



# TSMC Annual Report 2019 (I)



# TSMC Vision, Mission & Core Values

**Vision** Our vision is to be the most advanced and largest technology and foundry services provider to fabless companies and IDMs, and in partnership with them, to forge a powerful competitive force in the semiconductor industry.

To realize our vision, we must have a trinity of strengths:

1. be a technology leader, competitive with the leading IDMs
2. be the manufacturing leader
3. be the most reputable, service-oriented and maximum-total-benefits silicon foundry

**Mission** Our mission is to be the trusted technology and capacity provider of the global logic IC industry for years to come.

## Core Values

### Integrity

Integrity is our most basic and most important core value. We tell the truth. We believe the record of our accomplishments is the best proof of our merit. Hence, we do not brag. We do not make commitments lightly. Once we make a commitment, we devote ourselves completely to meeting that commitment. We compete to our fullest within the law, but we do not slander our competitors and we respect the intellectual property rights of others. With vendors, we maintain an objective, consistent, and impartial attitude. We do not tolerate any form of corrupt behavior or politicking. When selecting new employees, we place emphasis on the candidates' qualifications and character, not connections or access.

### Commitment

TSMC is committed to the welfare of customers, suppliers, employees, shareholders, and society. These stakeholders all contribute to TSMC's success, and TSMC is dedicated to serving their best interests. In return, TSMC hopes all these stakeholders will make a mutual commitment to the Company.

### Innovation

Innovation is the wellspring of TSMC's growth, and is a part of all aspects of our business, from strategic planning, marketing and management, to technology and manufacturing. At TSMC, innovation means more than new ideas, it means putting ideas into practice.

### Customer Trust

At TSMC, customers come first. Their success is our success, and we value their ability to compete as we value our own. We strive to build deep and enduring relationships with our customers, who trust and rely on us to be part of their success over the long term.

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# Letter to Shareholders

## Dear Shareholders,

2019 was a year of continued milestones for TSMC. We delivered a tenth consecutive year of record revenue even as we faced business headwinds from trade tensions between countries. Such tensions created greater uncertainty for our customers and impacted the end demand for products. Thanks to the strong demand coming to our industry-leading 7-nanometer (N7) technology, our revenue increased 1.3% year-over-year in US dollar terms in 2019, in contrast to the global semiconductor industry's 12% year-over-year decline.

In 2019, we witnessed an acceleration of the deployment of 5G networks and smartphones in several major markets around the world. We expect a faster worldwide penetration of 5G smartphones with higher silicon content over the next several years. The need for higher power efficiency, speed and more complex functionalities in 5G smartphones will lead to increasing use of TSMC's leading edge technologies. Therefore, we raised our 2019 capital spending to US\$14.9 billion in order to meet this increased demand. We will continue to anticipate the growth that will follow.

We continued to work on the fundamentals of our business in 2019 by improving our quality systems to provide better service to our customers, enriching our R&D infrastructures, strengthening our IT architecture and security, and accelerating our technology differentiation.

By working consistently to provide the foundry industry's most advanced technologies and to make it available to all the product innovators, TSMC continuously expands the pool of innovators who fuel the semiconductor industry growth.

In 2019, our N7, in its second year, continued to see strong adoption across a wide range of products, from mobile, high performance computing (HPC), Internet of Things (IoT) and automotive applications. Our new 7-nanometer Plus (N7+) technology also came to the world's first high volume production with Extreme Ultraviolet (EUV) lithography technology. Together, this 7-nanometer family, N7 and N7+, represented 27% of our total wafer revenue in 2019. Our 6-nanometer (N6) technology just entered risk production in the first quarter of 2020 and further extends our 7-nanometer family well into the future.

Our 5-nanometer (N5) technology, with extensive EUV adoption, will begin volume production in the first half of 2020. As the foundry industry's most advanced solution, N5 is further expanding our customer product portfolio and increase our addressable markets.

Our 3-nanometer (N3) technology will be another full node stride from our N5 and offer the foundry industry's best PPA technology when it is introduced.

Our proprietary wafer-level packaging solutions of InFO (Integrated Fan-Out) and CoWoS® (Chip on Wafer on Substrate) continue to see strong momentum. We are developing 3D chip stacking solutions, such as SoIC (System on Integrated Chip), to provide system level solutions for the industry.

Highlights of TSMC's accomplishments in 2019:

- Total wafer shipments were 10.1 million 12-inch equivalent wafers as compared to 10.8 million 12-inch equivalent wafers in 2018.
- Advanced technologies (16-nanometer and beyond) accounted for 50 percent of total wafer revenue, up from 41 percent in 2018.
- We deployed 272 distinct process technologies, and manufactured 10,761 products for 499 customers.
- TSMC's market share in the total semiconductor foundry segment increased to 52 percent in 2019 as compared to 51 percent in the previous year.

## 2019 Financial Performance

Consolidated revenue reached NT\$1,069.99 billion, an increase of 3.7 percent over NT\$1,031.47 billion in 2018. Net income was NT\$345.26 billion and diluted earnings per share were NT\$13.32. Both decreased 1.7 percent from the 2018 level of NT\$351.13 billion net income and NT\$13.54 diluted EPS.

TSMC generated net income of US\$11.18 billion on consolidated revenue of US\$34.63 billion, which decreased 4.0 percent and increased 1.3 percent respectively from the 2018 level of US\$11.64 billion net income and US\$34.20 billion consolidated revenue.

Gross profit margin was 46.0 percent compared with 48.3 percent in 2018, while operating profit margin was 34.8 percent compared with 37.2 percent a year earlier. Net profit margin was 32.3 percent, a decrease of 1.7 percentage points from 2018's 34.0 percent.

To implement an earlier profit distribution to our shareholders, TSMC transitioned from annual cash dividend to quarterly cash dividend in 2019, and further raised its total cash dividend payments to NT\$10.0 per share in 2019 from NT\$8.0 a year ago.

## Technological Developments

In 2019, we continued to increase our investment in R&D with a record US\$2.96 billion to meet our customer needs and to extend our technology leadership.

Our N5 reached risk production in 2019 and will begin volume production in the first half of 2020. N5 is expected to broaden our customer product portfolio and expand our addressable markets as customers seek to establish leadership positions for their products.

In its second year of ramp, N7 received more than 100 customer product tape-outs by the end of 2019, while N7+ began volume production with EUV. Our N6 is on track for volume production before the end of 2020. N6 provides a clear migration path for next wave N7 products.

Leveraging our leadership at 28-nanometer, our 22ULP (ultra-low power) and 22ULL (ultra-low leakage) technologies both began volume production in 2019. 22ULL supports IoT and wearable device applications while 22ULP supports image processing, digital TVs, set-top boxes and other consumer products. We also extended our 16-nanometer offerings with 12FFC+ and 16FFC+ in 2019 to support customer needs in ultra-low-power applications.

TSMC's advanced packaging solutions enable system integration with wafer level process, by seamless integration of front end wafer process and backend chip packaging. In 2019, we offered the 5<sup>th</sup> generation InFO solutions with finer interconnect line width and spacing to enable both mobile and high performance computing products. TSMC's CoWoS® continued to integrate with larger interposer size for heterogeneous integration. We also are developing TSMC-SoIC® (System-on-Integrated Chip), an industry-leading 3D chip stacking solution that enables multiple chips in close proximity to deliver the best system performance.

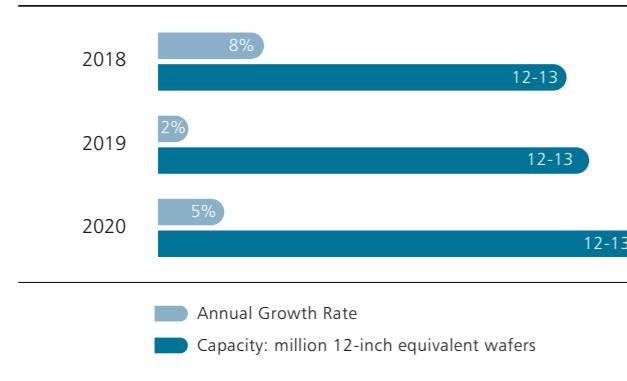
TSMC's ecosystem, Open Innovation Platform® (OIP), empowers our 499 distinct customers to unleash their innovations with fast time-to-market. In 2019, we continued to add partners to our OIP Cloud Alliance, which offers our customers to design in a safe and secure cloud environment. This cloud design environment significantly increases design productivity. We also worked with our ecosystem partners to expand our libraries and silicon IP portfolio to over 26,000 items in 2019. More than 10,600 technology files and over 360 process design kits, from 0.5-micron to 5-nanometer, are available to customers via TSMC-Online. We saw more than 100,000 customer downloads in 2019.

## Corporate Social Responsibility

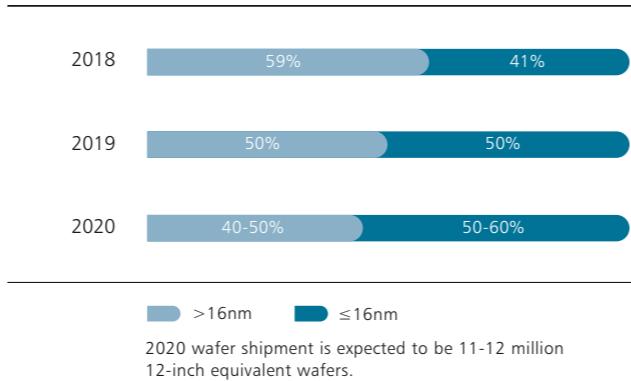
At TSMC, we are dedicated to sound corporate governance and pursue profitable growth. We also commit to the environment, society, and balancing the interests of all stakeholders. A sound corporate governance built upon our core values is the foundation of TSMC's corporate social responsibility. As an important member of the global semiconductor industry, we recognize it is our responsibility to face up to the increasingly challenging global environment and lead by example.

In 2019, we established the Corporate Social Responsibility Executive Committee, led by Chairman. The Executive Committee will work with senior management across many key functions and the existing CSR committee to set our CSR strategy, and align with UN Sustainable Development Goals. Our focuses are driving actions on green manufacturing, creating an inclusive workplace for talent development, building a responsible supply chain and caring for the underprivileged. We will work hard to fulfill our role to pursue a sustainable future.

## Capacity Plan



## Wafer Sales Plan



TSMC's dedicated foundry business model, open innovation platform and our four core values of Integrity, Commitment, Innovation and Customer Trust, are what enable us to be everyone's foundry. As we enter a new digital age, we will continue working closely with IC innovators around the world to create values and generate good returns to our shareholders. We are dedicated to sound corporate governance, fulfilling our responsibilities as a global corporate citizen and pursuing a sustainable future. We thank you for your trust and commitment to TSMC, and look forward to a prosperous future with our shareholders.

## Honors and Awards

TSMC received recognition for achievements in innovation, corporate governance, sustainability, investor relations, business information disclosure and overall excellence in management from organizations including *Forbes*, *Fortune Magazine*, *The Nikkei*, *CommonWealth Magazine*, PricewaterhouseCoopers, RobecoSAM (S&P Global) and the Taiwan Stock Exchange. In technology innovations, the Company was ranked 10<sup>th</sup> in the number of patents applications in the US Patent & Trademark Office, and ranked 1<sup>st</sup> in top 100 patent applicants in Taiwan. In sustainability, we were chosen once again as a component of the Dow Jones Sustainability Indices, becoming the only semiconductor company to be selected for 19 consecutive years. TSMC was also ranked 10<sup>th</sup> in *Corporate Knights* 2019 "Global 100 Most Sustainable Corporations in the World Ranking". Meanwhile, we remained a major component in both MSCI ESG and FTSE4Good Emerging Index. In investor relations, TSMC continued to receive multiple awards from *Institutional Investor Magazine*.

## Outlook

We believe the significant communication advancement brought by 5G networks will unlock new usage models across many different types of connected end devices, and drive exponential growth of data. Together with the continuous innovations in algorithms, a smarter and more intelligent society emerges. Digital computation now becomes increasingly ubiquitous and demands massive computation power. Therefore we expect the development of 5G-related and HPC applications will drive strong demand for our advanced technologies in the next several years. With the most advanced technology and capacity, and the widest coverage of customers, TSMC is well-positioned to lead the industry to capture the growth.

Macroeconomic uncertainties over trade tensions between countries continued in 2020. TSMC will remain agile and work on the fundamentals of our business and further accelerate our technology differentiation. We will be everyone's foundry and treat all customers equally and fairly. We will fiercely protect our intellectual property. We will conduct our business with the utmost integrity and uphold our Trinity of Strengths of technology leadership, manufacturing excellence and customers' trust.



Mark Liu

Chairman

C.C. Wei

Chief Executive Officer



# Company Profile

## 2.1 An Introduction to TSMC

Established in 1987 and headquartered in Hsinchu Science Park, Taiwan, TSMC pioneered the pure-play foundry business model with an exclusive focus on manufacturing customers' products. By choosing not to design, manufacture or market any semiconductor products under its own name, the Company ensures that it never competes with its customers. And so, the key to TSMC's success has always been to enable its customers' success. TSMC's foundry business model has enabled the rise of the global fabless industry, and TSMC is now the world's largest semiconductor foundry, manufacturing 10,761 different products using 272 distinct technologies for 499 different customers in 2019.

TSMC-manufactured semiconductors serve a global customer base that is large and diverse and includes a wide range of applications in the computer, communications, consumer, and industrial/standard segments. These products are used in a variety of end markets including mobile devices, high performance computing, automotive electronics and the Internet of Things (IoT). Strong diversification helps to smooth fluctuations in demand, which in turn helps TSMC maintain higher levels of capacity utilization and profitability, and generate healthy returns for future investment.

The annual capacity of the manufacturing facilities managed by TSMC and its subsidiaries exceeded 12 million 12-inch equivalent wafers in 2019. These facilities include three 12-inch wafer GIGAFAB® fabs, four 8-inch wafer fabs, and one 6-inch wafer fab – all in Taiwan – as well as one 12-inch wafer fab at a wholly owned subsidiary, TSMC Nanjing Company Limited, and two 8-inch wafer fabs at wholly owned subsidiaries, WaferTech in the United States and TSMC China Company Limited.

TSMC provides customer service, account management and engineering services through offices in North America, Europe, Japan, China, and South Korea. At the end of 2019, the Company and its subsidiaries employed more than 51,000 people worldwide.

The Company is listed on the Taiwan Stock Exchange (TWSE) under ticker number 2330, and its American Depository Shares (ADSs) are traded on the New York Stock Exchange (NYSE) under the symbol TSM.

## 2.2 Market/Business Summary

### 2.2.1 TSMC Achievements

In 2019, TSMC maintained its leading position in the foundry segment of the global semiconductor industry, with an estimated market share of 52%, despite ongoing intense competition from both established players and relatively new entrants to the business.

The Company's strong market position stems in great part from its leadership in advanced process technologies. In 2019, 50% of TSMC's wafer revenue came from advanced manufacturing processes – defined as geometries of 16nm and smaller – up from 41% in 2018.

TSMC offers the foundry segment's broadest technology portfolio and continues to invest in advanced and specialty technologies to provide customers more added value. This is a differentiating competitive advantage for TSMC.

In 2019, the Company developed or introduced the following:

#### Logic Technology

- 5nm Fin Field-Effect Transistor (FinFET) (N5) technology is TSMC's newest offering. This world-leading technology received multiple customer product tape-outs in 2019, including mobile and high performance computing products. Volume production of N5 technology is expected in the first half of 2020. Compared to 7nm FinFET (N7) technology, N5 technology offers about 15% speed improvement or about 30% power reduction. In addition, it is optimized upfront for both mobile and high performance computing applications.
- 5nm FinFET Plus (N5P) technology is a performance-enhanced version of N5 technology with same design rules. N5P technology provides about 20% faster speed than N7 technology or about 40% power reduction. Design kits of N5P technology will be available in the next N5 revision in the second quarter of 2020.

- 6nm FinFET (N6) technology successfully completed product yield verification in 2019. Thanks to mask layer reduction achieved through extreme ultraviolet (EUV) lithography technology, N6 technology could achieve better yield and shorten production cycles compared to N7 technology in the manufacture of the same products. In addition, N6 technology delivers about 18% higher logic transistor density than 7nm technology. This, along with higher yield due to mask layer reduction, can help customers get more good dies per wafer. Also, since its design rules are compatible with N7 technology, N6 technology can significantly reduce customers' product design cycle time and time-to-market. Risk production of N6 technology started in the first quarter of 2020 with volume production planned before the end of 2020.
- N7 technology is one of TSMC's fastest technologies in volume production, and provides optimized manufacturing processes for both mobile computing applications and high performance computing components. N7 received a total of more than 100 customer product tape-outs by the end of 2019, covering a wide range of applications, including mobile devices, game consoles, artificial intelligence (AI), central processing units, graphics processors, and network connected devices. In addition, 7nm FinFET plus (N7+) technology entered full-scale production in 2019 and delivered customer products to market in high volume. N7+ technology is the first commercially available EUV-enabled foundry process technology in the world. Its success is a testament to TSMC's world-leading capabilities in EUV volume production and paves a solid foundation for N6 and more advanced technologies.
- 12nm FinFET compact plus technology (12FFC+) and 16nm FinFET compact plus technology (16FFC+) comprise TSMC's latest 16nm/12nm family of offerings following 16nm FinFET plus technology (16FF+), 16nm FinFET compact technology (16FFC) and 12nm FinFET compact technology (12FFC). 12FFC+ and 16FFC+, which entered risk production in 2019, drive product performance and power consumption to the best levels among all the foundry's 16/14nm technologies. 16FF+ is aimed at high performance product applications, including mobile devices, servers, graphics and cryptocurrency. All 12FFC+, 12FFC, 16FFC+ and 16FFC technologies can support customer needs in mainstream and ultra-low power (ULP) product applications, including low-end to mid-range

mobile phones, consumer electronics, digital TVs and the Internet of Things (IoT). So far, 12FFC+, 12FFC, 16FFC+, 16FFC and 16FF+ have received a total of more than 500 customer product tape-outs, most of which have been first-time silicon successes.

- 22nm ultra-low leakage (ULL) (22ULL) technology began volume production in 2019 to support IoT and wearable devices applications. In addition, 22ULL low Vdd (low operating voltage) solutions were ready in 2019. Compared to 40ULP and 55ULP technologies, 22ULL technology offers new ULL device, ULL SRAM (static random access memory), and low Vdd solutions to significantly lower power consumption.
- 22nm ULP (22ULP) technology was developed based on TSMC's industry-leading 28nm technology and started volume production in 2019. Compared to 28nm high performance compact plus (28HPC+) technology, 22ULP provides 10% area reduction with 10% speed gain, or 20% power reduction for many applications including image processing, digital TVs, set-top boxes, smartphones and consumer products.
- 28HPC+ technology accumulated more than 300 customer product tape-outs by the end of 2019. 28HPC+ technology provides further performance enhancement or power reduction in mainstream smartphone, digital TV, storage, audio and SoC (System-on-Chip) applications. Compared to 28HPC technology, 28HPC+ technology improves performance by about 15% or reduces leakage by about 50%.
- 40nm ULP (40ULP) technologies received a total of over 100 product tape-outs by the end of 2019. These technologies support a variety of IoT and wearable devices applications, including wireless connectivity, wearable application processors and micro control units (MCUs). In addition, TSMC uses its leading 40ULP low Vdd technology to offer low energy consumption solutions for IoT devices and wearable connected devices. Development of new, enhanced analog devices is progressing well, which will enrich the 40ULP platform to support customers for broader analog design needs in the future.
- 55nm ultra-low power (55ULP) technology received a total of over 70 customer tape-outs by the end of 2019. Compared to 55nm low power (55LP) technology, 55ULP can significantly increase battery life for IoT applications. In addition, it integrates RF (radio frequency) and eFlash (embedded flash) to simplify customers' SoC designs.

### Specialty Technology

- 16FF+ technology has begun production for customer applications in the automotive industry since 2017. 16FFC foundation IPs (intellectual properties) passed the Automotive Electronic Council AEC-Q100 Grade-1 qualification and were certified for functional safety standard ISO 26262 ASIL-B. In addition, TSMC 9000A was introduced for automotive IP management to complete the automotive ecosystem with third party IP vendors. TSMC continues to develop more 7nm automotive foundation IPs, which completed AEC-Q100 Grade-2 qualification in the first quarter of 2020.
- 16FFC RF led the foundry to start volume production of the fifth generation (5G) mobile network chips for customers in the first half of 2018. This technology has been extended to the next generation wireless local area network (WLAN) 802.11ax and Millimeter Wave (mmWave) applications, as well as to wireless connectivity applications such as smartphones using the 5G mobile network. Continuing to advance 16FFC RF technology, in 2019 TSMC not only delivered the world's first FinFET device whose  $f_T$  (cut-off frequency) can reach  $>300\text{GHz}$  but also completed the development of the world's first and best FinFET device whose  $f_{max}$  can reach  $>400\text{GHz}$ . This high-performance and cost-effective technology will be used in many applications such as radar sensing and AR/VR to reduce chip power consumption and die size and to enable SoC designs.
- 22ULL RF technology extended its support for wireless LAN power amplifier devices and ultra-low leakage devices in 2019, in addition to magnetic random access memory (MRAM), resistive random access memory (RRAM) and high  $f_T$  devices. This further supports chip development for 5G mmWave mobile communication and IoT applications.
- 22ULL embedded RRAM technology started risk production in 2019 and is expected to complete IP reliability qualification in 2020. This technology can support various applications such as IoT MCUs and AI memory devices.
- 22ULL embedded magnetic random access memory (MRAM) technology IPs are expected to complete reliability qualification in 2020. In addition, 16nm MRAM is under development and is progressing well. MRAM technology provides a competitive migration path for eFlash replacement of high reliability MCUs, including AEC-Q100 Grade-1 applications.
- 28HPC+ RF technology led the foundry segment to deliver the first RF process design kit (PDK) in 2018, providing support for 110GHz mmWave, 150°C automotive grade and so on for 5G mmWave RF and automotive radar product designs. In 2019, 28HPC+RF technology extended its support for ultra-low leakage devices and embedded flash. Customer products of 5G mmWave RF and automotive radar are already in volume production.
- 28nm ULL eFlash technology completed AEC-Q100 Grade-1 reliability qualification in 2019. TSMC continues to enhance this technology, which is expected to meet more stringent AEC-Q100 Grade-0 requirements in 2020.
- 40ULP eFlash technology received over 40 product tape-outs by the end of 2019, including MCUs, wireless MCUs and security elements. 40ULP eFlash technology also offered a low Vdd option, which provides low energy consumption solutions for IoT devices and wearable connected devices.
- 40ULP embedded RRAM technology IPs completed reliability qualification in 2019. This technology is fully CMOS (Complementary Metal Oxide Semiconductor) logic compatible for PDK and IP re-use for applications including wireless MCU, IoT and wearable devices.
- 40ULP analog platform was further enhanced for reduced noise, improved mismatch and lower leakage devices and so on. Complete design documents are expected to be ready in 2020. This enhanced 40ULP analog platform is fully logic compatible and supports analog designs that require high precision analog performance along with low power consumption.
- 12-inch 0.13 $\mu\text{m}$  Bipolar-CMOS-DMOS (BCD) plus technology, which began production in 2017, saw significant wafer shipment growth in both 2018 and 2019. Compared to the previous 0.13 $\mu\text{m}$  BCD technology, this technology provides continuous performance improvement and features enhancement for power management applications in high-end smartphones.
- 0.18 $\mu\text{m}$  BCD third generation passed AEC-Q100 Grade-1 qualification in 2018, and went on to meet AEC-Q100 Grade-0 qualification in 2019. This technology provides superior cost competitiveness compared to the second generation BCD.

- Gallium nitride (GaN) on silicon technology was further enhanced to integrate GaN power switches with drivers in both 650V and 100V platforms, as well as improve reliability to support customer designs for higher power density and efficiency solutions for various market applications. Both 650V and 100V GaN IC technology platforms are expected to be ready in 2020.
- Organic light-emitting diode (OLED) on silicon panel technology increases pixel density by five to ten times compared to the traditional OLED on glass technology and can support the growing demand for high-quality AR/VR (augmented reality / virtual reality) goggles. In working with customers, TSMC successfully demonstrated this technology on both 8-inch and 12-inch high voltage (HV) technologies, which paves the way for AR/VR suppliers to develop next generation goggles for various industrial, medical and consumer electronics applications.
- As machine vision is quickly deployed in many security, automotive, home, and mobile communication applications, TSMC offers the next generation global shutter CMOS image sensor (CIS) and enhanced near infrared (NIR) CIS technologies, making machine vision systems safer, smaller, and consume less power.
- TSMC successfully supported customer to deliver the world's smallest CMOS-MEMS (micro-electromechanical systems) monolithic accelerometer in chip scale packaging (CSP) format, smaller than 1mm<sup>2</sup> in size. This small footprint can help reduce the size and weight of many IoT and wearable devices.

#### **Advanced Packaging Technology**

- Successfully developed InFO-PoP (Integrated Fan-Out Package-on-Package) technology which integrates 7nm SoC (System-on-Chip) and DRAM (dynamic random access memory) for advanced mobile device applications and delivered several customer products to market in high volume in 2019.
- CoWoS® (Chip on Wafer on Substrate) technology that heterogeneously integrates multiple 7nm SoC chips and the second generation high bandwidth memory (HBM2) on 2-reticle size silicon interposer successfully completed qualification in the third quarter of 2019 for high performance computing applications.
- In addition to CoWoS®, InFO\_oS (Integrated Fan-Out on Substrate) technology integrating multiple 7nm SoC chips began volume production in 2019.
- Fine pitch copper (Cu) bump technology for flip chip packaging on 5nm silicon successfully completed qualification in 2019 for both advanced mobile device and high performance computing applications.

- Successfully developed 16nm silicon in wafer level chip scale packaging (WLCSP) technology and delivered customer products to market in high volume in 2019 for IoT and high-end smartphone applications.

#### **2.2.2 Market Overview**

TSMC estimates that the worldwide semiconductor market excluding memory was US\$327 billion in revenue in 2019, representing a 2% decline from 2018. In the foundry segment of the semiconductor industry, total revenue was US\$67 billion in 2019, flat from 2018.

#### **2.2.3 Industry Outlook, Opportunities and Threats**

##### **Industry Demand and Supply Outlook**

TSMC's back-to-back years of growth in the foundry segment was driven by relatively healthy market demand. However, for 2020, the COVID-19 pandemic brings about uncertainty on both supply and demand of the total semiconductor industry. Considering the potential impacts, TSMC forecasts the total semiconductor market excluding memory to be flat or slightly decline. Over the longer term, however, fueled by increasing semiconductor content in electronic devices, continuing market share gains by fabless companies, gradual increases in integrated device manufacturer (IDM) outsourcing, and expanding in-house application-specific integrated circuits (ASIC) from systems companies, the Company expects its foundry segment revenue to outpace the mid-single digit compound annual growth rate projected for the overall semiconductor market excluding memory from 2019 through 2024.

As an upstream supplier in the semiconductor supply chain, the foundry segment is tightly correlated with the market health of the major platforms, including smartphone, high performance computing (HPC), Internet of Things (IoT), automotive, and digital consumer electronics (DCE).

##### **Smartphone**

Smartphone unit shipments, which were down for the first time in their history in 2018, by 4%, declined again in 2019, by 2%, reflecting established high penetration in many developed countries and China. For 2020, with 5G commercialization accelerating, new 5G smartphones will likely shorten the overall replacement cycle. However, COVID-19 pandemic may delay smartphone replacement. As a result, TSMC projects a high-single digit decline for smartphone market in 2020. Over the longer term, migration to 5G, together with improved performance, longer battery life, biosensors and more AI features, will all continue to propel new smartphone sales going forward.

Low-power IC is an essential requirement among handset manufacturers, and SoC design, in which TSMC is already the leader, is the preferred solution due to its optimized cost, power and form factor (device footprint and thickness) potential. The migration to advanced process technologies will continue to accelerate, spurred by the appetite for higher performance to run AI applications, various complex software routines and higher resolution video.

##### **High Performance Computing (HPC)**

The HPC platform includes PC, Tablets, Server, Base Station, Game Console etc. Major HPC unit shipment fell by 4% in 2019, mainly due to prolonged replacement cycle of consumer PC, lower enterprise Server demand, and current generation Game Console entering tail of product life cycle; while partially offset by 5G Base Station deployment and growing business PC demand.

The HPC is projected to have a mid-single digit unit decline in 2020, impacted by COVID-19. Nevertheless, several factors are expected to drive demand in HPC platform, including continually 5G Base Station deployment, rising Data Center AI Server demand, and next generation Game Console launching etc. All these require higher performance and power-efficient CPUs, GPUs, NPUs, AI Accelerators, and related-ASICs, which will drive the overall HPC platform towards richer silicon content and more advanced process technologies.

##### **Internet of Things (IoT)**

Internet of Things (IoT) platform includes various kinds of connected devices, such as smart wearable, smart speaker, and surveillance system, etc. The IoT unit shipments grew 25% in 2019, with Bluetooth earphone, smart watch, and smart speaker as the major growth drivers.

Looking into 2020, despite impacted by COVID-19, the IoT unit shipments will grow mid-teens, thanks to continued growth momentum of Bluetooth earphone, smart watch, and smart speaker, and continued development of various applications. By adding more AI functions, the IoT devices will drive more demand for more powerful yet lower power controllers, connectivity IC and sensors. TSMC offers high-performance yet low-power process technologies to enable customers' competitiveness for winning the market.

##### **Automotive**

The car unit sales fell 5% in 2019, because of the softened global economies. It is projected to decline again at low-teens in 2020 due to COVID-19 pandemic and continued macro uncertainty.

Moving forward, TSMC expects richer semiconductor content requirement driven by EV (electrical vehicle), ADAS (Advanced Driver Assistance System) and Infotainment system to fuel the demand for Processors, Sensors, Analog and Power ICs. TSMC offers various kinds of automotive process technologies to help customers winning the automotive market.

##### **Digital Consumer Electronics (DCE)**

The DCE unit shipments fell 7% in 2019. TVs and set-top boxes declined due to worldwide economic uncertainties, while MP3 players, digital cameras continued to be cannibalized by smartphones.

A continued drop in DCE is expected in 2020. Certain sub-segments such as 4K and 8K (UHD) TVs should achieve positive growth within the sector. In addition, AI functions such as picture quality improvement and voice control have continuously been incorporated in TVs. With its broad array of advanced technology offerings, TSMC expects to take advantage of these market trends.

##### **Supply Chain**

The electronics industry features a long and complex supply chain, the elements of which are correlated but highly interdependent. At the upstream manufacturing level, IC vendors need to have sufficient and flexible supply deliveries to handle fluctuating demand dynamics. Foundry vendors play an important role to ensure the health and effectiveness of the supply chain. As a leader in the foundry segment, TSMC provides advanced technologies and large-scale capacity to complement the innovations created in the downstream chain.

## 2.2.4 TSMC Position, Differentiation and Strategy

### Position

TSMC is the worldwide semiconductor foundry leader for advanced, specialty and advanced packaging technologies, commanding a 52% market share in 2019. Net revenue by geography, based mainly on the country in which customers are headquartered, was: 60% from North America; 9% from the Asia Pacific region, excluding China and Japan; 20% from China; 6% from Europe, the Middle East and Africa; and 5% from Japan. Net revenue by platform was: 49% from the smartphone; 30% from the high performance computing (HPC); 8% from the Internet of Things (IoT); 4% from automotive. In addition, 5% was from digital consumer electronics; and 4% from others.

### Differentiation

TSMC's leadership position is based on three defining competitive strengths and a business strategy rooted in the Company's heritage. The Company distinguishes itself from the competition through its technology leadership, manufacturing excellence and customers' trust.

As a technology leader, TSMC is consistently first among dedicated foundries to provide next generation, leading-edge technologies. The Company also maintains a leadership position in more mature technologies by applying the lessons learned in leading-edge technology development to enrich its specialty technologies. Beyond process technology, TSMC has established frontend and backend integration capabilities to create the optimum power/performance/area "sweet spot" to help customer achieve faster time-to-production.

Well known for industry-leading manufacturing management capabilities, TSMC extends that leadership through its Open Innovation Platform® and Grand Alliance initiatives. The Open Innovation Platform® initiative quickens the pace of innovation in the semiconductor design community and among its ecosystem partners, as well as in the Company's own IP, design implementation and design for manufacturing capabilities, process technology and backend services. A key element is a set of ecosystem interfaces and collaborative components initiated and supported by the Company that more efficiently empower innovation throughout the supply chain and drive the creation and sharing of new revenue and profits. The TSMC Grand Alliance is one of the most powerful forces for innovation in the semiconductor industry, bringing together customers, electronic design automation (EDA) partners, IP partners, and key equipment and material suppliers at a new, higher level of collaboration. Its objective is to help customers, alliance members and TSMC win business and increase competitiveness.

The foundation for customer trust is a commitment TSMC made when it opened for business in 1987 to never compete with its customers. As a result, TSMC has never owned or marketed a single semiconductor product, but instead has focused all of its resources on becoming the trusted foundry for its customers.

### Strategy

TSMC is confident that its differentiating strengths will enable it to prosper from the foundry segment's many attractive growth opportunities. In light of the rapid growth in four major markets, namely smartphone, high performance computing, the Internet of Things, and automotive electronics, and the fact that focus of customer demand is shifting from process-technology-centric to product-application-centric, TSMC has constructed four corresponding technology platforms to provide customers with the most comprehensive and competitive logic process technologies, specialty technologies, IPs and packaging and testing technologies to shorten customers' time-to-design and time-to-market. These platforms are:

**Smartphone:** TSMC offers leading process technologies such as 5nm FinFET, 6nm FinFET, 7nm FinFET Plus, and 7nm FinFET logic process technologies, as well as comprehensive IPs for premium product applications to further enhance chip performance, reduce power consumption, and decrease chip size. For mainstream product applications, TSMC offers leading process technologies such as 12nm FinFET compact (12FFC), 16nm FinFET compact (16FFC), 28nm high performance compact (28HPC), 28nm high performance mobile compact plus (28HPC+), and 22nm ultra-low power (22ULP) logic process technologies, in addition to comprehensive IPs, to satisfy customer needs for high performance and low power chips.

Furthermore, for premium, high-, mid- and low-end product applications, the Company also offers the most competitive, leading-edge specialty technologies, including RF, embedded flash memory, emerging memory technologies, power management, sensors, and display chips as well as advanced packaging technologies such as industry-leading Integrated Fan-Out (InFO) technology.

**High Performance Computing:** TSMC provides customers with leading process technologies such as 5nm FinFET, 6nm FinFET, 7nm FinFET and 12/16nm FinFET, as well as comprehensive IPs including high-speed interconnect IPs, to meet customers' high performance computing and communication requirements. The Company also offers multiple advanced packaging technologies such as CoWoS®, InFO, and 3D IC to enable homogeneous and heterogeneous chip integration to meet customers' performance, power, and system footprint requirements. TSMC will continue to

optimize its high performance computing platform offerings to help customers capture market growth driven by data explosion and application innovation.

**Internet of Things:** TSMC provides leading, comprehensive, and highly integrated ultra-low power (ULP) technology platform to support innovations for IoT and wearable applications. The Company's leading offerings, including 55nm ULP, 40nm ULP, 28nm ULP, and 22nm ULP/Ultra-low leakage (ULL), have been widely adopted by various IoT and wearable applications. TSMC has also extended its low Vdd (low operating voltage) offerings for extreme low-power applications. To support the ever-increasing demand in IoT edge computing and wireless connectivity, TSMC also offers the most competitive and comprehensive leading-edge specialty technologies in RF, enhanced analog devices, embedded flash memory, emerging memory, sensors and display chips, as well as multiple advanced packaging technologies including leading InFO technology.

**Automotive electronics:** TSMC offers leading automotive technologies to support the three megatrends – safer, smarter and greener – in the automotive industry. The Company is also the industry leader in providing a robust automotive IP ecosystem, which covers 16nm FinFET first and extends to 7nm FinFET and 5nm FinFET, for advanced driver-assistance systems (ADAS) and advanced in-vehicle infotainment (IVI), the two most computationally demanding systems in the automotive industry. In addition to its advanced logic platform, TSMC offers broad and competitive specialty technologies, including 28nm embedded flash memory, 28nm, 22nm, and 16nm mmWave RF, high sensitivity CMOS Image/LiDAR (light detection and ranging) sensors, and power management ICs. Magnetic random access memory (MRAM), an emerging technology, is being developed with good progress to meet automotive Grade-1 requirements. All these automotive technologies are applied to TSMC's automotive process qualification standards based on AEC-Q100 standards.

TSMC continually strengthens its core competitiveness and deploys both short-term and long-term plans for technology and business development and assists customers in taking on the challenges of short product cycles and intense competition in the electronic products market to meet ROI and growth objectives.

### • Short-Term Semiconductor Business Development Plan

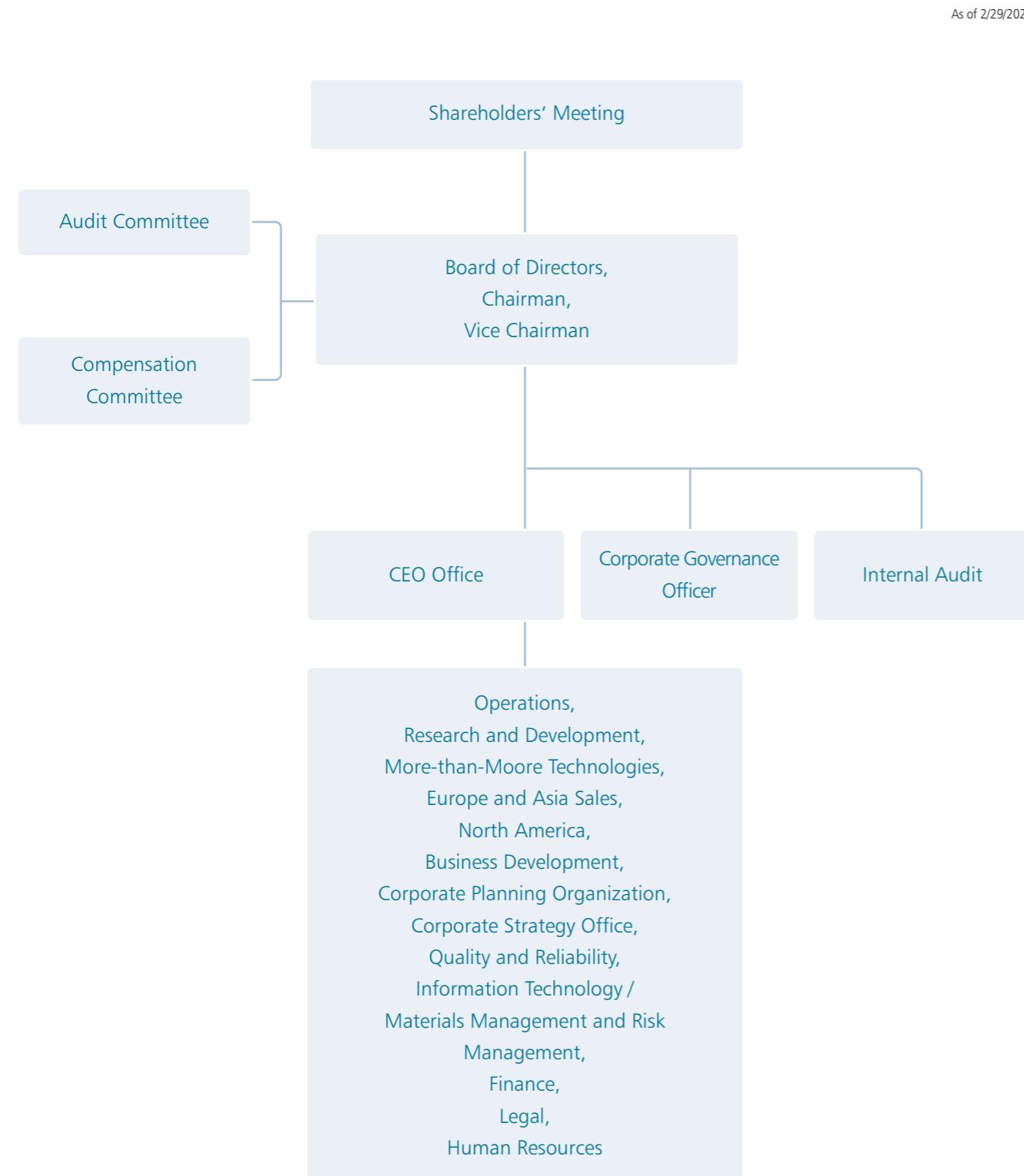
1. Substantially ramp up the business and sustain advanced technology market share by continued increasing capacity and R&D investments.
2. Maintain mainstream technology market share by expanding business to new customers and market segments.
3. Continue to enhance the competitive advantages of the Company's platforms in smartphone, high performance computing, IoT, and automotive electronics design ecosystems so as to expand TSMC's dedicated foundry services in these product applications.
4. Further expand TSMC's business and service infrastructure into emerging and developing markets.

### • Long-Term Semiconductor Business Development Plan

1. Continue developing leading-edge technologies at a pace consistent with the Moore's Law.
2. Broaden specialty business contributions by further developing derivative technologies.
3. Provide more integrated services, covering system-level integration design, design technology definition, design tool preparation, wafer processing, and backend services, all of which deliver more value to customers through optimized solutions.

## 2.3 Organization

### 2.3.1 Organization Chart



### 2.3.2 Major Corporate Functions

#### Operations

- Operations including all fabs in Taiwan and overseas, and manufacturing technology development; product development, advanced packaging technology development, production and service integration, and support and service for customers in Asia, Europe, and North America

#### Research and Development

- Advanced technology development, exploratory research, as well as design and technology platform development

#### More-than-Moore Technologies

- Specialty technology development

#### Europe and Asia Sales

- Sales and market development, technical marketing, field technical support and service, and business operations for customers in Europe and Asia, including China, Japan, Korea and Taiwan

#### North America

- Sales and market development, field technical solutions and business operations for customers in North America

#### Business Development

- Identification of market directions and new applications that shape the technology roadmap and portfolios for the Company. It also provides key support in strengthening customer relationships along with Company branding management

#### Corporate Planning Organization

- Planning for operation resources, as well as for production and demand; the integration of business processes, corporate pricing, market analysis and forecasting

#### Corporate Strategy Office

- Corporate strategy formation and implementation

#### Quality and Reliability

- Assurance of the quality and reliability of the Company's products by resolving reliability issues at new technology development stage; improving and managing product quality at production stage; providing solutions to resolve customers' quality related issues; and providing services for advanced materials and failure analysis

#### Information Technology / Corporate Information Security

- Integration of the Company's technology and business IT systems; infrastructure development; communication services and assurance of IT security and service quality; enabling the application of big data and machine learning to improve the Company's productivity and accelerate R&D delivery

#### Materials Management and Risk Management

- Procurement, warehousing, import and export, and logistics support; also environmental protection, industrial safety, occupational health and risk management

#### Internal Audit

- Inspection and review of the Company's internal control system, its adequacy in design and effectiveness in operation, with independent risk assessment to ensure compliance with the Company's policies and procedures as well as with external regulations

#### Finance and Spokesperson

- Corporate finance, accounting and corporate communications; with the head of the organization also serving as the Company spokesperson

#### Legal

- Corporate legal affairs including regulatory compliance, commercial transactions, patents and management of other intellectual properties, litigation, etc.

#### Human Resources

- Personnel management, organizational development, physical security management, employee services and wellness management

## 2.4 Board Members

### 2.4.1 Information Regarding Board Members

As of 02/29/2020

Title/Name (Note 1)	Gender	Nationality or Place of registration	Date Elected	Term Expires	Date First Elected	Shares Held When Elected		Shares Currently Held		Shares Currently Held by Spouse & Minors		Selected Education, Past Positions & Current Positions at Non-profit Organizations	Selected Current Positions at TSMC and Other Companies
						Shares	%	Shares	%	Shares	%		
Chairman Mark Liu	Male	U.S.	06/05/2018	06/04/2021	06/08/2017	12,913,114	0.05%	12,913,114	0.05%	-	-	Bachelor Degree in Electrical Engineering, National Taiwan University Master Degree and Ph.D. in Electrical Engineering & Computer Science, University of California, Berkeley  Former President, Worldwide Semiconductor Manufacturing Corp. Former Senior Vice President, Advanced Technology Business, TSMC Former Senior Vice President, Operations, TSMC Former Executive Vice President and Co-Chief Operating Officer, TSMC Former President and Co-CEO, TSMC  Chairman, Taiwan Semiconductor Industry Association (TSIA)	None
Vice Chairman C.C. Wei	Male	R.O.C.	06/05/2018	06/04/2021	06/08/2017	7,179,207	0.03%	7,179,207	0.03%	261	0.00%	Bachelor and Master Degrees in Electrical Engineering, National Chiao Tung University Ph.D. in Electrical Engineering, Yale University  Former Senior Vice President, Chartered Semiconductor Manufacturing Ltd. Former Senior Vice President, Mainstream Technology Business, TSMC Former Senior Vice President, Business Development, TSMC Former Executive Vice President and Co-Chief Operating Officer, TSMC Former President and Co-CEO, TSMC  Director, TSMC Charity Foundation	CEO, TSMC
Director F.C. Tseng	Male	R.O.C.	06/05/2018	06/04/2021	05/13/1997	34,472,675	0.13%	34,472,675	0.13%	132,855	0.00%	Bachelor Degree in Electrical Engineering, National Chengkung University Master Degree in Electrical Engineering, National Chiao Tung University Ph.D. in Electrical Engineering, National Chengkung University Honorary Ph.D., National Chiao Tung University Honorary Ph.D., National Tsing Hua University  Former President, Vanguard International Semiconductor Corp. Former President, TSMC Former Deputy CEO, TSMC Former Vice Chairman, TSMC Former Director, National Culture and Arts Foundation, R.O.C.  Chairman, TSMC Education and Culture Foundation Director, Cloud Gate Culture and Arts Foundation	Chairman of: - TSMC China Company Ltd. (a nonpublic company) - Global UniChip Corp. Vice Chairman, Vanguard International Semiconductor Corp. Independent Director, Chairman of Audit Committee & Compensation Committee member, Acer Inc.
Director National Development Fund, Executive Yuan (Note 1) Representative: Mei-ling Chen	Female	R.O.C.	06/05/2018	06/04/2021	12/10/1986 11/07/2017 (Note 2)	1,653,709,980	6.38%	1,653,709,980	6.38%	-	-	LL.B., National Chengchi University LL.M., National Taiwan University LL.D., National Chengchi University  Former Director General, Department of Legal Affairs, Ministry of Justice, R.O.C. Former Chairperson of Legal Affairs Committee & concurrently Chairperson of Petitions and Appeals Committee, Executive Yuan, R.O.C. Former Deputy Secretary-General, Executive Yuan, R.O.C. Former Secretary-General, Tainan City Government, R.O.C. Former Secretary-General, Executive Yuan, R.O.C.  Former Associate Professor, Department of Law, Chinese Culture University Minister without Portfolio, Executive Yuan & concurrently Minister, National Development Council, R.O.C.	None

(Continued)

Title/Name (Note 1)	Gender	Nationality or Place of registration	Date Elected	Term Expires	Date First Elected	Shares Held When Elected		Shares Currently Held		Shares Currently Held by Spouse & Minors		Selected Education, Past Positions & Current Positions at Non-profit Organizations	Selected Current Positions at TSMC and Other Companies
						Shares	%	Shares	%	Shares	%		
Independent Director Sir Peter L. Bonfield	Male	UK	06/05/2018	06/04/2021	05/07/2002	-	-	-	-	-	-	Bachelor and Honours Degrees in Engineering, Loughborough University  Former Chairman and CEO, ICL Plc Former CEO and Chairman of the Executive Committee, British Telecommunications Plc Former Vice President, the British Quality Foundation Former Director, Mentor Graphics Corp., U.S. Former Director, Sony Corp., Japan Former Director, L.M. Ericsson, Sweden Former Chairman, GlobalLogic Inc., U.S. (a nonpublic company) Former Senior Advisor to Hampton Group, London  Fellow of the Royal Academy of Engineering Chair of Council and Senior Pro-Chancellor, Loughborough University, UK Board Member, EastWest Institute, New York	Chairman, NXP Semiconductors N.V., the Netherlands Member, The Longreach Group Advisory Board, HK Board Mentor, CMI, UK Senior Advisor to Alix Partners, London
Independent Director Stan Shih	Male	R.O.C.	06/05/2018	06/04/2021	04/14/2000	1,480,286	0.01%	1,480,286	0.01%	16,116	0.00%	BSEE & MSEE, National Chiao Tung University Honorary EE Ph.D., National Chiao Tung University Honorary Doctor of Technology, The Hong Kong Polytechnic University Honorary Fellowship, University of Wales, Cardiff, UK Honorary Doctor of International Law, Thunderbird, American Graduate School of International Management, U.S.  Co-Founder, Chairman Emeritus, Acer Group Former Chairman & CEO, Acer Group Former Director, Qisda Corp. Former Director, Wistron Corp. Former Chairman, National Culture and Arts Foundation, R.O.C.  Director, Public Television Service Foundation, R.O.C. Council member of Asian Corporate Governance Associate (ACGA) Chairman, StanShih Foundation Chairman, Cloud Gate Culture and Arts Foundation	Director & Honorary Chairman, Acer Inc. Chairman, CT Ambi Investment and Consulting Inc. (a nonpublic company) Director of: - Egis Technology Inc. - Nan Shan Life Insurance Co., Ltd. (a non-listed company) - Chinese Television System Inc. (a non-listed company) - Digitimes Inc. (a nonpublic company)
Independent Director Kok-Choo Chen	Female	R.O.C.	06/05/2018	06/04/2021	06/09/2011	-	-	-	-	5,120	0.00%	Inns of Court School of Law, England Barrister-at-law, England Advocate & Solicitor, Singapore Attorney-at-law, California, U.S.  Lawyer, Tan, Rajah & Cheah, Singapore, 1969-1970 Lawyer, Sullivan & Cromwell, New York, U.S., 1971-1974 Lawyer, Heller, Erhman, White & McAuliffe, San Francisco, California, U.S., 1974-1975 Partner, Ding & Ding Law Offices, Taiwan, 1975-1988 Partner, Chen & Associates Law Offices, Taiwan, 1988-1992 Vice President, Echo Publishing, Taiwan, 1992-1995 President, National Culture and Arts Foundation, R.O.C., 1995-1997 Senior Vice-President & General Counsel, TSMC, 1997-2001 Founder & Executive Director of Taipei Story House, 2003-2015 Advisor, Executive Yuan, R.O.C., 2009-2016 Director, National Culture and Arts Foundation, R.O.C., 2011-2016 Chairman, National Performing Arts Center, 2014-2017  Lecturer, Nanyang University, Singapore, 1970-1971 Associate Professor, Soochow University, 1981-1998 Chair Professor, National Tsing Hua University, 1999-2002 Professor, National Chengchi University, 2001-2004 Professor, Soochow University, 2001-2008  Founder and Executive Director, Museum207 Director, Republic of China Female Cancer Foundation	None

(Continued)

Title/Name (Note 1)	Gender	Nationality or Place of registration	Date Elected	Term Expires	Date First Elected	Shares Held When Elected		Shares Currently Held		Shares Currently Held by Spouse & Minors		Selected Education, Past Positions & Current Positions at Non-profit Organizations	Selected Current Positions at TSMC and Other Companies
						Shares	%	Shares	%	Shares	%		
Independent Director Michael R. Splinter	Male	U.S.	06/05/2018	06/04/2021	06/09/2015	-	-	-	-	-	-	Bachelor and Master Degrees in Electrical Engineering, University of Wisconsin Madison Honorary Ph. D in Engineering, University of Wisconsin Madison  Former Executive Vice President of Technology and Manufacturing group, Intel Corp. Former Executive Vice President of Sales and Marketing, Intel Corp. Former CEO, Applied Materials, Inc. Former Chairman, Applied Materials, Inc. Former Director, The NASDAQ OMX Group, Inc. Former Director, Silicon Valley Leadership Group Former Director, Semiconductor Equipment and Materials International (SEMI) Former Director, Meyer Burger Technology Ltd., Switzerland  Director, University of Wisconsin Foundation Chairman of the Board, US-Taiwan Business Council	Chairman of the Board, NASDAQ, Inc. Director of: - Tigo Energy, Inc. (a nonpublic company) - Pica8, Inc., U.S. (a nonpublic company) - Gogoro Inc., Cayman Islands (a nonpublic company) General Partner, WISC Partners LP
Independent Director Moshe N. Gavrielov (Note 3)	Male	U.S.	06/05/2019	06/04/2021	06/05/2019	-	-	-	-	-	-	Bachelor Degree in Electrical Engineering, Technion - Israel Institute of Technology Master Degree in Computer Science, Technion - Israel Institute of Technology  In a variety of engineering and engineering management positions, National Semiconductor Corp. and Digital Equipment Corp. In a variety of executive management positions, LSI Logic Corp., nearly 10 years Former CEO, Verisity, Ltd. Former Executive Vice President and General Manager of the Verification Division, Cadence Design Systems, Inc. Former President and CEO, Xilinx, Inc.  Director, San Jose Institute of Contemporary Art	Executive Chairman, Wind River Systems, Inc. (a nonpublic company) Director, Foretellix, Ltd. (a nonpublic company)

Remarks:

1. No member of the Board of Directors held TSMC shares by nominee arrangement.
2. Chairman and President (or someone with an equivalent job responsibility, i.e. the highest ranking manager of the company) are not (1) the same person, (2) in a marital relationship with each other, or (3) within one degree of consanguinity.

Note 1: Major Shareholder of TSMC's Director that is an Institutional Shareholder.

Director that is an Institutional Shareholder of TSMC	Top 10 Shareholders
National Development Fund, Executive Yuan	Not Applicable

Major institutional shareholders of National Development Fund: Not Applicable.

Note 2: Ms. Mei-ling Chen was appointed as the representative of National Development Fund on November 7, 2017.

Note 3: Mr. Moshe N. Gavrielov was elected as TSMC's independent director at TSMC's Annual Shareholders' Meeting on June 5, 2019.

## 2.4.2 Remuneration Paid to Directors and Independent Directors (Note 1)

Unit: NT\$

Title/Name	Director's Remuneration								Compensation Earned by a Director Who is an Employee of TSMC or of TSMC's Consolidated Entities								(A+B+C+D+E+F+G) as a % of Net Income (Note 5)		Compensation Paid to Directors from Non-consolidated Affiliates or Parent Company		
	Base Compensation (A)		Severance Pay and Pensions (B) (Note 3)		Compensation to Directors (C)		Allowances (D) (Note 4)		(A+B+C+D) as a % of Net Income		Base Compensation, Bonuses, and Allowances (E) (Note 4)		Severance Pay and Pensions (F) (Note 3)		Employees' Profit Sharing Bonus (G)						
	From TSMC	From All Consolidated Entities	From TSMC	From All Consolidated Entities	From TSMC	From All Consolidated Entities	From TSMC	From All Consolidated Entities	From TSMC	From All Consolidated Entities	From TSMC	From All Consolidated Entities	From TSMC	From All Consolidated Entities	Cash	Stock (Fair Market Value)	Cash	Stock (Fair Market Value)	From TSMC	From All Consolidated Entities	
Chairman Mark Liu	12,750,000	12,750,000	224,400	224,400	279,105,120	279,105,120	1,338,981	1,338,981	0.0850%	0.0850%	-	-	-	-	-	-	-	-	0.0850%	0.0850%	-
Vice Chairman C.C. Wei	-	-	-	-	-	-	-	-	-	-	153,646,880	153,646,880	224,400	224,400	139,552,560	-	139,552,560	-	0.0850%	0.0850%	-
Director F.C. Tseng	-	-	-	-	-	9,600,000	9,600,000	1,715,592	1,715,592	0.0033%	0.0033%	-	-	-	-	-	-	-	0.0033%	0.0033%	8,911,973
Director National Development Fund, Executive Yuan Representative: Mei-ling Chen	-	-	-	-	-	9,600,000	9,600,000	-	-	0.0028%	0.0028%	-	-	-	-	-	-	-	0.0028%	0.0028%	-
Independent Director Sir Peter L. Bonfield	-	-	-	-	-	14,823,720	14,823,720	-	-	0.0043%	0.0043%	-	-	-	-	-	-	-	0.0043%	0.0043%	-
Independent Director Stan Shih	-	-	-	-	-	12,000,000	12,000,000	-	-	0.0035%	0.0035%	-	-	-	-	-	-	-	0.0035%	0.0035%	-
Independent Director Kok-Choo Chen	-	-	-	-	-	12,000,000	12,000,000	-	-	0.0035%	0.0035%	-	-	-	-	-	-	-	0.0035%	0.0035%	-
Independent Director Michael R. Splinter	-	-	-	-	-	14,823,720	14,823,720	-	-	0.0043%	0.0043%	-	-	-	-	-	-	-	0.0043%	0.0043%	-
Independent Director Moshe N. Gavrielov (Note 2)	-	-	-	-	-	8,451,777	8,451,777	-	-	0.0024%	0.0024%	-	-	-	-	-	-	-	0.0024%	0.0024%	-
Total	12,750,000	12,750,000	224,400	224,400	360,404,337	360,404,337	3,054,573	3,054,573	0.1090%	0.1090%	153,646,880	153,646,880	224,400	224,400	139,552,560	-	139,552,560	-	0.1940%	0.1940%	8,911,973

\*Other than disclosure in the above table, Directors remunerations earned by providing services (e.g. providing consulting services as a non-employee) to TSMC and all consolidated entities in the 2019 financial statements: Advisor Fee to Dr. F.C. Tseng NT\$14,405,550.

Note 1: Directors and Independent Directors' remuneration policies, procedures, standards and structure, as well as the linkage to responsibilities, risks and time spent:

1. According to TSMC's Articles of Incorporation, the Board of Directors is authorized to determine the salary for the Chairman, Vice Chairman and Directors, taking into account the extent and value of the services provided for the management of the Corporation and the standards of the industry within the R.O.C. and overseas.
2. The Articles of Incorporation also provide that the compensation to directors shall be no more than 0.3% of annual profit and directors who also serve as executive officers of TSMC are not entitled to receive compensation to directors. According to TSMC's Compensation Committee Charter, the distribution of compensation to directors shall be made in accordance with TSMC's "Rules for Distribution of Compensation to Directors" based on the following principles: (1) directors who also serve as executive officers of the Company are not entitled to receive compensation; (2) the compensation for independent directors may be higher than the other directors, as all independent directors also serve as members of the Audit Committee and the Compensation Committee and thus participate in the discussions as well as resolutions of related committee meetings in accordance with the charter of each committee; and (3) the compensation for overseas independent directors may be higher than domestic independent directors, as they require additional time to attend quarterly meetings in Taiwan.

Note 2: Mr. Moshe N. Gavrielov was elected as TSMC's independent director at TSMC's Annual Shareholders' Meeting on June 5, 2019.

Note 3: Pensions funded according to applicable law.

Note 4: The above-mentioned figures include expenses for Company cars and gasoline reimbursement, but do not include compensation paid to Company drivers (totaled NT\$2,705,364).

Note 5: Total remuneration paid to the directors from TSMC and from all consolidated entities in 2018, including their employee compensation, both accounted for 0.1997% of 2018 net income.

## 2.5 Management Team

### 2.5.1 Information Regarding Management Team

As of 02/29/2020

Title Name (Note 1)	Gender	Nationality	On-board Date (Note 2)	Shares Held		Shares Held by Spouse & Minors		Shares Held in the Name of Others		Education and Selected Past Positions	Selected Current Positions at Other Companies	Managers Who are Spouses or within Second-degree Relative of Consanguinity to Each Other (Note 3)			
				Shares	%	Shares	%	Shares	%			Title	Name	Relation	
Chief Executive Officer C.C. Wei	Male	R.O.C.	02/01/1998	7,179,207	0.03%	261	0.00%	-	-	Ph.D., Electrical Engineering, Yale University, U.S. President and Co-Chief Executive Officer, TSMC Executive Vice President and Co-Chief Operating Officer, TSMC Senior Vice President, Business Development, TSMC Senior Vice President, Mainstream Technology Business, TSMC Senior Vice President, Chartered Semiconductor Manufacturing Ltd.	None	None	None	None	None
Senior Vice President Europe & Asia Sales Lora Ho	Female	R.O.C.	06/01/1999	4,531,080	0.02%	2,230,268	0.01%	-	-	Master, Business Administration, National Taiwan University, Taiwan Senior Vice President, Chief Financial Officer/ Spokesperson, TSMC Senior Director, Accounting, TSMC Vice President & CFO, TI-Acer Semiconductor Manufacturing Corp.	Director and/or Supervisor, TSMC subsidiaries	None	None	None	None
Senior Vice President Research and Development/ Technology Development Wei-Jen Lo	Male	R.O.C.	07/01/2004	1,441,127	0.01%	-	-	-	-	Ph.D., Solid State Physics and Surface Chemistry, University of California, Berkeley, U.S. Vice President, Research and Development, TSMC Vice President, Manufacturing Technology Operations, TSMC Vice President, Advanced Technology Business, TSMC Vice President, Operations II, TSMC Director, Advanced Technology Development and CTM Plant Manager, Intel Corp.	None	None	None	None	None
Senior Vice President Corporate Strategy Office Rick Cassidy	Male	U.S.	11/14/1997	-	-	-	-	-	-	Bachelor, Engineering Technology, United States Military Academy at West Point, U.S. Chief Executive Officer, TSMC North America President of TSMC North America Vice President of TSMC North America Account Management	Director, TSMC subsidiary	None	None	None	None
Senior Vice President Operations/ Product Development Y.P. Chin	Male	R.O.C.	01/01/1987	6,920,122	0.03%	2,191,107	0.01%	-	-	Master, Electrical Engineering, National Cheng Kung University, Taiwan Vice President, Product Development Operations, TSMC Vice President, Advanced Technology and Business, TSMC Senior Director, Product Engineering and Services, TSMC	None	None	None	None	None
Senior Vice President Research and Development/ Technology Development Y.J. Mii	Male	R.O.C.	11/14/1994	1,000,419	0.00%	-	-	-	-	Ph.D., Electrical Engineering, University of California, Los Angeles, U.S. Vice President, Technology Development, TSMC TSMC Senior Director, R&D Platform I Division, TSMC	None	Director	Wayne Yeh	brother in law	
Senior Vice President Information Technology and Materials Management & Risk Management J.K. Lin	Male	R.O.C.	01/01/1987	12,518,018	0.05%	1,019,961	0.00%	-	-	Bachelor, Science, National Changhua University of Education, Taiwan Vice President, Mainstream Fabs and Manufacturing Technology Operations, TSMC Senior Director, Mainstream Fabs Operations, TSMC	None	None	None	None	None
Senior Vice President Operations/ Fab Operations J.K. Wang	Male	R.O.C.	02/11/1987	2,553,947	0.01%	160,844	0.00%	-	-	Master, Chemical Engineering, National Cheng Kung University, Taiwan Vice President, 300mm Fabs Operations, TSMC Senior Director, 300mm fabs Operations, TSMC	Director, TSMC subsidiaries	None	None	None	None
Vice President Research and Development/ Technology Development Cliff Hou	Male	R.O.C.	12/15/1997	366,351	0.00%	60,802	0.00%	-	-	Ph.D., Electrical Engineering, Syracuse University, U.S. Vice President, Design and Technology Platform, TSMC Senior Director, Design and Technology Platform, TSMC	Director, TSMC subsidiaries Director, TSMC affiliate President, TSMC subsidiaries	None	None	None	None
Vice President and General Counsel/ Corporate Governance Officer Legal Sylvia Fang	Female	R.O.C.	03/20/1995	700,285	0.00%	69,112	0.00%	384,000	0.00%	Master of Comparative Law, School of Law, University of Iowa Attorney-at-law, Taiwan Associate General Counsel, TSMC Senior Associate, Taiwan International Patent and Law Office (TIPO)	Director and/or Supervisor, TSMC subsidiaries	None	None	None	None
Vice President Human Resources Connie Ma	Female	R.O.C.	06/01/2014	139,000	0.00%	-	-	-	-	EMBA, International Business Management, National Taiwan University Director of Human Resources, TSMC Senior Vice President of Global Human Resources, Trend Micro Inc.	None	None	None	None	
Vice President Operations/ Fab Operations Y.L. Wang	Male	R.O.C.	06/01/1992	218,535	0.00%	1,135,529	0.00%	-	-	Ph.D., Electrical Engineering, National Chiao Tung University, Taiwan Vice President, Technology Development, TSMC Vice President, Fab 14B Operations, TSMC Senior Director, Fab 14B Operations, TSMC	Director, TSMC subsidiary Director, TSMC affiliate	None	None	None	None
Vice President Research and Development/ Integrated Interconnect & Packaging Doug Yu	Male	R.O.C.	12/28/1994	225,000	0.00%	-	-	-	-	Ph.D, Materials Engineering, Georgia Institute of Technology, USA Senior Director of Integrated Interconnect & Packaging Division in R&D, TSMC	None	None	None	None	

(Continued)

Title Name (Note 1)	Gender	Nationality	On-board Date (Note 2)	Shares Held		Shares Held by Spouse & Minors		Shares Held in the Name of Others		Education and Selected Past Positions	Selected Current Positions at Other Companies	Managers Who are Spouses or within Second-degree Relative of Consanguinity to Each Other (Note 3)		
				Shares	%	Shares	%	Shares	%			Title	Name	Relation
Vice President and TSMC Fellow More-than-Moore Technologies Alexander Kalnitsky	Male	U.S.	06/15/2009	-	-	-	-	-	-	PhD, Electrical Engineering, Carleton University, Canada Senior Director of More-than-Moore Technologies Division in R&D, TSMC	None	None	None	None
Vice President Business Development Kevin Zhang	Male	U.S.	11/01/2016	-	-	-	-	-	-	PhD, Electrical Engineering, Duke University, USA Vice President, Design and Technology Platform, TSMC Vice President, Technology and Manufacturing Group, Intel Corp.	None	None	None	None
Vice President and TSMC Fellow Operations/ Product Development T.S. Chang	Male	R.O.C.	02/06/1995	173,781	0.00%	-	-	-	-	PhD, Electrical Engineering, National Tsing Hua University Vice President, Fab 12B Operations, TSMC Senior Director, Fab 12B Operations, TSMC	None	None	None	None
Vice President Research and Development/ Platform Development Michael Wu	Male	R.O.C.	12/09/1996	478,501	0.00%	194,943	0.00%	-	-	PhD, Electrical Engineering, University of Wisconsin-Madison, USA Senior Director of N3 Platform Development Division in R&D, TSMC	None	None	None	None
Vice President Research and Development/ Pathfinding Min Cao	Male	U.S.	07/29/2002	363,152	0.00%	4,470	0.00%	-	-	PhD, Physics, Stanford University, USA Senior Director of Pathfinding Division in R&D, TSMC	None	None	None	None
Vice President Research and Development/ Corporate Research H.-S. Philip Wong (Note 4)	Male	U.S.	07/02/2018	-	-	-	-	-	-	PhD, Electrical Engineering, Lehigh University, U.S. Willard R. and Inez Kerr Bell Professor in the School of Engineering, Stanford University Senior Manager, IBM Research	None	None	None	None
Vice President Operations/ Advanced Packaging Technology and Service Marvin Liao	Male	R.O.C.	06/06/2002	50,485	0.00%	-	-	220,000	0.00%	PhD, Materials Science, University of Texas-Arlington, U.S. Senior Director, Backend Technology and Service Operations, TSMC Vice President, Chartered Semiconductor Manufacturing Ltd.	None	None	None	None
Vice President Operations/ Fab Operations Y.H. Liaw (Note 5)	Male	R.O.C.	08/03/1988	370,000	0.00%	-	-	430,000	0.00%	Master of Chemical Engineering, National Tsing Hua University Vice President, Fab 15B Operations, TSMC Senior Director, Fab 15B Operations, TSMC	None	None	None	None
Vice President Research and Development/ Advanced Tool and Module Development Simon Jang (Note 6)	Male	R.O.C.	09/01/1993	350,695	0.00%	663	0.00%	-	-	PhD, Materials Science & Engineering, Massachusetts Institute of Technology, U.S. Senior Director of Advanced Tool and Module Development Division in R&D, TSMC	None	1. Deputy Director 2. Manager	1. Sharon Jang 2. Jimmy Hu	1. sister 2. brother in law
Vice President and Chief Financial Officer/ Spokesperson Finance Wendell Huang (Note 7)	Male	R.O.C.	05/03/1999	1,651,418	0.01%	-	-	-	-	Master, Business Administration, Cornell University, U.S. Deputy Chief Financial Officer, TSMC Senior Director, Finance Division, TSMC Vice President, Corporate Finance, ING Barings Vice President, Corporate Finance, Chase Manhattan Bank Vice President, Corporate Finance, Bankers Trust Company	Director and/or Supervisor, TSMC subsidiaries President, TSMC subsidiaries Director, TSMC affiliate	None	None	None

Note 1: Vice President Dr. N.S. Tsai retired, effective May 1, 2019. Vice President Dr. Irene Sun retired, effective September 30, 2019.

Note 2: On-board date means the official date joining TSMC.

Note 3: President (or someone with an equivalent job responsibility, i.e. the highest ranking manager of the company) and Chairman are not (1) the same person, (2) in a marital relationship with each other, or (3) within one degree of consanguinity.

Note 4: Vice President Dr. Philip Wong resigned and became a special consultant to TSMC, effective April 1, 2020.

Note 5: Mr. Y.H. Liaw was promoted to Vice President, effective February 19, 2019.

Note 6: Dr. Simon Jang was promoted to Vice President, effective August 13, 2019.

Note 7: Mr. Wendell Huang was promoted to Vice President, effective September 1, 2019.

## 2.5.2 Compensation Paid to CEO and Vice Presidents (Note 1)

Unit: NT\$

Title	Name	Salary (A)		Severance Pay and Pensions (B) (Note 6)		Bonuses and Allowances (C) (Note 7)			Employees' Profit Sharing Bonus (D)				(A+B+C+D) as a % of Net Income (Note 8)		Compensation Received from Non-consolidated Affiliates or Parent Company
		From TSMC	From All Consolidated Entities	From TSMC	From All Consolidated Entities	From TSMC	From All Consolidated Entities	Cash	Stock (Fair Market Value)	Cash	Stock (Fair Market Value)	From TSMC	From All Consolidated Entities		
Chief Executive Officer	C.C. Wei	10,200,000	10,200,000	224,400	224,400	143,446,880	143,446,880	139,552,560	-	139,552,560	-	0.0850%	0.0850%	-	
Vice President, Chief Financial Officer/ Spokesperson	Wendell Huang (Note 2)	1,324,400	1,324,400	29,137	29,137	8,282,931	8,282,931	7,293,712	-	7,293,712	-	0.0049%	0.0049%	-	
Senior Vice President	Lora Ho														
Senior Vice President	Wei-Jen Lo														
Senior Vice President	Rick Cassidy														
Senior Vice President	Y.P. Chin														
Senior Vice President	Y.J. Mii														
Senior Vice President	J.K. Lin														
Senior Vice President	J.K. Wang														
Vice President	N.S. Tsai (Note 3)														
Vice President	Irene Sun (Note 3)														
Vice President	Cliff Hou														
Vice President and General Counsel/ Corporate Governance Officer	Sylvia Fang														
Vice President	Connie Ma														
Vice President	Y.L. Wang														
Vice President	Doug Yu														
Vice President and TSMC Fellow	Alexander Kalnitsky														
Vice President	Kevin Zhang														
Vice President and TSMC Fellow	T.S. Chang														
Vice President	Michael Wu														
Vice President	Min Cao														
Vice President	H.-S. Philip Wong														
Vice President	Marvin Liao														
Vice President	Y.H. Liaw (Note 4)														
Vice President	Simon Jang (Note 5)														
Total		95,753,082	110,950,896	2,106,013	2,461,350	696,213,951	780,401,449	651,924,628	-	651,924,628	-	0.4188%	0.4477%	-	

Note 1: Compensation policy, standards/packages, procedures, the linkage to operating performance and future risk exposure: The total compensation paid to the executive officers is decided based on their job responsibility, contribution, company performance and projected future risks the Company will face. It is reviewed by the Compensation Committee then submitted to the Board of Directors for approval.

Note 2: Mr. Wendell Huang was promoted to Vice President, effective September 1, 2019.

Note 3: Vice President Dr. N.S. Tsai retired, effective May 1, 2019. Vice President Dr. Irene Sun retired, effective September 30, 2019.

Note 4: Mr. Y.H. Liaw was promoted to Vice President, effective February 19, 2019.

Note 5: Dr. Simon Jang was promoted to Vice President, effective August 13, 2019.

Note 6: Pensions funded according to applicable law. In accordance with TSMC Procedure of Retirement, the pension payment to Dr. N.S. Tsai and Dr. Irene Sun amounts to NT\$28,084,800.

Note 7: The above-mentioned figures include the expense for the employees' cash bonuses distributed in May, August, November 2019 & February 2020, Company cars and gasoline reimbursement.

Note 8: Total compensation paid to the executive officers from TSMC in 2018 accounted for 0.4097% of 2018 net income. Total compensation paid to the executive officers from all consolidated entities in 2018 accounted for 0.4379% of 2018 net income.

## Compensation Paid to CEO and Vice Presidents

	2019	
	From TSMC	From All Consolidated Entities and Non-consolidated Affiliates
NT\$0 ~ NT\$999,999	Rick Cassidy	None
NT\$1,000,000 ~ NT\$1,999,999	None	None
NT\$2,000,000 ~ NT\$3,499,999	None	None
NT\$3,500,000 ~ NT\$4,999,999	None	None
NT\$5,000,000 ~ NT\$9,999,999	None	None
NT\$10,000,000 ~ NT\$14,999,999	N.S. Tsai	N.S. Tsai
NT\$15,000,000 ~ NT\$29,999,999	Wendell Huang, Irene Sun, Simon Jang	Wendell Huang, Irene Sun, Simon Jang
NT\$30,000,000 ~ NT\$49,999,999	Connie Ma, Y.L. Wang, Doug Yu, Alexander Kalnitsky, T.S. Chang, Michael Wu, Min Cao, H.-S. Philip Wong, Marvin Liao, Y.H. Liaw	Connie Ma, Y.L. Wang, Doug Yu, Alexander Kalnitsky, T.S. Chang, Michael Wu, Min Cao, H.-S. Philip Wong, Marvin Liao, Y.H. Liaw
NT\$50,000,000 ~ NT\$99,999,999	Lora Ho, Y.P. Chin, Y.J. Mii, J.K. Lin, J.K. Wang, Cliff Hou, Sylvia Fang, Kevin Zhang	Lora Ho, Rick Cassidy, Y.P. Chin, Y.J. Mii, J.K. Lin, J.K. Wang, Cliff Hou, Sylvia Fang, Kevin Zhang
Over NT\$100,000,000	C.C. Wei, Wei-Jen Lo	C.C. Wei, Wei-Jen Lo
Total	25	25

### 2.5.3 Employees' Profit Sharing Bonus Paid to Management Team

Unit: NT\$

Title	Name	Stock (Fair Market Value)	Cash	Total	Total Employees' Profit Sharing Bonus Paid to Management Team as a % of Net Income
Chief Executive Officer	C.C. Wei	-	139,552,560	139,552,560	0.0404%
Vice President, Chief Financial Officer/ Spokesperson	Wendell Huang (Note 1)	-	7,293,712	7,293,712	0.0021%
Senior Vice President	Lora Ho				
Senior Vice President	Wei-Jen Lo				
Senior Vice President	Rick Cassidy				
Senior Vice President	Y.P. Chin				
Senior Vice President	Y.J. Mii				
Senior Vice President	J.K. Lin				
Senior Vice President	J.K. Wang				
Vice President	N.S. Tsai (Note 2)				
Vice President	Irene Sun (Note 2)				
Vice President	Cliff Hou				
Vice President and General Counsel/ Corporate Governance Officer	Sylvia Fang				
Vice President	Connie Ma	-	505,078,355	505,078,355	0.1463%
Vice President	Y.L. Wang				
Vice President	Doug Yu				
Vice President and TSMC Fellow	Alexander Kalnitsky				
Vice President	Kevin Zhang				
Vice President and TSMC Fellow	T.S. Chang				
Vice President	Michael Wu				
Vice President	Min Cao				
Vice President	H.-S. Philip Wong				
Vice President	Marvin Liao				
Vice President	Y.H. Liaw (Note 3)				
Vice President	Simon Jang (Note 4)	-	651,924,628	651,924,628	0.1888%
Total					

Note 1: Mr. Wendell Huang was promoted to Vice President, effective September 1, 2019.

Note 2: Vice President Dr. N.S. Tsai retired, effective May 1, 2019. Vice President Dr. Irene Sun retired, effective September 30, 2019.

Note 3: Mr. Y.H. Liaw was promoted to Vice President, effective February 19, 2019.

Note 4: Dr. Simon Jang was promoted to Vice President, effective August 13, 2019.



**Breakthrough  
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## Corporate Governance

### 3.1 Overview

TSMC advocates and acts upon the principles of operational transparency and respect for shareholder rights. We believe that the basis for successful corporate governance is a sound and effective Board of Directors. In line with this principle, the TSMC Board delegates various responsibilities and authority to two Board Committees, Audit Committee and Compensation Committee. Each Committee has a written charter approved by the Board. Each Committee's chairperson regularly reports to the Board on the activities and actions of the relevant committee.

### 2019 Corporate Governance Awards and Ratings

Organization	Awards
Committee of 100	Founder Dr. Morris Chang was honored with Lifetime Achievement Awards
FT-ODX (Financial Times Outstanding Directors Exchange)	Our Independent Director Sir Peter L. Bonfield received 2019 Outstanding Directors Awards
Dow Jones Sustainability Indices (DJSI)	Dow Jones Sustainability World Index for the 19 <sup>th</sup> consecutive year Dow Jones Sustainability Emerging Markets Index
MSCI ESG Indexes	MSCI ACWI ESG Leaders Index component MSCI ACWI SRI Index component
FTSE4Good Indexes	FTSE4Good Emerging Index component FTSE4Good TIP Taiwan ESG Index component
Nikkei Asian Review	Asia300 Power Performers
Taiwan Stock Exchange	Top 5% in Corporate Governance Evaluation of Listed Companies for the 5 <sup>th</sup> consecutive year TWSE Corporate Governance 100 Index component
FORTUNE	2019 World's Most Admired Companies Fortune Global 500
Institutional Investor Magazine	Most Honored Company (Technology/Semiconductors) – All-Asia Best Corporate Governance (Technology/Semiconductor) – 1 <sup>st</sup> Place (buy-side and sell-side) – All-Asia Best ESG/SRI Metrics (Technology/Semiconductor) – 1 <sup>st</sup> Place (buy-side and sell-side) – All-Asia
Forbes	World's Best Employers Top 100 Digital Companies
CommonWealth Magazine	Corporate Social Responsibility Award – Large cap – 1 <sup>st</sup> Place
Taiwan Institute of Sustainable Energy	The Most Prestigious Sustainability Awards – Top Ten Domestic Corporates Taiwan Top 50 Corporate Responsibility Report Awards – IT & IC Manufacturing Industry – Platinum Award

### 3.2 Board of Directors

#### Board Structure

TSMC's Board of Directors consists of nine distinguished members with a great breadth of experience as world-class business leaders or professionals. We deeply rely on them for their diverse knowledge, personal perspectives, and solid business judgment. Five of those nine members are Independent Directors: former British Telecommunications Chief Executive Officer, Sir Peter L. Bonfield; Co-Founder, Chairman Emeritus of the Acer Group, Mr. Stan Shih; former Chairman of National Performing Arts Center and former Advisor of Executive Yuan, R.O.C., Ms. Kok-Choo Chen; former Chairman of Applied Materials, Inc., Mr. Michael R. Splinter; and former Chief

Executive Officer of Xilinx, Inc., Mr. Moshe N. Gavrielov. The number of Independent Directors exceeds 50% of the total number of Directors. There will be an election for one additional Independent Director at the 2020 Annual Shareholders' Meeting. The Board approved the nomination of Mr. Yancey Hai (currently Chairman of Delta Electronics Inc.) as a candidate for Independent Director at its meeting in the first quarter of 2020.

TSMC's Board is comprised of a diverse group of professionals from different backgrounds in industries, academia, law, etc. These professionals include citizens from Taiwan, Europe and the U.S. with world-class business operating experience, two of whom are female.

#### Board Responsibilities

Inheriting the spirit of TSMC's Founder, Dr. Morris Chang's philosophy on corporate governance, under the leadership of Chairman Dr. Mark Liu and CEO & Vice Chairman Dr. C.C. Wei, TSMC's Board of Directors takes a serious and forthright approach to its duties and is a dedicated, competent and independent Board.

The Board's primary duty is to supervise the Company's compliance with relevant laws and regulations, financial transparency, timely disclosure of material information, and maintaining of the highest integrity. TSMC's Board of Directors strives to perform these responsibilities through its Audit Committee and the Compensation Committee, the hiring of a financial expert consultant for the Audit Committee, and coordination with our Internal Audit department.

The second duty of the Board of Directors is to evaluate the management's performance and to appoint and dismiss officers of the Company when necessary. TSMC's management has maintained a healthy and functional communication with the Board of Directors, has been devoted in executing guidance of the Board, and is dedicated in running the business operations, all to achieve the best interests for TSMC shareholders.

The third duty of the Board of Directors is to resolve important, concrete matters, such as capital appropriations, investment activities, dividends, etc.

The fourth duty of the Board of Directors is to provide guidance to the management team of the Company. Quarterly, TSMC's management reports to the Board on a variety of subjects. The management also reviews the Company's business strategies with the Board and updates TSMC's Board on the progress of those strategies, obtaining Board guidance as appropriate.

#### Nomination and Election of Directors

TSMC envisions the membership of its esteemed Board of Directors to be composed of highly ethical professionals with the necessary knowledge, experience and understanding from diverse backgrounds. In 2019, TSMC established "Guidelines for Nomination of Directors", which describes the procedures and criteria for the nomination, qualification and evaluation of

candidates for Directors. In addition, TSMC envisions its Board to be composed of a majority of independent directors, with the independence of each independent director candidate considered and assessed under relevant laws.

Directors shall be elected pursuant to the candidate nomination system specified in Article 192-1 of the R.O.C. Company Law. The tenure of office for Directors shall be three years. The independence of each independent director candidate is also considered and assessed under relevant law such as the Taiwan "Regulations Governing Appointment of Independent Directors and Compliance Matters for Public Companies". Under R.O.C. law, in which TSMC was incorporated, any shareholders holding one percent or more of our total outstanding common shares may nominate their own candidate to stand for election as a Board member. This democratic mechanism allows our shareholders to become involved in the selection and nomination process of Board candidates. The final slate of candidates is put to the shareholders for voting at the relevant annual shareholders' meeting.

There are no limits on the number of terms that a director may serve. We believe the Company benefits from the contributions of directors who have over their years of dedicated service acquired unique insights into the operations and financial developments of the Company. The Company reviews the appropriateness of each director's continued service to ensure there are new viewpoints available to the Board.

#### Directors' Compensation

According to TSMC's Articles of Incorporation, the Board of Directors is authorized to determine the salary for the Chairman, Vice Chairman and Directors, taking into account the extent and value of the services provided for the management of the Corporation and the standards of the industry within the R.O.C. and overseas.

TSMC's Articles of Incorporation also state that not more than 0.3 percent of our annual profits may be distributed as compensation to our directors. In addition, directors who also serve as executive officers of the Company are not entitled to receive any director compensation. According to TSMC's Compensation Committee Charter, the distribution of compensation to directors shall be made in accordance with TSMC's "Rules for Distribution of Compensation to Directors" based on the following principles: (1) directors who also serve as executive officers of the Company are not entitled to receive compensation; (2) the compensation for independent directors may be higher than other directors, as all independent directors also serve as members of the Audit Committee and Compensation Committee and thus participate in the discussions as well as resolutions of related committee meetings in accordance with the charter of each committee; and (3) the compensation for overseas independent directors may be higher than domestic independent directors, as they require additional time to attend quarterly meetings in Taiwan.

#### Directors' Professional Qualifications and Independence Analysis

According to the relevant requirements set by Taiwan's Securities and Futures Bureau, the professional qualifications and independence status of the Company's Board members are listed in the table below.

Name	Meet the Following Professional Qualification Requirements, Together with At Least Five Years Work Experience												Criteria (Note)	Number of Other Taiwanese Public Companies Concurrently Serving as an Independent Director		
	An Instructor or Higher Position in a Department of Commerce, Law, Finance, Accounting, or Other Professional or Technical Specialists Who Has Passed a National Examination and Been Awarded a Certificate in a Profession Necessary for the Business of the Company in a Public or Private Junior College, College or University	A Judge, Public Prosecutor, Attorney, Certified Public Accountant, or Other Professional or Technical Specialists Who Has Passed a National Examination and Been Awarded a Certificate in a Profession Necessary for the Business of the Company	Have Work Experience in the Area of Commerce, Law, Finance, or Accounting, or Otherwise Necessary for the Business of the Company	1	2	3	4	5	6	7	8	9	10	11	12	
Mark Liu Chairman			V	V	V	V	V	V	V	V	V	V	V	V	V	0
C.C. Wei Vice Chairman			V	V	V	V	V	V	V	V	V	V	V	V	V	0
Mei-ling Chen Director	V		V	V	V	V	V	V	V	V	V	V	V	V	V	0
F.C. Tseng Director			V	V	V	V	V	V	V	V	V	V	V	V	V	1
Sir Peter L. Bonfield Independent Director			V	V	V	V	V	V	V	V	V	V	V	V	V	0
Stan Shih Independent Director			V	V	V	V	V	V	V	V	V	V	V	V	V	0
Kok-Choo Chen Independent Director	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	0
Michael R. Splinter Independent Director			V	V	V	V	V	V	V	V	V	V	V	V	V	0
Moshe N. Gavrielov Independent Director			V	V	V	V	V	V	V	V	V	V	V	V	V	0

Note: Directors, during the two years before being elected and during the term of office, meet any of the following situations, please tick the appropriate corresponding boxes:

1. Not an employee of the company or any of its affiliates;
2. Not a director or supervisor of the company or any of its affiliates;
3. Not a natural-person shareholder who holds shares, together with those held by the person's spouse, minor children, or held by the person under others' names, in an aggregate amount of one percent or more of the total number of issued shares of the company or ranks as one of its top ten shareholders;
4. Not a spouse, relative within the second degree of kinship, or lineal relative within the third degree of kinship, of any of the officer in the preceding 1 subparagraph, or of any of the above persons in the preceding subparagraphs 2 and 3;
5. Not a director, supervisor, or employee of a corporate/institutional shareholder that directly holds five percent or more of the total number of issued shares of the company, ranks as one of its top five shareholders, or has representative director(s) serving on the company's board based on Article 27 of the Company Law;
6. Not a director, supervisor, or employee of a company of which the majority of board seats or voting shares is controlled by a company that also controls the same of the company;
7. Not a director, supervisor, or employee of a company of which the chairman or CEO (or equivalent) themselves or their spouse also serve as the company's chairman or CEO (or equivalent);
8. Not a director, supervisor, officer, or shareholder holding five percent or more of the shares of a specified company or institution that has a financial or business relationship with the company;
9. Other than serving as a compensation committee member of the company, not a professional individual who, or an owner, partner, director, supervisor, or officer of a sole proprietorship, partnership, company, or institution that, provides commercial, legal, financial, accounting services or consultation to the company or to any affiliate of the company, or a spouse thereof, and the service provided is an "audit service" or a "non-audit service which total compensation within the recent two years exceeds NTD500,000";
10. Not having a marital relationship, or a relative within the second degree of kinship to any other director of the company;
11. Not been a person of any conditions defined in Article 30 of the Company Law; and
12. Not a governmental, juridical person or its representative as defined in Article 27 of the Company Law.

### 3.2.1 Audit Committee

The Audit Committee assists the Board in fulfilling its oversight of the quality and integrity of the accounting, auditing, reporting, and financial control practices of the Company.

The Audit Committee is responsible to review the following major matters:

- Financial reports;
- Auditing and accounting policies and procedures;
- Internal control systems and including related policies and procedures;
- Material asset or derivatives transactions;
- Material lending funds, endorsements or guarantees;
- Offering or issuance of any equity-type securities;
- Derivatives and cash investments;
- Legal compliance;
- Related-party transactions and potential conflicts of interests involving executive officers and directors;
- Ombudsman reports;
- Fraud prevention and investigation reports;
- Corporate IT security;
- Corporate risk management;
- Performance, independence, qualification of independent auditor;
- Hiring or dismissal of an attesting CPA, or the compensation given thereto;
- Appointment or discharge of financial, accounting, or internal auditing officers;
- Assessment of Committee Charter and fulfillment of Audit Committee duties; and
- Assessment of the Committee's performance, etc.

Under R.O.C. law, the membership of Audit Committee shall consist of all independent directors. TSMC's Audit Committee satisfies this statutory requirement. The Committee also engaged a financial expert consultant in accordance with the rules of the U.S. Securities and Exchange Commission. The Audit Committee annually conducts self-evaluation to assess the Committee's performance and identify areas for further attention.

TSMC's Audit Committee is empowered by its Charter to conduct any study or investigation it deems appropriate to fulfill its responsibilities. It has direct access to TSMC's internal auditors, the Company's independent auditors, and all employees of the Company. The Committee is authorized to retain and oversee special legal, accounting, or other consultants as it deems appropriate to fulfill its mandate. The Audit Committee Charter is available on TSMC's corporate website.

### 3.2.2 Compensation Committee

The Compensation Committee assists the Board in discharging its responsibilities related to TSMC's compensation and benefits policies, plans and programs, and in the evaluation and compensation of TSMC's directors of the Board and executives.

The members of the Compensation Committee are appointed by the Board as required by R.O.C. law. According to TSMC's Compensation Committee Charter, the Committee shall consist of no fewer than three independent directors of the Board. The Compensation Committee is comprised of all independent directors, and the Board appointed Mr. Yancey Hai as a member of the Compensation Committee on February 11, 2020. The Chairman of the Board and the Chief Executive Officer are invited by the Committee to attend all meetings and are excused from the Committee's discussion of their own compensation.

TSMC's Compensation Committee is authorized by its Charter to retain an independent consultant to assist in the evaluation of CEO, or executive officer compensation. The Compensation Committee Charter is available on TSMC's corporate website.

### Compensation Committee Members' Professional Qualifications and Independence Analysis

According to the relevant requirements set by Taiwan's Securities and Futures Bureau, the professional qualifications and independence status of the Company's Compensation Committee members are listed in the table below.

Criteria Name Title	Meet the Following Professional Qualification Requirements, Together with at Least Five Years Work Experience										Number of Other Taiwanese Public Companies Concurrently Serving as a Compensation Committee Member
	1	2	3	4	5	6	7	8	9	10	
Michael R. Splinter Independent Director				V	V	V	V	V	V	V	0
Sir Peter L. Bonfield Independent Director				V	V	V	V	V	V	V	0
Stan Shih Independent Director				V	V	V	V	V	V	V	0
Kok-Choo Chen Independent Director	V		V	V	V	V	V	V	V	V	0
Moshe N. Gavrielov Independent Director				V	V	V	V	V	V	V	0
Yancey Hai Independent Member (Note 2)				V	V	V	V	V	V	V	0

Note 1: Compensation Committee Members, during the two years before being elected or during the term of office, meet any of the following situations, please tick the appropriate corresponding boxes:

1. Not an employee of the company or any of its affiliates;
2. Not a director or supervisor of the company or any of its affiliates;
3. Not a natural-person shareholder who holds shares, together with those held by the person's spouse, minor children, or held by the person under others' names, in an aggregate amount of one percent or more of the total number of issued shares of the company or ranks as one of its top ten shareholders;
4. Not a spouse, relative within the second degree of kinship, or lineal relative within the third degree of kinship, of any of the officer in the preceding 1 subparagraph, or of any of the above persons in the preceding subparagraphs 2 and 3;
5. Not a director, supervisor, or employee of a corporate/institutional shareholder that directly holds five percent or more of the total number of issued shares of the company, ranks as one of its top five shareholders, or has representative director(s) serving on the company's board based on Article 27 of the Company Law;
6. Not a director, supervisor, or employee of a company of which the majority of board seats or voting shares is controlled by a company that also controls the same of the company;
7. Not a director, supervisor, or employee of a company of which the chairman or CEO (or equivalent) themselves or their spouse also serve as the company's chairman or CEO (or equivalent);
8. Not a director, supervisor, officer, or shareholder holding five percent or more of the shares of a specified company or institution that has a financial or business relationship with the company;
9. Other than serving as a compensation committee member of the company, not a professional individual who, or an owner, partner, director, supervisor, or officer of a sole proprietorship, partnership, company, or institution that, provides commercial, legal, financial, accounting services or consultation to the company or to any affiliate of the company, or a spouse thereof, and the service provided is an "audit service" or a "non-audit service which total compensation within the recent two years exceeds NTD500,000";
10. Not been a person of any conditions defined in Article 30 of the Company Law.

Note 2: The Board appointed Mr. Yancey Hai as a member of the Compensation Committee on February 11, 2020.

### 3.2.3 Corporate Governance Officer

In 2019, the Board of Directors appointed Ms. Sylvia Fang, the Vice President of Legal and General Counsel of TSMC, as the Corporate Governance Officer responsible for corporate governance matters, including handling of matters relating to Board, Audit Committee, Compensation Committee and Shareholders' meetings in compliance with law, assistance in onboarding and continuing education of directors, provision of information required for performance of duties by directors, and assistance in directors' compliance of law, etc.

For details on performance of duties by the Corporate Governance Officer, please refer to "3. Corporate Governance" on page 35-55 of this Annual Report.

### 3.2.4 Director and Committees Members' Attendance

Each Director is expected to attend every Board meeting and the committees meeting on which he or she serves. In 2019, the average Board Meeting attendance rate was 96% and the attendance rate for the Audit Committee and Compensation Committee's Meetings were 96% and 90% respectively.

#### Board of Directors Meeting Status

TSMC's Chairman of the Board of Directors convened four regular meetings and one special meeting in 2019. The directors' attendance status is as follows.

Title	Name	Attendance in Person	By Proxy	Attendance Rate in Person (%)	Notes
Chairman	Mark Liu	5	0	100%	None
Vice Chairman	C.C. Wei	5	0	100%	None
Director	National Development Fund, Executive Yuan Representative: Mei-ling Chen	4	1	80%	None
Director	F.C. Tseng	5	0	100%	None
Independent Director	Sir Peter L. Bonfield	4	1	80%	None
Independent Director	Stan Shih	5	0	100%	None
Independent Director	Kok-Choo Chen	5	0	100%	None
Independent Director	Michael R. Splinter	5	0	100%	None
Independent Director	Moshe N. Gavrielov	3	0	100%	New office assumed (Note)
Financial Expert Consultant	J.C. Lobbezoo	5	0	100%	None

Annotations:

A. (1) Securities and Exchange Act §14-3 resolutions:

Meeting Dates	Resolution	Any Independent Director Had a Dissenting Opinion or Qualified Opinion
2019 1 <sup>st</sup> Regular Meeting February 18 & 19	• approving amendments to TSMC's "Procedures for Acquisition or Disposal of Assets" • approving amendments to TSMC's "Procedures for Financial Derivatives Transactions"	None
2019 2 <sup>nd</sup> Regular Meeting May 13 & 14	• approving amendments to TSMC's internal control related policies and procedures	
2019 3 <sup>rd</sup> Regular Meeting August 12 & 13	• approving the promotion of Mr. Wendell Huang as Vice President, Chief Financial Officer and Spokesperson of TSMC • approving the appointment of Ms. Lora Ho as transitional Controller of TSMC	
2019 4 <sup>th</sup> Regular Meeting November 11 & 12	• approving the proposed 2020 service fees and out-of-pocket expenses for Deloitte & Touche, TSMC's independent auditor • approving the appointment of Ms. Mingli Weng as Controller of TSMC	

(2) There were no other written or otherwise recorded resolutions on which an independent director had a dissenting opinion or qualified opinion in 2019.

B. Recusals of Directors due to conflicts of interests in 2019: Directors recused themselves from the discussion and voting of their compensation resolution.

C. Performance evaluation of the Board of Directors: TSMC will establish and implement processes to evaluate Board performance in 2020.

D. Measures taken to strengthen the functionality of the Board:

- Five of the nine current Directors are Independent Directors. The number of Independent Directors exceeds 50% of the total number of Directors. TSMC's Directors are composed of diverse backgrounds, including professional backgrounds in different industries, academic and legal, etc.; nationalities in different countries in Taiwan, Europe and the U.S.; world-class business operating experience; and two Directors are female.
- The Chairman of the Board of Directors is not executive officer of the Company.
- In 2019, TSMC Board of Directors established "Guidelines for Nomination of Directors", which describes the procedures and criteria for the nomination, qualification and evaluation of candidates for Directors.
- In 2019, TSMC Board of Directors appointed Ms. Sylvia Fang, the Vice President of Legal and General Counsel of TSMC, as the Corporate Governance Officer responsible for corporate governance matters.

#### Audit Committee Meeting Status

Sir Peter L. Bonfield, Chairman of the Audit Committee, convened four regular meetings and one special meeting in 2019. The Committee members and consultant's attendance status is shown in the following table. In addition to these meetings, the Committee members and Financial Expert Consultant participated in four telephone conferences to discuss the Company's Annual Report to be filed with the Taiwan and U.S. authorities and investor conference materials with management.

Title	Name	Attendance in Person	By Proxy	Attendance Rate in Person (%)	Telephone Conferences	Attendance Rate of Telephone Conferences (%)	Notes
Chair	Sir Peter L. Bonfield	4	1	80%	4	100%	None
Member	Stan Shih	5	0	100%	4	100%	None
Member	Kok-Choo Chen	5	0	100%	4	100%	None
Member	Michael R. Splinter	5	0	100%	4	100%	None
Member	Moshe N. Gavrielov	3	0	100%	2	100%	New office assumed (Note)
Financial Expert Consultant	J.C. Lobbezoo	5	0	100%	4	100%	None

Annotations:

A. (1) Resolutions related to Securities and Exchange Act §14-3:

Meeting Dates	Resolution	Any Independent Director Had a Dissenting Opinion or Qualified Opinion
2019 1 <sup>st</sup> Regular Meeting February 18	• approving the 2018 annual financial statements • approving 2018 Statement of Internal Control System • approving amendments to TSMC's "Procedures for Acquisition or Disposal of Assets" • approving amendments to TSMC's "Procedures for Financial Derivatives Transactions"	None
2019 2 <sup>nd</sup> Regular Meeting May 13	• reviewing the first quarter financial statements • approving amendments to TSMC's internal control related policies and procedures	
2019 1 <sup>st</sup> Special Meeting June 5	• reviewing the first quarter business report and earnings distribution proposal	
2019 3 <sup>rd</sup> Regular Meeting August 12	• approving appointment of Mr. Wendell Huang as CFO • approving appointment of Ms. Lora Ho as transitional Controller • reviewing the second quarter financial statements • reviewing the second quarter business report and earnings distribution proposal	
2019 4 <sup>th</sup> Regular Meeting November 11	• approving appointment of Ms. Mingli Weng as Controller • reviewing the third quarter financial statements • reviewing the third quarter business report and earnings distribution proposal • approving the proposed 2020 service fees and out-of-pocket expenses for TSMC's independent auditor	
2020 1 <sup>st</sup> Regular Meeting February 10	• approving the 2019 annual financial statements • reviewing of 2019 business report and 2019 fourth quarter earnings distribution proposal • approving amendments to TSMC's "Procedures for Lending Funds to Other Parties" • approving the proposed additional 2020 service fees to Deloitte & Touche for TSMC's subsidiaries VisEra Tech • reviewing Company's ability to prepare financial statements independently as required by regulatory authority • approving 2019 Statement of Internal Control System	

(2) There was no other resolutions which was not approved by the Audit Committee but was approved by two thirds or more of all directors in 2019.

B. There were no recusals of independent directors due to conflicts of interests in 2019.

C. Descriptions of the communications between the independent directors, the internal auditors, and the independent auditors in 2019 (which should include the material items, channels, and results of the audits on the corporate finance and/or operations, etc.):

- (1) The internal auditors have sent the audit reports to the members of the Audit Committee periodically, and presented the findings of all audit reports in the quarterly meetings of the Audit Committee. The head of Internal Audit will immediately report to the members of the Audit Committee any material matters. During 2019, the head of Internal Audit did not report any such material matters. The communication channel between the Audit Committee and the internal auditor functioned well.
  - (2) The Company's independent auditors have presented the findings of their quarterly review or audits on the Company's financial results. Under applicable laws and regulations, the independent auditors are also required to immediately communicate to the Audit Committee any material matters that they have discovered. During 2019, the Company's independent auditors did not report any irregularity. The communication channel between the Audit Committee and the independent auditors functioned well.
- The communications between the independent directors, the internal auditors, and the independent auditors are listed in the table below.

Meeting Dates	Communications between the Independent Directors and the Internal Auditors	Communications between the Independent Directors and the Independent Auditors
2019 1 <sup>st</sup> Regular Meeting February 18	• reviewing the Internal Auditor's report (closed door) • reviewing report on SOX 404 self-testing results for the year 2018 • reviewing and approving 2018 Statement of Internal Control System	• reviewing any audit problems or difficulties and management's response in connection with 2018 annual financial statements (closed door) • reviewing regulatory developments • reviewing external auditor relationship (i.e. qualification, performance and independence)
2019 2 <sup>nd</sup> Regular Meeting May 13	• reviewing the Internal Auditor's report (closed door) • reviewing and approving amendments to TSMC's internal control related policies and procedures	• reviewing any review problems or difficulties and management's response in connection with 2019 first quarter financial statements (closed door) • reviewing regulatory developments • reviewing the result of CPA evaluation questionnaire
2019 3 <sup>rd</sup> Regular Meeting August 12	• reviewing the Internal Auditor's report (closed door) • reviewing 2019 Supplier Survey Result	• reviewing any review problems or difficulties and management's response in connection with 2019 second quarter financial statements (closed door) • reviewing regulatory developments
2019 4 <sup>th</sup> Regular Meeting November 11	• reviewing the Internal Auditor's report (closed door) • reviewing and approving the 2020 internal audit plan	• reviewing any review problems or difficulties and management's response in connection with 2019 third quarter financial statements (closed door) • reviewing regulatory developments
2020 1 <sup>st</sup> Regular Meeting February 10	• reviewing the Internal Auditor's report (closed door) • reviewing report on SOX 404 self-testing results for the year 2019 • reviewing and approving 2019 Statement of Internal Control System	• reviewing any audit problems or difficulties and management's response in connection with 2019 annual financial statements (closed door) • reviewing regulatory developments • reviewing external auditor relationship (i.e. qualification, performance and independence)

Result: all of above matters were reviewed and/or approved by the Audit Committee whereupon independent directors raised no objection.

Note: Mr. Moshe N. Gavrielov was elected to fill the vacancy as TSMC's independent director and became member of the Compensation Committee on June 5, 2019.

### Compensation Committee Meeting Status

Mr. Michael R. Splinter, Chairman of the Compensation Committee, convened four regular meetings in 2019. The Committee members' attendance status is as follows:

Title	Name	Attendance in Person	By Proxy	Attendance Rate in Person (%)	Notes
Chair	Michael R. Splinter	4	0	100%	None
Member	Sir Peter L. Bonfield	3	1	75%	None
Member	Stan Shih	4	0	100%	None
Member	Kok-Choo Chen	4	0	100%	None
Member	Moshe N. Gavrielov	3	1	75%	None
Member	Yancey Hai	-	-	-	New office assumed (Note)

#### Annotations:

- A. In 2019, the Compensation Committee conducted four regular meetings in February, May, August as well as November. The discussion items are as follows:
  - Report the matters related to employee compensation
  - Total amount of quarterly employee profit sharing bonus
  - Total amount of annual employee profit sharing
  - The amount of quarterly profit sharing bonus for executive officers, CEO and Chairman
  - The annual compensation of Directors and executive officers, and the disclosure of the same in annual report

All of above matters were reviewed and/or approved by the Compensation Committee.

B. There was no recommendation of the Compensation Committee which was not adopted or was modified by the Board of Directors in 2019.

C. There were no written or otherwise recorded resolutions on which a member of the Compensation Committee had a dissenting opinion or qualified opinion.

Note: The Board appointed Mr. Yancey Hai as a member of the Compensation Committee on February 11, 2020.

### 3.3 Major Decisions of Shareholders' Meeting and Board Meetings

#### 3.3.1 Major Resolutions of Shareholders' Meeting and Implementation Status

TSMC held 2019 Annual Shareholders' Meeting in Hsinchu, Taiwan on June 5, 2019. At the meeting, shareholders present in person or by proxy approved the following resolutions:

- (1) The 2018 Business Report and Financial Statements. Consolidated revenue totaled NT\$1,031.47 billion and net income was NT\$351.13 billion, with diluted earnings per share of NT\$13.54;
- (2) The distribution of a NT\$8 cash dividend per common share;
- (3) The revisions to the Articles of Incorporation;
- (4) The revisions to the following TSMC policies:
  - Procedures for Acquisition or Disposal of Assets;
  - Procedures for Financial Derivatives Transactions; and
- (5) Election of a new Independent Director to fill the vacancy.

#### Implementation Status

All the resolutions of the Shareholders' Meeting have been fully implemented in accordance with the resolutions.

Mr. Moshe N. Gavrielov was elected as the Independent Director. His tenure is from June 5, 2019 to June 4, 2021.

#### 3.3.2 Major Resolutions of Board Meetings

During 2019 and as of the date of this Annual Report, major resolutions approved at Board meetings are summarized below:

- (1) Regular Board Meeting of February 18 & 19, 2019:
  - approving 2018 business report and financial statements;
  - approving distribution of 2018 profits, and cash dividends, employee cash bonus and employee profit sharing;
  - approving capital appropriations of approximately US\$3,728.9 million for purposes including: 1. Installation of advanced technology capacity; 2. Conversion of logic capacity to specialty technology capacity; 3. Second quarter 2019 R&D capital investments and sustaining capital expenditures;
  - approving capital appropriation of approximately US\$4.91 million to increase the budget for capitalized leased assets in the first half of 2019;
  - convening the 2019 Annual Shareholders' Meeting, at which shareholders held a by-election for one independent director; and
  - approving the promotion of Mr. Y.H. Liaw as Vice President.
- (2) Regular Board Meeting of May 13 & 14, 2019:
  - approving capital appropriations of approximately US\$3,979.8 million for purposes including: 1. Upgrading and expanding advanced technology capacity; 2. Conversion of certain logic capacity to specialty technology; 3. Third quarter 2019 R&D capital investments and sustaining capital expenditures; and
  - approving capital appropriation of approximately US\$115.1 million for capitalized leased assets in the second half of 2019.
- (3) Special Board Meeting of June 5, 2019:
  - approving a NT\$2 per share cash dividend for the first quarter of 2019, and the dividend will be paid in the fourth quarter of 2019. All shareholders of TSMC common shares will receive a NT\$8 per share cash dividend in July 2019, and a NT\$2 cash dividend per share in the fourth quarter, for a total of NT\$10 cash dividend per share; and
  - setting June 30, 2019 as the record date for common stock shareholders entitled to participate in distribution of 2018 profits in the form of cash dividend.
- (4) Regular Board Meeting of August 12 & 13, 2019:
  - approving a NT\$2.5 per share cash dividend for the second quarter of 2019, and set December 25, 2019 as the record date for common stock shareholders entitled to participate in this cash dividend distribution;
  - approving capital appropriations of approximately US\$6,502.3 million for purposes including: 1. Construction of fab facilities; 2. Installation, expansion and upgrade of advanced technology capacity; 3. Installation of specialty technology capacity; 4. fourth quarter 2019 R&D capital investments and sustaining capital expenditures;
  - approving the promotion of Mr. Wendell Huang as Vice President, Chief Financial Officer and Spokesperson, effective September 1, 2019; and
  - approving the promotion of Mr. S.M. Jang as Vice President.
- (5) Regular Board Meeting of November 11 & 12, 2019:
  - approving a NT\$2.5 per share cash dividend for the third quarter of 2019, and set March 25, 2020 as the record date for common stock shareholders entitled to participate in this cash dividend distribution;
  - approving capital appropriations of approximately US\$6,618.4 million for purposes including: 1. Fab construction, and installation of fab facility systems; 2. Installation of advanced technology capacity, and upgrade of advanced packaging capacity; 3. Installation of specialty technology capacity; 4. first quarter 2020 R&D capital investments and sustaining capital expenditures;
  - approving capital appropriation of approximately US\$106.1 million for capitalized leased assets in the first half of 2020;
  - approving an investment to establish a wholly-owned subsidiary in Japan to expand our design service center for providing engineering services support to customers; and
  - approving the appointment of Ms. Mingli Weng as controller of TSMC, effective November 13, 2019.
- (6) Board Meeting of February 10 & 11, 2020:
  - approving 2019 business report and financial statements;
  - approving a NT\$2.5 per share cash dividend for the fourth quarter of 2019, and set June 24, 2020 as the record date for common stock shareholders entitled to participate in this cash dividend distribution;
  - approving distribution of employees' cash bonus and profit sharing bonus for 2019;
  - approving capital appropriations of approximately US\$6,742.1 million for purposes including: 1. Fab construction, and installation of fab facility systems; 2. Installation and upgrade of advanced technology capacity; 3. Installation of specialty technology capacity; 4. Installation of advanced packaging capacity; 5. Second quarter 2020 R&D capital investments and sustaining capital expenditures;
  - approving the issuance of no more than approximately US\$2.01 billion in unsecured corporate bonds in Taiwan to finance TSMC's capacity expansion and/or pollution prevention related expenditures; and
  - convening the 2020 Annual Shareholders' Meeting, at which shareholders will hold an election for one additional independent director.

#### 3.3.3 Major Issues of Record or Written Statements Made by Any Director Dissenting to Important Resolutions

Passed by the Board of Directors during 2019 and as of the Date of this Annual Report: None.

### 3.4 Taiwan Corporate Governance Implementation as Required by Taiwan Financial Supervisory Commission

Assessment Item	Implementation Status			Non-implementation and Its Reason(s)	Assessment Item	Implementation Status			Non-implementation and Its Reason(s)
	Yes	No	Explanation			Yes	No	Explanation	
1. Does Company follow "Taiwan Corporate Governance Implementation" to establish and disclose its corporate governance practices?	V		TSMC has always followed excellent corporate governance practices, provided the utmost in operational transparency and safeguarded shareholders' equity. Although the Company does not have a formal code of practice for corporate governance, however TSMC has always been highly regarded as the industry leader in implementing comprehensive corporate governance practices. In addition, the Company also has a world-class Board of Directors. The Company believes that corporate governance is based on integrity, professional management and implementation. TSMC has been proving its excellent corporate governance in its operating performance and continued winning of domestic and international awards on best corporate governance company.	Same as explanation	4. Does the Company appoint competent and appropriate corporate governance personnel and corporate governance officer to be in charge of corporate governance affairs (including but not limited to furnishing information required for business execution by directors, assisting directors' compliance of law, handling matters related to board meetings and shareholders' meetings according to law, and recording minutes of board meetings and shareholders' meetings)?	V		In 2019, the Board of Directors appointed the Vice President of Legal and General Counsel of TSMC as the Corporate Governance Officer. TSMC's Corporate & Compliance Legal Division, which directly reports to the General Counsel, is in charge of assisting in related affairs, including handling of matters relating to Board, Audit Committee, Compensation Committee and Shareholders' meetings in compliance with law, assistance in onboarding and continuing education of directors, provision of information required for performance of duties by directors, and assistance in directors' compliance of law, etc.	None
2. Shareholding Structure & Shareholders' Rights (1) Does Company have Internal Operation Procedures for handling shareholders' suggestions, concerns, disputes and litigation matters. If yes, has these procedures been implemented accordingly?  (2) Does Company possess a list of major shareholders and beneficial owners of these major shareholders?  (3) Has the Company built and executed a risk management system and "firewall" between the Company and its affiliates?  (4) Has the Company established internal rules prohibiting insider trading on undisclosed information?	V		(1) TSMC has designated appropriate departments, such as Investor Relations Division, the SEC Compliance Department, Legal Department, etc., to handle shareholder suggestions, concerns, disputes or litigation matters.	None	5. Has the Company established a means of communicating with its Stakeholders (including but not limited to shareholders, employees, customers, suppliers, etc.) or created a Stakeholders Section on its Company website? Does the Company respond to stakeholders' questions on corporate responsibilities?	V		Depending on the situation, the Company's Investor Relations Division, Public Relations Department, SEC Compliance Department, Human Resources Organization, Customer Service Department and Procurement Department will communicate with stakeholders. We also have publicly disclosed the contact information of our corporate spokesperson and relevant departments. Also, we have a stakeholder section on our corporate website to address our corporate social responsibilities and any other issues. For details, please refer to "7. Corporate Social Responsibility" on page 113-133 of this Annual Report and "Materiality Analysis and Stakeholder Communication" of TSMC's CSR Report.	None
	V		(2) TSMC tracks the shareholdings of directors, officers, and top ten shareholders.		6. Has the Company appointed a professional registrar for its Shareholders' Meetings?	V		We have appointed China Trust as registrar for our Shareholders' Meetings.	None
	V		(3) TSMC has set up internal rules in the Company's Internal Control System and Affiliated Corporations Management.		7. Information Disclosure (1) Has the Company established a corporate website to disclose information regarding its financials, business and corporate governance status?	V		(1) TSMC discloses its financials business and corporate governance status on its website at <a href="https://www.tsmc.com">https://www.tsmc.com</a> (in Chinese and English). TSMC's American Depository Receipt (ADR) is listed on the New York Stock Exchange (NYSE). As a foreign issuer, TSMC must comply with NYSE's rules. We have been operating in accordance with NYSE listing standards, and have been disclosing the major differences between our corporate governance practices and U.S. corporate governance practices. Please see <a href="https://www.tsmc.com/download/ir/NYSE_Section_303A.pdf">https://www.tsmc.com/download/ir/NYSE_Section_303A.pdf</a> .	None
	V		(4) TSMC has established its "Insider Trading Policy" that applies to all employees, officers and members of the Board of Directors of the Company and to any other person having a duty of trust or confidence, with respect to transactions in the Company's securities. This policy prohibits any insider trading and the Company regularly provides internal training on this issue.		(2) Does the Company use other information disclosure channels (e.g. maintaining an English-language website, designating staff to handle information collection and disclosure, appointing spokespersons, webcasting investors conference etc.)?	V		(2) TSMC has designated appropriate departments (e.g. the Investor Relations Division, Public Relations Department, the SEC Compliance Department, etc.) to handle the collection and disclosure of information as required by the relevant laws and regulations of Taiwan and other jurisdictions. TSMC has designated spokespersons as required by relevant regulations. TSMC webcasts live investor conferences.	None
3. Composition and Responsibilities of the Board of Directors (1) Has the Company established a diversification policy for the composition of its Board of Directors and has it been implemented accordingly?  (2) Other than the Compensation Committee and the Audit Committee which are required by law, does the Company plan to set up other Board committees?  (3) Has the Company established methodology for evaluating the performance of its Board of Directors, on an annual basis, reported the results of performance to the Board of Directors, and use the results as reference for directors' remuneration and renewal?  (4) Does the Company regularly evaluate its external auditors' independence?	V		(1) In 2019, TSMC established "Guidelines for Nomination of Directors", which describes the procedures and criteria for the nomination, qualification and evaluation of candidates for Directors. The members of TSMC Board of Directors are nominated via a rigorous selection process. It not only considers diverse backgrounds, professional competence and experience, but also attaches great importance to his/her personal reputation on ethics and leadership. Presently, the Company's Board of Directors consists of nine members who possess world-class managerial and/or professional experiences. We rely on each directors' knowledge, personal insight and business judgment. TSMC's Board is comprised of a diverse group of professionals from different backgrounds in industries, academia, law, etc. These professionals include citizens from Taiwan, Europe and the U.S. with world-class business operating experience, two of whom are female. With five independent directors, over half of our Board is independent.	None	(3) Does the Company announce and report the annual financial statements within two months after the end of the fiscal year, and announce and report the first, second, and third quarter financial statements as well as the operating status of each month before the prescribed deadline?	V		(3) TSMC follows relevant laws and regulations to announce and report the annual financial statements within two months after the end of the fiscal year, and announce and report the first, second, and third quarter financial statements as well as the operating status of each month before the prescribed deadline. Please see <a href="https://emops.twse.com.tw/server-java/t58query">https://emops.twse.com.tw/server-java/t58query</a> .	None
	V		(2) Audit Committee (founded in 2002); Compensation Committee (founded in 2003); CSR Executive Committee (founded in 2019); is formed by the Company's management team and chaired by Chairman Mark Liu; CSR Committee (founded in 2011); is formed by the Company's executive team and reports to the Board of Directors.		8. Has the Company disclosed other information to facilitate a better understanding of its corporate governance practices (e.g. including but not limited to employee rights, employee wellness, investor relations, supplier relations, rights of stakeholders, directors' training records, the implementation of risk management policies and risk evaluation measures, the implementation of customer relations policies, and purchasing insurance for directors)?	V		(1) For employee rights and employee wellness, please refer to "5.5 Human Capital" on page 82-86 of this Annual Report.  (2) For investor relations, supplier relations and rights of stakeholders, please refer to "7. Corporate Social Responsibility" on page 113-133 of this Annual Report.  (3) For Directors' training records, please refer to "Continuing Education/Training of Directors in 2019" on page 46 of this Annual Report.  (4) For Risk Management Policies and Risk Evaluation, please refer to "6.3 Risk Management" on page 100-111 of this Annual Report.  (5) For Customer Relations Policies, please refer to "5.4 Customer Trust" on page 80-82 of this Annual Report.  (6) TSMC maintains D&O Insurance for its directors and officers.	None
	V		(3) As TSMC's corporate governance concept, the Board of Director's primary responsibility is to supervise, evaluate the management's performance and dismiss officers of the Company when necessary, resolve the important, concrete matters and provide guidance to the management team. TSMC's Board of Directors consists of distinguished members with a great breadth of experience as world-class business leaders or professionals and adhere high ethical standards and commitment to the Company. Each quarter's Board Meeting is last for two days. Company's resolutions are determined in board meeting, also business strategy and future orientation are discussed in the meeting, in order to create best interest for shareholders. Based on TSMC's operating performance and local/international awards of best corporate governance, it certainly proves the Company's excellent performance of Board of Directors. Also, TSMC's audit committee performs self-evaluation and discusses future issues of concern by questionnaire on annual basis.		9. The improvement status for the result of Corporate Governance Evaluation announced by Taiwan Stock Exchange				
	V		(4) The Audit Committee annually evaluates the independence of external auditors and reports the same to the Board of Directors. Please refer to "3.9.4 Evaluation of the External Auditor's Independence" on page 55 of this Annual Report.		TSMC was ranked in top 5% in Corporate Governance Evaluation in 2018 and 2019. The implementation status regarding below three non-scoring items: (1) Appointment of Corporate Governance Officer: The Board of Directors appointed the Vice President of Legal and General Counsel of TSMC, as the Corporate Governance Officer in May 2019, responsible for corporate governance matters, including handling of matters relating to Board, Audit Committee, Compensation Committee and Shareholders' meetings in compliance with law, assistance in onboarding and continuing education of directors, provision of information required for performance of duties by directors, and assistance in directors' compliance of law, etc.  (2) Performance evaluation of the Board of Directors: TSMC will establish and implement processes to evaluate Board performance in 2020.  (3) D&O Insurance and Report to the Board: TSMC maintains D&O Insurance for its directors and reported to the Board in February 2019.				

(Continued)

## Continuing Education/Training of Directors in 2019

The major training methods of Directors include:

- At quarterly Board meetings, TSMC management presents updates on the Company's business, regulatory developments and other information;
- The Company arranges speeches on politics, economics, regulatory compliance, etc.;
- At quarterly Audit Committee meetings, TSMC's General Counsel and the Company's independent auditors provide regulatory update reports; and
- Directors participate in externally-provided training courses as needed.

In addition, from time to time, Directors are invited by other parties to give speeches on corporate governance and related topics.

Name	Date	Host by	Training/Speech Title	Duration
Mark Liu (Note)	01/18	National Taiwan University	TSMC - NTU Research Symposium	1 hour
	06/13 06/14	McKinsey & Company	T-30 Seminar - Disruption 2.0: A&B (AI & Blockchain)	2 days
	09/18	SEMI Taiwan	SEMICON Taiwan 2019 - Technology Think Tank Summit Speech: The Taiwan Semiconductor Industry's Next 60 Years	1 hour
	11/01	TSMC University of Tokyo	Research Symposium	1 hour
F.C. Tseng	03/20	Taiwan Corporate Governance Association	Corporate Governance and Legal Compliance - Starting from Anti-Corruption and Economic Crime	1.5 hours
	05/08		Cyber Insurance and Corporate Governance	3 hours
	08/01		U.S.-China Trade Negotiations and Export Control Management	3 hours
	08/07		Recent Securities and Exchange Act and Tax Act Updates	1.5 hours
Sir Peter L. Bonfield	08/19	NASDAQ	Review of Changes in Governance	4 hours
Stan Shih	03/20	Taiwan Corporate Governance Association	Corporate Governance and Legal Compliance - Starting from Anti-Corruption and Economic Crime	1.5 hours
	05/08		Cyber Insurance and Corporate Governance	3 hours
	08/07		Recent Securities and Exchange Act and Tax Act Updates	1.5 hours
	12/25		IFRS Transformation and the Adaptive Strategies of the Insurance Industry	3 hours
	09/04	Taiwan Insurance Institute	Anti-Money Laundering and Counter-Terrorism Financing Regulatory Analysis	2.5 hours
Kok-Choo Chen	04/12	Taiwan Corporate Governance Association	The Last Defense Line of Corporate Governance - Directors and Supervisors Liability Insurance	3 hours
Michael R. Splinter	08/19	NASDAQ	Review of Changes in Governance	4 hours
Moshe N. Gavrielov	06/13 06/14	McKinsey & Company	T-30 Seminar - Disruption 2.0: A&B (AI & Blockchain)	2 days

Note: Selected speeches on corporate governance and related topics.

## Continuing Education/Training of Corporate Governance Officer in 2019

Name/Title	Date	Host by	Training/Speech Title	Duration
Sylvia Fang Vice President and General Counsel / Corporate Governance Officer	05/22	Intellectual Property Office Taiwan Trade Secret Protection Association	2019 Cross-Strait Trade Secrets Investigation and Litigation Practice Forum	8 hours
	07/10	Ministry of Justice Intellectual Property Office Bureau of Foreign Trade, Ministry of Economic Affairs Taiwan Trade Secret Protection Association Taiwan Law Society National Chiao Tung University	Trade Secrets Protection - Legislation, Practice and Enforcement	8 hours
	09/09	Taiwan Hsinchu District Prosecutors Office Hsinchu City Government	Forum on Anti-Corruption and Integrity of Hsinchu Science Park in 2019 Speech: Trade Secrets and Business Integrity	1.5 hours
	09/27	Technology Transfer and Law Center, Industrial Technology Research Institute	2019 International IP Strategy Forum	6.5 hours
	11/02 11/03	Beijing Anti-Infringement and Anti-Counterfeit Alliance Intellectual Property Research Institute of Xiamen University Taiwan Trade Secret Protection Association	2019 Cross-Strait Trade Secret Protection Symposium	2 days

## 3.5 Code of Ethics and Business Conduct

### Ethics at TSMC

"Integrity" is TSMC's most important core value. TSMC strictly adheres to the highest standards of integrity and promotes good ethical behavior to sustain the hard-earned trust and confidence of its shareholders, customers, suppliers, employees and the general public – constantly and vigilantly promoting integrity, fairness, and transparency in all that we say and do. We have zero tolerance for corruption, refrain from bribery, fraud, waste of corporate assets, and prohibit the advancement of personal interests at the expense of or in conflict with TSMC. At the heart of our corporate governance culture is the "TSMC Ethics and Business Conduct Policy" ("Ethics Code"). The Ethics Code requires that each employee bear a heavy personal responsibility to preserve and to protect TSMC's ethical values and reputation. At the same time, we have formulated the "TSMC's Supplier Code of Conduct" as well to ensure our suppliers understand and follow the Ethics Code and together fulfill our corporate social responsibilities.

#### Major Ethics Code Obligations

- Do not advance personal interests at the expense of or in conflict with the Company;
- Refrain from corruption, bribery, unfair competition, fraud, extortion, collusion, embezzlement, and waste or abuse of corporate assets;
- Avoid any efforts improperly to influence the decisions of anyone, including government officials, agencies, as well as TSMC's customers and suppliers;
- Do not undertake any practices detrimental to TSMC, to the environment, or to society;
- Procure all of our raw materials from socially responsible sources;
- Protect proprietary information of TSMC and our customers; and
- Abide by the letter of all applicable laws, rules and regulations.

**Intellectual Property Protection:** In order to build and sustain an environment of innovation, technology leadership, and sustainable profitable growth, the Ethics Code requires that TSMC promotes business relationships founded upon an unwavering respect for the intellectual property rights, proprietary information and trade secrets of TSMC, our customers, and others.

**Public Disclosures:** TSMC's officers, especially our CEO, CFO, and General Counsel, with oversight from our Board, are responsible for the full, fair, accurate, timely, and understandable financial accounting and financial disclosure in reports and documents filed by the Company with securities authorities and in all TSMC public communications and disclosures. TSMC has a variety of measures in place to ensure compliance with these disclosure obligations.

Any modification to the Ethics Code requires the approval of our Audit Committee to ensure our ethics compliance program is independently reviewed against corporate best practices.

### Ethics Code Implementation

**High Standard Ethical Culture:** Our ethics program is implemented in four ways by all of TSMC's employees, officers and Board members. First, TSMC's management sets the "tone from the top" by acting in accordance with the Ethics Code so that they may be an example to all stakeholders. Second, working-level managers are responsible for ensuring their staff's understanding of and compliance with applicable rules and regulations. Third, TSMC encourages an environment of open communications in discussing any questions related to the Ethics Code. Any employee may consult his or her direct supervisors, Human Resources or Legal to obtain timely advice. Lastly, TSMC requires all employees to stay vigilant and report any noncompliance by anyone to their supervisors, the function head of Human Resources, the responsible corporate senior management appointed by CEO that oversees the Ombudsman system, or to the Chairman of the Company's Audit Committee directly.

**Self-Assessment of All Departments and Employees:** Self-assessment of all departments and employees is an important part of our ethics compliance program. All departments and subsidiaries of TSMC are required to conduct Control Self-Assessment (CSA) tests annually to review employees' awareness of the Ethics Code. The CSA results are reviewed to track the results of our compliance program. In addition, all employees must disclose any matters that cause, or may cause, actual or potential conflict of interest. In addition to this proactive disclosure requirement, employees with specific job grades or job responsibilities must annually declare any relationships that may constitute a conflict of interest, which enables TSMC to take necessary arrangements and report the results to the Audit Committee.

**Internal Auditing:** The Internal Auditor of TSMC plays a critical role in ensuring the Company's compliance with the Ethics Code and relevant rules and regulations. To ensure that our financial, managerial, and operating information is accurate, reliable, and timely and that our employees' actions are in compliance with applicable policies, standards, procedures, laws and regulations, our Internal Auditor conducts audits of various control points within the Company in accordance with its annual audit plan approved by the Board of Directors and subsequently reports its audit findings and remedial issues to the Board and management on a regular basis.

**Training and Promotion:** To promote awareness to our employees of their responsibilities under the Ethics Code, we publish our Ethics Code and related policies and documents on our intranet and, provide training courses, posters, and emails. In addition, we provide an introductory training course on the Ethics Code which is available to all employees online, as well as face-to-face training courses delving into more specific ethics-related topics for targeted employees. In 2019, there were about 47,500 attendances that completed ethics-related training courses at TSMC and its subsidiaries.

In addition to our internal compliance efforts, we expect and assist our business partners such as customers and suppliers, and any other entities with whom we deal (include consultants or third party agents who act for or on behalf of TSMC) to recognize and understand TSMC's ethical standards to fulfill our responsibilities as a corporate citizen. For instance, we require all of our suppliers to declare in writing that they will respect and comply with TSMC's ethical standards and culture. TSMC is a full member of the Responsible Business Alliance ("RBA", formerly the (Electronic Industry Citizenship Coalition, EICC)), dedicated to electronics supply chain sustainability. In addition to adopting the RBA Code of Conduct at all of its facilities, TSMC applied the RBA's standards to enhance our audit program of our suppliers and relevant business partners. We provide training and communicate our ethical culture to our suppliers through live seminars to prevent any unethical conduct and detect any sign of Ethics Code violations. In 2019, we held both a sustainable supply chain experience exchange and our annual Responsible Supply Chain Forum to share/exchange practical experiences on topics such as the Ethics Code, labor rights, environmental protection, and occupational safety. In total, 709 attendees from 481 suppliers participated in these activities. We also exchange views on appropriate business conduct and TSMC's ethical standards with our customers as part of customer audit programs.

#### Reporting Channels and Whistleblower Protection

To ensure that our conduct meets relevant legal requirements and the highest ethical standards under the Ethics Code, TSMC provides multiple channels for reporting business conduct concerns. First of all, our Audit Committee approved and we have implemented the "Complaint Policy and Procedures for Certain Accounting and Legal Matters" and "Procedures for Ombudsman System" that allow employees or any whistleblowers with relevant evidence to report any financial, legal, or ethical irregularities anonymously through either the Ombudsman or directly to the Audit Committee. TSMC maintains additional internal reporting channels for our employees. To foster an open culture of ethics compliance, we encourage our employees and the third parties we do business with to report any suspected noncompliance with law or relevant TSMC policy.

TSMC treats any complaint and the investigation thereof in a confidential and sensitive manner, and strictly prohibits any form of retaliation against any individual who in good faith reports or helps with the investigation of any complaint.

Due to the open reporting channels, TSMC receives reports on various issues from employees and external parties such as our customers and suppliers from time to time. Below is a summary of the Number of Reported Incidents.

Year	FY 2016	FY 2017	FY 2018	FY2019
Total reported cases	116	113	150	205 (Note 1)
Ethics-related cases	16	20	14	26
Cases investigated and verified as ethics violations	2	4	1	2 (Note 2)
Sexual Harassment Investigation Committees Formed	5	7	3	4
Cases investigated and verified as violations	5	3	3	4 (Note 3)

Note 1: Among the 205 cases, 132 were related to employee relationship, 47 cases related to other matters (e.g. employee's individual interest or private matters), and 26 cases related to ethical matters.

Note 2: One case involved an employee who requested a supplier to reserve a hotel and pay advance accommodation fees during his business trip, actions which violate TSMC policy, and the employee was disciplined. Another case involved an employee who abused his work relationship by requesting a supplier to make a personal loan to the employee, a severe violation of our Ethics Code, and the employee was terminated.

Note 3: After the investigation by TSMC's Sexual Harassment Investigation Committee, four employees involved in confirmed cases of sexual harassment received severe discipline from the Company.

#### Ethics Code Violation Disciplinary Action

We do not tolerate any violation of the Ethics Code and treat every possible violation incident seriously. Any violator of the Ethics Code (or relevant regulations) will be severely disciplined to the full extent of our policies and the law, up to and including immediate dismissal, termination of business relationship, and judicial prosecution as appropriate.

#### 3.5.1 Taiwan Corporate Conduct and Ethics Implementation as Required by the Taiwan Financial Supervisory Commission

Assessment Item	Implementation Status			Causes for the Difference
	Yes	No	Summary	
1. Establishment of Corporate Conduct and Ethics Policy and Implementation Measures (1) Does the company have a clear ethical corporate management policy approved by its Board of Directors, and bylaws and publicly available documents addressing its corporate conduct and ethics policy and measures, and commitment regarding implementation of such policy from the Board of Directors and the top management team?	V		(1) Integrity is the most important core value of TSMC's culture. TSMC is committed to acting ethically in all aspects of our business. We have established TSMC Code of Ethics and Business Conduct (the "Ethics Code") to require that each employee bears a heavy personal responsibility to uphold TSMC's ethics value. For more details on the Ethics Code and the measures that TSMC Board of Directors (the "Board") and the management team take to ensure compliance of the Ethics Code please refer to TSMC's Annual Report and the Corporate Social Responsibility Report.	None
(2) Whether the company has established an assessment mechanism for the risk of unethical conduct; regularly analyzes and evaluates within a business context, the business activities with a higher risk of unethical conduct; has formulated a program to prevent unethical conduct with a scope no less than the activities prescribed in paragraph 2, Article 7 of the Ethical Corporate Management Best Practice Principles for TWSE/GTSM Listed Companies?	V		(2) At the heart of our corporate governance culture is the Ethics Code that applies to TSMC and its subsidiaries, and this Ethics Code requires that each employee bears a heavy personal responsibility to preserve and to protect TSMC's ethical values and reputation and to comply with various applicable laws and regulations. Specific requirements under the Ethics Code could be found in our Annual Report. In addition, to educate and remind our employees of their responsibilities under the Ethics Code, we publish our Ethics Code, relevant policies and documents on our intranet and promote its awareness through training courses, posters, and internal news articles. Furthermore, to ensure that our conduct meets relevant legal requirements and the highest ethical standards under the Ethics Code, TSMC provides multiple channels for reporting business conduct concerns. Please refer to Assessment Item 3 for details.	
(3) Whether the company has established relevant policies that are duly enforced to prevent unethical conduct, provided implementation procedures, guidelines, consequences of violation and complaint procedures, and periodically reviews and revises such policies?	V		(3) Under the framework of the Ethics Code, TSMC has established a regulatory compliance program that includes policies, guidelines and procedures in other policy areas, including: Anti-corruption, Anti-harassment, Anti-discrimination, Anti-trust (unfair competition), Environment, Export Control, Financial Reporting, Insider Trading, Intellectual Property, Proprietary Information Protection ("PIP"), Personal Data Protection, Record Retention and Disposal, as well as procuring certain raw materials from socially responsible sources ("Conflict-free Minerals"). The above-mentioned policies are crucial in facilitating overall compliance with the Ethics Code. TSMC, its employees and its subsidiaries are expected to fully understand and comply with all laws and regulations that govern our businesses, as well as relevant policies, guidelines and procedures, and make ethical decisions in every circumstance. The Internal Auditor of TSMC also plays a critical role in ensuring the Company's compliance with the Ethics Code and relevant rules and regulations. To ensure that our financial, managerial, and operating information is accurate, reliable, and timely and that our employee's actions are in compliance with applicable policies, standards, procedures, laws and regulations, our Internal Auditor conducts audits of various control points within the Company in accordance with its annual audit plan approved by the Board of Directors and subsequently reports its audit findings and remedial issues to the Board and Management on a regular basis.	

(Continued)

Assessment Item	Implementation Status			Causes for the Difference
	Yes	No	Summary	
2. Ethic Management Practice (1) Whether the company has assessed the ethics records of whom it has business relationship with and include business conduct and ethics related clauses in the business contracts?	V		(1) We expect and assist our customers, suppliers, business partners, and any other entities with whom we deal (such as consultant or third party agents who act for or on behalf of TSMC) to understand and act in accordance with TSMC's ethical standards. For instance, as for our suppliers, we require all of them to declare in writing that they will not engage in any fraud or any unethical conduct when dealing with us or our officers and employees. In addition to periodic audit, we provide training and communicate our ethical culture to our suppliers through live seminars to prevent any unethical conduct. We exchange views on appropriate business conduct and TSMC's ethical standards with our customers as part of customer audit programs.	None
(2) Whether the company has set up a unit which is dedicated to promoting the company's ethical standards and regularly (at least once a year) reports directly to the Board of Directors on its ethical corporate management policy and relevant matters, and program to prevent unethical conduct and monitor its implementation?	V		(2) TSMC's Board of Directors strives to perform the responsibilities of supervising the corporate conduct and ethics compliance practice through the Audit Committee and the Compensation Committee, the hiring of a financial expert consultant for the Audit Committee, and coordination with the Internal Audit department. The General Counsel and the Corporate & Compliance Legal Division (which directly reports to the General Counsel) promotes, with other divisions, the Company's ethical standards, and the General Counsel reports quarterly to the Board on the implementation status. In addition, both the responsible senior manager appointed by the CEO to oversee the Ombudsmen system and Internal Auditors update the Board on ethical standards and compliance issues on a regular basis. Moreover, TSMC's officers, especially our CEO, CFO, and General Counsel, with oversight from our Board, are responsible for the full, fair, accurate, timely, and understandable financial accounting and financial disclosure in reports and documents filed by the Company with securities authorities and in all TSMC public communications and disclosures.	
(3) Whether the company has established policies to prevent conflict of interests, provide appropriate communication and complaint channels and implement such policies properly?	V		(3) TSMC requires newly hired employees to declare any conflict of interest situation as appropriate. In addition, all employees must disclose any matters that have, or may have, the appearance of undermining the Ethics Code (such as any actual or potential conflict of interest). Furthermore, key employees and senior officers must periodically declare their compliance status with the Ethics Code according to relevant procedures.	
(4) To implement relevant policies on ethical conducts, has the company established effective accounting and internal control systems, audit plans based on the assessment of unethical conduct, and have its ethical conduct program audited by internal auditors or CPA periodically?	V		(4) TSMC continues maintaining the integrity of its financial reporting processes and controls and establishes appropriate internal control systems for preventing higher potential unethical conduct, and the Internal Auditor formulate annual audit plans based on the results of the risk assessment and subsequently reports its audit findings and remedial issues to the Board and Management on a regular basis. In addition, all departments and subsidiaries of TSMC are also required to conduct Control Self-Assessment (CSA) tests annually to review the effectiveness of the internal control system.	
(5) Does the company provide internal and external ethical conduct training programs on a regular basis?	V		(5) Training is a major component of our compliance program, conducted throughout the year to refresh TSMC's employees' commitment to ethical conduct, and to get updated information on laws and regulations related to their daily operations. As for our suppliers, we communicate our ethical culture to our business partners through live seminars to ensure their fully understanding of our commit to ethical conduct.	
3. Implementation of Complaint Procedures (1) Does the company establish specific complaint and reward procedures, set up conveniently accessible complaint channels, and designate responsible individuals to handle the complaint received?	V		(1) TSMC's Audit Committee approved and TSMC has implemented the "Complaint Policy and Procedures for Certain Accounting and Legal Matters" and "Procedures for Ombudsman System" that allow employees or any whistleblowers with relevant evidence to report any financial, legal, or ethical irregularities anonymously through either the Ombudsman or directly to the Audit Committee. TSMC also requires all employees to stay vigilant and whistle-blow any noncompliance by anyone to their supervisors, the function head of Human Resources, the responsible corporate Vice President that oversees the Ombudsman system, or to the Chairman of the Company's Audit Committee directly.	None
(2) Whether the company has established standard operation procedures for investigating the complaints received, follow-up measures after investigation are completed, and ensuring such complaints are handled in a confidential manner?	V		(2) TSMC treats any complaint and the investigation thereof in a confidential and sensitive manner, as is clearly stated in our bylaws.	
(3) Does the company adopt proper measures to prevent a complainant from retaliation for his/her filing a complaint?	V		(3) TSMC strictly prohibits any form of retaliation against any individual who in good faith reports or helps with the investigation of any complaint, as is clearly stated in our bylaws.	
4. Information Disclosure Does the company disclose its guidelines on business ethics as well as information about implementation of such guidelines on its website and Market Observation Post System ("MOPS")?	V		Our internal website provides guidelines and informative articles on ethics and honorable business conduct (in both Chinese and English) for employees' easy access. In addition, TSMC discloses relevant policies and information in its Annual Report (which is also available at the MOPS) and CSR Report (available at: <a href="https://www.tsmc.com">https://www.tsmc.com</a> ).	None

(Continued)

Assessment Item	Implementation Status			Causes for the Difference
	Yes	No	Summary	
5. If the company has established corporate governance policies based on Ethical Corporate Management Best Practice Principles for TWSE/GTSM Listed Companies, please describe any discrepancy between the policies and their implementation.  TSMC has established the Ethics Code to require that all employees, officers and board members comply with the Ethics Code and the other policies and procedures. There is no discrepancy between the Ethics Code, including its affiliate policies and procedures, and its implementation. For more details, please refer to "3.5 Code of Ethics and Business Conduct" on page 47-51 of this Annual Report.  6. Other important information to facilitate better understanding of the company's corporate conduct and ethics compliance practices (e.g., review the company's corporate conduct and ethics policy).  For details on the implementation of TSMC's Corporate Conduct and Ethics, please refer to "3.5 Code of Ethics and Business Conduct" on page 47-51 of this Annual Report.				

### 3.6 Regulatory Compliance

TSMC's compliance systems are comprised of a series of legislation monitoring, developing and implementation of effective compliance policies and programs, training, and maintaining open reporting channels.

#### Legislative Monitoring

TSMC operates in many countries. To comply with governing legislation, applicable laws, regulations and regulatory expectations, we closely monitor domestic and foreign government policies and regulatory developments that could materially impact TSMC's business and financial operations. Our Legal organization periodically updates our relevant internal departments, management and the Audit Committee of applicable regulatory changes so that internal teams ensure compliance with new regulatory requirements in a timely manner. We are also a proactive advocate for legislative and regulatory reform, and our comments and recommendations on legal reforms to the government have been accepted constructively. TSMC is increasingly dedicated to identifying potential regulatory issues and will continue to be involved in advocating public policy changes that foster a positive and fair business environment.

#### Policy and Compliance Program Development and Implementation

Under the framework of the Ethics Code, TSMC has established a regulatory compliance program that includes policies, guidelines and procedures in different compliance areas, including: Anti-corruption, Anti-harassment, Anti-discrimination, Employment Regulations, Antitrust (unfair competition), Environment, Export Control, Financial Reporting, Insider Trading, Intellectual Property, Proprietary Information Protection ("PIP"), Personal Data Protection, Record Retention and Disposal, as well as procuring certain raw materials from socially responsible sources ("Conflict-free Minerals"). It is our belief that these policies are crucial in strengthening overall compliance with the Ethics Code and compliance program. TSMC, its employees and its subsidiaries are expected to fully understand and comply with all laws and regulations that govern our businesses, as well as relevant policies, guidelines and procedures, and make ethical decisions in every circumstance.

#### Compliance Awareness Training

Training is a major component of our regulatory compliance program, conducted throughout the year to refresh TSMC's employees' commitment to ethical conduct, and to get updated information on laws and regulations related to their daily operations. Highlights of our training include:

- Awareness promotion emails to employees, posters at our facilities, and news articles, compliance guidelines, tips and FAQs which our employees can access through our intranet;
- Live seminars focusing on specific topics such as Anti-Corruption, PIP, Intellectual Property, Personal Data Protection, Export Control Management and Antitrust. Training is made mandatory for those employees whose jobs are especially relevant to a particular topic to ensure sufficient awareness of relevant laws and internal policies;
- On-line learning programs updated frequently to provide most up-to-date information and timely and flexible access for employees to understand the law and key compliance issues, covering topics of Anti-Corruption, Antitrust, Anti-harassment, Insider Trading, Export Control Management, PIP, and Personal Data Protection among others;
- External training, in Taiwan and abroad, for TSMC's Legal team to receive current developments of new laws and regulations, and for its lawyers to comply with applicable continuing legal education requirements. External experts are also invited to give in-house lectures on key issues.

## Reporting Channels

TSMC provides multiple channels for reporting business conduct concerns to ensure that our conduct meets relevant legal requirements and the highest ethical standards under the Ethics Code. For more details about the reporting channels, please refer to "3.5 Code of Ethics and Business Conduct" on page 47-51 of this Annual Report.

## Major Accomplishments

In 2019, TSMC achieved several major accomplishments in regulatory compliance. Externally, in addition to fulfilling the company's obligations toward regulatory compliance matters, TSMC exercised its civic duties as a responsible corporate citizen by providing feedback on current regulations and regulations in legislation, with the intent to improve Taiwan's industrial investment environment, enhance economic development, and help align domestic laws with international law. Furthermore, TSMC continues to focus on the topics related to the Company Law, the Securities and Exchange Act, intellectual property protection and environment protection. In addition, TSMC advised government agencies on recent revisions to trade secrets and environmental protection regulations.

Internally, TSMC provides multiple courses about legal and regulatory compliance, including anti-corruption, anti-trust, anti-harassment, insider trading, export control, and protection of confidential and personal information. These courses are taught by both internal and external experts and law professionals. The important achievements are as follows:

- Ethics and Compliance: (1) providing an annual compulsory ethics and compliance online course covering various important regulatory compliance topics – a total of about 47,500 employees completed this training course – and all of the production staff are included in this course for the first time in 2019; (2) focusing on the production lines supervisors in Taiwan's fabs, 22 seed lecturers were trained, and through face-to-face courses, the guidelines of avoiding conflict of interest was promoted – a total of 1,134 production lines supervisors participated.
- Export Compliance: TSMC's export management system (EMS) and policy have been in place for a number of years, and are continuously maintained to ensure compliance with all applicable regulations covering the export of information, technologies, products, materials and equipment. Our EMS was certified in September 2012 by the Bureau of Foreign Trade, the Taiwan regulator, as a qualified ICP (Internal Compliance Program) exporter. In 2018, TSMC successfully

extended the validity period of its ICP certificate to October 2021. In addition, TSMC implements "No ECCN, No Shipment" control and customers are required to provide end use and export control classification number (ECCN) of their products, among other required information, for TSMC to apply for applicable export licenses. To further enhance relevant employees' awareness on the export control requirements, in 2019 we provided more than 30 face-to-face communication sessions to employees in relevant functions.

- Supplier Management: TSMC held both a sustainable supply chain experience exchange and our annual Responsible Supply Chain Forums to share and exchange practical experiences on topics such as Ethics Code, labor rights, environmental protection and occupational safety. In total, 709 attendees from 481 suppliers were participated in these activities.
- Conflict-Free Supply Chain: As a recognized global leader in the hi-tech supply chain, we acknowledge our corporate social responsibility to strive to procure conflict-free minerals in an effort to recognize humanitarian and ethical social principles that protect the dignity of all persons. Meanwhile, we have implemented a series of compliance safeguards in accordance with industry leading practices. In 2019, TSMC has made continued progress to ensure a conflict-free supply chain, and our conflict-free minerals compliance program has also been highly ranked by several independent third party rating agencies.
- Personal Data Protection: Because of the importance of personal data protection, TSMC periodically reviews the Rules of Privacy and Personal Data Protection and external and internal privacy policies to identify the needs to update such documents. Based on current personal data protection laws and risks, TSMC updated its Privacy and Cookies Policy online for its websites and privacy notice to relevant employees. In addition, following results of a personal data risk assessment, relevant divisions (such as Information Technology Security) have also established more enhanced control measures for their business needs.
- Antitrust Compliance: Based on annual antitrust risk assessment results, TSMC identified functions with potential higher risk from an antitrust perspective. To enhance targeted functions' employee awareness of the importance of competition and antitrust laws and issues in daily operation, TSMC established antitrust training plans and conducted several antitrust trainings for global sales personnel and employees at those relevant departments.

## 3.7 Internal Control System Execution Status

### 3.7.1 Statement of Internal Control System

#### Taiwan Semiconductor Manufacturing Company Limited

#### Statement of Internal Control System

February 11, 2020

Based on the findings of a self-assessment, Taiwan Semiconductor Manufacturing Company Limited (TSMC) states the following with regard to its internal control system during the year 2019:

1. TSMC's Board of Directors and management are responsible for establishing, implementing, and maintaining an adequate internal control system. Our internal control is a process designed to provide reasonable assurance over the effectiveness and efficiency of our operations (including profitability, performance and safeguarding of assets), reliability, timeliness, transparency of our reporting, and compliance with applicable rulings, laws and regulations.
2. An internal control system has inherent limitations. No matter how perfectly designed, an effective internal control system can provide only reasonable assurance of accomplishing its stated objectives. Moreover, the effectiveness of an internal control system may be subject to changes due to extenuating circumstances beyond our control. Nevertheless, our internal control system contains self-monitoring mechanisms, and TSMC takes immediate remedial actions in response to any identified deficiencies.
3. TSMC evaluates the design and operating effectiveness of its internal control system based on the criteria provided in the Regulations Governing the Establishment of Internal Control Systems by Public Companies (herein below, the "Regulations"). The criteria adopted by the Regulations identify five key components of managerial internal control: (1) control environment, (2) risk assessment, (3) control activities, (4) information and communication, and (5) monitoring activities.
4. TSMC has evaluated the design and operating effectiveness of its internal control system according to the aforesaid Regulations.
5. Based on the findings of such evaluation, TSMC believes that, on December 31, 2019, it has maintained, in all material respects, an effective internal control system (that includes the supervision and management of our subsidiaries), to provide reasonable assurance over our operational effectiveness and efficiency, reliability, timeliness, transparency of reporting, and compliance with applicable rulings, laws and regulations.
6. This Statement is an integral part of TSMC's annual report and prospectus, and will be made public. Any falsehood, concealment, or other illegality in the content made public will entail legal liability under Articles 20, 32, 171, and 174 of the Securities and Exchange Law.
7. This Statement was passed by the Board of Directors in their meeting held on February 11, 2020, with none of the nine attending directors expressing dissenting opinions, and the remainder all affirming the content of this Statement.

Taiwan Semiconductor Manufacturing Company Limited



Mark Liu  
Chairman



C. C. Wei  
Chief Executive Officer

### 3.7.2 If CPA Was Engaged to Conduct a Special Audit of Internal Control System, Provide Its Audit Report: None.

### 3.8 Status of Personnel Responsible for the Company's Financial and Business Operation

#### 3.8.1 Resignation or Dismissal of Chairman, President, and Heads of Accounting, Finance, Internal Audit, Corporate Governance Officer and R&D during 2019 and as of the Date of this Annual Report:

				As of 02/29/2020
Title Name	On-board Date (Note 1)	Date of Resignation or Dismissal	Summary of Resignation or Dismissal	
Head of Accounting Jessica Chou	2005/11/08	2019/06/10	Retired	
Senior Vice President, Chief Financial Officer/ Spokesperson Lora Ho	2003/09/08	2019/08/31	Transferred to TSMC's Europe & Asia Sales Head	

Note: On-board date means the official date of presiding the position.

#### 3.8.2 Certification of Employees Whose Jobs are Related to the Release of the Company's Financial Information

Certification	Number of Employees	
	Internal Audit	Finance
Certified Public Accountants (CPA)	4	39
US Certified Public Accountants (US CPA)	4	13
The Chartered Institute of Management Accountants (CIMA)	-	1
Certified Internal Auditor (CIA)	14	6
Chartered Financial Analyst (CFA)	-	1
Certified Management Accountant (CMA)	-	1
Financial Risk Manager (FRM)	-	2
Certification in Control Self-Assessment (CCSA)	3	-
Certification in Risk Management Assurance (CRMA)	5	-
Certified Information Systems Auditor (CISA)	5	-
Chief Fraud Examiner (CFE)	2	-
BS7799/ISO 27001 Lead Auditor	2	-

### 3.9 Information Regarding TSMC's Independent Auditor

#### 3.9.1 Audit Fees

The Audit Committee approves all fees payable to TSMC's independent auditor and recommends the same to the Board of Directors for further approval. The Board of Directors has authorized the Audit Committee to approve any increase not exceeding 10% of the approved fees.

Unit: NT\$ thousands

Accounting Firm	Name of CPA	Audit Fee	Non-audit Fee					CPA's Audit Period	Remark
			System Design	Company Registration	Human Resource	Others (Note)	Subtotal		
Deloitte & Touche	Mei-Yen Chiang, Yu-Feng Huang, and others	63,920	-	-	-	83	83	01/01/2019 - 12/31/2019	-

Note : Fees mainly related to research tool for accounting standards and regulations.

#### 3.9.2 TSMC did not replace its independent auditor during 2018, 2019, and as of February 29, 2020.

#### 3.9.3 TSMC's Chairman, Directors, Chief Executive Officer, Chief Financial Officer, and Managers in Charge of Its Finance and Accounting Operations Did Not Hold Any Positions within TSMC's Independent Audit Firm or Its Affiliates in the Most Recent Year.

#### 3.9.4 Evaluation of the External Auditor's Independence

The Audit Committee annually monitors the independence of TSMC's external auditor by conducting the following evaluation standards and reports the same to the Board of Directors:

1. The auditor's independence declaration
2. The Audit Committee pre-approves all audit and non-audit services conducted by the auditor to ensure that the non-audit services do not influence the results of the audit
3. Ensure the audit partner rotates every five years
4. Annually evaluate the independence of the external auditor based on the results of the auditor survey regarding its financial interests, commercial relations, employment relations, and etc.

### 3.10 Material Information Management Procedure

TSMC has established relevant procedures for managing and disclosing material information. The responsible departments regularly remind all officers and employees about the need to comply with these procedures and other applicable regulations when they become aware of any potential material information and the possible need to publicly disclose such information. To ensure that our employees, managers and board directors are aware of and comply with these relevant regulations, TSMC has also established our "Insider Trading Policy". To reduce the risk of insider trading, on-line training programs and live seminars are conducted periodically. In addition, employees can familiarize themselves with relevant internal policies and training articles by easily accessing TSMC's Legal Organization intranet website.



## Capital and Shares

### 4.1 Capital and Shares

#### 4.1.1 Capitalization

Unit: Shares/NT\$

As of 02/29/2020

Month/ Year	Issue Price (Per Share)	Authorized Share Capital		Capital Stock		Remark		
		Shares	Amount	Shares	Amount	Sources of Capital	Capital Increase by Assets Other than Cash	Date of Approval & Approval Document No.
07/2015	10	28,050,000,000	280,500,000,000	25,930,380,458	259,303,804,580	Exercise of Employee Stock Options: NT\$7,180,220	None	07/13/2015 Zhu Shang Tzu No. 1040020526

#### 4.1.2 Capital and Shares

Unit: Shares

As of 02/29/2020

Type of Stock	Authorized Share Capital			Unissued Shares	Total		
	Issued Shares						
	Listed	Non-listed	Total				
Common Stock	25,930,380,458	-	25,930,380,458	2,119,619,542	28,050,000,000		

Shelf Registration: None.

#### 4.1.3 Composition of Shareholders

Common Shares

As of 12/25/2019 (record date)

Type of Shareholders	Government Agencies	Financial Institutions	Other Juridical Persons	Foreign Institutions and Natural Persons	Domestic Natural Persons	Total
Number of Shareholders	5	161	1,427	4,641	350,139	356,373
Shareholding	1,653,710,183	725,454,157	1,179,372,052	20,351,638,123	2,020,205,943	25,930,380,458
Holding Percentage	6.38%	2.80%	4.55%	78.48%	7.79%	100.00%

## Distribution Profile of Share Ownership

Common Shares

Shareholder Ownership (Unit: Share)	Number of Shareholders	Ownership	Ownership Percentage
1-999	151,730	31,645,048	0.12%
1,000-5,000	151,188	299,198,263	1.15%
5,001-10,000	23,804	172,583,766	0.67%
10,001-15,000	8,996	109,918,663	0.42%
15,001-20,000	4,311	76,003,106	0.29%
20,001-30,000	4,616	112,808,380	0.44%
30,001-40,000	2,246	78,049,090	0.30%
40,001-50,000	1,449	65,268,164	0.25%
50,001-100,000	2,799	195,609,524	0.75%
100,001-200,000	1,698	235,303,512	0.91%
200,001-400,000	1,110	310,013,271	1.20%
400,001-600,000	469	229,159,754	0.88%
600,001-800,000	307	211,417,333	0.82%
800,001-1,000,000	186	165,621,997	0.64%
Over 1,000,001	1,464	23,637,780,587	91.16%
Total	356,373	25,930,380,458	100.00%

Preferred Shares: None.

## 4.1.4 Major Shareholders

Common Shares

Shareholders	Total Shares Owned	Ownership Percentage
ADR-Taiwan Semiconductor Manufacturing Company, Ltd.	5,325,610,353	20.54%
National Development Fund, Executive Yuan	1,653,709,980	6.38%
Government of Singapore	759,304,376	2.93%
JPMorgan Chase Bank N.A., Taipei Branch in custody for Vanguard Total International Stock Index Fund, a series of Vanguard Star Funds	388,270,768	1.50%
Norges Bank	364,952,088	1.41%
New Labor Pension Fund	239,351,255	0.92%
Vanguard Emerging Markets Stock Index Fund, a series of Vanguard International Equity Index Funds	228,786,845	0.88%
iShares Core MSCI Emerging Markets ETF	216,832,000	0.84%
JPMorgan Chase Bank N.A. Taipei Branch in custody for EuroPacific Growth Fund	214,458,329	0.83%
Invesco Oppenheimer Developing Markets Fund	207,328,429	0.80%

## 4.1.5 Net Change in Shareholding by Directors, Management and Shareholders with 10% Shareholdings or More

Unit: Shares

Title Name	2019		01/01/2019 - 02/29/2020	
	Net Change in Shareholding	Net Change in Shares Pledged	Net Change in Shareholding	Net Change in Shares Pledged
Chairman Mark Liu	-	-	-	-
Chief Executive Officer & Vice Chairman C.C. Wei	-	-	-	-
Director F.C. Tseng	-	-	-	-
Director National Development Fund, Executive Yuan Representative: Mei-ling Chen	-	-	-	-
Independent Director Sir Peter L. Bonfield	-	-	-	-
Independent Director Stan Shih	-	-	-	-
Independent Director Kok-Choo Chen	-	-	-	-
Independent Director Michael R. Splinter	-	-	-	-
Independent Director Moshe N. Gavrielov (Note 1)	-	-	-	-
Senior Vice President Lora Ho	-	-	20,000	-
Senior Vice President Wei-Jen Lo	(3,000)	-	-	-
Senior Vice President Rick Cassidy	-	-	-	-
Senior Vice President Y.P. Chin	(2,000)	-	-	-
Senior Vice President Y.J. Mii	-	-	-	-
Senior Vice President J.K. Lin	-	-	-	-
Senior Vice President J.K. Wang	-	-	-	-
Vice President N.S. Tsai (Note 2)	-	-	-	-
Vice President Irene Sun (Note 2)	-	(220,000)	-	-
Vice President Cliff Hou	11,994	-	1,825	-
Vice President and General Counsel/ Corporate Governance Officer Sylvia Fang	-	100,000	-	-

(Continued)

Title Name	2019		01/01/2019 - 02/29/2020	
	Net Change in Shareholding	Net Change in Shares Pledged	Net Change in Shareholding	Net Change in Shares Pledged
Vice President Connie Ma	22,000	-	-	-
Vice President Y.L. Wang	-	-	-	-
Vice President Doug Yu	-	-	-	-
Vice President and TSMC Fellow Alexander Kalnitsky	-	-	-	-
Vice President Kevin Zhang	-	-	-	-
Vice President and TSMC Fellow T.S. Chang	-	-	(27,000)	-
Vice President Michael Wu	-	-	-	-
Vice President Min Cao	-	-	-	-
Vice President H.-S. Philip Wong	-	-	-	-
Vice President Marvin Liao	-	-	-	-
Vice President Y.H. Liaw (Note 3)	-	-	-	-
Vice President Simon Jang (Note 4)	-	-	-	-
Vice President, Chief Financial Officer / Spokesperson Wendell Huang (Note 5)	95	-	35	-

Note 1: Mr. Moshe N. Gavrielov was elected as TSMC's independent director at TSMC's Annual Shareholders' Meeting on June 5, 2019. His shareholding was disclosed starting from that date.

Note 2: Vice President Dr. N.S. Tsai retired, effective May 1, 2019. Vice President Dr. Irene Sun retired, effective September 30, 2019. Their shareholdings were not disclosed after that date.

Note 3: Mr. Y.H. Liaw was promoted to Vice President, effective February 19, 2019. His shareholding was disclosed starting from that date.

Note 4: Dr. Simon Jang was promoted to Vice President, effective August 13, 2019. His shareholding was disclosed starting from that date.

Note 5: Mr. Wendell Huang was promoted to Vice President, effective September 1, 2019. His shareholding was disclosed starting from that date.

#### 4.1.6 Stock Trade with Related Party

Name	Reason of the Transfer	Transfer Date	Transferee	Relation with the Transferee	Shares	Transfer Price
Wei-Jen Lo	Gifting	10/30/2019	Wei-Li Lo	Brother	3,000	-

#### 4.1.7 Stock Pledge with Related Party: None.

#### 4.1.8 Related Party Relationship among TSMC's 10 Largest Shareholders

Name	Shares Held		Shares Held by Spouse & Minors		Shares Held in the Name of Others		Name and Relationship between TSMC's Shareholders	
	Shares	%	Shares	%	Shares	%	Name	Relationship
ADR-Taiwan Semiconductor Manufacturing Company, Ltd.	5,325,610,353	20.54%	N/A	N/A	N/A	N/A	None	None
National Development Fund, Executive Yuan Representative: Mei-ling Chen	1,653,709,980	6.38%	N/A	N/A	N/A	N/A	None	None
Government of Singapore	759,304,376	2.93%	N/A	N/A	N/A	N/A	None	None
JPMorgan Chase Bank N.A., Taipei Branch in custody for Vanguard Total International Stock Index Fund, a series of Vanguard Star Funds	388,270,768	1.50%	N/A	N/A	N/A	N/A	None	None
Norges Bank	364,952,088	1.41%	N/A	N/A	N/A	N/A	None	None
New Labor Pension Fund	239,351,255	0.92%	N/A	N/A	N/A	N/A	None	None
Vanguard Emerging Markets Stock Index Fund, a series of Vanguard International Equity Index Funds	228,786,845	0.88%	N/A	N/A	N/A	N/A	None	None
iShares Core MSCI Emerging Markets ETF	216,832,000	0.84%	N/A	N/A	N/A	N/A	None	None
JPMorgan Chase Bank N.A. Taipei Branch in custody for EuroPacific Growth Fund	214,458,329	0.83%	N/A	N/A	N/A	N/A	None	None
Invesco Oppenheimer Developing Markets Fund	207,328,429	0.80%	N/A	N/A	N/A	N/A	None	None

#### 4.1.9 Long-term Investment Ownership

Long-term Investment (Note 1)	Ownership by TSMC (1)		Ownership by Directors, Managers and Directly/Indirectly Owned Subsidiaries (2)		Total Ownership (1) + (2)	
	Shares	%	Shares	%	Shares	%
Equity Method:						
TSMC Partners, Ltd.	988,268,244	100%	-	-	988,268,244	100%
TSMC Global Ltd.	11,284	100%	-	-	11,284	100%
TSMC North America	11,000,000	100%	-	-	11,000,000	100%
TSMC Europe B.V.	200	100%	-	-	200	100%
TSMC Japan Limited	6,000	100%	-	-	6,000	100%
TSMC Korea Limited	80,000	100%	-	-	80,000	100%
TSMC China Company Limited	Not Applicable (Note 2)	100%	Not Applicable (Note 2)	-	Not Applicable (Note 2)	100%
TSMC Nanjing Company Limited	Not Applicable (Note 2)	100%	Not Applicable (Note 2)	-	Not Applicable (Note 2)	100%
VisEra Technologies Company Ltd.	253,120,000	86.94%	-	-	253,120,000	86.94%
Systems on Silicon Manufacturing Co. Pte. Ltd.	313,603	38.79%	-	-	313,603	38.79%
Vanguard International Semiconductor Corp.	464,223,493	28.32%	275,576,082	16.82% (Note 3)	739,799,575	45.14%
Xintec Inc.	111,281,925	41.01%	-	-	111,281,925	41.01%
Global UniChip Corporation	46,687,859	34.84%	-	-	46,687,859	34.84%
VentureTech Alliance Fund II, L.P.	Not Applicable (Note 2)	98.00%	Not Applicable (Note 2)	-	Not Applicable (Note 2)	98.00%
VentureTech Alliance Fund III, L.P.	Not Applicable (Note 2)	98.00%	Not Applicable (Note 2)	-	Not Applicable (Note 2)	98.00%

Note 1: On 01/10/2020, TSMC Design Technology Japan, Inc., a 100% owned subsidiary of TSMC, was established.

Note 2: Not applicable. These firms do not issue shares. TSMC's investments are measured as a percentage of ownership.

Note 3: TSMC's Director, National Development Fund of Executive Yuan, held 16.72% while other Directors and Management held 0.10%.

#### 4.1.10 Share Information

TSMC's earnings per share in 2019 decreased 1.7% from 2018 to NT\$13.32 per share. The following table details TSMC's market price, net worth, earnings, and dividends per common share, as well as other data regarding return on investment.

##### Market Price, Net Worth, Earnings, and Dividends Per Common Share

Unit: NT\$, except for weighted average shares and return on investment ratios

Item	2018	2019	01/01/2020 - 02/29/2020
Market Price Per Share (Note 1)			
Highest Market Price	266.00	345.00	346.00
Lowest Market Price	212.00	208.00	315.00
Average Market Price	237.45	261.73	329.71
Net Worth Per Share			
Before Distribution	64.67	62.53	-
After Distribution	56.67	60.03 (Note 5)	-
Earnings Per Share			
Weighted Average Shares (thousand shares)	25,930,380	25,930,380	-
Diluted Earnings Per Share	13.54	13.32	-
Dividends Per Share			
Cash Dividends	8.00	9.50 (Note 5)	-
Accumulated Undistributed Dividend	-	-	-
Return on Investment			
Price/Earnings Ratio (Note 2)	17.54	19.65	-
Price/Dividend Ratio (Note 3)	29.68	27.55 (Note 5)	-
Cash Dividend Yield (Note 4)	3.4%	3.6% (Note 5)	-

Note 1: Referred to TWSE website

Note 2: Price/Earnings Ratio = Average Market Price/ Diluted Earnings Per Share

Note 3: Price/Dividend Ratio = Average Market Price/Cash Dividends Per Share

Note 4: Cash Dividend Yield = Cash Dividends Per Share/Average Market Price

Note 5: Including the dividends amount for fourth quarter of 2019, which were approved by Board of Directors on February 11, 2020

#### 4.1.11 Dividend Policy and Distribution of Earnings

Except as otherwise specified in the Articles of Incorporation or under the R.O.C. law, we will not pay dividends or make other distributions to shareholders when there are no earnings. The R.O.C. Company Act also requires that 10% of annual net income (less prior years' losses and outstanding taxes) be set aside as legal reserve until the accumulated legal reserve equals our paid-in capital. Our profits may be distributed by way of cash dividend, stock dividend, or a combination of cash and stock. Pursuant to our Articles of Incorporations, distributions of profits shall be made preferably by way of cash dividend. In addition, the ratio for stock dividends shall not exceed 50% of the total distribution. Distribution of stock dividends is subject to approval by the R.O.C. Financial Supervisory Commission.

On February 19, 2019, TSMC's board of directors adopted a proposal recommending distribution of a 2018 cash dividend of NT\$8 per common share, which was approved by the annual general meeting of shareholders on June 5, 2019. In the same meeting, shareholders also approved the amendments to TSMC's Articles of Incorporation to authorize the Company's board of directors to approve quarterly cash dividends after the close of each quarter, after which the dividend will be distributed within six months. In the subsequent board meetings, TSMC's board of directors approved quarterly cash dividends, of which the respective amounts and payment dates are demonstrated in the table below. In the future, TSMC intends to maintain a sustainable quarterly cash dividend, and to distribute the cash dividend each year at a level not lower than the year before.

#### 2018 Yearly and 2019 Quarterly Earnings Distribution

Unit: NT\$

Period	Approved Date	Payment Date	Cash Dividends Per Share	Total Earnings Distribution Amount
2018	June 5, 2019	July 18, 2019	NT\$8.0	207,443,043,664
First quarter of 2019	June 5, 2019	October 17, 2019	NT\$2.0	51,860,760,916
Second quarter of 2019	August 13, 2019	January 16, 2020	NT\$2.5	64,825,951,145
Third quarter of 2019	November 12, 2019	April 16, 2020	NT\$2.5	64,825,951,145
Fourth quarter of 2019	February 11, 2020	July 16, 2020	NT\$2.5	64,825,951,145

#### 4.1.12 Compensation to Directors and Profit Sharing Bonus to Employees

Based on TSMC's Articles of Incorporation, before paying dividends or bonuses to shareholders, TSMC shall set aside not more than 0.3% of its annual profit to directors as compensation and not less than 1% to employees as profit sharing bonus.

As resolved by TSMC's Board of Directors on February 11, 2020, a profit sharing bonus to employees was expensed based on a certain percentage of 2019 profit; compensation to directors was expensed based on the estimated amount of payment. If the actual amounts subsequently paid differ from the above estimated amounts, the differences will be recorded in the year paid as a change in accounting estimate.

#### 2019 Directors' Compensation and Employees' Profit Sharing Bonus

	Board Resolution (02/11/2020)	Amount (NT\$ thousands)
Directors' Compensation (Cash)		360,404
Employee's Profit Sharing Bonus (Cash)		23,165,745

Note: NT\$23,165,745 thousand employees' cash bonus was already distributed following each quarter of 2019. The above employees' profit sharing bonus will be distributed in July, 2020.

#### 2018 Directors' Compensation and Employees' Profit Sharing Bonus

	Board Resolution (02/19/2019)	Actual Result (Note)
	Amount (NT\$ thousands)	Amount (NT\$ thousands)
Directors' Compensation (Cash)	349,271	349,271
Employees' Profit Sharing Bonus (Cash)	23,570,040	23,537,898

Note: The above directors' compensation and employees' profit sharing bonus were expensed under the Company's 2018 statement of comprehensive income and were approved by the Board of Directors at its meeting on February 19, 2019. However, due to employee turnover, the employees' profit sharing bonus in the amount of NT\$32,142 thousand was undistributed, and related expense was reversed in 2019.

**4.1.13 Impact to 2020 Business Performance and EPS Resulting from Stock Dividend Distribution:** Not applicable.

**4.1.14 Buyback of Common Stock:** None.

## 4.2 Issuance of Corporate Bonds

### 4.2.1 Corporate Bonds

#### NTD Corporate Bonds

As of 02/29/2020

Issuance	Domestic Unsecured Bond (101-3)	Domestic Unsecured Bond (101-4)	Domestic Unsecured Bond (102-1)	Domestic Unsecured Bond (102-2)	Domestic Unsecured Bond (102-4)
<b>Issuing Date</b>	10/09/2012	01/04/2013	02/06/2013	07/16/2013	09/25/2013
<b>Denomination</b>	NT\$10,000,000	NT\$10,000,000	NT\$10,000,000	NT\$10,000,000	NT\$10,000,000
<b>Offering Price</b>	Par	Par	Par	Par	Par
<b>Total Amount</b>	NT\$4,400,000,000	NT\$23,600,000,000	NT\$21,400,000,000	NT\$13,700,000,000	NT\$15,000,000,000
<b>Coupon</b>	1.53% p.a.	Tranche A: 1.23% p.a. Tranche B: 1.35% p.a. Tranche C: 1.49% p.a.	Tranche A: 1.23% p.a. Tranche B: 1.38% p.a. Tranche C: 1.50% p.a.	Tranche A: 1.50% p.a. Tranche B: 1.70% p.a.	Tranche A: 1.35% p.a. Tranche B: 1.45% p.a. Tranche C: 1.60% p.a. Tranche D: 1.85% p.a. Tranche E: 2.05% p.a. Tranche F: 2.10% p.a.
<b>Tenor and Maturity Date</b>	Tenor: 10 years Maturity: 10/09/2022	Tranche A: 5 years Maturity: 01/04/2018 Tranche B: 7 years Maturity: 01/04/2020 Tranche C: 10 years Maturity: 01/04/2023	Tranche A: 5 years Maturity: 02/06/2018 Tranche B: 7 years Maturity: 02/06/2020 Tranche C: 10 years Maturity: 02/06/2023	Tranche A: 7 years Maturity: 07/16/2020 Tranche B: 10 years Maturity: 07/16/2023	Tranche A: 3 years Maturity: 09/25/2016 Tranche B: 4 years Maturity: 09/25/2017 Tranche C: 5.5 years Maturity: 03/25/2019 Tranche D: 7.5 years Maturity: 03/25/2021 Tranche E: 9.5 years Maturity: 03/25/2023 Tranche F: 10 years Maturity: 09/25/2023
<b>Outstanding</b>	NT\$4,400,000,000	NT\$3,000,000,000	NT\$3,600,000,000	NT\$13,700,000,000	NT\$10,600,000,000
<b>Credit Rating</b>	twAAA (Taiwan Ratings Corporation, 09/04/2012)	twAAA (Taiwan Ratings Corporation, 11/29/2012)	twAAA (Taiwan Ratings Corporation, 12/18/2012)	twAAA (Taiwan Ratings Corporation, 05/16/2013)	twAAA (Taiwan Ratings Corporation, 08/06/2013)
<b>Trustee</b>	Taipei Fubon Commercial Bank				
<b>Guarantor</b>	None				
<b>Underwriter</b>	Not Applicable				
<b>Legal Counsel</b>	Modern Law Office				
<b>Auditor</b>	Deloitte & Touche				
<b>Repayment</b>	Bullet				
<b>Redemption or Early Repayment Clause</b>	None				
<b>Covenants</b>	None				
<b>Other Rights of Bondholders</b>	<b>Conversion Right</b>	None			
	<b>Amount of Converted or Exchanged Common Shares, ADRs or Other Securities</b>	Not Applicable			
<b>Dilution Effect and Other Adverse Effects on Existing Shareholders</b>	None				
<b>Custodian</b>	None				

**4.2.2 Convertible Bond:** None.

**4.2.3 Exchangeable Bond:** None.

**4.2.4 Shelf Registration:** None.

**4.2.5 Bond with Warrants:** None.

#### 4.3 Preferred Shares

**4.3.1 Preferred Shares:** None.

**4.3.2 Preferred Shares with Warrants:** None.

#### 4.4 Issuance of American Depository Shares

Issuing Date	10/08/1997	11/20/1998	01/12/1999 - 01/14/1999	07/15/1999	08/23/1999 - 09/09/1999	02/22/2000 - 03/08/2000	04/17/2000	06/07/2000 - 06/15/2000	05/14/2001 - 06/11/2001	06/12/2001	11/27/2001	02/07/2002 - 02/08/2002	11/21/2002 - 12/19/2002	07/14/2003 - 07/21/2003	11/14/2003	08/10/2005 - 09/08/2005	05/23/2007
<b>Total Amount (US\$)</b>	594,720,000	184,554,440	35,500,000	296,499,641	158,897,089	379,134,599	224,640,000	1,167,873,850	240,999,660	297,649,640	320,600,000	1,001,650,000	160,097,914	908,514,880	1,077,000,000	1,402,036,500	2,563,200,000
<b>Offering Price Per ADS (US\$)</b>	24.78	15.26	17.75	24.516	28.964	57.79	56.16	35.75	20.63	20.63	16.03	16.75	8.73	10.40	10.77	8.6	10.68
<b>Units Issued</b>	24,000,000	12,094,000	2,000,000	12,094,000	5,486,000	6,560,000	4,000,000	32,667,800	11,682,000	14,428,000	20,000,000	59,800,000	18,348,000	87,357,200	100,000,000	163,027,500	240,000,000
<b>Common Shares Represented</b>	120,000,000	60,470,000	10,000,000	60,470,000	27,430,000	32,800,000	20,000,000	163,339,000	58,410,000	72,140,000	100,000,000	299,000,000	91,740,000	436,786,000	500,000,000	815,137,500	1,200,000,000
<b>Underlying Securities</b>	TSMC Common Shares from Selling Shareholders	TSMC Common Shares from Selling Shareholders	TSMC Common Shares from Selling Shareholders	TSMC Common Shares from Selling Shareholders	TSMC Common Shares from Selling Shareholders (Pursuant to ADR Conversion Sale Program)	TSMC Common Shares from Selling Shareholders (Pursuant to ADR Conversion Sale Program)	TSMC Common Shares from Selling Shareholders	Cash Offering and TSMC Common Shares from Selling Shareholders from Selling Shareholders	TSMC Common Shares from Selling Shareholders (Pursuant to ADR Conversion Sale Program)	TSMC Common Shares from Selling Shareholders (Pursuant to ADR Conversion Sale Program)	TSMC Common Shares from Selling Shareholders						
<b>Apportionment of Expenses for Issuance and Maintenance</b>	(Note 3)							(Note 4)					(Note 3)				
<b>Issuance and Listing</b>	NYSE																
<b>Rights and Obligations of ADS Holders</b>	Same as those of Common Share Holders																
<b>Trustee</b>	Not Applicable																
<b>Depository Bank</b>	Citibank, N.A. – New York																
<b>Custodian Bank (Note 1)</b>	Citibank, N.A. – Taipei Branch																
<b>ADSs Outstanding (Note 2)</b>	As of February 29, 2020, total number of outstanding ADSs was 1,065,090,813																
<b>Terms and Conditions in the Deposit Agreement and Custody Agreement</b>	See Deposit Agreement and Custody Agreement for Details																
<b>Closing Price Per ADS (US\$; source: Bloomberg)</b>	2019	High	58.81														
		Low	32.79														
		Average	42.74														
	01/01/2020 - 02/29/2020	High	60.32														
		Low	53.29														
		Average	57.28														

Note 1: Citibank, N.A., Taipei Branch changed its name to "Citibank Taiwan Limited" in 2009.

Note 2: TSMC has aggregate issued 813,544,500 ADSs since 1997, which, if taking into consideration stock dividends distributed over the period, would amount to 1,147,835,205 ADSs. Stock dividends distributed in 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008 and 2009 were 45%, 23%, 28%, 40%, 10%, 8%, 14.08668%, 4.99971%, 2.99903%, 0.49991%, 0.50417% and 0.49998%, respectively. As of February 29, 2020, total number of outstanding ADSs was 1,065,090,813 after 82,744,392 were redeemed.

Note 3: All fees and expenses such as underwriting fees, legal fees, listing fees and other expenses related to issuance of ADSs were paid by the selling shareholders, while maintenance expenses such as annual listing fees and accountant fees were borne by TSMC.

Note 4: All fees and expenses such as underwriting fees, legal fees, listing fees and other expenses related to issuance of ADSs were paid proportionately by TSMC and the selling shareholders, while maintenance expenses such as annual listing fees and accountant fees were borne by TSMC.

#### **4.5 Status of Employee Stock Option Plan**

**4.5.1 Issuance of Employee Stock Options:** None.

**4.5.2 Employee Stock Options Granted to Management Team and to Top 10 Employees:** None.

#### **4.6 Status of Employee Restricted Stock**

**4.6.1 Status of Employee Restricted Stock:** None.

**4.6.2 Employee Restricted Stock Granted to Management Team and to Top 10 Employees:** None.

**4.7 Status of New Share Issuance in Connection with Mergers and Acquisitions:** None.

**4.8 Financing Plans and Implementation:** Not applicable.



## Operational Highlights

### 5.1 Business Activities

#### 5.1.1 Business Scope

As the founder and leader of the dedicated semiconductor foundry segment, TSMC provides a full range of integrated semiconductor foundry services, including the most advanced process technologies, leading specialty technologies, the most comprehensive design ecosystem support, excellent manufacturing productivity and quality, advanced mask and packaging services, and so on, to meet a growing variety of customer needs. The Company strives to provide the best overall value to its customers and views customer success as TSMC success. As a result, TSMC has gained customer trust from around the world and has experienced strong growth and success of its own.

#### 5.1.2 Customer Applications

TSMC manufactured 10,761 different products for 499 customers in 2019. These chips were used across a broad spectrum of electronic applications, including computers and peripherals, information appliances, wired and wireless communication systems, servers and data centers, automotive and industrial equipment, consumer electronics such as digital TVs, game consoles, digital cameras, IoT and wearables, and many other devices and applications.

The rapid ongoing evolution of end products prompts customers to pursue differentiation using TSMC's innovative technologies and services and, at the same time, spurs TSMC's own development of technology. As always, success depends on leading rather than following industry trends.

#### 5.1.3 Consolidated Shipments and Net Revenue in 2019 and 2018

Unit: Shipments (thousand 12-inch equivalent wafers) / Net Revenue (NT\$ thousands)

	2019		2018	
	Shipments	Net Revenue (Note 3)	Shipments	Net Revenue (Note 3)
Wafer	Domestic (Note 1)	1,678	91,259,259	1,575
	Export	8,390	836,058,092	9,177
Others (Note 2)	Domestic (Note 1)	N/A	8,835,783	N/A
	Export	N/A	133,832,314	N/A
Total	Domestic (Note 1)	1,678	100,095,042	1,575
	Export	8,390	969,890,406	9,177
				941,356,950

Note 1: Domestic means sales to Taiwan.

Note 2: Others mainly include revenue associated with packaging and testing services, mask making, design services, and royalties.

Note 3: Commencing in 2018, the Company began to break down the net revenue by product based on a new method which associates most estimated sales returns and allowances with individual sales transactions, as opposed to the previous method which allocated sales returns and allowances based on the aforementioned gross revenue. The Company believes the new method provides a more relevant breakdown than the previous one.

#### 5.1.4 Production in 2019 and 2018

Unit: Capacity / Output (million 12-inch equivalent wafers) / Amount (NT\$ millions)

Year	Wafers		
	Capacity	Output	Amount
2019	12 - 13	9 - 10	448,292
2018	12 - 13	10 - 11	478,269

## 5.2 Technology Leadership

### 5.2.1 R&D Organization and Investment

In 2019 TSMC continued to invest in research and development, with total R&D expenditures amounting to 8.5% of revenue, a level that equals or exceeds the R&D investment of many other leading high-tech companies.

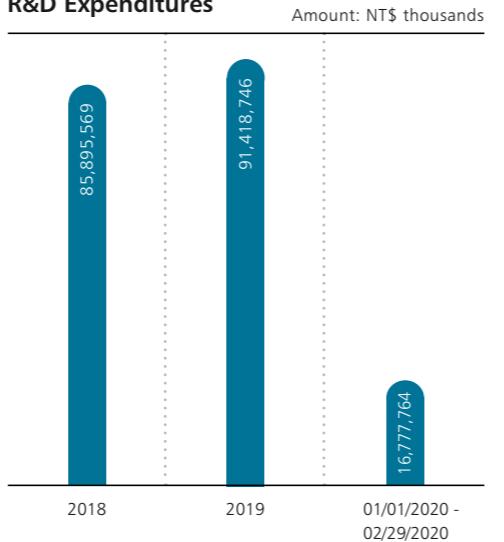
Faced with the increasingly difficult challenge to continue extending Moore's Law, which calls for the doubling of semiconductor computing power every two years, TSMC has focused its R&D efforts on offering customers first-to-market, leading-edge technologies and design solutions that contribute to their product success. In 2019, following the transfer to manufacturing of the 7nm+ technology and the successful risk production of 5nm technology, the Company's R&D organization continued to fuel the pipeline of technological innovation needed to maintain industry leadership. While TSMC's 3nm technology, the sixth generation of technology platform to make use of 3D transistors, continues full development, the Company has initiated the development of 2nm technology, a pioneering effort within the semiconductor industry, and at the same time, is progressing in research and exploratory studies for nodes beyond 2nm.

In addition to CMOS logic, TSMC conducts R&D on a wide range of other semiconductor technologies that provide the functionalities required by customers for mobile SoC and other applications. Highlights in 2019 include:

- process validation for System-on-Integrated Chips (TSMC-SoIC®), an innovative wafer-level package technology;
- high-volume production of Gen-4 Integrated Fan-Out Package on Package (InFO-PoP) for mobile processor packaging;
- successful qualification of Gen-5 InFO-PoP advanced packaging technology for mobile applications and Gen-2 Integrated Fan-Out on Substrate (InFO\_oS) for HPC applications;
- development of 40nm BCD (Bipolar-CMOS-DMOS) technology – unique in the industry – offering leading-edge 20-24V HV devices with full compatibility to 40nm ultra-low-power platform and integration of RRAM, in turn, enabling low power, high integration and small footprint for high-speed communication interface in mobile applications;
- technical qualification of 28nm eFlash which is for high performance mobile computing and high performance low-leakage platforms, is achieved for automobile electronics and micro controller units (MCU); and
- development of the latest generation CMOS image sensors of sub-micron pixel for mobile applications and embedded 3D metal-insulator-metal (MiM) high-density capacitors for global shutter and high dynamic-range sensor applications.

In 2019, TSMC maintained strong partnerships with many world-class research institutions, including SRC in the U.S. and IMEC in Belgium. TSMC also continued to expand research collaboration with leading universities throughout the world for two grand purposes; the advancement of semiconductor technologies and the nurturing of talent for the future.

#### R&D Expenditures



### 5.2.2 R&D Accomplishments in 2019

#### Highlights

##### • 5nm Technology

Even though the semiconductor industry is approaching the physical limits of silicon, 5nm technology still follows Moore's Law and delivers substantial density improvement with better performance at the same or lower power consumption with comparable performance. In 2019, TSMC continued full development of 5nm focusing on manufacturing baseline process setup, yield learning, transistor and interconnect R/C performance improvement and reliability evaluation. The SRAM and logic yield results met the required expectations and TSMC achieved its goal of risk production in 2019.

##### • 3nm Technology

3nm technology offers substantial density improvement and power reduction with the same chip performance as 5nm technology. Development activities in 2019 focused on manufacturing baseline process setup, yield learning, transistor and interconnect R/C performance improvement and reliability evaluation. TSMC plans to continue full development of 3nm in 2020.

##### • 2nm Technology

In 2019, in a pioneering role in the semiconductor industry, TSMC launched research and development of 2nm technology.

#### • Lithography Technology

The focus for R&D lithography in 2019 was on 5nm technology transfer, 3nm technology development and preparation of 2nm to move beyond development. 5nm technology was smoothly transferred and R&D is working with the fab to resolve the remaining EUV production issues. As for 3nm development, EUV (extreme ultraviolet) lithography showed promising imaging capability with expected wafer yield. R&D is working on EUV to reduce mask defects in scanner, and overlay errors while lowering overall cost. In 2020, TSMC will focus intensely on improving EUV quality and cost in 2nm technology and beyond.

In 2019, the Company's EUV program made continuous improvement in light-source power and stability, enabling faster learning rates and process development for advanced nodes. Additional progress was made with resist process, pellicle, and related mask blanks, as EUV moves closer to full scale manufacturing readiness.

#### • Mask Technology

Mask technology is an integral part of advanced lithography. In 2019, R&D successfully completed 5nm node mask technology transfer and smoothly implemented more complicated and advanced EUV mask technology in 3nm node. Solid progress was made on production yield, cycle time and the reduction of blank defects to meet high-volume manufacturing requirements.

#### Integrated Interconnect and Packaging

TSMC has pushed the system performance envelope beyond Moore's Law by continuously upgrading wafer level system integration (WLSI) technologies in both interconnect pitch density and system sizes. WLSI encompasses innovative technologies with frontend 3D integration, system-on-integrated-chip (TSMC-SoIC®) and backend 3D integration, including Integrated Fan-Out (InFO) and Chip on Wafer on Substrate (CoWoS®). Armed with TSMC's most advanced node wafers/chips and mix-and-match frontend 3D and backend 3D system integration, customers can build differentiated products on TSMC's unique wafer-to-package turnkey services.

#### • 3D IC and TSMC-SoIC® (System-on-Integrated Chips)

System-on-Integrated Chips (TSMC-SoIC®) is an innovative wafer-level package technology that can holistically integrate multiple chiplets into a single SoC chip with a smaller footprint and thinner profile. Through this technology, advanced SoC chips (made by 7nm, 5nm, or even 3nm nodes) can be integrated with multi-tier, multi-functional chips for the embodiment of high speed, high bandwidth, low power, high pitch density, and minimal footprint heterogeneous 3D IC integration. Unlike conventional package technology, TSMC-SoIC® applies an essential copper-to-copper bonding structure along with

through-silicon-via (TSV) to enable the most advanced 3D IC technologies. Currently, TSMC has accomplished the process validation for TSMC-SoIC® and developed micron-level bonding-pitch processes with promising electrical yield and reliability data. This shows TSMC's readiness and the capability of TSMC-SoIC®-based production for any potential customers. In brief, the TSMC-SoIC® technology provides the opportunity not only to sustain Moore's Law, but also to achieve a significant breakthrough in SoC performance.

#### • Si Interposer and CoWoS® (Chip on Wafer on Substrate)

Demand for CoWoS® remained strong throughout 2019 as a result of rapid growth in the HPC and AI markets. The unique requirements for this product category include the integration of logic chips with the most computing power and memory chips with greatest capacity and bandwidth – exactly where CoWoS® excels. To meet the increasing production demand, advanced backend fabs AP3 and AP5 joined forces with AP1, the original CoWoS® fab, to provide the needed CoWoS® capacity for our customers. On the technology front, CoWoS® Gen-4 was developed to further boost overall performance at the package level by expanding the Si interposer dimensions. The CoWoS® Gen-4 features an interposer area up to 1,700 mm<sup>2</sup>, which is large enough to accommodate one full-reticle size SoC chip and up to six 3D high bandwidth memory (HBM) stacks. CoWoS® Gen-5 with an interposer area up to 2,400 mm<sup>2</sup> is currently being developed with new chip architectures in mind, such as chiplets, TSMC-SoIC® and HBM3 (third generation high bandwidth memory).

#### • Advanced Fan-Out and InFO (Integrated Fan-Out)

In 2019, TSMC continued to lead in high-volume manufacturing of InFO-PoP Gen-4 packaging for mobile applications processors and Integrated Fan-Out on Substrate (InFO\_oS) HPC chip partition applications. InFO-PoP Gen-5 and InFO\_oS Gen-2 were also successfully qualified for mobile and HPC applications respectively. InFO-PoP Gen-5 qualification meant a smaller package size with more pin counts and better power integrity. InFO\_oS Gen-2 provided more chip partition integration with larger package size and higher bandwidth. Continuous development of multi-die heterogeneous integration with finer-pitch die-to-die interconnection has led to new InFO without substrate for consumer applications. New generation IPD (integrated passive device) technology, which provides higher density capacitors and low ESL (effective series inductance) for electrical performance boost, passed qualification on InFO-PoP. This enhanced InFO-PoP will benefit both AI and 5G mobile applications. New high volume manufacturing of IPD is scheduled to begin in 2020.

### • Advanced Interconnect

To strengthen customers' competitiveness, TSMC provides advanced interconnect technologies to boost chip performance through architecture innovation and new material development. The innovative power distribution network (PDN) scheme aims to reduce high IR-drop and RC-delay in traditional schemes and improve pattern density with better routing resources. New materials include both metals and dielectrics. The development focuses on robust low-k and lower effective dielectric constant structures. In addition to metal barrier engineering, the Company is performing research in single metallic elements, binary and ternary alloys as well.

### Corporate Research

Innovation in transistor architectures and materials continues to drive higher performance and reduced power consumption in advanced logic technologies. TSMC is at the forefront of 2D and carbon nanotube (CNT) transistor research. At the 2019 Symposia on VLSI Technology, TSMC published a first demonstration of 40nm channel length top-gate WS<sub>2</sub> (tungsten disulfide) pFET (p-channel field-effect transistor) using channel area-selective chemical vapor deposition (CVD) growth on SiO<sub>x</sub>/Si substrate. Without the 2D layer transfer, this CVD direct growth is suitable for volume manufacturing. At the 2019 International Electron Device Meeting, TSMC also successfully demonstrated the first heterogeneous integration of advanced 28nm Si logic circuits with low-cost and high-mobility CNT transistors in the backend of line (BEOL) with a BEOL-compatible low temperature. TSMC continues to look for emerging high density, non-volatile memory hardware accelerators for AI and HP computing. The Company's research is well positioned to pave the way for continued density scaling, performance enhancement and power reduction to deliver advanced logic technologies for mobile and HPC applications.

### Specialty Technologies

TSMC offers a broad mix of technologies to address a wide range of applications:

#### • Mixed Signal / Radio Frequency (MS/RF)

In 2019, TSMC developed a 5nm silicon and EM simulation-based LC tank design solution to facilitate high-speed SerDes (serializer/deserializer) circuit design with various metal scheme options and layout specifications to shorten design turnaround time. To meet customers' growing demand for high speed, low latency and massive IoT applications in the 5G network roadmap, TSMC provided 16nm and 28nm RF devices by boosting f<sub>t</sub>/f<sub>max</sub> for transceiver design and 40nm special process by enhancing breakdown voltage under the same benefit from lower R<sub>on</sub>-C<sub>off</sub> for better power handling in RF switch applications.

#### • Power IC / Bipolar-CMOS-DMOS (BCD)

In 2019, TSMC developed 40nm BCD technology with 20-24V HV devices on a 40nm ultra-low-power platform with low-voltage devices and full logic process compatibility. This also successfully integrated RRAM (Resistive Random Access Memory) for the first time to enable low power, high integration in a small footprint for high-speed communication interface on mobile applications. TSMC will continue to develop 28V and 12-16V HV devices to cover more power management IC applications.

#### • Panel Drivers

In 2019, TSMC completed dual platforms in advanced high-voltage display driver IC technologies. Both wafer-on-wafer stacking (WoW 28HPC/40HV) and 28HV technologies passed process and reliability qualification. WoW stacking has completed customers' product yield and qualification with 60% active power reduction from 40HV. Several customers have early IP verification in 28HV technology. These technologies are leading-edge for small panel 4K resolution, OLED (organic light-emitting diode) and 120Hz display driver ICs. In addition, OLED on Si for AR/VR applications showed excellent illumination uniformity in 80HV technology. In 2020, TSMC plans to enhance the performance for OLED TDDI (touch with display driver integration) applications on 28HV and 8V transistors on WoW stacking.

#### • Micro-Electromechanical Systems (MEMS)

In 2019, TSMC's modular MEMS technology was qualified for mass production of high-resolution accelerometers and gyroscopes. Future plans include the development of next-generation high-sensitivity thin microphone, total solutions for MEMS optical image stabilization (OIS) systems in 12-inch wafer and BioMEMS applications.

#### • GaN

The first generation of 650V and 100V enhanced GaN high electron mobility transistors (E-HEMT) went into production in 2019. The second generation of 650V and 100V E-HEMT demonstrated 50% FOM (figure of merit) improvement and passed engineering qualification. In addition, TSMC developed 100V D-HEMT devices, which passed engineering qualification and will go into risk production in 2020.

#### • Complementary Metal-Oxide-Semiconductor (CMOS) Image Sensor

In 2019, TSMC had several achievements in CMOS image sensor technology. Two major accomplishments were: the completion of the development of a newest-generation miniaturized sub-micron pixel, which brought about a 12.5% pixel size reduction from the previous generation, an increase in the pixel's readout

speed and a reduction of read noise for mobile applications; and the successful development of 3D metal-insulator-metal (MiM) high-density capacitors embedded inside an image sensor array for global shutter and high dynamic-range sensor applications.

#### • Embedded Flash / Emerging Memory

TSMC reached several major milestones in embedded non-volatile memory (NVM) technologies in 2019. At the 40nm node, the Company successfully mass-produced NOR-based cell technology with split-gate cell to support consumer electronics such as IoT, smartcards, MCUs and numerous automotive electronics applications. At 28nm node, the Company's embedded flash development for HP mobile computing and HP low-leakage platforms achieved technical qualification for automotive electronics and MCUs. TSMC also offered RRAM technology to be embedded in NVM (non-volatile memory) technologies as a low-cost solution for the price-sensitive IoT market. 40nm node also achieved technical qualification as customer product qualifications continued. The Company expects the 28nm node to enter production in 2020. Development in 22nm node is on track and expected to pass technical qualification in 2020. TSMC is also developing 22nm embedded MRAM technology, which has achieved technical qualification to enter production. Furthermore, TSMC is developing 16nm embedded MRAM for next generation embedded memory MCUs, automotive devices, IoT and AI to serve many new applications.

### 5.2.3 Technology Platform

TSMC provides customers with advanced technology platforms that include the comprehensive design infrastructure required to optimize design productivity and cycle times. These include: design flows for electronic design automation (EDA); silicon-proven libraries and IP building blocks; and simulation and verification design kits, i.e., process design kits (PDKs) and technology files.

For TSMC's latest advanced technologies of 5nm, 6nm, 7nm, 7nm+, 12nm, 22nm and 3D IC design enablement platform, EDA tools, features and IP solutions are readily available for customers to adopt to meet their product requirements at various design stages. The Company also extends its IP quality program (TSMC 9000) to allow IP audits to be performed either at TSMC or at TSMC-certified laboratories. To help customers plan new product tape-outs incorporating library/IP from the Company's Open Innovation Platform® (OIP) ecosystem, the OIP ecosystem features a portal to connect customers to 42 IP solution providers. Overall, TSMC and its IP partners have accumulated a portfolio of more than 26,000 IP titles, from 0.35μm to 5nm, with major IP types to meet customer design

needs. TSMC and its EDA partners have created numerous deliverables from 0.13μm to 5nm that have successfully supported customer tape-outs.

### 5.2.4 Design Enablement

TSMC's technology platforms provide a solid foundation to facilitate the design process. Customers can design using the Company's internally developed IP and tools or use tools available from TSMC's OIP partners.

#### Tech Files and PDKs

EDA tool certification is an essential element for IP and customer designs to ensure that features meet TSMC process technology requirements, with certification results that can be found on TSMC-Online™. There are corresponding tech files and process development kits (PDKs) available for customers to download and design together with certified EDA tools. TSMC provides a broad range of PDKs for digital logic, mixed-signal, radio frequency (RF), high-voltage driver, CMOS image sensor (CIS) and embedded flash technologies across a range of nodes from 0.5μm to 5nm. In addition, the Company provides tech files for design rule checking (DRC), layout verification of schematic (LVS), resistance-capacitance (RC) extraction, automatic place and route, and a layout editor to ensure process technology information is accurately represented in EDA tools. By 2019, TSMC had provided customers more than different 10,600 tech files and 360 PDKs via TSMC-Online™. There are more than 100,000 customer downloads of these files every year.

#### Library and IP

Silicon intellectual property (IP) is the basic building block of integrated circuit designs. Various IP types are available to support different customer design applications including foundation IP, analog IP, embedded memory IP, interface IP and soft IP. To support 3D IC customer needs, TSMC also starts to offer 3D IC IP in 2019. TSMC and its alliance partners offer customers a rich portfolio of reusable IPs, which are essential building blocks for many circuit designs. In 2019, the Company expanded its library and silicon IP portfolio to contain more than 26,000 items, a 30% increase over 2018.

#### Design Methodology and Flow

Reference flows are built on top of certified EDA tools to provide additional design flow methodology innovations that can help boost productivity. In 2019, TSMC addressed critical design challenges associated with new 6nm and 3D IC technologies for digital and SoC applications by announcing the availability of reference flows through OIP collaboration that feature FinFET-specific design solutions and TSMC-SoIC® (System-on-Integrated Chips) methodologies for performance, power and area optimization.

## 5.2.5 Intellectual Property

TSMC has an active worldwide patent strategy and places on equivalent emphasis on both quality and quantity as the core principle of TSMC patent management. In terms of patent filings, TSMC has accumulated more than 55,000 patent applications worldwide as of end of 2019, including near 6,500 applications filed in 2019 which made TSMC ranked in top 10 global US patent applicants, and No. 1 among patent applicants in Taiwan for four consecutive years. In terms of patent grants, TSMC has obtained exceeding 39,000 patent worldwide accumulated as of end of 2019, including 3,600 global patents (more than 2,300 U.S. patents included) received in 2019. In terms of patent quality, the allowance rate of TSMC's U.S. applications reached 99% and TSMC ranked No. 1 in patent allowance rate among global top 20 U.S. Patent Assignees in 2019. At least once a year, the General Counsel updates to the Board of Directors the status of the intellectual property management scheme. Going forward, TSMC will continue to implement a unified strategic plan for intellectual capital management, combining with strategic considerations and close alignment with the business objectives, to drive the timely creation, management and use of intellectual property.

TSMC has established a process to generate company value from intellectual property by aligning intellectual property strategy with R&D, business operation objectives, marketing, and corporate development strategies. Intellectual property rights protect the company's freedom to operate, enhance competitive position, and provide leverage to participate in many profit-generating activities.

TSMC has worked continuously to improve the quality of intellectual property portfolio and to reduce the maintenance costs. TSMC will continue to invest in intellectual property portfolio and intellectual property management system to ensure the company's technology leadership and receive maximum business value from intellectual property rights.

## 5.2.6 TSMC University Collaboration Programs

In recent years TSMC has significantly expanded its collaboration with prestigious universities in Taiwan. The mission of joint research is twofold: to encourage and prepare competent graduate students for the semiconductor industry and to inspire university professors to conduct leading-edge semiconductor research, including but not limited to novel devices, process and materials technologies, semiconductor manufacturing and engineering, and specialty technologies for electronic applications.

Back in 2013, TSMC established research centers at four top universities in Taiwan – National Chiao Tung University, National Taiwan University, National Cheng Kung University and National Tsing Hua University. More than 1,000 high-caliber students with backgrounds in the disciplines of electronics, physics, materials, chemistry, chemical engineering and mechanical engineering participated in semiconductor-related research centers. Also in 2019, the Company jointly launched TSMC-NTHU Semiconductor Program for the purpose of enhancing the quality and quantity of domestic semiconductor students and attracting more outstanding students to a career in the semiconductor industry. Meanwhile, semiconductor programs from other universities are expected to open for student enrollment in 2020 to narrow the gap between industries and academics and strengthen the quality and competitiveness of the talent pool in the industry. In addition, TSMC also conducts strategic research projects at top overseas universities, such as Stanford, MIT, UC Berkeley and so on. The focus is on innovative capabilities in transistors, interconnect, patterning, modeling and specialty technologies.

### TSMC University Shuttle Program

The TSMC University Shuttle Program was established to provide professors at leading research universities worldwide with access to the advanced silicon process technologies needed to develop innovative circuit design concepts. This program links motivated professors and graduate students with enthusiastic managers at TSMC in order to promote excellence in the development of advanced silicon design technologies and to nurture new generations of engineering talents in the semiconductor field. The program provides access to TSMC silicon process technologies for digital and analog/mixed-signal circuits, RF designs and micro-electromechanical system designs. Participants include major university research groups worldwide. TSMC and the University Shuttle Program participants achieve "win-win" collaboration through the program, which allows graduate students to implement exciting new designs and achieve silicon proof points for innovations in various end-applications.

## 5.2.7 Future R&D Plans

To maintain and strengthen TSMC's technology leadership, the Company plans to continue investing heavily in R&D. For advanced CMOS logic, the Company's 3nm and 2nm CMOS nodes continue to progress in the pipeline. In addition, the Company's reinforced exploratory R&D work is focused on beyond-2nm node and on areas such as 3D transistors, new memory and low-R interconnect, which are on track to establish a solid foundation to feed into technology platforms. For 3D IC advanced packaging, TSMC is developing innovations for energy-

efficient sub-system integration and scaling to provide further augmentation to CMOS logic applications. The Company has intensified its focus on new specialty technologies such as RF and 3D intelligent sensors targeting 5G and smart IoT applications. The corporate research function, established in 2017, continues to focus on novel materials, processes, devices, nanowires and memories for the long-term, beyond eight to ten years. The Company also continues to collaborate with external research bodies from academia and industry consortia alike with the goal of extending Moore's Law and paving the way to future cost-effective technologies and manufacturing solutions for its customers.

With a highly competent and dedicated R&D team and its unwavering commitment to innovation, TSMC is confident in its ability to deliver the best and most cost-effective SoC technologies to its customers and to drive future business growth and profitability for years to come.

## Summary of TSMC's Major Future R&D Projects

Project Name	Description	Risk Production (Estimated Target Schedule)
3nm logic technology platform and applications	6 <sup>th</sup> generation 3D CMOS technology platform for SoC	2021
Beyond-3nm logic technology platform and applications	3D CMOS technology platform for SoC	2023
3D IC	Cost-effective solution with better form factor and performance for System-in-Package (SiP)	2018 - 2021
Next-generation lithography	EUV lithography and related patterning technology to extend Moore's Law	2018 - 2021
Long-term research	Specialty SoC technology (including new NVM, MEMS, RF, analog) and transistors for 8 - 10 year out horizon	2018 – 2026

The projects above account for roughly 70% of the total R&D budget for 2020. Total R&D budget is estimated to be around 9% of 2020 revenue.

## 5.3 Manufacturing Excellence

### 5.3.1 GIGAFAB® Facilities

Maintaining dependable capacity is a key part of TSMC's manufacturing strategy. The Company currently operates three 12-inch GIGAFAB® facilities – Fabs 12, 14 and 15. The combined capacity of the three facilities exceeded eight million 12-inch equivalent wafers in 2019. Production within these three facilities supports 0.13µm, 90nm, 65nm, 40nm, 28nm,

20nm, 16nm, 10nm, and 7nm process technologies, including each technology's sub-nodes. Fab 18 expects to start volume production using 5nm processes in early 2020 and will be TSMC's fourth 12-inch GIGAFAB® facility. An additional portion of the capacity is reserved for R&D work on leading-edge manufacturing technologies, which currently supports the technology development of the 3nm, 2nm node and beyond.

The three GIGAFAB® facilities are coordinated by a centralized fab manufacturing management system known as super manufacturing platform (SMP) to provide customers with more consistent quality and reliability, improved flexibility to cope with demand fluctuations, faster yield learning and time-to-volume, and lower-cost product requalification.

### 5.3.2 Engineering Performance Optimization

As advanced technology continues to evolve and the geometry keeps shrinking, the need for tighter process control and quality requirement becomes extremely challenging for manufacturing. TSMC's unique manufacturing infrastructure is tailored to handle a diversified product portfolio, which uses strict process control to attain tightened specs and meet higher product quality, performance and reliability requirements. To achieve excellence in both quality and manufacturing, TSMC's process control systems have been integrated with numerous intelligent functions to assist self-diagnosis, self-learning and self-reacting. These, in turn, have demonstrated remarkable results in yield enhancement, quality assurance, workflow improvement, fault detection, cost reduction and shortening of the R&D cycle.

TSMC has developed systems for precise fault detection and classification, intelligent advanced equipment control and intelligent advanced process control to monitor the manufacturing process in a timely manner and adjust conditions precisely. To achieve quality-first and ensure highly efficient and effective production, the Company has developed precision equipment matching and yield mining to minimize process variations and potential defects and excursion.

With the advent of the 5G era's stricter quality requirements for mobile, high performance computing, automotive and the Internet of Things, TSMC has further established big data, machine learning and artificial intelligence architecture to systematically integrate foundry know-how and data science methodology in order to develop knowledge-based engineering analysis and realize engineering performance optimization.

### 5.3.3 Agile and Intelligent Operations

The Company's sophisticated, agile and intelligent operating systems continue to drive manufacturing excellence. TSMC has integrated artificial intelligence, machine learning, expert systems, and advanced algorithms to build up an intelligent manufacturing environment. Intelligent manufacturing technologies are widely applied in scheduling and dispatching, employee productivity, equipment productivity, process and equipment control, quality defense, and robotic control in order to optimize quality, productivity, efficiency, and flexibility while maximizing cost effectiveness and accelerating overall innovation. TSMC has also integrated new applications such as intelligent mobile devices, IoT, and mobile robots, and combined with intelligent automated material handling systems (AMHS) to consolidate wafer manufacturing data collection and analysis, utilize manufacturing resource efficiently, and maximize manufacturing effectiveness. As a result, the system provides fast ramp-up, short cycle time, stable manufacturing, on-time delivery, and total quality satisfaction and offers as well great flexibility to quickly support customers' urgent pull-in requests when needed.

### 5.3.4 Raw Materials and Supply Chain Management

In 2019, TSMC continued to review and resolve supply issues, quality issues and potential supply chain risks through the collaboration of teams formed by fab operations, quality control and business organizations. TSMC also worked with suppliers to further advance material and process innovation, improve quality and create recycling savings with benefits from win-win solutions.

#### Raw Materials Supply

Major Materials	Major Suppliers	Market Status	Procurement Strategy
Raw Wafers	FST GlobalWafers SEH Siltronic SUMCO	These 5 suppliers together provide over 90% of the world's raw wafer supply.	<ul style="list-style-type: none"> <li>TSMC's suppliers of silicon wafers are required to pass stringent quality certification procedures.</li> <li>TSMC procures wafers from multiple sources to ensure adequate supplies for volume manufacturing and to appropriately manage supply risk.</li> <li>Raw wafer quality enhancement programs are in place to support TSMC's technology advancement.</li> <li>TSMC regularly reviews the quality, delivery, cost, sustainability and service performance of its wafer suppliers. The results of these reviews are incorporated into subsequent purchasing decisions.</li> <li>A periodic audit of each wafer supplier's quality assurance system ensures that TSMC can maintain the highest quality in its own products.</li> <li>TSMC takes various approaches with suppliers to better manage the cost and supply.</li> </ul>
Chemicals	Air Liquide BASF DuPont Entegris Fujifilm Electronic Materials Kanto PPC Kuang Ming Merck RASA Shiny Tokuyama Versum Wah Lee	These 13 companies are the major worldwide suppliers of chemicals.	<ul style="list-style-type: none"> <li>Most suppliers have relocated some of their operations closer to TSMC's major manufacturing facilities, thereby significantly improving procurement logistics.</li> <li>All supplied products are regularly reviewed to ensure that TSMC's specifications are met and product quality is satisfactory.</li> <li>TSMC encourages and engages with chemical suppliers to implement innovative green solutions for waste reduction.</li> </ul>
Lithographic Materials	3M Fujifilm Electronic Materials JSR Nissan Shin-Etsu Chemical Sumitomo Chemical T.O.K.	These 7 companies are the major worldwide suppliers of lithographic materials.	<ul style="list-style-type: none"> <li>TSMC works closely with suppliers to develop materials that meet all application and cost requirements.</li> <li>TSMC and suppliers periodically conduct programs to improve their quality, delivery, sustainability and green policy, and to ensure continuous progress of TSMC's supply chain.</li> <li>Some major suppliers have relocated or plan to replicate their manufacturing sites closer to TSMC's major manufacturing facilities, thereby significantly improving procurement logistics and reducing supply risks.</li> </ul>
Gases	Air Liquide Air Products Central Glass Entegris Linde LienHwa Praxair SK Materials Taiwan Material Technology Taiyo Nippon Sanso Versum	These 10 companies are the major worldwide suppliers of specialty gases.	<ul style="list-style-type: none"> <li>The majority of these suppliers have facilities in multiple geographic locations, which minimizes supply risk for TSMC.</li> <li>TSMC conducts periodic audits to ensure that they meet TSMC's standards.</li> </ul>

(Continued)

Major Materials	Major Suppliers	Market Status	Procurement Strategy
Slurry, Pad, Disk	3M AGC Cabot Microelectronics DuPont Fujibo Fujifilm Electronic Materials Fujimi	These 7 companies are the major worldwide suppliers of CMP (Chemical Mechanical Polishing) materials.	<ul style="list-style-type: none"> <li>TSMC works closely with suppliers to develop materials that meet all application and cost requirements.</li> <li>TSMC and suppliers periodically conduct programs to improve their quality, delivery, sustainability and green policy, and to ensure continuous progress of TSMC's supply chain.</li> <li>Most suppliers have relocated or plan to replicate some of their manufacturing sites closer to TSMC's major manufacturing facilities, thereby significantly improving procurement logistics and reducing supply risks.</li> </ul>

#### Suppliers Accounting for at Least 10% of Annual Consolidated Net Procurement

Unit: NT\$ thousands

Supplier	2019			2018		
	Procurement Amount	As % of 2019 Total Net Procurement	Relation to TSMC	Procurement Amount	As % of 2018 Total Net Procurement	Relation to TSMC
Company A	11,275,564	19%	None	10,233,843	16%	None
Company B	10,322,266	17%	None	11,047,359	17%	None
Company C	5,735,862	10%	None	6,800,865	11%	None
Others	31,826,777	54%	-	35,324,987	56%	-
Total Net Procurement	59,160,469	100%	-	63,407,054	100%	-

- Reason for Increase or Decrease:** No significant change.

### 5.3.5 Quality and Reliability

TSMC strives to provide excellence in semiconductor manufacturing services to all its customers worldwide. The Company is dedicated to quality in every facet of its business and maintains a culture of continuous improvement to assure customer satisfaction. TSMC implements expedient containment programs to shield customers from any product defects until each has been eliminated.

In the technology development stage, the Q&R organization helps customers design in superior product reliability. In 2019, Q&R worked with R&D in advanced logic, specialty and advanced packaging technologies throughout development and qualification stages continuously to ensure meeting requirements for device characteristics, process yield and product reliability.

For advanced logic technology, in 2019 Q&R successfully qualified the 5nm FinFET, the second generation process with EUV lithography, to ensure its competitiveness in mobile and high performance computing applications, with plans to move into mass production in 2020. For specialty technologies, Q&R completed technology qualification of 22nm ULL (ultra-low leakage) embedded MRAM (magnetic random access memory). Regarding CIS (CMOS image sensor) technology, Q&R qualified 45nm NIR (near infrared) CIS with ASIC (application specific integrated circuit) wafer on wafer stack. For CoWoS® (Chip on Wafer on Substrate) packaging technologies, the Company established a new manufacturing site in 2019 that doubled capacity from 2018. To ensure that the new site could provide products with the same quality and reliability, Q&R completed the process and equipment matching and qualification among different sites. In addition, integrated fan-out (InFO) assembly technology for mobile applications moved into its fourth generation of manufacturing. Moreover, InFO\_oS, 1.5x reticle InFO size on substrate, was qualified with products in production for networking applications.

To continuously achieve product defect reduction, enhance process controls, make early detection of abnormalities and prevent quality problems that affect customers, Q&R collaborates with other operational entities to establish real-time defense systems using advanced statistical methods and quality tools. Since 2017, Q&R and Fabs have worked together on enhancements for automotive product quality improvement, including design rule implementation and migration to Automotive Quality System 2.0. This covers process capability requirement tightening for in-line and wafer acceptance testing in fabs and maverick wafers/lots handling. Q&R also provides dedicated resources for field/line return analysis and timely physical failure analysis (PFA) for process improvement to meet automotive customers' stringent DPPM (defective parts per million) requirements. In 2019, quality control for automotive products was deployed to 7nm and 12nm process technologies for the preparation of automotive electronic business in 2020.

To enhance employee problem-solving capabilities and develop related quality systems and methodologies, Q&R held several company-wide symposia and training programs on total quality excellence (TQE), design of experiment (DOE), statistical process control (SPC) and metrology in 2019. These included the promotion and training of deep machine learning, which was successfully applied to automatic classification of wafer defects and advanced spectral analysis to detect differences among processes and equipment so that corrective actions could be initiated. In 2020, Q&R will continue the development of employee capabilities by promoting and using new methodologies to enhance TSMC competitiveness.

For material and supplier management, in 2019 Q&R and the material management organization collaborated to enhance the inspection capability for incoming material quality and supplier management. A material quality improvement task force was formed to work with suppliers. Material quality checks were added to critical control points of the production line. Q&R also required suppliers to apply statistical process methods to strictly control the stability of their own process quality and enhance upstream raw material analysis. Q&R requested that supply chain factories seek ISO 9001 certification, implement process change management and evaluation, and undertake quality audits. In 2019, Q&R collaborated with SEMI (Semiconductor Equipment and Materials International) to hold the Strategic Materials Conference (SMC) in Taiwan for the first time. This conference, which had previously been held only in the U.S. and Europe, helped motivate and elevate the competitiveness of the local supply chain.

TSMC fully supports continuous improvement programs to strengthen the work culture, improve product quality and production efficiency, reduce production costs, and improve customer satisfaction. These programs encourage colleagues to strive for excellence, drive cross-departmental observation and learning, and enhance their innovative and problem-solving abilities – all traits that greatly contribute to achieving a win-win outcome of honing TSMC's competitive edge and building customer satisfaction. In addition to internal cross-organizational learning and exchange, TSMC participates with other industries in the Taiwan Continuous Improvement Competition in order to promote the development of other local industries by sharing its experience, and to enhance the problem-solving and innovation ability of its colleagues by observing the improvement methods of other industries. In 2019, TSMC's outstanding performance was recognized with six gold awards and one silver award; at the same time, Q&R coached domestic material suppliers to participate in the competition and they won a total of three gold, six silver, and four bronze awards.

Thanks to qualification in technology development, real-time defense systems and innovative applications in semiconductor manufacturing services, as well as its continuous quality improvement culture, TSMC had no major product recalls in 2019. Meanwhile, a third party audit verified the effectiveness of TSMC's quality management systems in compliance with IATF 16949: 2016 and IECQ QC 080000: 2017 certificates requirements. Periodic customer feedback indicates that products shipped from TSMC have consistently met or exceeded all field quality and reliability requirements. In these ways, TSMC assists customers in time-to-market delivery and competitiveness enhancement with excellent and reliable products for the four major growth markets: mobile communication, high performance computing (HPC), Internet of Things (IoT), and automotive electronics.

#### 5.4 Customer Trust

##### 5.4.1 Customers

TSMC's worldwide customers have a variety of products that deliver excellent performances across semiconductor industry. Customers include fabless semiconductor companies, system companies, and integrated device manufacturers such as Advanced Micro Devices, Inc., Broadcom Limited, Hisilicon Technologies Co. Ltd., Intel Corporation, MediaTek Inc., NVIDIA Corporation, NXP Semiconductors N.V., Qualcomm Inc., Sony Corporation, XILINX Inc., and many more.

##### Customer Service

TSMC has been dedicated to provide the best client services, and we strongly believe that a good client service is critical to customer satisfaction, and is key for customer retention, customer relationship enhancement, and new customer engagement. TSMC has established a devoted customer service team which strives to provide world-class services in supporting clients in mask making, wafer manufacturing, and backend services, thereby creating the best customer experiences, gaining customer trust, and sustaining corporate revenue and profitability.

To improve customer interaction on a real-time basis, TSMC-Online™ offers a suite of web-based applications that allows us to play an active role in collaborations with clients in design, engineering and logistics. Customers thus have 24-7 access to critical information, and are able to create customized reports. Within TSMC-Online™, design collaboration lies upon data availability and accessibility, and provides clients with accurate and the most updated information at each stage of design process. Engineering collaboration includes engineering lots,

wafer yields and wafer acceptance test analysis, as well as quality and reliability data. Logistics collaboration includes information of wafer fabrication, backend process, and shipments in client orders.

##### Customer Satisfaction

To ensure customer satisfaction, and to make sure we fully apprehend customer needs, TSMC appoints third party consulting firms to conduct customer satisfaction survey (ACSS) with majority of our existing customers through either web survey or interview on an annual basis.

In addition to the survey, customer service team also conduct quarterly business reviews (QBRs) with our customers to make sure we receive customers' feedbacks on a regular basis. Through surveys and feedback reviews, TSMC is able to closely interact with customers, provides better services, and enhances quality of collaborations.

Customer feedback is routinely reviewed, analyzed and then used to develop appropriate improvement plans, all in all becoming an integral part of the customer satisfaction process. TSMC uses the results derived from the survey as important basis for future developments, and we firmly believe that customer satisfaction leads to healthy customer relationships and business growths.

##### Customers Accounting for at Least 10% of Annual Consolidated Net Revenue

Unit: NT\$ thousands

Customer	2019			2018		
	Net Revenue (Note)	As % of 2019 Total Net Revenue	Relation to TSMC	Net Revenue (Note)	As % of 2018 Total Net Revenue	Relation to TSMC
Customer A	247,213,291	23%	None	224,690,695	22%	None
Customer B	152,876,885	14%	None	83,885,616	8%	None
Others	669,895,272	63%	-	722,897,246	70%	-
Total Net Revenue	1,069,985,448	100%	-	1,031,473,557	100%	-

Note: Commencing in 2018, the Company began to break down the net revenue by customer based on a new method which associates most estimated sales returns and allowances with individual sales transactions, as opposed to the previous method which allocated sales returns and allowances based on the aforementioned gross revenue. The Company believes the new method provides a more relevant breakdown than the previous one.

- **Reason for Increase or Decrease:** The changes of sales amount and percentage were mainly due to customer product demand change.

##### 5.4.2 Open Innovation Platform® (OIP) Initiative

Innovation has always been an exciting and challenging proposition. Competition among semiconductor companies continues to intensify in the face of increasing industry consolidation and the commoditization of technology at more mature, conventional levels. Companies must find ways to keep innovating in order to survive and prosper. One way to promote innovation is through active collaboration with external partners. At TSMC this is known as "Open Innovation®." It is an "outside in" approach to complement traditional "inside out" methods. TSMC has chosen this path to innovation via its Open Innovation Platform® (OIP) initiative, which is a key part of the TSMC Grand Alliance.

The OIP initiative is a comprehensive design technology infrastructure that encompasses all critical IC implementation areas to lower design barriers and improve first-time silicon success. OIP promotes the speedy implementation of innovation amongst the semiconductor design community and its ecosystem partners using TSMC's IP, design implementation, process technology and backend services.

Crucial to OIP are ecosystem interfaces and collaborative components initiated and supported by TSMC to empower innovation throughout the supply chain and, in turn, drive the creation and sharing of new revenue and profits. TSMC's active accuracy assurance (AAA) initiative is key to OIP, providing the accuracy and quality required by the ecosystem interfaces and collaborative components.

TSMC's Open Innovation® model brings together the creative thinking of customers and partners under the common goal of shortening each of the following: design time, time-to-volume, time-to-market and, ultimately, time-to-revenue. The model features:

- the foundry segment's earliest and most comprehensive electronic design automation (EDA) certification program, delivering timely design tool enhancement required by new process technologies
- the foundry segment's largest, most comprehensive and most robust silicon-proven IP (intellectual properties) and library portfolio, and
- comprehensive design ecosystem alliance programs covering market-leading EDA, library, IPs, and design service partners.

TSMC's OIP alliance consists of 22 EDA partners, six cloud partners, 42 IP partners, 19 design center alliance (DCA) partners, and eight value chain aggregator (VCA) partners. TSMC and its partners work together proactively and engage much earlier and deeper than ever before in order to address mounting design challenges at advanced technology nodes. Through this early and intensive collaboration effort, TSMC's OIP is able to deliver the needed design infrastructure with timely enhancement of EDA tools, early availability of critical IPs and quality design services when customers need them. Taking full advantage of the process technologies once they reach production-ready maturity is critical to customers' success.

TSMC's OIP partner management portal facilitates communication with its ecosystem partners for efficient business productivity. Designed with a highly intuitive interface, this portal can be accessed via a direct link from TSMC-Online™.

In September and October, TSMC held its 2019 Open Innovation Platform® (OIP) Ecosystem Forum in Santa Clara, California and in Beijing, respectively. This annual event demonstrates how TSMC and its ecosystem partners jointly develop design solutions on top of TSMC's advanced technologies through OIP collaboration. At the forum, TSMC made key presentations on EDA and IP ecosystem readiness of 5nm, as well as on continuous development of solutions to enhance power, performance and area (PPA) on existing production technology nodes from 7nm to 6nm, from 16nm to 12nm and from 28nm to 22nm. TSMC's comprehensive radio frequency (RF) design platform is developed to support emerging 5G design applications. In addition, the

availability of various 3D integration technologies forms a complete 3D IC design ecosystem that helps unleash customers' product innovation. The readiness of the aforementioned design ecosystem solutions will help customers successfully pursue opportunities in mobile, high performance computing, the Internet of Things and automotive markets.

## 5.5 Human Capital

Human capital is TSMC's most treasured asset. In this area regard, the Company's main role is to provide jobs with challenging, meaningful work in a safe environment with excellent compensation and benefits. TSMC goes beyond this, however, by actively encouraging employees to nurture and enjoy a healthy family life, develop outside interests, expand social participation, and, in general, live a happy life.

TSMC abides by local laws and participates in the Responsible Business Alliance (RBA) as a full member. The Company refrains from forcing employees to do unwilling labor service, listens to the employees, keeps communication channels open, and respects the right of all workers to form and join trade unions of their own choosing as well as to refrain from such activities as they choose.

### 5.5.1 TSMC Human Rights Policy

TSMC abides by local laws and regulations in all countries and regions where we operate, and upholds the human rights of workers, including regular, contract and temporary employees, and interns. We treat all workers with dignity and respect as understood by the international human rights standards such as *The International Bill of Human Rights*, *The International Labour Organization's Declaration on Fundamental Principles and Rights at Work*, and *Ten Principles of the United Nations Global Compact*. We also align our actions with the *Responsible Business Alliance Code of Conduct*. And TSMC's *Supplier Code of Conduct* requires our suppliers to follow the same standards.

### 5.5.2 Workforce Structure

At the end of 2019, TSMC had 51,297 employees worldwide, including 5,364 managers, 24,416 professionals, 4,357 assistants and 17,160 technicians. The following table summarizes the makeup of TSMC's workforce as of the end of February, 2020:

		12/31/2018	12/31/2019	02/29/2020
Job	Managers	5,294	5,364	5,428
	Professionals	22,285	24,416	24,809
	Assistant Engineer/Clerical	4,109	4,357	4,394
	Technician	17,064	17,160	17,414
<b>Total</b>		48,752	51,297	52,045
Gender	Male (%)	61.3%	62.2%	62.3%
	Female (%)	38.7%	37.8%	37.7%
Education	Ph.D.	4.7%	4.5%	4.5%
	Master's	42.6%	44.7%	44.9%
	Bachelor's	25.9%	25.3%	25.5%
	Other Higher Education	11.1%	10.6%	10.6%
	High School	15.7%	14.8%	14.5%
<b>Average Years of Age</b>		36.4	36.6	36.6
<b>Average Years of Service</b>		9.1	9.3	9.3

### 5.5.3 Recruitment

Key elements of TSMC's success and growth depend on the Company's employees, who share a common vision and values. In order to strengthen growth momentum, the Company is dedicated to recruiting top-notch professionals in all positions. TSMC is an equal opportunity employer and operates on the principles of open and fair recruitment. The hiring principles are integrity and ability, and the Company evaluates all candidates according to their qualifications as related to the requirement of each position without regard to race, gender, age, religion, nationality or political affiliation.

To promote continuous growth, in 2019 TSMC recruited more than 5,000 employees, including over 3,900 managers and professionals, as well as over 1,100 assistants and technicians.

### 5.5.4 People Development

Employee development is an integral and critical factor for the growth of any company, and at TSMC it is goal oriented, disciplined and planned. The Company is committed to expanding and fulfilling employee potential by providing meaningful work in a world-class workplace. TSMC is also

committed to cultivating a consistent and diverse learning environment. To this end, the Company has initiated the TSMC Employee Training and Education Procedure to ensure the Company's and the individuals' development objectives can be achieved through the integration of internal and external training resources and with internal rotation opportunities.

To help employees reach their potential, TSMC is committed to on-the-job training and systematic job rotation. In addition, TSMC provides various resources and channels to encourage employees to learn on their own to further raise their performance and achieve their potential. TSMC integrates internal and external resources and designs diversified development programs based on business objectives, the nature of the individual's job, work performance and career development path. The Company provides employees with a diverse network of learning resources, including on-the-job training, classroom training, e-learning, coaching, mentoring and job rotation; it also creates an educational atmosphere through learning activities in response to organization development requirements and employee capability enhancement goals.

The Company provides employees with a wide range of onsite general, professional and managerial training programs. In addition to engaging external experts as trainers, hundreds of TSMC employees are trained to be qualified instructors to share their valuable knowledge in internal educational courses.

TSMC provides the following training programs:

- New employee –basic training and job orientation. In addition, the newcomers' managers and a well-established buddy system are in place to support new hires in their assimilation process regarding both corporate culture and work requirements.
- General – as required by government regulations and/or the Company policies, as well as on general subjects for all employees or employees in various job functions. Topics include industry-specific safety, workplace health and safety, quality, fab emergency response and personal effectiveness management.
- Professional/functional – technical and professional training required by different functions within the Company. TSMC offers training courses on equipment engineering, process engineering, accounting, information technology and so forth.
- Management – management development programs tailored to the needs of managers at all levels based on their managerial capabilities and responsibilities, including new, experienced, and senior managers; optional courses also available.

- Direct labor – for production-line employees to acquire the knowledge, skills and approaches they need to perform their jobs well and to pass certification for operating equipment. Includes direct labor skill training, technician “Train the Trainer” training, and manufacturing leadership training.
- Customized – programs tailored to the needs of the organization and/or the employee’s development plan.

In 2019, TSMC conducted 1,115 internal training sessions and provided over 740 thousand hours of training and a total of more than 700 thousand attendees participated. On average, each employee attended over 14 hours of training and TSMC spent over NT\$59 million on the education and development of employees.

Apart from internal training resources, TSMC employees are also subsidized when pursuing external short-term courses, for-credit classes and degrees.

#### 5.5.5 Compensation

TSMC employees are entitled to a comprehensive compensation and benefits program above the industry average. TSMC provides a diversified compensation program that is competitive externally, fair internally, and adapted locally. TSMC adheres to the philosophy of sharing wealth with employees in order to attract, retain, develop, motivate and reward talented, performing employees. Thanks to solid business results over the past 30 years, the actual total compensation received by employees has been above the industry's average.

TSMC's compensation program includes a monthly salary, employee cash bonuses based on quarterly business results, and an employee profit sharing bonus based on annual profits.

The purpose of the employee cash bonus and profit sharing bonus programs is to reward employee contributions appropriately, to encourage employees to work consistently toward ensuring TSMC success, and to align employees' interests with those of TSMC's shareholders so as to achieve wins for the Company, shareholders and employees. The Company determines the amount of the cash bonus and profit sharing bonus based on operating results and industry practice in the Republic of China. The amount and distribution of the employee bonuses are recommended by the Compensation Committee to the Board of Directors for approval. Individual rewards are based on each employee's job responsibility, contribution and performance.

The same philosophy applies to TSMC's compensation programs in overseas subsidiaries. In addition to providing employees with a locally competitive base salary, the Company grants annual bonuses as a part of total compensation. The annual bonuses are granted in line with local regulations, market practices, and the overall operating performance of each subsidiary, to promote employee commitment and development.

#### 5.5.6 Employee Engagement

The Company encourages employees to maintain a healthy and well-balanced life while pursuing their career goals effectively. TSMC continuously facilitates employee communication and provides employee caring, benefit, rewards and recognition programs.

#### Employee Communication

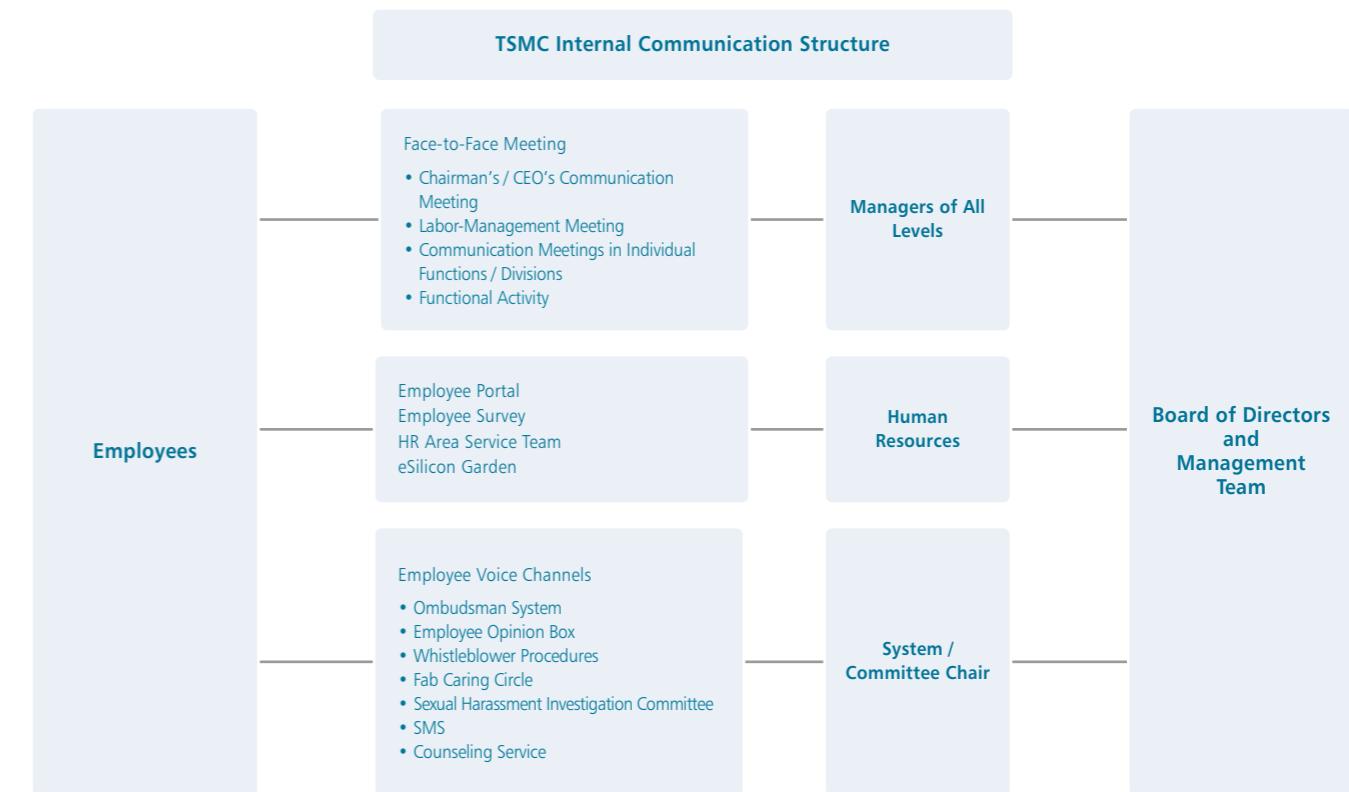
TSMC values two-way communication and is committed to keeping communication channels open and transparent for management, subordinates and peers. The Company is committed to ensuring that employees are able to communicate openly and share ideas and concerns with management regarding work conditions and management practices without fear of discrimination, reprisal, intimidation or harassment.

TSMC makes continuous efforts to listen to the voice of employees and to facilitate mutual and timely employee communication, based on multiple channels and platforms, which in turn fosters harmonious labor relations and creates a win-win situation for the Company and employees.

The Company supports a host of two-way communication channels, including:

- Communication meetings for various levels of managers and employees; for example, the Chairman's/CEO's communication meeting, and communication meetings in individual functions/divisions.
- Quarterly labor-management meetings to provide business updates and invite employees to discuss labor conditions and welfare activities.
- Aperiodic employee satisfaction surveys to selected employees, with follow-up actions based on survey findings.
- The Core Value survey taken biennially to understand the Company's implementation of core values and employees' commitment and engagement.
- myTSMC employee portal, an internal website featuring the Founder's, Chairman's, and CEO's talks, corporate messages, executive interviews, and other activities of interest to employees.

- eSilicon Garden, a website hosting TSMC's internal electronic publications and providing real-time updates on major activities of the Company, as well as inspirational content featuring outstanding teams and individuals.
- Two reporting channels for complaints regarding managerial, financial, auditing, ethics and business conduct issues:
  - The whistleblower reporting system administered by the audit committee
  - The ombudsman system administered by a senior manager appointed by the CEO
- The Employee Opinion Box, which provides an opportunity to submit suggestions or opinions regarding work and the overall work environment.
- The Fab Caring Circle in each fab, which addresses issues related to employees' work and personal life; the system is dedicated mainly to the Company's direct labors.
- Sexual harassment investigation committee, a channel dedicated to ensuring a work environment free from the threat of sexual harassment; the committee consists of three directors, one from human resources, one from legal affairs, and the third from other organizations.



TSMC has many internal communication channels, a major reason why the relationship between management and employees has been quite harmonious. The Company respects the right of all workers to form and join trade unions of their own choosing as well as the right to refrain from such activities. No employees have pursued this avenue or issued a request to form a union so far.

In 2019 and in 2020 as of the date of this annual report, there have been no losses resulting from labor disputes. However, the Company was issued a fine for NT\$70,000 following a labor inspection result dated 11/25/2019 due to overtime applications not being timely processed (Labor Standards Act Article 32) and working hours exceeding the permitted limit (Labor Standards Act Article 24). The Company has reviewed the working hour management process and strengthened communication to employees to better manage overtime application.

### **Employee Benefit Programs**

- Convenient onsite services and amenities: cafeterias, laundry services, convenience stores, bakery, juice bar, coffee shop, travel agent and bank services, as well as commuting assistance are available to employees in the fabs.
- Comprehensive health management services, including programs for weight control, in-fab clinic and dentist services, smoking cessation, massage, cancer screening and blood donation, as well as mental and health seminars to raise personal health awareness. Other programs include post health-exam follow-up activities, prevention of cerebrovascular disease, ergonomic hazards management, and maternal care and protection. Employee assistance programs include five free annual counseling hours for mental health and financial/legal issues.
- Diverse employee welfare programs: in 2019, including 63 hobby clubs organized by employee, 42 presentations covering various topics, 10 art events, sports day and family day. In addition, marriage bonuses, condolence allowances, emergency subsidies and holiday bonuses are also available to address employees' needs.
- Excellent sports and leisure space: a variety of workout facilities available to improve employee wellness. Also discounted price to various events are made available to both employees and their families to enhance the sense of identity.
- Safe and convenient preschool service: childcare service to fulfill employees' need of child care in four fabs in Hsinchu, Taichung, and Tainan.

### **Diverse Employee Recognition**

TSMC sponsors various internal award programs to recognize employees for outstanding achievements, both individual and at a team level. With these award programs, TSMC aims to encourage continued employee development, which also enhances the Company's competitive advantage.

The award programs include:

- TSMC Academy: recognizes outstanding scientists and engineers whose individual technical capabilities have made significant contributions.
- TSMC Excellent Labor Award: recognizes technicians whose outstanding performances have made significant contributions.
- Total Quality Excellence at each fab: recognizes employees' continuous efforts in creating value.
- Service Award: recognition and appreciation of senior employees and their long-term commitment and dedication.
- Excellent Instructor Award: praises the outstanding performance and contribution of internal instructors in training courses for employees.
- Function-wide awards dedicated to innovation, such as the Idea Forum and TQE awards, which recognize employee initiative and continuous implementation of innovative practices.

Apart from corporate-wide awards, TSMC encourages employees to participate in external talent activities and competitions. In 2019, distinguished TSMC employees continued to be recognized through a host of awards, such as the Model Labor Award of each Science Park, and national awards including the Outstanding Engineer Award, the Excellent Young Engineers Award, and the National Manager Excellence Award.

### **5.5.7 Retention**

Overall employee satisfaction with the Company was measured in the biennial TSMC core values survey last taken in 2018. In this survey, 98% of participants said they were willing to commit fully in their work to make TSMC an even more successful company; while 96% concurred with the statement that they are willing to contribute their talents to TSMC and grow together with the Company for the next five years.

In 2019, the Company recorded a manageable turnover rate of 4.9%. Although a bit lower than a healthy outflow often defined as 5% to 10%, the Company is still in continuous growth mode resulting in 5,000 new staff hired in 2019, accounting for 9.9% of all employees and helping the organization stay energized.

### **5.5.8 Retirement Policy**

TSMC's retirement policy is set according to the labor standard laws and labor pension practices of various respective regions. Thanks to the Company's sound financial condition, it is able to ensure solid pension contributions and payments, which encourages employees to make long-term career plans and further deepens their commitment to TSMC.

### **5.6 Material Contracts**

TSMC is not currently party to any material contract, other than contracts entered into in the ordinary course of its business. The Company's "Significant Contingent Liabilities and Unrecognized Commitments" are disclosed in Annual Report section (II), Financial Statements, pages 72-73.



**Breakthrough  
Speed**

## Financial Highlights and Analysis

### 6.1 Financial Highlights

#### 6.1.1 Condensed Balance Sheet

##### Condensed Balance Sheet from 2015 to 2019 (Consolidated)

Unit: NT\$ thousands

Item	Year	2015	2016	2017	2018	2019
Current Assets		746,743,991	817,729,126	857,203,110	951,679,721	822,613,914
Long-term Investments (Note 1)		34,993,583	46,153,916	41,569,074	29,304,796	30,172,039
Property, Plant and Equipment		853,470,392	997,777,687	1,062,542,322	1,072,050,279	1,352,377,405
Right-of-use Assets		0	0	0	0	17,232,402
Intangible Assets		14,065,880	14,614,846	14,175,140	17,002,137	20,653,028
Other Assets (Note 2)		8,244,452	10,179,727	16,371,997	20,091,105	21,756,244
Total Assets		1,657,518,298	1,886,455,302	1,991,861,643	2,090,128,038	2,264,805,032
Current Liabilities						
Before Distribution		212,228,594	318,239,273	358,706,680	340,542,586	590,735,701
After Distribution		367,810,877	499,751,936	566,149,724	547,985,630	655,561,652 (Note 3)
Noncurrent Liabilities		222,655,225	178,164,903	110,395,320	72,089,056	51,973,905
Total Liabilities						
Before Distribution		434,883,819	496,404,176	469,102,000	412,631,642	642,709,606
After Distribution		590,466,102	677,916,839	676,545,044	620,074,686	707,535,557 (Note 3)
Equity Attributable to Shareholders of the Parent						
Capital Stock		259,303,805	259,303,805	259,303,805	259,303,805	259,303,805
Capital Surplus		56,300,215	56,272,304	56,309,536	56,315,932	56,339,709
Retained Earnings						
Before Distribution		894,293,586	1,072,008,169	1,233,362,010	1,376,647,841	1,333,334,979
After Distribution		738,711,303	890,495,506	1,025,918,966	1,169,204,797	1,268,509,028 (Note 3)
Others		11,774,113	1,663,983	(26,917,818)	(15,449,913)	(27,568,369)
Equity Attributable to Shareholders of the Parent						
Before Distribution		1,221,671,719	1,389,248,261	1,522,057,533	1,676,817,665	1,621,410,124
After Distribution		1,066,089,436	1,207,735,598	1,314,614,489	1,469,374,621	1,556,584,173 (Note 3)
Noncontrolling Interests		962,760	802,865	702,110	678,731	685,302
Total Equity						
Before Distribution		1,222,634,479	1,390,051,126	1,522,759,643	1,677,496,396	1,622,095,426
After Distribution		1,067,052,196	1,208,538,463	1,315,316,599	1,470,053,352	1,557,269,475 (Note 3)

Note 1: Long-term investments as of December 31, 2015, 2016 and 2017 include noncurrent available-for-sale financial assets, held-to-maturity financial assets, financial assets carried at cost and investments accounted for using equity method. Starting from 2018, upon initial application of IFRS 9 "Financial Instruments", the category includes noncurrent financial assets at fair value through other comprehensive income, noncurrent financial assets at amortized cost, and investments accounted for using equity method.

Note 2: Other assets consist of deferred income tax assets, refundable deposits, and other noncurrent assets.

Note 3: The amount approved by Board of Directors on February 11, 2020.

## 6.1.2 Condensed Statement of Comprehensive Income

### Condensed Balance Sheet from 2015 to 2019 (Unconsolidated)

Unit: NT\$ thousands

Item	Year	2015	2016	2017	2018	2019
Current Assets		426,913,080	443,781,164	436,769,337	469,966,106	355,118,125
Long-term Investments (Note 1)		326,330,737	397,290,976	464,401,415	550,524,494	559,380,999
Property, Plant and Equipment		831,784,912	979,401,337	1,016,355,970	1,025,286,941	1,310,900,634
Right-of-use Assets		0	0	0	0	15,030,020
Intangible Assets		9,391,418	10,047,991	9,870,127	12,429,930	16,271,444
Other Assets (Note 2)		5,265,368	6,816,676	11,992,542	17,253,537	18,774,850
Total Assets		1,599,685,515	1,837,338,144	1,939,389,391	2,075,461,008	2,275,476,072
Current Liabilities						
Before Distribution		194,299,278	308,177,214	308,383,240	328,060,518	605,540,547
After Distribution		349,881,561	489,689,877	515,826,284	535,503,562	670,366,498 (Note 3)
Noncurrent Liabilities		183,714,518	139,912,669	108,948,618	70,582,825	48,525,401
Total Liabilities						
Before Distribution		378,013,796	448,089,883	417,331,858	398,643,343	654,065,948
After Distribution		533,596,079	629,602,546	624,774,902	606,086,387	718,891,899 (Note 3)
Equity						
Capital Stock		259,303,805	259,303,805	259,303,805	259,303,805	259,303,805
Capital Surplus		56,300,215	56,272,304	56,309,536	56,315,932	56,339,709
Retained Earnings						
Before Distribution		894,293,586	1,072,008,169	1,233,362,010	1,376,647,841	1,333,334,979
After Distribution		738,711,303	890,495,506	1,025,918,966	1,169,204,797	1,268,509,028 (Note 3)
Others		11,774,113	1,663,983	(26,917,818)	(15,449,913)	(27,568,369)
Total Equity						
Before Distribution		1,221,671,719	1,389,248,261	1,522,057,533	1,676,817,665	1,621,410,124
After Distribution		1,066,089,436	1,207,735,598	1,314,614,489	1,469,374,621	1,556,584,173 (Note 3)

Note 1: Long-term investments as of December 31, 2015, 2016 and 2017 include held-to-maturity financial assets, financial assets carried at cost and investments accounted for using equity method.

Starting from 2018, upon initial application of IFRS 9 "Financial Instruments", the category includes noncurrent financial assets at fair value through other comprehensive income and investments accounted for using equity method.

Note 2: Other assets consist of deferred income tax assets, refundable deposits, and other noncurrent assets.

Note 3: The amount approved by Board of Directors on February 11, 2020.

### Condensed Statement of Comprehensive Income from 2015 to 2019 (Consolidated)

Unit: NT\$ thousands (Except EPS: NT\$)

Item	Year	2015	2016	2017	2018	2019
Net Revenue		843,497,368	947,938,344	977,447,241	1,031,473,557	1,069,985,448
Gross Profit		410,394,893	474,832,098	494,826,402	497,874,253	492,701,896
Income from Operations		320,047,775	377,957,778	385,559,223	383,623,524	372,701,090
Non-operating Income and Expenses		30,381,136	8,001,602	10,573,807	13,886,739	17,144,246
Income before Income Tax		350,428,911	385,959,380	396,133,030	397,510,263	389,845,336
Net Income		306,556,167	334,338,236	343,146,848	351,184,406	345,343,809
Other Comprehensive Income for the Year, Net of Income Tax		(14,714,182)	(11,067,189)	(28,821,631)	9,836,976	(11,823,562)
Total Comprehensive Income for the Year		291,841,985	323,271,047	314,325,217	361,021,382	333,520,247
Net Income (Loss) Attributable to:						
Shareholders of the Parent		306,573,837	334,247,180	343,111,476	351,130,884	345,263,668
Noncontrolling Interests		(17,670)	91,056	35,372	53,522	80,141
Total Comprehensive Income (Loss) Attributable to:						
Shareholders of the Parent		291,867,757	323,186,736	314,294,993	360,965,015	333,440,460
Noncontrolling Interests		(25,772)	84,311	30,224	56,367	79,787
Basic/Diluted Earnings Per Share (Note)		11.82	12.89	13.23	13.54	13.32

Note: Based on weighted average shares outstanding in each year.

### Condensed Statement of Comprehensive Income from 2015 to 2019 (Unconsolidated)

Unit: NT\$ thousands (Except EPS: NT\$)

Item	Year	2015	2016	2017	2018	2019
Net Revenue		837,046,888	936,387,291	969,136,109	1,023,925,713	1,059,646,793
Gross Profit		397,708,840	461,808,296	478,937,691	492,955,501	480,143,141
Income from Operations		313,408,698	369,730,533	374,690,117	384,027,838	365,923,992
Non-operating Income and Expenses		36,579,970	15,458,427	18,626,059	12,170,315	22,821,227
Income before Income Tax		349,988,668	385,188,960	393,316,176	396,198,153	388,745,219
Net Income		306,573,837	334,247,180	343,111,476	351,130,884	345,263,668
Other Comprehensive Income for the Year, Net of Income Tax		(14,706,080)	(11,060,444)	(28,816,483)	9,834,131	(11,823,208)
Total Comprehensive Income for the Year		291,867,757	323,186,736	314,294,993	360,965,015	333,440,460
Basic/Diluted Earnings Per Share (Note)		11.82	12.89	13.23	13.54	13.32

Note: Based on weighted average shares outstanding in each year.

### 6.1.3 Financial Analysis

#### Financial Analysis from 2015 to 2019 (Consolidated)

		2015	2016	2017	2018	2019
Capital Structure Analysis	Debts Ratio (%)	26.24	26.31	23.55	19.74	28.38
	Long-term Fund to Property, Plant and Equipment (%)	169.34	157.17	153.70	163.20	123.79
Liquidity Analysis	Current Ratio (%)	351.86	256.95	238.97	279.46	139.25
	Quick Ratio (%)	319.58	241.34	217.94	248.76	124.92
	Times Interest Earned (Times)	110.84	117.74	119.95	131.28	120.92
Operating Performance Analysis	Average Collection Turnover (Times)	8.37	8.78	7.74	8.19	7.95
	Days Sales Outstanding	43.61	41.57	47.16	44.57	45.91
	Average Inventory Turnover (Times)	6.49	8.18	7.88	6.02	6.20
	Average Inventory Turnover Days	56.24	44.62	46.32	60.63	58.87
	Average Payment Turnover (Times)	20.10	20.11	16.82	16.56	15.48
	Property, Plant and Equipment Turnover (Times)	1.01	1.02	0.95	0.97	0.88
	Total Assets Turnover (Times)	0.54	0.53	0.50	0.51	0.49
Profitability Analysis	Return on Total Assets (%)	19.62	19.03	17.84	17.34	15.99
	Return on Equity Attributable to Shareholders of the Parent (%)	27.04	25.60	23.57	21.95	20.94
	Operating Income to Paid-in Capital Ratio (%)	123.43	145.76	148.69	147.94	143.73
	Pre-tax Income to Paid-in Capital Ratio (%)	135.14	148.84	152.77	153.30	150.34
	Net Margin (%)	36.34	35.27	35.11	34.05	32.28
	Basic Earnings Per Share (NT\$)	11.82	12.89	13.23	13.54	13.32
	Diluted Earnings Per Share (NT\$)	11.82	12.89	13.23	13.54	13.32
Cash Flow	Cash Flow Ratio (%)	249.67	169.63	163.17	168.54	104.13
	Cash Flow Adequacy Ratio (%)	103.82	108.57	112.41	113.11	106.60
	Cash Flow Reinvestment Ratio (%)	13.76	11.51	11.08	9.06	8.45
Leverage	Operating Leverage	2.26	2.15	2.16	2.28	2.41
	Financial Leverage	1.01	1.01	1.01	1.01	1.01
Industry Specific Key Performance Indicator	Billing Utilization Rate (%) (Note)	93	92	91	87	81
	Advanced Technologies (16-nanometer and below) Percentage of Wafer Sales (%)	5	21	32	41	50
	Sales Growth (%)	10.58	12.38	3.11	5.53	3.73
	Net Income Growth (%)	16.18	9.03	2.65	2.34	-1.67

Analysis of deviation of 2019 vs. 2018 over 20%:

- Debts ratio increased by 44%, current ratio decreased by 50%, quick ratio decreased by 50% and cash flow ratio decreased by 38% mainly due to increase in short-term loans, payables to contractors and equipment suppliers and cash dividends payable.
- Long-term fund to property, plant and equipment decreased by 24% mainly due to increase in advanced technology equipment.

Note: Capacity includes wafers committed by Vanguard and SSMC.

#### \* Glossary

1. Capital Structure Analysis  
 (1) Debt Ratio = Total Liabilities / Total Assets  
 (2) Long-term Fund to Property, Plant and Equipment Ratio = (Shareholders' Equity + Noncurrent Liabilities) / Net Property, Plant and Equipment

2. Liquidity Analysis  
 (1) Current Ratio = Current Assets / Current Liabilities  
 (2) Quick Ratio = (Current Assets - Inventories - Prepaid Expenses) / Current Liabilities  
 (3) Times Interest Earned = Earnings before Interest and Taxes / Interest Expenses

3. Operating Performance Analysis  
 (1) Average Collection Turnover = Net Sales / Average Trade Receivables  
 (2) Days Sales Outstanding = 365 / Average Collection Turnover  
 (3) Average Inventory Turnover = Cost of Sales / Average Inventory  
 (4) Average Inventory Turnover Days = 365 / Average Inventory Turnover  
 (5) Average Payment Turnover = Cost of Sales / Average Trade Payables  
 (6) Property, Plant and Equipment Turnover = Net Sales / Average Net Property, Plant and Equipment  
 (7) Total Assets Turnover = Net Sales / Average Total Assets

#### 4. Profitability Analysis

(1) Return on Total Assets = (Net Income + Interest Expenses \* (1 - Effective Tax Rate)) / Average Total Assets  
 (2) Return on Equity Attributable to Shareholders of the Parent = Net Income Attributable to Shareholders of the Parent / Average Equity Attributable to Shareholders of the Parent  
 (3) Operating Income to Paid-in Capital Ratio = Operating Income / Paid-in Capital  
 (4) Pre-tax Income to Paid-in Capital Ratio = Income before Tax / Paid-in Capital  
 (5) Net Margin = Net Income / Net Sales  
 (6) Earnings Per Share = (Net Income Attributable to Shareholders of the Parent - Preferred Stock Dividend) / Weighted Average Number of Shares Outstanding

#### 5. Cash Flow

(1) Cash Flow Ratio = Net Cash Provided by Operating Activities / Current Liabilities  
 (2) Cash Flow Adequacy Ratio = Five-year Sum of Cash from Operations / Five-year Sum of Capital Expenditures, Inventory Additions, and Cash Dividend  
 (3) Cash Flow Reinvestment Ratio = (Cash Provided by Operating Activities - Cash Dividends) / (Gross Property, Plant and Equipment + Long-term Investments + Other Noncurrent Assets + Working Capital)

#### 6. Leverage

(1) Operating Leverage = (Net Sales - Variable Cost) / Income from Operations  
 (2) Financial Leverage = Income from Operations / (Income from Operations - Interest Expenses)

#### Financial Analysis from 2015 to 2019 (Unconsolidated)

		2015	2016	2017	2018	2019
Capital Structure Analysis	Debt Ratio (%)	23.63	24.39	21.52	19.21	28.74
	Long-term Fund to Property, Plant and Equipment Ratio (%)	168.96	156.13	160.48	170.43	127.39
Liquidity Analysis	Current Ratio (%)	219.72	144.00	141.63	143.26	58.64
	Quick Ratio (%)	186.00	128.65	118.68	113.07	45.81
	Times Interest Earned (Times)	144.41	146.73	144.04	137.46	122.80
Operating Performance Analysis	Average Collection Turnover (Times)	8.58	8.89	7.86	8.45	8.32
	Days Sales Outstanding	42.54	41.07	46.44	43.21	43.88
	Average Inventory Turnover (Times)	6.87	8.56	8.39	6.31	6.65
	Average Inventory Turnover Days	53.11	42.63	43.49	57.89	54.91
	Average Payment Turnover (Times)	19.73	19.04	16.39	16.22	15.10
	Property, Plant and Equipment Turnover (Times)	1.03	1.03	0.97	1.00	0.91
	Total Assets Turnover (Times)	0.55	0.54	0.51	0.51	0.49
Profitability Analysis	Return on Total Assets (%)	20.42	19.58	18.29	17.62	16.00
	Return on Equity (%)	27.04	25.60	23.57	21.95	20.94
	Operating Income to Paid-in Capital Ratio (%)	120.87	142.59	144.50	148.10	141.12
	Pre-tax Income to Paid-in Capital Ratio (%)	134.97	148.55	151.68	152.79	149.92
	Net Margin (%)	36.63	35.70	35.40	34.29	32.58
	Basic Earnings Per Share (NT\$)	11.82	12.89	13.23	13.54	13.32
	Diluted Earnings Per Share (NT\$)	11.82	12.89	13.23	13.54	13.32
Cash Flow	Cash Flow Ratio (%)	264.94	172.81	184.45	173.17	98.00
	Cash Flow Adequacy Ratio (%)	102.35	107.06	99.42	113.52	106.59
	Cash Flow Reinvestment Ratio (%)	13.85	11.74	10.98	9.23	8.23
Leverage	Operating Leverage	2.31	2.19	2.22	2.28	2.46
	Financial Leverage	1.01	1.01	1.01	1.01	1.01

Analysis of deviation of 2019 vs. 2018 over 20%:

- Debts ratio increased by 50%, current ratio decreased by 59%, quick ratio decreased by 59% and cash flow ratio decreased by 43% mainly due to increase in short-term loans, payables to contractors and equipment suppliers and cash dividends payable.
- Long-term fund to property, plant and equipment decreased by 25% mainly due to an increase in advanced technology equipment.

#### \* Glossary

##### 1. Capital Structure Analysis

(1) Debt Ratio = Total Liabilities / Total Assets  
 (2) Long-term Fund to Property, Plant and Equipment Ratio = (Shareholders' Equity + Noncurrent Liabilities) / Net Property, Plant and Equipment

##### 2. Liquidity Analysis

(1) Current Ratio = Current Assets / Current Liabilities  
 (2) Quick Ratio = (Current Assets - Inventories - Prepaid Expenses) / Current Liabilities  
 (3) Times Interest Earned = Earnings before Interest and Taxes / Interest Expenses

##### 3. Operating Performance Analysis

(1) Average Collection Turnover = Net Sales / Average Trade Receivables  
 (2) Days Sales Outstanding = 365 / Average Collection Turnover  
 (3) Average Inventory Turnover = Cost of Sales / Average Inventory  
 (4) Average Inventory Turnover Days = 365 / Average Inventory Turnover  
 (5) Average Payment Turnover = Cost of Sales / Average Trade Payables  
 (6) Property, Plant and Equipment Turnover = Net Sales / Average Net Property, Plant and Equipment  
 (7) Total Assets Turnover = Net Sales / Average Total Assets

##### 4. Profitability Analysis

(1) Return on Total Assets = (Net Income + Interest Expenses \* (1 - Effective Tax Rate)) / Average Total Assets  
 (2) Return on Equity = Net Income / Average Shareholders' Equity  
 (3) Operating Income to Paid-in Capital Ratio = Operating Income / Paid-in Capital  
 (4) Pre-tax Income to Paid-in Capital Ratio = Income before Tax / Paid-in Capital  
 (5) Net Margin = Net Income / Net Sales  
 (6) Earnings Per Share = (Net Income - Preferred Stock Dividend) / Weighted Average Number of Shares Outstanding

##### 5. Cash Flow

(1) Cash Flow Ratio = Net Cash Provided by Operating Activities / Current Liabilities  
 (2) Cash Flow Adequacy Ratio = Five-year Sum of Cash from Operations / Five-year Sum of Capital Expenditures, Inventory Additions, and Cash Dividend  
 (3) Cash Flow Reinvestment Ratio = (Cash Provided by Operating Activities - Cash Dividends) / (Gross Property, Plant and Equipment + Long-term Investments + Other Noncurrent Assets + Working Capital)

##### 6. Leverage

(1) Operating Leverage = (Net Sales - Variable Cost) / Income from Operations  
 (2) Financial Leverage = Income from Operations / (Income from Operations - Interest Expenses)

#### 6.1.4 Auditors' Opinions from 2015 to 2019

Year	CPA	Audit Opinion
2015	Yih-Hsin Kao, Hung-Wen Huang	An Unqualified Opinion
2016	Yih-Hsin Kao, Yu-Feng Huang	An Unmodified Opinion (Note)
2017	Yih-Hsin Kao, Yu-Feng Huang	An Unmodified Opinion (Note)
2018	Mei Yen Chiang, Yu-Feng Huang	An Unmodified Opinion (Note)
2019	Mei Yen Chiang, Yu-Feng Huang	An Unmodified Opinion (Note)

Note: Starting in 2016, the new auditing standard of the Republic of China requires "An Unqualified Opinion" be replaced by "An Unmodified Opinion".

Deloitte & Touche  
20F, No. 100, Songren Rd., Xinyi Dist., Taipei, Taiwan, R.O.C.  
Tel: 886-2-2725-9988

#### 6.1.5 Audit Committee's Review Report

The Board of Directors has prepared the Company's 2019 Business Report, Financial Statements, and proposal for allocation of quarterly earnings. The CPA firm of Deloitte & Touche was retained to audit TSMC's Financial Statements and has issued an audit report relating to the Financial Statements. The Business Report, Financial Statements, and quarterly earnings allocation proposal have been reviewed and determined to be correct and accurate by the Audit Committee members of Taiwan Semiconductor Manufacturing Company Limited. According to relevant requirements of the Securities and Exchange Act and the Company Law, we hereby submit this report.

Taiwan Semiconductor Manufacturing Company Limited

Chairman of the Audit Committee: Sir Peter L. Bonfield

February 11, 2020

#### 6.1.6 Financial Difficulties

The Company should disclose the financial impact to the Company if the Company and its affiliated companies have incurred any financial or cash flow difficulties in 2019 and as of the date of this Annual Report: None

#### 6.1.7 Consolidated Financial Statements and Independent Auditors' Report along with Parent Company Only

##### Financial Statements and Independent Auditors' Report

Please refer to Annual Report section (II), Financial Statements.

#### 6.2 Financial Status and Operating Results

##### 6.2.1 Financial Status

###### Consolidated

Unit: NT\$ thousands

Item	2019	2018	Difference	%
Current Assets	822,613,914	951,679,721	(129,065,807)	-14%
Long-term Investments (Note 1)	30,172,039	29,304,796	867,243	3%
Property, Plant and Equipment	1,352,377,405	1,072,050,279	280,327,126	26%
Right-of-use Assets	17,232,402	0	17,232,402	NM
Intangible Assets	20,653,028	17,002,137	3,650,891	21%
Other Assets (Note 2)	21,756,244	20,091,105	1,665,139	8%
Total Assets	2,264,805,032	2,090,128,038	174,676,994	8%
Current Liabilities	590,735,701	340,542,586	250,193,115	73%
Noncurrent Liabilities	51,973,905	72,089,056	(20,115,151)	-28%
Total Liabilities	642,709,606	412,631,642	230,077,964	56%
Capital Stock	259,303,805	259,303,805	0	0%
Capital Surplus	56,339,709	56,315,932	23,777	0%
Retained Earnings	1,333,334,979	1,376,647,841	(43,312,862)	-3%
Others	(27,568,369)	(15,449,913)	(12,118,456)	78%
Equity Attributable to Shareholders of the Parent	1,621,410,124	1,676,817,665	(55,407,541)	-3%
Total Equity	1,622,095,426	1,677,496,396	(55,400,970)	-3%

Note 1: Long-term investments consist of noncurrent financial assets at fair value through other comprehensive income, noncurrent financial assets at amortized cost, and investments accounted for using equity method.

Note 2: Other assets consist of deferred income tax assets, refundable deposits, and other noncurrent assets.

##### • Analysis of Deviation over 20%

Increase in property, plant and equipment: The increase was mainly due to increase in advanced technology equipment.

Increase in intangible assets: The increase was mainly due to increase in technology license and software.

Increase in current liabilities: The increase was mainly due to increase in short-term loans, payables to contractors and equipment suppliers and cash dividends payable.

Decrease in noncurrent liabilities: The decrease was mainly due to reclassification of bonds payable due in 1 year to current liabilities, partially offset by increase in lease liabilities.

Increase in total liabilities: The increase was mainly due to increase in short-term loans, payables to contractors and equipment suppliers and cash dividends payable.

Decrease in other equity: The decrease was mainly due to increase in currency exchange loss arising from translation of foreign operations in 2019.

##### • Major Impact on Financial Position

The above deviations had no major impact on TSMC's financial position.

• Future Plan on Financial Position: Not applicable.

## 6.2.2 Financial Performance

### Unconsolidated

Unit: NT\$ thousands

Item	2019	2018	Difference	%
Current Assets	355,118,125	469,966,106	(114,847,981)	-24%
Long-term Investments (Note 1)	559,380,999	550,524,494	8,856,505	2%
Property, Plant and Equipment	1,310,900,634	1,025,286,941	285,613,693	28%
Right-of-use Assets	15,030,020	0	15,030,020	NM
Intangible Assets	16,271,444	12,429,930	3,841,514	31%
Other Assets (Note 2)	18,774,850	17,253,537	1,521,313	9%
Total Assets	2,275,476,072	2,075,461,008	200,015,064	10%
Current Liabilities	605,540,547	328,060,518	277,480,029	85%
Noncurrent Liabilities	48,525,401	70,582,825	(22,057,424)	-31%
Total Liabilities	654,065,948	398,643,343	255,422,605	64%
Capital Stock	259,303,805	259,303,805	0	0%
Capital Surplus	56,339,709	56,315,932	23,777	0%
Retained Earnings	1,333,334,979	1,376,647,841	(43,312,862)	-3%
Others	(27,568,369)	(15,449,913)	(12,118,456)	78%
Total Equity	1,621,410,124	1,676,817,665	(55,407,541)	-3%

Note 1: Long-term investments consist of noncurrent financial assets at fair value through other comprehensive income and investments accounted for using equity method.

Note 2: Other assets consist of deferred income tax assets, refundable deposits, and other noncurrent assets.

### • Analysis of Deviation over 20%

Decrease in current assets: The decrease was mainly due to decrease in cash and cash equivalents.

Increase in property, plant and equipment: The increase was mainly due to increase in advanced technology equipment.

Increase in intangible assets: The increase was mainly due to increase in technology license and software.

Increase in current liabilities: The increase was mainly due to increase in short-term loans, payables to contractors and equipment suppliers and cash dividends payable.

Decrease in noncurrent liabilities: The decrease was mainly due to reclassification of bonds payable due in 1 year to current liabilities, partially offset by increase in lease liabilities.

Increase in total liabilities: The increase was mainly due to increase in short-term loans, payables to contractors and equipment suppliers and cash dividends payable.

Decrease in other equity: The decrease was mainly due to increase in currency exchange loss arising from translation of foreign operations in 2019.

### • Major Impact on Financial Position

The above deviations had no major impact on TSMC's financial position.

### • Future Plan on Financial Position:

Not applicable.

### Consolidated

Unit: NT\$ thousands

Item	2019	2018	Difference	%
Net Revenue	1,069,985,448	1,031,473,557	38,511,891	4%
Cost of Revenue	577,286,947	533,487,516	43,799,431	8%
Gross Profit before Realized (Unrealized) Gross Profit on Sales to Associates	492,698,501	497,986,041	(5,287,540)	-1%
Realized (Unrealized) Gross Profit on Sales to Associates	3,395	(111,788)	115,183	NM
Gross Profit	492,701,896	497,874,253	(5,172,357)	-1%
Operating Expenses	119,504,582	112,149,280	7,355,302	7%
Other Operating Income and Expenses, Net	(496,224)	(2,101,449)	1,605,225	76%
Income from Operations	372,701,090	383,623,524	(10,922,434)	-3%
Non-operating Income and Expenses	17,144,246	13,886,739	3,257,507	23%
Income before Income Tax	389,845,336	397,510,263	(7,664,927)	-2%
Income Tax Expenses	44,501,527	46,325,857	(1,824,330)	-4%
Net Income	345,343,809	351,184,406	(5,840,597)	-2%
Other Comprehensive Income (Loss), Net of Income Tax	(11,823,562)	9,836,976	(21,660,538)	-220%
Total Comprehensive Income for the Year	333,520,247	361,021,382	(27,501,135)	-8%
Total Net Income Attributable to Shareholders of the Parent	345,263,668	351,130,884	(5,867,216)	-2%
Total Comprehensive Income Attributable to Shareholders of the Parent	333,440,460	360,965,015	(27,524,555)	-8%

### • Analysis of Deviation over 20%

Increase in realized (unrealized) gross profit on sales to associates: The increase was mainly due to lower sales to investees in the fourth quarter of 2019.

Increase in other operating income and expenses, net: The increase was mainly due to reversal of impairment losses on property, plant and equipment in 2019.

Increase in non-operating income and expenses: The increase was mainly due to higher interest income in 2019.

Decrease in other comprehensive income (loss), net of income tax: The decrease was mainly due to increase in currency exchange loss arising from translation of foreign operations in 2019.

### • Sales Volume Forecast and Related Information

For additional details, please refer to "1. Letter to Shareholders".

### • Major Impact on Financial Performance

The above deviations had no major impact on TSMC's financial performance.

### • Future Plan on Financial Performance:

Not applicable.

## Unconsolidated

Unit: NT\$ thousands

Item	2019	2018	Difference	%
Net Revenue	1,059,646,793	1,023,925,713	35,721,080	3%
Cost of Revenue	579,507,047	530,861,166	48,645,881	9%
Gross Profit before Realized (Unrealized) Gross Profit on Sales to Subsidiaries and Associates	480,139,746	493,064,547	(12,924,801)	-3%
Realized (Unrealized) Gross Profit on Sales to Subsidiaries and Associates	3,395	(109,046)	112,441	NM
Gross Profit	480,143,141	492,955,501	(12,812,360)	-3%
Operating Expenses	114,067,919	107,259,429	6,808,490	6%
Other Operating Income and Expenses, Net	(151,230)	(1,668,234)	1,517,004	91%
Income from Operations	365,923,992	384,027,838	(18,103,846)	-5%
Non-operating Income and Expenses	22,821,227	12,170,315	10,650,912	88%
Income before Income Tax	388,745,219	396,198,153	(7,452,934)	-2%
Income Tax Expenses	43,481,551	45,067,269	(1,585,718)	-4%
Net Income	345,263,668	351,130,884	(5,867,216)	-2%
Other Comprehensive Income (Loss), Net of Income Tax	(11,823,208)	9,834,131	(21,657,339)	-220%
Total Comprehensive Income for the Year	333,440,460	360,965,015	(27,524,555)	-8%

### • Analysis of Deviation over 20%

Increase in realized (unrealized) gross profit on sales to subsidiaries and associates: The increase was mainly due to lower sales to investees in the fourth quarter of 2019.

Increase in other operating income and expenses, net: The increase was mainly due to reversal of impairment losses on property, plant and equipment in 2019.

Increase in non-operating income and expenses: The increase was mainly due to higher share of profits of subsidiaries and associates in 2019.

Decrease in other comprehensive income (loss), net of income tax: The decrease was mainly due to increase in currency exchange loss arising from translation of foreign operations in 2019.

### • Sales Volume Forecast and Related Information

For additional details, please refer to "1. Letter to Shareholders".

### • Major Impact on Financial Performance

The above deviations had no major impact on TSMC's financial performance.

### • Future Plan on Financial Performance:

Not applicable.

## 6.2.3 Cash Flow

### Consolidated

Unit: NT\$ thousands

Cash Balance 12/31/2018	Net Cash Provided by Operating Activities in 2019	Net Cash Used in Investing Activities in 2019	Net Cash Used in Financing Activities in 2019	Effect of Exchange Rate Changes on Cash and Cash Equivalents in 2019	Cash Balance 12/31/2019	Remedy for Liquidity Shortfall	
						Investment Plan	Financing Plan
577,814,601	615,138,744	(458,801,647)	(269,638,166)	(9,114,196)	455,399,336	None	None

### • Analysis of Cash Flow

NT\$615.1 billion net cash generated by operating activities: mainly include net income, along with depreciation and amortization expenses.

NT\$458.8 billion net cash used in investing activities: primarily for capital expenditures.

NT\$269.6 billion net cash used in financing activities: primarily for cash dividend payment and repayment of corporate bonds.

### • Remedial Actions for Liquidity Shortfall

As a result of positive operating cash flows and cash on-hand, remedial actions are not required.

### • Cash Flow Projection for Next Year:

Not applicable.

### Unconsolidated

Unit: NT\$ thousands

Cash Balance 12/31/2018	Net Cash Provided by Operating Activities in 2019	Net Cash Used in Investing Activities in 2019	Net Cash Used in Financing Activities in 2019	Cash Balance 12/31/2019	Remedy for Liquidity Shortfall	
					Investment Plan	Financing Plan
240,202,525	593,432,071	(451,460,013)	(240,723,885)	141,450,698	None	None

### • Analysis of Cash Flow

NT\$593.4 billion net cash generated by operating activities: mainly include net income, along with depreciation and amortization expenses.

NT\$451.5 billion net cash used in investing activities: primarily for capital expenditures.

NT\$240.7 billion net cash used in financing activities: primarily for cash dividend payment and repayment of corporate bonds.

### • Remedial Actions for Liquidity Shortfall

As a result of positive operating cash flows and cash on-hand, remedial actions are not required.

### • Cash Flow Projection for Next Year:

Not applicable.

## 6.2.4 Recent Years Major Capital Expenditures and Impact on Financial and Business

Unit: NT\$ thousands

Plan	Actual or Planned Source of Capital	Total Amount for 2019 and 2018	Actual Use of Capital	
			2019	2018
Production Facilities, R&D and Production Equipment	Cash flow generated from operations	768,726,829	456,424,278	312,302,551
Others	Cash flow generated from operations	7,277,202	3,997,872	3,279,330
Total		776,004,031	460,422,150	315,581,881

Based on capital expenditures listed above, TSMC's annual production capacity increased by approximately 0.2 million 12-inch equivalent wafers in 2019.

## 6.2.5 Long-term Investment Policy and Results

TSMC's long-term investments accounted for using equity method were all made for strategic purposes. However, when an investment is no longer of strategic value, it will be considered a financial investment. In 2019, the gains from these investments amounted to NT\$2,844,222 thousand on a consolidated basis, decreasing from previous year mainly due to a decrease in product demand. In the future, TSMC's long-term investments accounted for using equity method will continue to focus on strategic purposes through prudent assessments.

### 6.3 Risk Management

The Board of Directors plays a key role in helping the Company identify and manage economic risks. The risk management organization periodically briefs the Audit Committee on the ever-changing risk environment facing TSMC, the focus of the Company's enterprise risk management, and risk assessment and mitigation efforts. The Audit Committee's Chairperson also reports on the risk environment and risk mitigation actions to be taken.

TSMC and its subsidiaries are committed to proactively and cost effectively integrating and managing strategic, operational, financial and hazardous risks that represent potential negative consequences to operations and financial results. TSMC operates an enterprise risk management (ERM) program based on both its corporate vision and its long-term, sustainable responsibility to both industry and society. ERM seeks to provide the appropriate management of risks on behalf of all stakeholders. The Company maintains a risk map that considers likelihood and impact severity, and is used to identify and prioritize risk controls and implement various controls and risk treatment strategies in response to risks as they are identified.

#### Scope of Risk Management

##### Strategic Perspective

- Regulatory change and compliance
- Government policies
- Changes in technology and industry
- Technology development and competition
- Demand and capacity expansion

##### Operational Perspective

- Sales and purchasing concentration
- Information security
- Intellectual property rights
- Recruitment of qualified personnel
- Corporate image

##### Financial Perspective

- Interest rate, foreign exchange, inflation, deflation and taxation
- External financing
- High-risk and/or highly leveraged investments; financial derivative transactions
- Strategic investments

##### Hazardous Events

- Earthquakes and natural hazards
- Fire or chemical spills
- Climate change
- Utility supply

### Enterprise Risk Management Framework



To mitigate the operational impacts of crisis events, ERM conducts pre-crisis risk assessment and identifies feasible strategies for crisis prevention. Response procedures and recovery plans are compiled corresponding to different scenarios. For specific severe crisis events involving multiple TSMC manufacturing sites, the cross-functional central crisis command center composed of operations and support functions is responsible for internal coordination to speed up response time and proactively communicate with stakeholders. To raise risk awareness and strengthen the risk management culture in TSMC, RM task forces have been formed. Enhanced risk assessment and crisis response exercises have also been conducted for potentially critical events such as fire, earthquake, IT service disruption, IT security breach, supply chain disruption, major yield loss and utility supply disruption. In order to continuously mitigate corporate risks, crisis response exercises are used to test the integrity and effectiveness of ERM.

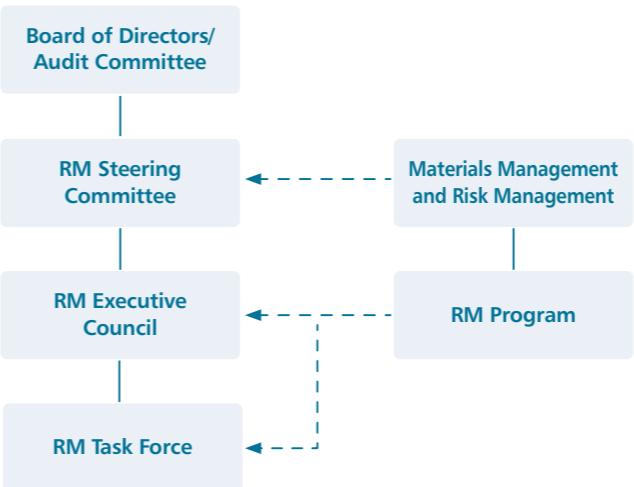
To reduce supply chain disruption risks, TSMC has created a task force comprised of members from fab operations, materials management, risk management and quality systems management to work with suppliers to develop business continuity plans and enhance supply chain resilience. Partly as a result of these efforts, there were no interruptions in TSMC's supply chain in 2019.

As production capacity continues to expand with more advanced technology, TSMC has initiated and implemented seismic protection engineering design, risk treatment practices and green manufacturing projects in all new fabs.

### 6.3.1 Risk Management Organization Chart

TSMC's risk management organization reports annually to the Audit Committee on the risk environment TSMC faces, enterprise risk management, risk assessment and mitigation efforts. The Audit Committee Chairperson also reports to the Board on these discussion and actions.

#### Organization Functions



#### RM Steering Committee

- Consists of functional heads (with internal audit head sitting in as an observer)
- Reports to the Audit Committee
- Reviews risk control progress
- Identifies and approves prioritization of risk controls

#### RM Executive Council

- Consists of representatives from each function
- Determines and implements cost-effective risk controls
- Improves risk management transparency and how risks are managed

#### RM Program

- Supports RM task forces to enhance effective risk control
- Coordinates and facilitates RM Executive Council on risk management activities
- Consolidates ERM reports and updates provided to the RM Steering Committee

#### RM Task Force

- Identifies potential scenarios and business impact
- Determines risk mitigation actions to respond to the scenarios
- Compiles crisis management procedures and conducts exercises

### 6.3.2 Strategic Risks

#### Risks Associated with Changes in Technology and Industry

##### • Industry Developments

The electronics industries and semiconductor markets are cyclical and subject to significant and often rapid fluctuations in product demand, which could impact TSMC's semiconductor foundry business. Variations in order levels from customers may result in volatility in the Company's revenue and earnings.

From time to time, the electronics and semiconductor industries have experienced significant, occasionally prolonged periods of downturns and overcapacity. Because TSMC is, and will continue to be, dependent on the requirements of electronics and semiconductor companies for TSMC's services, periods of downturns and overcapacity in the general electronics and semiconductor industries could lead to reduced demand for overall semiconductor foundry services, including TSMC's services. If TSMC cannot take appropriate actions such as reducing its costs to sufficiently offset declines in demand, the Company's revenue, margin, and earnings will likely suffer during periods of downturns and overcapacity.

##### • Changes in Technology

The semiconductor industry and its technologies are constantly changing. TSMC competes by developing process technologies using increasingly advanced nodes and on manufacturing products with more functions. The Company also competes by developing new derivative technologies. If TSMC does not anticipate these changes in technologies and rapidly develop new and innovative technologies, or the Company's competitors unforeseeably gain sudden access to additional technologies, TSMC may not be able to provide foundry services on competitive terms. In addition, TSMC's customers have significantly decreased the time in which their products or services are launched into the market. If TSMC is unable to meet these shorter product time-to-market, the Company risks losing these customers. These factors have also been intensified by the shift of the global technology market to consumer driven products such as smartphones, and increasing concentration of customers and competition (all further discussed among these risk factors). Also, the uncertainty and instability inherent in advanced technologies also impose challenges for achieving expected product quality and product yield. If TSMC fails to maintain quality, the Company may result in loss of revenue and additional costs, as well as loss of business or customer trust. For example, in January 2019, TSMC discovered the yield problems in 12- and 16-nanometer wafers caused by a batch of photoresist, which resulted in delayed delivery of products and had a negative effect on the Company's margin and operating margin in the first quarter on 2019. The Company

has strengthened inline wafer inspection and tightened control of incoming material to deal with the increasing complexity of leading-edge technologies. If TSMC is unable to innovate new technologies that meet the demand of its customers or overcome the above factors, the Company may become less competitive and our revenue may decline significantly.

Regarding the response measures for the above-mentioned risks, please refer to "2.2.4 TSMC Position, Differentiation and Strategy" on pages 14-15 of this annual report.

#### Risks Associated with Decrease in Demand and Average Selling Price

A vast majority of our revenue is derived from customers who use our products in smartphones, high performance computing (HPC), Internet of Things (IoT), automotive electronics, and digital consumer electronics (DCE). Any deterioration in or a slowdown in the growth of such end markets resulting in a substantial decrease in the demand for overall global semiconductor foundry services, including our products and services, could adversely affect our revenue. Further, semiconductor manufacturing facilities require substantial investment to construct and are largely fixed cost assets once they are in operation. Because we own most of our manufacturing capacities, a significant portion of our operating costs is fixed. In general, these costs do not decline when customer demand or our capacity utilization rates drop, and thus declines in customer demand, among other factors, may significantly decrease our margins. Conversely, as product demand rises and factory utilization increases, the fixed costs are spread over increased output, which can improve our margins. In addition, the historical and current trend of declining average selling prices (or "ASP") of end use applications places downward pressure on the prices of the components that go into such applications. If the ASP of end use applications continues decreasing, the pricing pressure on components produced by us may lead to a reduction of our revenue, margin and earnings.

#### Risks Associated with Competition

The markets for TSMC's foundry services are highly competitive. TSMC competes with other foundry service providers, as well as with a number of integrated device manufacturers. Some of these companies may have access to more advanced technologies than TSMC. Other companies may have greater financial and other resources than TSMC, such as the possibility of receiving direct or indirect government subsidy, economic stimulus funds, or other incentives that may be unavailable to TSMC. For example, Chinese companies are expected to be key players for new semiconductor fab development and fab equipment spending in part due to various incentives provided by the Chinese government.

Furthermore, the Company's competitors may, from time to time, also decide to undertake aggressive pricing initiatives in one or several technology nodes. These competitive activities may decrease TSMC's customer base, or its ASP, or both. If TSMC is unable to compete effectively with these new and aggressive competitors on technology, manufacturing capacity, product quality and customer satisfaction, it risks losing customers to these new contenders.

#### Risks Associated with Changes in the Government Policies and Regulatory Environment

TSMC management closely monitors all domestic and foreign governmental policies and regulations that might impact TSMC's business and financial operations. During 2019 and as of the date of this Annual Report, there were no governmental policies or regulatory changes would materially impact TSMC's operations or financial condition.

#### 6.3.3 Operational Risks

##### Risks Associated with Capacity Expansion

TSMC performs long-term market demand forecast for its products and services to manage its overall capacity. Because market conditions are dynamic, TSMC's market demand forecast may change significantly at any time. During periods of decreased demand, certain manufacturing lines or tools in some of the Company's manufacturing facilities may be suspended or shut down temporarily. However, if subsequent demand increases rapidly in a short period of time, TSMC may not be able to restore the capacity in a timely manner to take advantage of the upturn.

According to the market demand forecasts, TSMC has recently been adding capacity to meet market needs for its products and services. Expansion of the Company's capacity will increase its costs. For example, the Company will need to purchase additional equipment, hire additional personnel and train personnel to operate the new equipment. If TSMC does not increase its net revenue accordingly, its financial performance may be adversely affected by these increased costs.

In order to mitigate the risk associated with capacity expansion, TSMC continuously watches for changes in market conditions and works closely with its customers. When market demand is not as expected, the Company tries to adjust its capacity plans in a timely manner to reduce the impact on its financial performance.

#### Risks Associated with Sales Concentration

Over the years, TSMC's customer profile and the nature of the Company's customers' businesses have changed dramatically. While the Company generates revenue from hundreds of customers worldwide, TSMC's ten largest customers in 2017, 2018, and 2019 accounted for approximately 66%, 68% and 71% of TSMC's net revenue in the respective year. TSMC's largest customer in 2017, 2018, and 2019 accounted for 23%, 22% and 23% of the Company's net revenue in the respective year. TSMC's second largest customer for each particular year accounted for less than 10% of the Company's net revenue in 2017 as well as 2018 and 14% of the Company's net revenue in 2019.

A more concentrated customer base will subject TSMC's revenue to seasonal demand fluctuations from our large customers, and cause different seasonal patterns of the Company's business. This customer concentration results in part from the changing dynamics of the electronics industry with the structural shift to mobile devices and applications and software that provide the content for such devices. There are only a limited number of customers who are successfully exploiting this new business model paradigm.

Also, in order to respond to the new business model paradigm, TSMC has seen the changes of nature in the Company's business models. For example, there is a growing trend toward the system companies developing their own designs and working directly with semiconductor foundries which makes their products and services more marketable in a changing consumer market. Also, since the global semiconductor industry is becoming increasingly competitive, some of TSMC's customers have engaged in industry consolidations in order to remain competitive. Such consolidations have taken the form of mergers and acquisitions. If more of TSMC's major customers consolidate, this will further decrease the overall number of the Company's customer pool. In addition, regulatory restrictions such as export control directed at TSMC's major customers could impact the Company's ability to supply products and services to those customers, reduce those customers' demand for TSMC's products and services and impact their business operations. The loss of, or significant curtailment of purchases by, one or more of the Company's top customers, including curtailments due to increased competitive pressures, industry consolidation, changes in applicable regulatory restrictions, product designs, manufacturing sourcing policies or practices of these customers, or the timing of customer or distributor inventory adjustments, or change in its major customers' business models may adversely affect TSMC's results of operations and financial condition.

#### Risks Associated with Purchasing Concentration

##### • Raw Materials

TSMC's production operations require that it obtains adequate supplies of raw materials, such as silicon wafers, gases, chemicals and photoresist, on a timely basis and at commercially reasonable prices. In the past, shortages in the supply of some materials, whether by specific vendors or by the semiconductor industry generally, have resulted in occasional industry-wide price adjustments and delivery delays. Moreover, major natural disasters, trade barriers and political or economic turmoil occurring within the country of origin of such raw materials may also significantly disrupt the availability of such raw materials or increase their prices. Also, since TSMC procures some of its raw materials from sole-sourced suppliers, there is a risk that the Company's needs for such raw materials may not be met or that back-up supplies may not be readily available. In addition, recent trade tensions could result in increased prices or even unavailability of raw materials due to tariffs, export control or other non-tariff barriers. TSMC's revenue and earnings could decline if the Company is unable to obtain adequate supplies of the necessary raw materials in a timely manner or if there are significant increases in the costs of raw materials. To reduce the supply chain risk and to manage the cost effectively, TSMC commits resources toward developing new supply sources. In addition, the Company continually encourages its suppliers to reduce their supply chain risk by decentralizing production plants and to improve their cost competitiveness by moving their production facilities to Taiwan from higher-cost areas.

Given that qualified backup suppliers are hard to obtain, TSMC engages early and extensively with primary suppliers on managing quality and capacity issues to be prepared for any unexpected need to ramp up or curtail production when the Company lacks sufficient time to re-tune its production process. For leading technology nodes, TSMC not only adopts world-class processes and facilities but also requires world-class materials. To streamline supply chain risk management, the Company has increased supplier site audits and meetings to extend supply chain best practices to its upstream suppliers. In addition, in response to the rapid increase or decrease in production capacity of new products, TSMC has continued to improve its inventory monitoring system to achieve more accurate demand forecasts and ensure that the supply chain maintains sufficient inventory levels. The Company has established a supply chain risk assessment to ensure critical suppliers meet standards in labor, ethics, ESH (Environmental, Safety and Health) and BCP (Business Continuity Plan). Onsite audits are conducted regularly to empower these suppliers to take responsibility for their supply

chain as any regulatory violations or adverse environmental impact event, or failure to meet sustainability requirements could result in business reduction or termination.

#### • Equipment

The Company's operations and ongoing expansion plans depend on its ability to obtain an appropriate amount of equipment and related services from a limited number of suppliers in a market that is characterized from time to time by limited supply and long delivery cycles. During such times, supplier-specific or industry-wide lead times for delivery can be as long as six months or more. To better manage its supply chain, the Company has implemented various business models and risk management contingencies with suppliers to shorten the procurement lead times. Further, the growing complexities, especially in advanced lithographic technologies may delay the timely availability of the equipment and parts needed to exploit time-sensitive business opportunities and also increase the market price for such equipment and parts. If TSMC is unable to obtain equipment in a timely manner to fulfill its customers' demand on technology and production capacity, or at a reasonable cost, its financial condition and results of operations could be negatively impacted.

#### Risks Associated with IT Security

TSMC has established a comprehensive internet and computing security network, it cannot guarantee that its computing systems which control or maintain vital corporate functions, such as its manufacturing operations and enterprise accounting, would be completely immune to crippling cyber attacks by any third party to gain unauthorized access to its internal network systems, to sabotage its operations and goodwill or otherwise. In the event of a serious cyber attack, TSMC's systems may lose important corporate data or its production lines may be shut down pending the resolution of such attack. While TSMC seeks to continuously review and assess its cybersecurity policies and procedures to ensure their adequacy and effectiveness, the Company cannot guarantee that it will not be susceptible to new and emerging risks and attacks in the evolving landscape of cybersecurity threats. These cyber attacks may also attempt to steal TSMC trade secrets and other sensitive information, such as proprietary information of its customers and other stakeholders and personal information of its employees.

Malicious hackers may also try to introduce computer viruses, corrupted software or ransomware into TSMC network systems to disrupt our operations, blackmail us to regain control of its computing systems, or spy on it for sensitive information. These

attacks may result in us having to pay damages for its delayed or disrupted orders or incur significant expenses in implementing remedial and improvement measures to enhance its cybersecurity network, and may also expose us to significant legal liabilities arising from or related to legal proceedings or regulatory investigations associated with, among other things, leakage of employee, customer or third party information, which the company has an obligation to keep confidential.

TSMC experienced and may be subject to attack onward by malicious software contained in the equipment TSMC purchase and install. The cyber security risk management and solution enhancement actions have been taken continuously, such as building up an automated virus-scan system to prevent fab from installing virus infected tools, strengthening of firewall and network control to prevent computer viruses from spreading among tools and fabs, installation of proper anti-virus solutions for different computers, development and deployment of security monitor application to monitor and alert computer security issues, enhancement of computer vulnerability scan and patch updating, improving phishing email detection, employee awareness testing, external security risk assessments, and the establishment of an integrated and automatic security operation platform. While these ongoing enhancements further improved the cyber security defense solutions, there can be no assurance that the company is immune to malicious software attacks.

In addition, TSMC employs certain third party service providers for the Company and its affiliates worldwide with whom the Company needs to share highly sensitive and confidential information to enable them to provide the relevant services. Despite that the Company requires the third party service providers to comply with the confidentiality and/or internet security requirements in its service agreements with them, there is no assurance that each of them will strictly fulfill such obligations, or at all. The on-site network systems of and the off-site cloud computing networks, such as servers maintained by such service providers and/or its contractors, are also subject to risks associated with cyber attacks. If TSMC or its service providers are not able to timely resolve the respective technical difficulties caused by cyber attacks, or ensure the integrity and availability of its data (and data belonging to its customers and other third parties) or control of its or its service providers' computing systems, the Company's commitments to its customers and other stakeholders may be materially impaired and its results of operations, financial condition, prospects and reputation may also be materially and adversely affected as a result.

#### Risks Associated with Intellectual Property Rights

The Company's ability to compete successfully and to achieve future growth depends in part on the continued strength of its intellectual property portfolio. While we actively enforce and protect our intellectual property rights, there can be no assurance that its efforts will be adequate to prevent the misappropriation or improper use of its proprietary technologies, software, trade secrets or know-how. Also, the Company cannot assure you that, as its business or business models expand into new areas, it will be able to develop independently the technologies, patents, software, trade secrets or know-how necessary to conduct its business or that it can do so without unknowingly infringing the intellectual property rights of others. As a result, TSMC may have to rely on, to a certain degree, licensed technologies and patent licenses from others. To the extent that the Company relies on licenses from others, there can be no assurance that it will be able to obtain any or all of the necessary licenses in the future on terms it considers reasonable or at all. The lack of necessary licenses could expose TSMC to claims for damages and/or injunctions from third parties, as well as claims for indemnification by its customers in instances where it has contractually agreed to indemnify its customers against damages resulting from infringement claims.

TSMC has received, from time-to-time, communications from third parties asserting that TSMC's technologies, its manufacturing processes, or the design IPs of the semiconductors made by TSMC or the use of those semiconductors by its customers may infringe their patents or other intellectual property rights. These assertions have at times resulted in litigation. Because of the nature of the industry and its market position, the Company may continue to receive such communications in the future. The Company continues to face a number of assertions made and lawsuits initiated by litigious, well-funded, non-practicing entities who are aggressive in their monetary demand and in seeking court-issued injunctions. This Company also encounters, from time-to-time, assertions and litigations initiated by semiconductor companies seeking to disrupt its business such as the patent infringement lawsuits in August 2019 filed by GlobalFoundries ("GF") attempting to restrict its and its customers' activities in the United States and Germany. The Company responded with counter-lawsuits against GF for patent infringement in September 2019 targeting its manufacturing activities in the U.S., Germany, and Singapore. Shortly after, the Company reached an agreement with GF in October 2019 to dismiss all litigation between the parties, as well as those that involve any of its customers. Such lawsuits

and assertions may increase TSMC's cost of doing business and may potentially be extremely disruptive if these asserting entities succeed in blocking the trade of products made and services offered by TSMC. Also, as the Company expended its manufacturing operations into certain non-R.O.C jurisdictions, it has faced increasing challenges to manage risks of intellectual property misappropriation. Despite our efforts to adopt robust measures to mitigate the risk of intellectual property misappropriation in such new jurisdictions, we cannot guarantee that the protection measures we adopted will be sufficient to prevent us from potential infringements by others, or at all.

If TSMC fails to obtain or maintain certain technologies or intellectual property licenses or fails to prevent our intellectual property from being misappropriated and, if litigation relating to alleged intellectual property matters occurs, it could: (1) prevent the Company from manufacturing particular products or selling particular services or applying particular technologies; and (2) reduce our ability to compete effectively against entities benefiting from our misappropriated intellectual property, which could reduce its opportunities to generate revenue.

TSMC has taken related measures to minimize potential loss of shareholder value arising from intellectual property claims and litigation filed against the Company. These measures include: strategically obtaining licenses from certain semiconductor and other technology companies as needed; timely securing intellectual property rights for defensive and/or offensive protection of TSMC technology and business; and aggressively defending against baseless litigation.

#### Risks Associated with Litigious and Non-litigious Matters

As is the case with many companies in the semiconductor industry, TSMC has received from time-to-time communications from third parties asserting that its technologies, its manufacturing processes, or the design of the semiconductors made by TSMC or the use of those semiconductors by its customers may infringe upon their patents or other intellectual property rights. These assertions have at times resulted in litigation by or against the Company and settlement payments by the Company. Irrespective of the validity of these claims, TSMC could incur significant costs in the defense thereof or could suffer adverse effects on its operations. TSMC is also subject to antitrust compliance requirements and scrutiny by governmental regulators in multiple jurisdictions. Any adverse results of such proceeding or other similar proceedings that may arise in

those jurisdictions could harm TSMC's business and distract its management, and thereby have a material adverse effect on its results of operations or prospects, and subject TSMC to potential significant legal liability.

Currently, TSMC's material legal proceedings are as follows:

In February 2019, Innovative Foundry Technologies LLC ("IFT") filed a complaint in the U.S. District Court for the District of Delaware alleging that TSMC and TSMC Technology Inc. infringe five U.S. patents. IFT also filed a complaint in the U.S. International Trade Commission (the "ITC") alleging that TSMC, TSMC North America, TSMC Technology Inc., and other companies infringe the same patents. The ITC instituted an investigation in March 2019. Both parties agreed to end the dispute and the ITC terminated the investigation in October 2019. The pending litigation in the U.S. District Court for the District of Delaware was dismissed at the same time.

On September 28, 2017, TSMC was contacted by the European Commission (the "Commission"), which has asked us for information and documents concerning alleged anti-competitive practices in relation to semiconductor sales. We are cooperating with the Commission to provide the requested information and documents. In light of the fact that this proceeding is still in its preliminary stage, it is premature to predict how the case will proceed, the outcome of the proceeding or its impact.

Other than the matters described above, as of the date of this Annual Report, TSMC is not currently a party to any other material legal proceedings.

#### Risks Associated with Mergers and Acquisitions

In 2019 and as of the date of this annual report, TSMC did not conduct any merger and acquisition.

#### Risks Associated with Recruiting Quality Personnel

TSMC's growth relies on the continued services and contributions of its management team, skilled technical and professional personnel. The Company's business could suffer from the inability to fulfill personnel needs with high quality professionals in a timely fashion caused by the loss of personnel or related changes in market demand for its products and services. Since there is fierce competition for talent recruitment, the Company cannot ensure timely fulfillment of its personnel demand.

#### Future R&D Plans and Expected R&D Spending

For additional details, see "5.2.7 Future R&D Plans" on page 76 of this annual report.

#### Changes in Corporate Reputation and Impact on Company's Crisis Management

TSMC has established an excellent corporate reputation around the world based on its core values of integrity, commitment, innovation and customer trust. The Company's positive image also reflects outstanding operations, rigorous corporate governance and dedication to social responsibility by serving as a good corporate citizen. TSMC continues to pursue innovation in the economic, environmental and social dimensions of CSR.

In 2019, TSMC was honored with numerous awards for achievements in operations, corporate governance, patents, profit growth, investor relations, environmental protection, corporate sustainability and other fields. These included: the Taiwan Institute for Sustainable Energy 2019 Taiwan Corporate Sustainability Awards' Most Prestigious Sustainability Award, Platinum Medal For Sustainability Report, Sustainable Water Management Award, Climate Leader Award, and Circular Economy Leadership Award; First Place in *CommonWealth Magazine*'s Excellence in Corporate Social Responsibility Award for Large-Cap companies; ranked top 5% in the Taiwan Stock Exchange corporate governance evaluation; member of the *Fortune Magazine*'s 2019 World's Most Admired Companies and the 2019 Global 500; the R.O.C. Ministry of Economic Affairs Industrial Development Bureau's Green Factory Label and Energy Conservation Benchmark Award ; the R.O.C. Environmental Protection Administration's Enterprise Green Procurement Award; First Place in the Greenpeace ranking of ten leading Taiwanese electronics companies; and membership of the *Corporate Knights* 100 Most Sustainable Corporations for 2019. In addition, TSMC was selected as a part of the Dow Jones Sustainability Indices for the 19<sup>th</sup> consecutive year, further strengthening the Company's corporate culture and reputation.

TSMC adheres to its vision of uplifting society, and applies technology and innovation to help humanity overcome many challenges. As TSMC strives to excel in corporate social responsibility, the Company also encourages employees to make innovative breakthroughs in how they think about things

and do things, as well as nurture their empathy and broaden their horizons. In 2019, TSMC established the Corporate Social Responsibility Executive Committee, led by Chairman Dr. Mark Liu with senior vice president Lora Ho serving as the executive secretary, to work with senior management in a variety of functions to set the Company's future CSR strategy. The CSR Executive Committee acts in tandem with the existing CSR Committee to consolidate the Company's resources, drive and implement actions and cultivate CSR culture. TSMC pursues corporate sustainability and contribution to society and seeks to build further on its positive corporate reputation.

With its global reputation in mind, TSMC employs numerous preventative measures to address potential risks from earthquakes, fires, IT service disruption, yield loss, information security, supply chain disruption, environmental events, and utility supply disruption. TSMC sets crisis response and recovery measures according to possible crisis events and maintains a "TSMC crisis command center control instruction" as well as a "TSMC emergency response procedure" to establish its emergency response command structure.

TSMC holds regular monthly meetings of the Environment, Safety and Health Committee, which coordinates relevant departments in each fab to conduct regular emergency response drills and continuously improve their notification and operational procedures to ensure clear channels of communication to stakeholders in crisis management, with the public relations department serving as the designated gateway for external communications.

In the event of an emergency, all departments immediately deploy emergency response measures to eliminate or minimize impact on personnel safety, the surrounding environment, company property and manufacturing operations. Responders also alert the public relations department at the earliest stages of response to ensure timely, clear and consistent communication regarding the situation.

#### Risks Associated with Change in Management

During 2019 and as of the date of this Annual Report, there were no such risks for TSMC.

### 6.3.4 Financial Risks

#### Economic Risks

##### • Interest Rate Fluctuation

TSMC is exposed to interest rate risks primarily related to its investment portfolio and outstanding debt. Changes in interest rates affect the interest earned on the Company's cash and cash equivalents, and fixed income securities, the fair value of those securities, as well as interest paid on its debt.

The objective of TSMC's investment policy is to achieve a return that will allow the Company to preserve principal and support liquidity requirements. The policy generally requires securities to be investment grade and limits the amount of credit exposure to any one issuer. TSMC's cash and cash equivalents as well as fixed income investments in both fixed- and floating-rate securities carry a degree of interest rate risk. The majority of TSMC's fixed income investments are fixed-rate securities and classified as financial assets at fair value through other comprehensive income, and may have their fair value adversely affected due to a rise in interest rates, while cash and cash equivalents as well as floating-rate securities may generate less interest income than predicted if interest rates fall.

TSMC has entered, and may enter in the future, into interest rate futures to partially hedge the interest rate risk on its fixed income investments. However, these hedges can offset only a small portion of the financial impact from movement in interest rates.

As it relates to TSMC's outstanding debt, all of the Company's short-term debt are floating-rate, hence a rise in interest rates may incur higher interest expense than predicted; all of its long-term debt are fixed-rate and measured at amortized cost. As such, changes in interest rates would not affect the future cash flows and the fair value.

Certain of TSMC's fixed income investments and short-term debt are primarily based on the London Interbank Offered Rate ("LIBOR"), which is expected to be replaced by other benchmark rate after 2021. TSMC cannot predict the consequences and timing of these developments, and if such transition may cause a reduction in its interest income and/or an increase in its interest expense.

#### • Foreign Exchange Volatility

The majority of TSMC's sales are denominated in U.S. dollar and over one-half of its capital expenditures are denominated in currencies other than NT dollar, primarily in U.S. dollar, Japanese yen, and Euro. As a result, any significant fluctuations to its disadvantage in exchange rate of NT dollar against such currencies, in particular a weakening of U.S. dollar against NT dollar, would have an adverse impact on the Company's revenue and operating profit as expressed in NT dollar. For example, every one percent depreciation of the U.S. dollar against the NT dollar would result in approximately 0.4 percentage point decrease in TSMC's operating margin based on TSMC's 2019 results.

Conversely, if the U.S. dollar appreciates significantly versus other major currencies, the demand for the products and services of TSMC's customers and for TSMC's goods and services will likely decrease, which will negatively affect the Company's revenue.

TSMC uses foreign currency derivatives contracts, such as currency forwards or currency swaps, to protect against currency exchange rate risks associated with non-NT dollar-denominated assets and liabilities and certain forecasted transactions. The Company also utilizes U.S. dollar-denominated debt to partially offset currency risk arising from U.S. dollar-denominated receivables for balance sheet hedges. These hedges reduce, but do not entirely eliminate, the effect of foreign currency exchange rate movements on its assets and liabilities.

Fluctuations in the exchange rate between the U.S. dollar and the NT dollar may affect the U.S. dollar value of the Company's common shares and the market price of the Company's American Depository Shares (ADSs) and of any cash dividends paid in NT dollar on TSMC's common shares represented by ADSs.

#### • Inflation

In 2019 and as of the date of this annual report, inflation did not have a material impact on TSMC's operations, or the business operations of its customers and suppliers.

#### • Amendments to Tax Regulations or Implementation of New Tax Laws

Any amendments to existing tax regulations or the implementation of any new tax laws in the jurisdictions in which TSMC operates its business may have an adverse effect on its net income.

While the Company is subject to tax laws and regulations in various jurisdictions in which it operates or conducts business, TSMC's principal operations are in the R.O.C. and it is exposed primarily to taxes levied by the R.O.C. government. Any unfavorable changes of tax laws and regulations in this jurisdiction could increase TSMC's effective tax rate and have an adverse effect on its operating results.

In order to control tax risk, the Company closely monitors all domestic and foreign governmental policies and regulations that might impact its financial operations. TSMC has established risk management procedures to collect information, analyze potential tax implications, and develop countermeasures.

#### Risks Associated with External Financing

In times of market instability, sufficient external financing may not be available to the Company on a timely basis, on commercially reasonable terms to the Company, or at all. If sufficient external financing is not available, when TSMC needs such financing to meet its capital requirements, it may be forced to curtail its expansion, modify plans or delay the deployment of new or expanded services until it obtains such financing.

#### Risks Associated with High-Risk/Highly Leveraged Investments; Lending, Endorsements, and Guarantees for Other Parties; and Financial Derivative Transactions

In 2019 and as of the date of this annual report, TSMC did not make high-risk or highly leveraged financial investments.

Since 2014, TSMC has provided a guarantee no more than US\$83.21 million to TSMC North America, a wholly-owned subsidiary of TSMC, for its obligation to an office leasing contract. Since 2020, TSMC Japan Limited has provided a guarantee no more than JPY1,320 million to TSMC Design Technology Japan, Inc., a wholly-owned subsidiary of TSMC, for its obligation to an office leasing contract.

As of February 29, 2020, there were RMB 4.8 billion and US\$86 million in intercompany loans between the Company's subsidiaries, and US\$1 billion in intercompany loans between the Company and its subsidiary, which were all in compliance with relevant rules and regulations.

All financial transactions of a derivative nature that TSMC entered into in 2019 were strictly for hedging and not for any trading or speculative purposes. For more transaction information and risk assessment, please refer to Note 7, Note 10, and Note 32 of the annual report section (II), Financial Statements.

To control various types of financial transactions, the Company has established internal policies and procedures based on sound financial and business practices, all in compliance with the relevant rules and regulations issued by the Taiwan Securities and Futures Bureau. TSMC policies and procedures include "Procedures for Financial Derivatives Transactions," "Procedures for Lending Funds to Other Parties," "Procedures for Acquisition or Disposal of Assets," and "Procedures for Endorsement and Guarantee."

#### Risks Associated with Impairment Charges

Under Taiwan-IFRSs, TSMC is required to evaluate its tangible assets, right-of-use assets and intangible assets for impairment whenever triggering events or changes in circumstances indicate that the asset may be impaired. If certain criteria are met, TSMC is required to record an impairment charge. TSMC is unable to estimate the extent or timing of any impairment charge for future years. Any impairment charge required may have a material adverse effect on the Company's net income.

The determination of an impairment charge at any given time is based significantly on the projected results of operations over several years subsequent to that time. Consequently, an impairment charge is more likely to occur during a period when the Company's operating results are otherwise already depressed. See "Note 5." CRITICAL ACCOUNTING JUDGMENTS AND KEY SOURCES OF ESTIMATION AND UNCERTAINTY" in Annual Report section (II), Financial Statements for a discussion of how TSMC assesses if an impairment charge is required and, if so, how the amount is determined.

#### 6.3.5 Hazardous Risks and Utility Supply Interruption or Shortage Risks

The frequency and severity of disruptive events, including damaging earthquakes, natural disasters and severe weather has been increasing in part due to climate change or systemic regional geological changes. TSMC has manufacturing and other operations in locations subject to natural disasters, such as flooding, earthquakes, tsunamis, typhoons and droughts that may cause interruptions or shortages in the supply of utilities, such as water and electricity, which in turn could disrupt operations. In addition, TSMC's suppliers and customers also have operations in such locations. For example, most of TSMC's production facilities, as well as those of many of its suppliers and customers and upstream providers of complementary semiconductor manufacturing services, are located in Taiwan and Japan, areas susceptible to earthquakes, tsunamis, flooding,

typhoons, and droughts from time to time that may cause shortages in electricity or water or interruptions to the Company's operations.

Thus, if one or more natural disasters that result in a prolonged disruption to TSMC's operations or those of its customers or suppliers, or if any of its fabs or vendor facilities were to be damaged or cease operations as a result of an explosion or fire, it could reduce the Company's manufacturing capacity and cause the loss of important customers and thereby have an adverse and material impact on its operational and financial performance.

TSMC has occasionally suffered power outages in Taiwan caused by difficulties encountered by its electricity supplier, the Taiwan Power Company, or other power consumers on the same power grid. Some of these have resulted in interruptions to TSMC operations. Such shortages or interruptions in electricity supply could further be exacerbated by changes in the energy policy of the government, which intends to make Taiwan a nuclear-free country by 2025. If the Company is unable to secure reliable and uninterrupted supply of electricity to power its manufacturing fabs within Taiwan, its ability to fill customers' orders would be severely jeopardized.

The recent COVID-19 pandemic may materially adversely affect TSMC business and results of operations in several ways, including but not limited to: (1) interruption of the operations of global semiconductor supply chains and those of TSMC's suppliers, including those in Asia, Europe and North America; (2) downward pressure on TSMC global customer demand; and (3) potential production delays for TSMC products due to forced factory or office closures or partial operation. The Company has instituted various measures, including disinfection routines, self-quarantine, mandatory hygienic practices and segregated work teams. However, given the uncertainty surrounding the COVID-19 pandemic, the Company cannot predict that such measures will limit the spread of the virus in the Company's workplace or whether its operations would be materially disrupted by the pandemic. As of the date of this annual report, TSMC's current business and results of operations have not been materially affected by the pandemic. However, depending on unfolding developments of the pandemic, the Company could face various risks, including those identified here and others. As the pandemic is still ongoing and may worsen, there is significant uncertainty surrounding its developments and impacts, including whether the current epidemic or continued spread of COVID-19 will cause an economic slowdown or a global recession, and TSMC cannot predict at this time the impact it will have on its business or results of operations.

The recent COVID-19 pandemic has caused TSMC to modify its business practices, including but not limited to health management of employees, customers and suppliers, management of production inventory, and supply chain risk management. TSMC has formed an "Epidemic Prevention Committee" to identify, implement and monitor such actions as required by the dynamic exigencies arising from the pandemic. There is no certainty that such measures and others will be sufficient to mitigate the risks posed by COVID-19, and TSMC's ability to perform critical functions could be materially adversely affected.

TSMC maintains a comprehensive risk management system dedicated to the safety of people, the conservation of natural resources and the protection of property. In order to cope effectively with emergencies and natural disasters, management at each facility has developed comprehensive plans and procedures that focus on risk prevention, emergency response, crisis management and business continuity. All TSMC manufacturing fabs have been ISO 14001 certified (environmental management system) and ISO 45001 or OHSAS 18001 certified (occupational health and safety management system). All manufacturing fabs in Taiwan have also been TOSHMS (Taiwan Occupational Safety and Health Management System) certified. New fabs will also attain the above certifications within 18 months after acquiring factory registration certification.

TSMC has further strengthened its business continuity plans, which include periodic risk assessment, risk mitigation, and implementation through the establishment of emergency taskforces when necessary, combined with the preparation of a thorough analysis of an emergency, its impact, alternative actions, and solutions for each possible scenario together with appropriate precautionary and/or recovery measures. Each taskforce is given the responsibility of ensuring TSMC's ability to minimize personal injury, business disruption and financial impact under the circumstances. TSMC periodically reviews its business continuity plans and revise it according to exercise results and implementation.

In response to the impact of the earthquake that occurred in Taiwan, TSMC continued to improve its earthquake emergency response, tool anchorage and seismic isolation facilities, and readiness for tool salvage and production recovery. These improvements have also been integrated into new fab design. TSMC business continuity procedures were further enhanced through the compliance with ISO 22301.

TSMC and many of its suppliers use combustible and toxic materials in their manufacturing processes and are therefore subject to risks that cannot be completely eliminated arising from explosion, fire, or environmental influences. Although the Company maintains many overlapping risk prevention and protection systems, as well as fire and casualty insurance, TSMC's risk management and insurance coverage may not always be sufficient to cover all of the Company's potential losses. If any of TSMC's fabs or vendor facilities were to be damaged or cease operations as a result of an explosion, fire or environmental causes, it could reduce the Company's manufacturing capacity leading to the loss of important sales and customers and as a negative impact on TSMC's financial performance. In addition to periodic fire-protection inspections and firefighting drills, the Company has also carried out a corporate-wide fire risk mitigation project focused on managerial and hardware improvements.

### **6.3.6 Risks Regarding Non-Compliance with Export Control, Environmental and Climate Related Laws, Regulations and Accords, and Failure to Timely Obtain Requisite Approvals Necessary for Conducting Business**

Because TSMC engages in manufacturing activities in multiple jurisdictions and conducts business with customers located worldwide, such activities are subject to a myriad of governmental regulations. For example, the manufacturing, assembling and testing of TSMC's products require the use of metals, chemicals and materials that are subject to environmental, climate-related, health and safety, and humanitarian conflict-free sourcing laws, regulations and guidelines issued worldwide.

The Company's failure to comply with any such laws or regulations, as amended from time to time, and its failure to comply with any information and document sharing requests from the relevant authorities in a timely manner could result in:

- significant penalties and legal liabilities, such as the denial of import or export permits or third party private lawsuits, criminal or administrative proceedings;
- the temporary or permanent suspension of production of the affected products;
- unfavorable alterations in TSMC manufacturing, fabrication and assembly and test processes;
- challenges from customers that place TSMC at a significant competitive disadvantage, such as loss of actual or potential sales contracts in case the Company is unable to satisfy the applicable legal standard or customer requirement;

- restrictions on TSMC operations or sales;
- loss of tax benefits, including termination of current tax incentives, disqualification of tax credit application and repayment of the tax benefits that the Company is not entitled to; and
- damages to TSMC's goodwill and reputation.

Complying with applicable laws and regulations, such as environmental and climate related laws and regulations, could also require TSMC, among other things, to do the following: (1) purchase, use or install remedial equipment; (2) implement remedial programs such as climate change mitigation programs; (3) modify product designs and manufacturing processes, or incur other significant expenses such as obtaining substitute raw materials or chemicals that may cost more or be less available for the Company's operations.

TSMC's inability to timely obtain approvals necessary for the conduct of its business could impair its operational and financial results. For example, if the Company is unable to timely obtain environmental related approvals needed to undertake the development and construction of a new fab or expansion project, then such inability may delay, limit, or increase the cost of its expansion plans that could also in turn adversely affect its business and operational results. In light of increased public interest in environmental issues, TSMC's operations and expansion plans may be adversely affected or delayed responding to public concern and social environmental pressures even if the Company complies with all applicable laws and regulations.

TSMC believes that climate change should be regarded as a significant corporate risk that must be controlled to improve competitiveness. For TSMC's climate change related risks and control measures, see the Climate Change and Energy Management section under 7.2.1 Environmental Protection on page 119 of this annual report.

### **6.3.7 Other Risks**

#### **Potential Impact and Risks Associated with Sales of Significant Numbers of Shares by TSMC's Directors, and/or Major Shareholders Who Own 10% or More of TSMC's Total Outstanding Shares**

The value of TSMC shareholders' investment may be reduced by possible future sales of TSMC shares owned by major shareholders.

One or more of TSMC's existing shareholders may, from time to time, dispose of significant numbers of TSMC common shares or ADSs. For example, the National Development Fund, Executive Yuan, R.O.C., which owned 6.38% of TSMC's outstanding shares as of February 29, 2020, had from time to time in the past sold TSMC shares in the form of ADSs in several transactions.

As of the date of this annual report, no single shareholder owns 10% or more of TSMC's total outstanding shares.

#### **Risks of Trade Policies**

As TSMC's revenue is primarily derived from sales to major economies in the world (please refer to "2.2.4 TSMC Position, Differentiation and Strategy" on page 14 of this annual report), any changes in the trade policies (such as the increase of tariffs on certain products, the implementation of import and export controls, and the adoption of other trade barriers) of such major economies can affect the sales of TSMC or its customers and thereby affect TSMC's operating results. TSMC continues to monitor the recent shifts in trade policies and measures among the relevant major economies and will take corresponding responsive actions in accordance with subsequent developments.

#### **Other Material Risks**

In 2019 and as of the date of this annual report, TSMC's management was not aware of any other risk that could impart a potentially material impact on the financial status of the Company.



# Corporate Social Responsibility

## 7.1 Overview

As the world's largest dedicated semiconductor foundry, TSMC has not only strived for the highest achievements in its core business of dedicated IC foundry services but has also actively sought to fulfill its corporate social responsibility (CSR). In this regard, TSMC focuses on three primary missions: integrity, strengthening environmental protection and caring for the disadvantaged. And in so doing the Company collaborates with all stakeholders – employees, shareholders, customers, suppliers, and community – to drive continuous positive change for society.

### Guidance for the Implementation of CSR

Following its vision of uplifting society, TSMC Corporate Social Responsibility Policy is the Company's overall guide for sustainable development. The CSR matrix clearly defines the scope of the Company's responsibilities. The horizontal axis shows the seven areas where TSMC aims to set a benchmark for sustainability: morality, business ethics, economy, rule of law, sustainability, work/life balance and happiness, and philanthropy. On the vertical axis are actions that TSMC has taken to implement its responsibilities.

### TSMC CSR Matrix

TSMC	Society	Morality	Business Ethics	Economy	Rule of Law	Sustainability	Work/Life Balance Happiness	Philanthropy
Integrity		V	V					
Law Compliance					V			
Anti-Corruption Anti-Bribery Anti-Cronyism		V	V		V			
Environmental Protection Climate Control Energy Conservation					V	V		
Corporate Governance			V	V	V			
Provide Well-Paying Jobs				V			V	
Good Shareholder Return				V				
Employees' Work-Life Balance							V	
Encourage Innovation		V	V					
Good Work Environment							V	
TSMC Charity Foundation						V	V	V
TSMC Education and Culture Foundation					V	V	V	V

### CSR Management

In compliance with the vision and missions of TSMC Corporate Social Responsibility Policy, in 2019 TSMC further established the Corporate Social Responsibility Executive Committee as the highest-level CSR decision-making center within the Company to align more closely with international sustainability trends. TSMC's Chairman chairs the CSR Executive Committee, and the Chairperson of the CSR Committee serves as Executive Secretary. Together with senior executives from a wide variety of functions, they survey the Company's core operating capabilities, set the medium- to long-term strategic direction for CSR, and draft the blueprint to link the Company's core competencies with the UN sustainable development goals (SDGs). The existing CSR Committee serves as a cross-departmental communication platform. Through quarterly meetings and issue-based discussions by cross-organizational teams, the committee members jointly set the Company's CSR strategies and key issues for the year, draft CSR-related budgets for their organizations and coordinate resource deployment, as well as plan and carry out annual projects. The Committee achieves sustainability objectives of interest to all stakeholders and ensures CSR strategies are implemented effectively in the Company's daily operations.

The Chairperson of the CSR Committee reports annually to the Board of Directors on implementation results of the prior year and the work planned for the upcoming year. In 2019, TSMC focused on strengthening green manufacturing performance to develop various resource renewal technologies, apply circular economy, and undertake renewable energy adoption. To build a sustainable supply chain, the Company performed supplier risk assessments and implemented a signed supplier code of conduct. To have a positive social impact, the TSMC Education and Culture Foundation and the TSMC Charity Foundation also actively support and promote youth development, culture and art, and care for the disadvantaged.

The Company's CSR plans for 2020 focus on further promotion of green manufacturing by driving circular economics and renewable energy adoption and by building a responsible green supply chain through strengthening human rights, environmental protection and sustainable development among upstream and downstream suppliers. TSMC spares no effort to perform its corporate social responsibility and aspires to be an uplifting force for the society.

#### **Stakeholder Engagement**

TSMC respects shareholder rights. In order to understand the level of stakeholder interest in sustainability issues, TSMC uses multiple systematic channels to communicate with stakeholders, including the "Contact Us" section of the corporate website, the CSR website and the CSR mailbox, as well as the Irregular Business Conduct Reporting System. TSMC has conducted three studies focused on identification, prioritization and validation with regard to these issues.

In 2019, the TSMC Corporate Social Responsibility mailbox received 371 valid emails on subjects ranging from corporate governance, innovation and services, to supply chain, green manufacturing, workplace, and social issues. Submissions were primarily regarding requests for visits, inquiries on operations, opinion and feedback from the public, and proposals for donations and collaborations. TSMC responded through direct action from related departments and timely replies from the public relations department, supporting communication with the public as well as positive development in society.

#### **Stakeholders and Communication Channels in 2019**

Stakeholders	Communication Channels
Employees	<ul style="list-style-type: none"> <li>• Communications and working meetings throughout all levels and all units of the Company</li> <li>• Corporate intranet, internal emails and other announcement channels (such as promotion posters at facilities)</li> <li>• Human resources representatives</li> <li>• Employee training and classroom courses</li> <li>• Regular and ad-hoc communication meetings, such as Manager Development Consulting Committee, Operations Engineer Training Committee, Manufacturing Department Technical Committee, etc.</li> <li>• Employee voice channels, such as Immediate Response System, Employee Opinion Box, Wellness Center, wellness website, each function's PIP committee, Employee PIP Opinion Dedicated Line, etc.</li> <li>• Ombudsman System</li> <li>• Audit Committee Whistleblower System</li> <li>• EWC event questionnaire survey</li> <li>• The biennial "Employee Opinion Survey on Company Core Values"</li> </ul>
Shareholders/Investors	<ul style="list-style-type: none"> <li>• Annual general meeting of shareholders</li> <li>• Quarterly earnings conference call</li> <li>• Investor conferences and face-to-face meetings</li> <li>• Telephone calls and emails</li> <li>• Annual reports, CSR reports, 20-F filings to US SEC, material announcements to Taiwan Stock Exchange, and corporate press releases on the Company's website</li> </ul>
Customers	<ul style="list-style-type: none"> <li>• Customer satisfaction survey</li> <li>• Customer meetings</li> <li>• Customer audits</li> <li>• Business and technology assessment</li> <li>• Email responses to the issues that customers are concerned</li> </ul>
Suppliers	<ul style="list-style-type: none"> <li>• Supplier meetings</li> <li>• Supplier onsite audits</li> <li>• Supply Chain Management Forum</li> <li>• Supply Chain ESH Forum</li> <li>• Supplier Ethics and Code of Conduct Promotion</li> <li>• On-site consult and audit</li> <li>• Advanced Process Material Workshop</li> <li>• Supplier self-assessment questionnaire and Supplier Survey on Ethics</li> </ul>

(Continued)

Stakeholders	Communication Channels
Government	<ul style="list-style-type: none"> <li>• Official correspondence and visits</li> <li>• Industry experience and advice sharing</li> <li>• Meetings (such as communication meetings, public hearings, forums, seminars or social gatherings)</li> <li>• Communication with government authorities through industry organizations, including the Association of Science Park Industries, Taiwan Semiconductor Industry Association, World Semiconductor Council, and Chinese National Federation of Industries</li> </ul>
Society	<ul style="list-style-type: none"> <li>• Arts events in the communities</li> <li>• Sponsorship of youth development events</li> <li>• Sponsorship of charity projects and emergency aid</li> <li>• Sponsorship of non-profit organizations to support educational projects</li> <li>• Professorship endowments and student scholarships at universities</li> <li>• Project collaboration and visits</li> <li>• Support of non-profit organizations and institutions via monetary and in-kind donation, as well as providing necessary manpower for a good cause</li> <li>• Regular visits to National Museum of Science, Hsinchu Veterans Home, St. Teresa Children Center, Jacana Ecology Education Park, remote schools and TSMC ecological parks to provide volunteer services</li> <li>• Annual volunteer activities in collaboration with TSMC fabs and divisions</li> <li>• TSMC corporate social responsibility website, newsletters and mailbox</li> <li>• "Sending Love" charity platform</li> </ul>

#### **Responsibilities of TSMC CSR Committee Members**

Committee Members	Responsibilities	Stakeholders
Legal	Corporate Governance, Code of Conduct, Legal Compliance (including fair competition, privacy and personal information, and protection for whistle-blowers), Intellectual Property, Protection of Confidential Information	Employees Government Society (Note)
Customer Service	Customer service and satisfaction, customer trust, customer confidentiality, RBA and its code of conduct	Customers
Materials Management	Materials and supply chain risk management, supplier management, conflict minerals, RBA and its code of conduct	Suppliers
Quality and Reliability	Product quality and reliability, product recall mechanism	Customers Suppliers
Research and Development	Innovation management, green products	Employees Customers Suppliers
Risk Management	Risk management, crisis management, emergency response and action plan	Employees Investors Customers Suppliers Government Society
Finance	Financial disclosure, dividend policy, tax strategy	Employees Investors Customers Suppliers Government
Investor Relations	Resolving issues of stakeholder concern, establishing trusting long-term relationships, effective two-way communication, annual report production	Investors
Operations	Operational eco-efficiency, pollution prevention, water resource risk management, green manufacturing	Customers Investors Suppliers
Environment, Safety and Health	Environmental policy and management system, climate change mitigation and adaption, pollution prevention, energy consumption efficiency, carbon emissions and carbon rights management, product environmental responsibility, response mechanism for environmental issues, environmental spending, green supply chain, policy and management systems for occupational health and safety, workplace health and safety, occupational disease prevention and health promotion, communication of ESH regulations	Employees Investors Customers Suppliers Government Society
Human Resources	Talent attraction and retention, proprietary information protection, employees' physical and mental well-being and work-life balance, labor-management relations and employee engagement, labor rights, training and development, mobility, RBA and its code of conduct	Employees
TSMC Education and Culture Foundation, TSMC Charity Foundation	Philanthropy, community relations	Society
Public Relations	Stakeholder engagement, mechanism for reflecting issues of social concern, media relations	Society

Note: Society includes community, non-governmental organizations, non-profit organizations and the public.

TSMC believes that technological progress and corporate growth are only meaningful in a sustainable society and environment. As the only semiconductor company chosen for the Dow Jones Sustainability World Indices over the past 19 consecutive years, TSMC is clearly committed to "responsible operations," and actively creates sustainable values in the economy, the environment and society for its stakeholders.

As the world's largest dedicated IC foundry, TSMC is aware that customer trust is enhanced if the Company follows the law and values corporate governance. Investors will be more willing to invest in the Company over the long-term if the Company maintains solid financial performance and a sustainable dividend policy. Through a reciprocal commitment between the Company and its employees, TSMC carries out its core values -Integrity, Commitment, Innovation, and Customer Trust, and exerts its influence as an industry leader in encouraging suppliers to devote more resources to better operations, greener factories and a more responsible supply chain. TSMC combines the strengths that drive society forward and hopes to build a future of common good together with the engagement of all stakeholders.

## 2019 CSR Awards, Recognitions and Ratings

Category	Organization	Awards and Recognitions
Overall CSR	Dow Jones Sustainability Indices (DJSI)	<ul style="list-style-type: none"> <li>Dow Jones Sustainability World Index for the 19<sup>th</sup> consecutive year</li> <li>Dow Jones Sustainability Emerging Markets Index</li> </ul>
	MSCI ESG Indexes	<ul style="list-style-type: none"> <li>MSCI ACWI ESG Leaders Index component</li> <li>MSCI ESG Research – AA Ratings</li> <li>MSCI ACWI SRI Index component</li> </ul>
	ISS ESG	<ul style="list-style-type: none"> <li>"Prime" rated by ISS ESG Corporate Rating</li> </ul>
	Corporate Knights	<ul style="list-style-type: none"> <li>Global 100 Most Sustainable Corporations</li> </ul>
	CommonWealth Magazine	<ul style="list-style-type: none"> <li>Corporate Social Responsibility Award – Large cap – 1<sup>st</sup> Place</li> </ul>
	Taiwan Institute of Sustainable Energy	<ul style="list-style-type: none"> <li>The Most Prestigious Sustainability Awards – Top Ten Domestic Corporates</li> <li>Taiwan Top 50 Corporate Responsibility Report Awards – IT &amp; IC Manufacturing – Platinum Award</li> <li>Industry Sustainable Water Management Awards</li> <li>Climate Leadership Awards</li> <li>Circular Economy Leadership Award</li> </ul>
Economy, Governance	Institutional Investor Magazine	<ul style="list-style-type: none"> <li>Most Honored Company (Technology/Semiconductors) – All-Asia</li> <li>Best ESG/SRI Metrics (Technology/Semiconductor) – 1<sup>st</sup> Place (buy-side and sell-side) – All-Asia</li> <li>Best Corporate Governance (Technology/Semiconductor) – 1<sup>st</sup> Place (buy-side and sell-side) – All-Asia</li> <li>Best CEO (Technology/Semiconductor) – 1<sup>st</sup> Place (buy-side and sell-side) – All-Asia</li> <li>Best CEO (Technology/Semiconductor) – 1<sup>st</sup> Place (buy-side) – All-Asia</li> <li>Best CFO (Technology/Semiconductor) – 1<sup>st</sup> Place (buy-side and sell-side) – All-Asia</li> <li>Best CFO (Technology/Semiconductor) – 1<sup>st</sup> Place (buy-side) – All-Asia</li> <li>Best Investor Relations Program (Technology/Semiconductor) – 1<sup>st</sup> Place (buy-side and sell-side) – All-Asia</li> <li>Best Investor Relations Program (Technology/Semiconductor) – 1<sup>st</sup> Place (buy-side) – All-Asia</li> <li>Best Investor Relations Professional (Technology/Semiconductor) – 1<sup>st</sup> Place (buy-side and sell-side) – All-Asia</li> </ul>
	IFI Claims	<ul style="list-style-type: none"> <li>2019 Top 50 US Patent Assignees</li> </ul>
	Forbes	<ul style="list-style-type: none"> <li>Top Regarded Companies</li> <li>Asia's Best over a Billion</li> <li>Top 100 Digital Companies</li> <li>Global 2000</li> </ul>
	FORTUNE	<ul style="list-style-type: none"> <li>Fortune Global 500</li> </ul>
	Nikkei Asian Review	<ul style="list-style-type: none"> <li>Asia 300 Power Performers</li> </ul>
	Germany Federal Office for Information Security	<ul style="list-style-type: none"> <li>Common Criteria, ISO/IEC 15408- EAL6 Site Certification – Fab 14B</li> </ul>
	Business Today	<ul style="list-style-type: none"> <li>Top 1,000 Enterprises in Taiwan, Hong Kong and Mainland China</li> </ul>
	Taiwan Stock Exchange	<ul style="list-style-type: none"> <li>Top 5% in Corporate Governance Evaluation of Listed Companies for the 5<sup>th</sup> consecutive year</li> </ul>
	R.O.C. Ministry of Economic Affairs Intellectual Property Office	<ul style="list-style-type: none"> <li>Ranked No. 1 in Top 100 Patent Applicants in Taiwan for the 4<sup>th</sup> consecutive year</li> </ul>
	PricewaterhouseCoopers	<ul style="list-style-type: none"> <li>Global Top 100 Companies by market capitalization for the 7<sup>th</sup> consecutive year</li> </ul>
	Ministry of Finance	<ul style="list-style-type: none"> <li>Outstanding Business Entity Award</li> </ul>
	Corporate Synergy Development Center	<ul style="list-style-type: none"> <li>Taiwan Continuous Improvement Award – Gold Tower Award – Advanced Packaging Technology and Service, Intelligent Manufacturing Center, Fab 14A, Fab 10, Fab 8</li> <li>Taiwan Continuous Improvement Award – Silver Tower Award – Fab 12A</li> <li>Taiwan Continuous Improvement Award – Best Improvement Innovation Award – Fab 14A, Fab 10</li> </ul>

(Continued)

Category	Organization	Awards and Recognitions
Environment, Safety and Health	U.S. Green Building Council Leadership in Energy and Environmental Design (LEED) certification	<ul style="list-style-type: none"> <li>"Gold" class certification – Fab 16 P1 Manufacturing Facility</li> </ul>
	R.O.C. Ministry of the Interior "Ecology, Energy Saving, Waste Reduction and Health (EEWH)" certification	<ul style="list-style-type: none"> <li>"Diamond" class of green building certification – Fab 15 P6 Manufacturing Facility</li> </ul>
	R.O.C. Ministry of Economic Affairs	<ul style="list-style-type: none"> <li>Excellence in Carbon Reduction Award – Fab 5, Fab 15A</li> </ul>
	R.O.C. Sports Administration, Ministry of Education	<ul style="list-style-type: none"> <li>Taiwan iSports – Certificate of Corporate Wellness</li> </ul>
Society	FORTUNE	<ul style="list-style-type: none"> <li>2019 World's Most Admired Companies</li> </ul>
	Cheers	<ul style="list-style-type: none"> <li>Top 10 Most Admired Companies to Young Generations</li> </ul>
	Forbes	<ul style="list-style-type: none"> <li>World's Best Employers</li> </ul>
	R.O.C. Ministry of Culture	<ul style="list-style-type: none"> <li>The 14<sup>th</sup> Arts and Business Awards – Gold Award</li> </ul>

## 7.2 Environmental, Safety and Health (ESH) Management

TSMC believes its environmental, safety and health practices must not only meet legal requirements, but should also align to internationally recognized practices. TSMC's ESH policies aim to achieve "zero incident" and "environmental sustainability", and to make TSMC a world-class company in environmental, safety and health management. The Company's strategies for attaining these goals are to comply with regulations, promote safety and health, strengthen recycling and pollution prevention, manage ESH risks, instill an ESH culture, establish a green supply chain, and fulfill its related corporate social responsibilities.

All TSMC manufacturing facilities have received ISO 14001: 2015 certification for environmental management systems and OHSAS 18001: 2007 certification for occupational safety and health management systems. All fabs in Taiwan have been TOSMS (Taiwan Occupational Safety and Health Management System) certified since 2009. The International Organization for Standardization (ISO) released the final version of ISO 45001:2018 to replace OHSAS 18001 in March 2018. All TSMC fabs in Taiwan received ISO 45001: 2018 certification in August 2019. All TSMC subsidiaries plan to obtain certification in 2020.

TSMC strives for continuous improvement and actively seeks to enhance climate-change management, pollution prevention and control, power and resource conservation, waste reduction and recycling, safety and health management, fire and explosion prevention as well as to minimize the impact of earthquake damage, so as to reduce overall environmental, safety and health risks.

In order to meet regulatory and customer requirements for the management of hazardous materials, TSMC has adopted the IECQ QC 080000 Hazardous Substance Process Management (HSPM) System. All TSMC manufacturing facilities have been QC 080000 certified since 2007. By practicing QC 080000, TSMC ensures that its products comply with International regulatory and customer requirements, including the European Union's "Restriction of Hazardous Substances (RoHS) Directive," the EU's "Registration, Evaluation, Authorization and Restriction of Chemicals (REACH)," the "Montreal Protocol on Substances that Deplete the Ozone Layer" (the "halogen-free in electronic products" initiative), Perfluorooctane Sulfonates (PFOS), Perfluorooctanoic Acid (PFOA) and its related substances restriction standards. In addition, TSMC has started a project for reducing usage of hazardous substance N-methylpyrrolidinone (NMP) since 2016. In 2019, the project reduced NMP usage by 38%, and we will keep promoting further reduction.

Since 2011, TSMC has adopted the ISO 50001 Energy Management System for the continuous improvement in energy conservation. In 2019, all TSMC fabs in Taiwan received ISO 50001 Energy Management System certification, and we expect TSMC overseas subsidiaries to receive the certification by 2020.

Aiming to establish the healthiest workplace, in 2017 TSMC formed a corporate-level health promotion committee led by managers with vice president level. The committee members include site directors, managers of safety and health department, and representatives from wellness, HR and legal affairs divisions. We also have invited external experts to discuss the potential risks of occupational diseases in the semiconductor manufacturing process, and have developed prevention plans for such diseases. To mitigate health risks to employees, suppliers and contractors in the workplace, TSMC has adopted rigorous safety and health control measures to prevent occupational injuries and diseases and promote employee safety, physical and mental health.

To mitigate the supply chain risk and fulfill corporate social responsibility, TSMC not only follows ESH best practices internally but also strives to improve ESH performance of the Company's suppliers and contractors through audits and counselling.

TSMC uses priority work management and self-management to govern works performed by contractors. The Company requires contractors performing level-one high-risk operations to complete certification for technicians and to establish their own ISO 45001 or OHSAS 18001 safety and health management system. The promotion of self-management aims at improving sense of responsibility of TSMC's contractors, with the goal of promoting safety awareness and technical improvement for all contractors in the industry. For onsite contractor personnel, TSMC standardizes the training courses for safety and health, while increasing the frequency of such courses, to improve training effectiveness and safety awareness. To ensure our safety protocols are accurately delivered to our contractors on a timely manner, TSMC has established a digital platform for mutual communications, so that on-site operational risks can be mitigated.

TSMC collaborates with suppliers to improve the sustainability of the Company's supply chain regarding ESH-related issues, such as environmental protection, compliance of safety and hygiene codes, hazardous substance management, fire protection, and mitigation of natural disaster. The Company not only performs ESH audits at its suppliers' manufacturing sites, but also proactively assists them to improve ESH performance.

In addition, TSMC also monitors potential climate-change related risks in the supply chain. The Company requests that suppliers conduct carbon emissions inventory and encourages them to implement measures to save energy, reduce carbon emissions, conserve water and reduce waste.

In recent years, TSMC suppliers' performances in pollution control and safety management have made good progress in procedure establishment and implementation. To take a step further, the Company gives greater attention to occupational hygiene issues directly related to labor health. Since 2017, TSMC and the Ministry of Labor Occupational Safety and Health Administration (OHSA) have jointly launched the "Semiconductor Supply Chain Safety and Health Promotion Project." TSMC invited suppliers to participate in the project. As engaged by OHSA, a professional team has taken on the responsibility of providing consultation through document review and onsite inspection to participating suppliers on management procedures and hardware setup in order to improve the working environment and labor health management.

## 7.2.1 Environmental Protection

### Climate Change and Energy Management

#### • Task Force on Climate-related Financial Disclosures (TCFD)

Given that climate change could potentially affect operations and pose financial risk, in 2018 TSMC began adopting the recommendations of the Task Force on Climate-related Financial Disclosures (TCFD) released by the Financial Stability Board (FSB) to identify risk and opportunities, and we established metrics and target management based on the identification results.

### Management structure of TSMC climate-related risk and opportunity

Category	Management Actions
Governance	<ul style="list-style-type: none"> <li>Board of Directors periodically reviews climate change risk, opportunity and green manufacturing           <ul style="list-style-type: none"> <li>The senior vice president of materials management and risk management makes annual reports to the Board of Directors on corporate risk and control measures including climate change risks</li> <li>Corporate Social Responsibility (CSR) Executive Committee briefs the Board of Directors on green manufacturing targets and status of achievement semi-annually</li> </ul> </li> <li>CSR Executive Committee led by Chairman is the Company's top organization that deals with climate change management. The committee oversees TSMC climate change strategy and targets every half year and responds the Sustainable Development Goals through aggressive actions</li> <li>The CSR committee follows the strategy and targets to review mitigation of climate change quarterly and briefs to the Board of Directors on results of climate change-related measures directly</li> <li>The Energy and Carbon Reduction Committee is the organization for the implement and management on climate change risk and opportunity in TSMC. It is co-led by the senior vice presidents of Fab operations and senior vice presidents of materials management and risk management. This committee develops management plans, reviews the execution status and discusses future plans on a quarterly basis</li> </ul>
Strategy	<ul style="list-style-type: none"> <li>Adopting Recommendations of the Task Force on Climate related Financial Disclosures to discuss and identify Climate risk and opportunity, which is divided into short term (less than 3 years), medium term (3 to 5 years), and long term (greater than 5 years) based on internal target management periods</li> <li>Focusing the identified major risks and opportunities to evaluate potentials impact of Company operation, strategy and finance</li> <li>Adopting the 2°C scenario defined by Intergovernmental Panel on Climate Change (IPCC) to analyze climate resilience of production lines</li> <li>Adopting the scenario of Science Based Targets (SBT) to evaluate the financial impact to company and develop responding countermeasures in response to international carbon reduction trend</li> </ul>
Risk Management	<ul style="list-style-type: none"> <li>Using the TCFD framework to identify climate change risks and hosting workshops to reach a consensus approved by senior management, also bring into mechanism of climate change management</li> <li>Following the risk identification and ranking on climate change to develop relevant responding projects</li> <li>Bringing identification and evaluation result of climate-related risk into enterprise risk management (ERM) for integration and creating action plans</li> </ul>
Metrics and targets	<ul style="list-style-type: none"> <li>Defining the performance index of unit product of total greenhouse gas emissions, procurement amount of renewable energy and accumulated energy consumption and production interruption time and managing the responding actions of climate change</li> <li>Conducting inventory of scope 1, 2 and 3 emission data annually according to ISO 14064-1 and evaluating the risks of scope 1, 2 and 3 and risk reduction strategies after passing external verification</li> <li>TSMC sets up the targets of risk and opportunity in the year of 2030 according to the performance index on climate change. CSR committee and Energy and Carbon Reduction Committee review implementation actions and performance of climate change targets</li> </ul>

## Financial Impact Analysis of Climate Risks and Opportunities

Climate Risks	Potential Financial Impact	Climate Opportunities	Potential Financial Impact	2019 Actions
GHG emissions cap and carbon trading system	Restriction on capacity expansion, increase in operation costs	Participation in renewable energy plans Participation in carbon trading market	Early purchases of renewable energy, successfully increasing production capacity	<ul style="list-style-type: none"> <li>Look for and purchase more renewable energy in Taiwan continuously</li> <li>Purchased 910 GWh in renewable energy, renewable energy certificates (REC), and carbon credit</li> </ul>
GHG voluntary reduction commitments	Increased cost of installation for carbon reduction facilities and operating costs	Win public recognition / cooperation	Accumulate carbon credits in preparation for future production expansion	<ul style="list-style-type: none"> <li>Applied for Fluorinated-Greenhouse Gas and Dinitrogen Monoxide reduction offset project reward</li> </ul>
Unstable utility supply	Impact on production, increase in operating costs	Construct green buildings	Lower utility costs	<ul style="list-style-type: none"> <li>Applied and received 4 green building certifications</li> </ul>
		Increase efficiency of water consumption and water recycling	Strengthen climate resilience, lower the impact of disasters on production	<ul style="list-style-type: none"> <li>Built new fabs (Fab 18 Phase 2, Fab 15 Phase 7B, and Fab 6 Phase 2) while maintaining a water recycling rate higher than 85% design</li> </ul>
Cost of developing low-carbon energy saving products	Increased cost of developing low-carbon energy saving products	Develop or increase energy-saving products or services	Satisfy customer demands for energy saving products, increase in revenue	<ul style="list-style-type: none"> <li>Invest in the development of energy-saving products</li> </ul>
Impact on the Company's image	Unable to satisfy the expectations of stakeholders, impacting the Company's reputation or image	Increase investors' willingness to make long-term investments	Stabilize stakeholder structure, lower the risk of substantial fluctuations in stock prices	<ul style="list-style-type: none"> <li>Boost green production</li> </ul>
Typhoon, Flood	Production is affected, causing financial losses and a decrease in revenue	Increase resilience against natural disasters	Strengthen climate resilience, lower risk of operations disruption, and reduce potential losses	<ul style="list-style-type: none"> <li>Raised the building base of Fab 18 Phase 2 two meters higher</li> <li>Fab 18 Phase 2 is committed to using and developing renewable water</li> <li>Established a comprehensive water monitoring system</li> </ul>
Drought				
Rising Temperatures	Increase in energy consumption, cost, and carbon emissions	Driving low-carbon green manufacturing	Save energy and cut cost	<ul style="list-style-type: none"> <li>Conserved 300 GWh of electricity through energy-saving projects</li> </ul>

### Greenhouse Gas (GHG) Emission Reduction and Energy Management

TSMC actively participates in the World Semiconductor Council (WSC) in its efforts to establish a global voluntary PFC (perfluorinated compounds) emissions reduction goal for the decade of 2011 to 2020, and has incorporated past experience to develop best practices. The implementation of best practices has been adopted by the WSC as a major element of the 2020 goal. In 2013, in accordance with the "EPA Early Actions for Carbon Credit of Greenhouse Gases Reduction" regulation, TSMC applied for the recognition of greenhouse gas reduction from 2005 to 2011, and received 5.28 million tons of carbon dioxide credits in 2015. Those carbon credits can be used to offset greenhouse gas emissions of new manufacturing facilities regulated by Environmental Impact Assessment (EIA) Act, which can support the Company's sustainable operations and mitigate climate-change risk.

Since 2005, TSMC has completed the GHG (Greenhouse Gas) inventory program and taken a complete inventory of its GHG emissions to gain ISO 14064 certification. The inventory shows that the major direct GHG emissions are PFCs, which are widely used in the semiconductor manufacturing process. The primary indirect GHG emission is electricity consumption. The analysis of the inventory data is not only to meet domestic regulatory reporting requirements but also to serve as a baseline reference for TSMC's strategy to reduce GHG emissions.

In response to the commitment of global climate summit "Paris Agreement" and the Republic of China's "Greenhouse Gas Reduction and Management Act" promulgated in 2015, TSMC initiated a cross-functional platform for corporate carbon management in 2016. The three areas of focus of this platform are legal compliance, carbon emission reduction, and carbon credit acquisition. In addition to participating in official regulatory consultation and communications meetings, TSMC also sets short, medium and long-term reduction targets through the energy and carbon reduction committee led by vice presidents which are carried out by energy and carbon reduction teams of individual fabs, as the Company continues to strengthen climate mitigation and adaption. Because more than 75% of TSMC's GHG emissions come from electricity consumption, TSMC always emphasizes energy conservation and carbon reduction initiatives. TSMC has not only implemented energy-conserving designs in its manufacturing fabs and offices but has also continuously improved the energy efficiency of its facilities during operation. These efforts simultaneously reduce both carbon dioxide gas emissions and costs. TSMC has accumulated 1.2 billion kilowatt hours (kWh) power conservation since 2016.

From 2015 to 2017, TSMC actively participated in the Republic of China Ministry of Economic Affairs' voluntary green power purchasing program for three consecutive years and became the largest purchaser in Taiwan, purchasing 400 million kilowatt hours (kWh) of green power. Although the Taiwan Power Company has stopped selling green power since 2018, TSMC still aggressively negotiates the purchase of renewable energy with renewable energy suppliers in Taiwan. Targeting a long-term commitment of 100% renewable energy for the Company, TSMC is first committed to achieving a target of 25% renewable energy for fabs and 100% renewable energy for non-fab facilities by 2030. Since 2018, the overseas manufacturing fabs and offices have purchased renewable energy, REC and carbon credits to offset all carbon emissions caused by power consumption. All TSMC overseas sites achieved zero carbon emission of electricity consumption in 2019 again. Although development of renewable energy in Taiwan is at budding stage, TSMC established a renewable energy task force and continued to communicate with government closely through Association of Science Park Industries and Taiwan Semiconductor Industry Association. We gave some recommendations to government and hoped that the collaboration could speed up renewable energy development in Taiwan for instance, our recommendations included expanding the development of offshore wind power and increasing supply of renewable energy trading platform. TSMC also continued to find renewable energy. There are around 700MW of renewable energy under business negotiation currently. The renewable energy will be provided to TSMC gradually after related business process being completed. This is a clear manifestation of the Company's active support of the United Nations Sustainable Development Goals (SDGs).

### Air and Water Pollution Control

The Company has installed effective air and water pollution control equipment in each wafer fab to meet regulatory emissions standards. In addition, TSMC maintains backup pollution control systems, including emergency power supplies, to lower the risk of pollutant emissions in the event of equipment failure. The Company centrally monitors the operations of its air and water pollution control equipment around the clock and treats system effectiveness as an important tracking item to ensure the quality of emitted air and discharged water.

To make the most effective use of Taiwan's limited water resources, all TSMC fabs strive to increase water reclamation rates by adjusting the water usage of manufacturing equipment and improving wastewater reclamation systems. All fabs meet or exceed the process water reclamation rate standard of the Science Park Administration. Some fabs are able to reclaim more than 90% of process water, outperforming most semiconductor fabs around the world. TSMC also makes every effort to reduce non-manufacturing-related water consumption, including

water used in air conditioning systems, sanitary facilities, cleaning and landscaping activities and kitchens. TSMC uses an intranet website to collect and measure water recycling volumes company-wide.

Since water resources are inherently local, TSMC shares its water saving experiences with other semiconductor companies through the Association of Science-Based Industrial Park to promote water conservation in order to achieve the Science Park's goals and ensure a long-term balance of supply and demand. In addition, TSMC has committed to using partially reclaimed water in newly constructed fabs in the future in order to further reuse water resource and support the government policy and promotion for reclaimed water.

To continue enhancing water resource management, TSMC has adopted and followed the AWS Standard, the world's only sustainable water management standard. Early in 2019, Fab 6 and Fab 14 Phase 5/6/7 served as demonstration factories receiving AWS certification in December 2019 and making TSMC the first semiconductor enterprise to receive AWS platinum level certification in the world.

### Waste Management and Recycling

The Company has a designated unit responsible for waste recycling and disposal. To meet the goal of sustainable resource utilization, TSMC's priorities are: process waste reduction, onsite regeneration and reuse, and offsite recycling. The last option consists of treatment or disposal. To achieve raw material reduction, resource recycling and the goal of zero waste, for example, the Company built an in-house waste sulfuric acid pre-treatment system, as electronic grade sulfuric acid can be used as a waste water treatment agent after the wafer fabrication process. In order to track waste flow and ensure that all waste is treated or recycled legally and properly, TSMC carefully selects waste disposal and recycling contractors. All recycling contractors must report their recycled product sales monthly. The Company performs regular onsite audits to check factory status and review the reported data with actual reuse and recycling data to assure that the recycled product is flowing downstream properly. TSMC checks their licenses and on-site operational statuses, and also takes proactive steps to strengthen vendor auditing effectiveness. For example, all waste transportation contractors have been asked and agreed to join the GPS Satellite Fleet so that the cleanup transportation routes and abnormal stays for all trucks can be traced. In addition, all waste recycling and treatment vendors have installed closed-circuit TV systems at operating sites to monitor and audit waste handling. Meanwhile, TSMC also conducts an ongoing survey of recycled product tracking, actions taken to ensure lawful and proper waste recycling and treatment.

In 2019, TSMC's fabs in Taiwan achieved a 95% waste recycling rate for the tenth consecutive year, with a landfill rate below 1%, also for the tenth consecutive year. In 2017, TSMC amended its articles of incorporation to add four business items for chemical materials to ensure waste flow and reduce risks of improper waste disposal by commissioned agencies. TSMC also set up onsite resource activation facilities to convert waste resources produced from processing activities into products to be used onsite or to sell to other factories. As a result, TSMC has become a leader in waste resources regeneration. In 2019, the Company extended its capacity to regenerate used copper sulfate into copper tubes and took the further step of collaborating with raw material suppliers to produce electronic grade copper anodes using copper tubes regenerated in the TSMC manufacturing process. In addition, in order to achieve the target of reclaiming all ammonia, TSMC built the first ammonium sulfate drying system, which converted biologically toxic ammonia wastewater into industrial grade ammonium sulfate as valuable recycled products for sale.

#### **Environmental Accounting**

The purpose of TSMC's environmental accounting system is to identify and calculate environmental costs for internal management. At the same time, the Company can also evaluate the savings or economic benefits of environmental protection programs so as to promote economically-effective programs. While environmental expenses are expected to continue growing, environmental accounting can help TSMC manage these costs more effectively. TSMC's environmental accounting measures various environmental costs, establishes independent environmental account codes, and provides the data to all units for use in annual budgeting. The Company's economic benefit evaluation calculates cost savings for reduction of energy, water or waste and benefits from waste recycling in accordance with its environmental protection programs.

The environmental benefits disclosed in this report include real income from projects such as waste recycling and savings from major environmental projects. In 2019, the total benefits of environmental protection programs of TSMC fabs including waste recycling were more than NT\$1,496 million.

#### **2019 Environmental Cost of TSMC Fabs in Taiwan**

Unit: NT\$ thousands

Classification	Description	Expense	Investment
1. Direct Costs for Reducing Environmental Impact			
(1) Pollution Control	Fees for air pollution control, water pollution control, and others	5,592,000	9,810,000
(2) Resource Conservation	Costs for resource (e.g. water) conservation	-	1,653,000
(3) Industrial Waste Disposal and Recycling	Costs for waste treatment (including recycling, incineration and landfill)	1,994,000	-
2. Indirect Cost for Reducing Environmental Impact (Environmental Managerial Costs)	(1) Cost of training (2) Environmental management system and certification expenditures (3) Environmental impact measurement and monitoring fees (4) Environmental protection product costs (5) Environmental protection organization fees	285,000	323,000
3. Other Environmental Costs	(1) Costs for soil decontamination and natural environment remediation (2) Environmental damage insurance fees and environmental taxes and expenses (3) Costs related to environmental settlement, compensations, penalties and lawsuits	-	-
Total		7,871,000	11,786,000

#### **2019 Environmental Efficiency of TSMC Fabs in Taiwan**

Unit: NT\$ thousands

Category	Description	Efficiency
1. Cost Savings of Environmental Protection Projects	Energy savings	752,500
	Water savings	40,875
	Waste reduction	309,000
2. Real Income from Industrial Waste Recycling	Recycling of used chemicals, wafers, sputter targets, batteries, lamps, packaging materials, paper cardboard, metals, plastics, and other waste	394,600
Total		1,496,975

#### **Green Building and Green Factory**

Since 2006, TSMC has adopted standards from both the Taiwan Green Building and the evaluation of the U.S. Green Building Council – Leadership in Energy and Environmental Design (LEED) for new fab and office building designs to achieve better energy and resource efficiency than conventional designs. TSMC has also continued to upgrade existing office buildings to comply with the LEED standard each year. From 2008 to 2019, 32 of TSMC's fabs and office buildings have achieved LEED certifications – three platinum and 29 gold. Meanwhile, TSMC also received five Taiwan Intelligent Building diamond-class certifications and 23 Taiwan EEWH (ecology, energy saving, waste reduction and health) certifications – 20 diamond, two gold and one silver.

TSMC believes that more manufacturing companies should convert their facilities into green factories to improve the environment and lower construction costs. Therefore, the Company shares its practical experience with industry for free, government and academia. As of the end of 2019, 14,557 visitors from more than 353 different industrial, government, academic and general community groups had contacted TSMC to have communication for the Company's green building technology and practical experience. Since 2009, TSMC has led the industry in support of the Taiwan government's Green Factory Label standard, which includes the Clean Production evaluation system and Factory Green Building evaluation system. TSMC received Taiwan's first Green Factory Label and 12 labels in total as of the end of 2019, and was the most awarded company in Taiwan.

#### **Environmental Audit Results in Violation of Environmental Regulations**

In 2019 and as of the date of this annual report, the Company has had no violations of environmental regulations recorded by governmental authorities.

#### **7.2.2 Sustainable Products**

TSMC collaborates with its upstream material and equipment suppliers, design ecosystem partners and downstream assembly and testing service providers to minimize environmental impact. Reducing the resources and energy consumed for each unit of production allows the Company to provide customers with more advanced, power efficient and ecologically sound products, such as ultra-low power chips for narrowband IoT, low Vdd (low operating voltage) chips for wearables and IoT

devices, low-power chips for mobile devices, high-efficiency LED driver chips for flat panel display backlighting, indoor/outdoor solid state LED lighting, Energy Star certified low standby AC-DC adaptors chips, high-efficiency DC brushless motor chips, electric vehicle chips and low-power server chips. By leveraging TSMC's superior energy-efficient technologies, these chips support sustainable city infrastructure, greener vehicles, smart grids, more energy efficient servers and data centers and other applications. In addition to helping customers design low-power, high performance products to reduce resource consumption over the product's life cycle, TSMC's green manufacturing practices provide further green value to customers and other stakeholders.

TSMC-manufactured ICs are used in a broad variety of applications in various segments of the computer, communications, consumer, industrial, electric vehicle, server and data center, and other electronics markets. Through TSMC's manufacturing technologies, customers' designs are realized and their products are incorporated into people's lives. These chips, therefore, make significant contributions to the progress of modern society. TSMC works hard to achieve profitable growth while providing products that add environmental and social value. Listed below are several examples of how TSMC-manufactured products make significant contributions to the environment and society.

#### **Environmental Contribution by TSMC Foundry Services**

##### **1. Continue to Drive Technology to Lower Power Consumption and Save Resources**

- To improve sustainability, TSMC continues to drive the development of advanced semiconductor process technologies to support customer designs that result in the most advanced, energy-saving and environmentally friendly products. In each new technology generation, circuitry line widths shrink, making transistors smaller and reducing product power consumption for completing the same tasks or achieving the same level of performance.

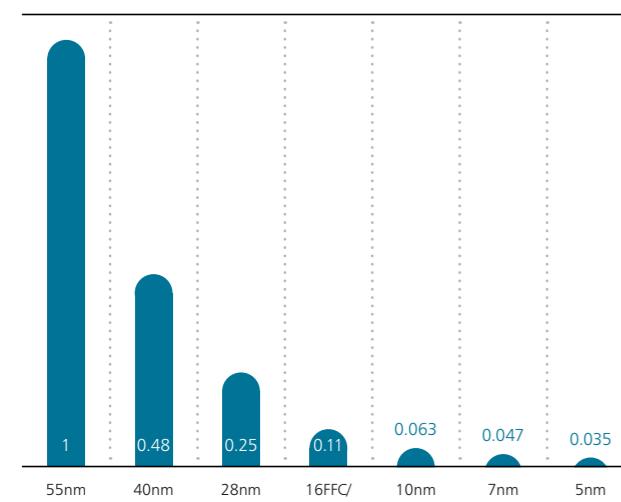
- As TSMC quickly ramped up its 16nm and newer generation technologies, combined wafer revenue contribution grew significantly from 4% in 2015 to 50% in 2019. TSMC's objective is to continue R&D investment and to increase wafer revenue contribution in 16nm and beyond technologies, helping the Company achieve both profitable growth and sustainability.

## TSMC Wafer Revenue Contribution from 16nm and Beyond Technologies

2015	2016	2017	2018	2019
4%	21%	31%	41%	50%

## Chip Die Size Cross-Technology Comparison

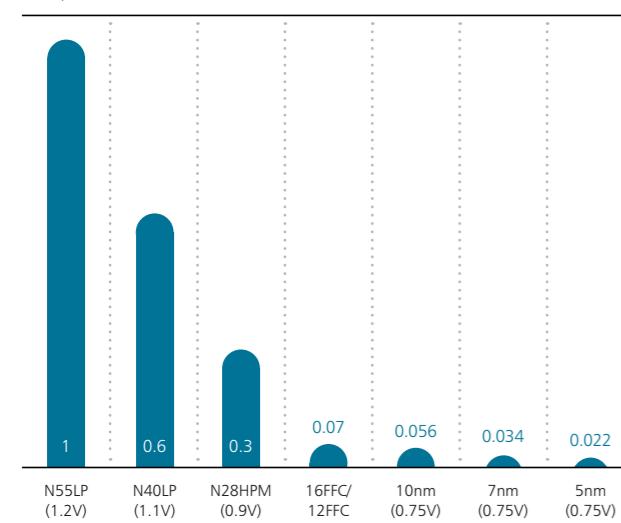
Die size shrinks as line width shrinks



Note: The logic chip/SRAM/I/O (input/output) ratio, which affects die size and power consumption, was re-aligned.

## Chip Total Power Consumption Cross-Technology Comparison

More power saved as line width shrinks



Note: The logic chip/SRAM/I/O (input/output) ratio, which affects die size and power consumption, was re-aligned.

## 2. Provide Customers Leading Power Management IC Process with the Highest Efficiency

- TSMC's leading manufacturing technology helps customers design and produce green products. Power management ICs, the key components that supply and regulate power to all other IC components within electronic devices, are the most notable green IC products. TSMC helps customers produce industry-leading power management chips with more stable and efficient power supplies and lower energy consumption.
- In 2019, more than 2.9 million 8-inch equivalent wafers using TSMC's HV/Power technologies were shipped to customers. Power management ICs manufactured by TSMC are widely used in computer, communication, consumer, electric vehicle, server and data center, and other systems around the globe.

### HV/Power Technologies Shipments

Unit: 8-inch equivalent wafer

2015	2016	2017	2018	2019
>2,000K	>2,100K	>2,500K	>2,600K	>2,900K

## 3. Drive Industry-leading, Comprehensive Ultra-low Power (ULP) Technology Platform

- To meet low-power consumption requirements for the wearable and IoT markets, TSMC continues to invest in expanding and enhancing its ultra-low power processes. TSMC provides industry's leading and most comprehensive ultra-low power (ULP) technology platform to support innovations for a wide range of IoT applications that demand increased computing in smart edge devices, including smart speakers, smart cameras, wearables, and various smart appliances. TSMC's industry-leading offerings, including 55nm ULP, 40nm ULP, 28nm ULP, 22nm ULL (ultra-low leakage), have been widely adopted by various IoT customers. TSMC further extends its low Vdd (low operating voltage) offerings for extremely low power applications. In 2019, TSMC continued to develop 12nm ULL technology to enable more advanced IoT products, including IoT WiFi and BLE (Bluetooth low energy) connectivity products.

## 4. Develop Greener Manufacturing to Lower Energy Consumption

- TSMC continues to develop more advanced and efficient technologies to reduce energy/resource consumption and pollution per unit during the manufacturing process, as well

as power consumption and pollution during product use. In each new technology generation, circuitry line widths shrink, making chips smaller for the same circuit designs and lowering the energy and raw materials consumed for per chip in manufacturing. In addition, the Company continuously provides process simplification and new design methodology based on its manufacturing excellence to help customers reduce design and process waste so as to produce more advanced, energy-saving and environmentally-friendly products. For total energy savings and benefits realized in 2019 through TSMC's green manufacturing, see Environmental Accounting on page 122 in this annual report.

## Social Contribution by TSMC Foundry Services

### 1. Unleash Customers' Mobile and Wireless Chip Innovations that Enhance Mobility and Convenience

- The rapid growth of smartphones and tablets in recent years reflects strong demand for mobile devices, which accelerates innovations for IC products such as baseband, RF transceivers, application processors (AP), wireless local area networks (WLAN), CMOS image sensors, near field communication (NFC), Bluetooth, and global positioning systems (GPS) among others. While these mobile devices offer remarkable convenience to human lives, TSMC contributes significant value to these devices in the following ways: (1) new TSMC process technologies help chips achieve faster computing speed in smaller sizes, leading to smaller form factors for these electronic devices. In addition, TSMC SoC technology integrates more functions into one chip, reducing the total number of chips in electronic devices, again resulting in a smaller system form factor; (2) new TSMC process technologies also help chips reduce power consumption, allowing mobile devices to be used for a longer period of time; and (3) TSMC helps spread the growth of more convenient wireless connectivity such as 3G/4G/5G and WLAN/Bluetooth, meaning people can communicate more efficiently and "work anytime and anywhere," significantly increasing the mobility of modern society. In 2019, smartphone products represented about 49% of TSMC wafer revenue.

### TSMC Wafer Revenue Contribution from Smartphone Products

2017	2018	2019
52%	45%	49%

## 2. Unleash Customers' CIS and MEMS (micro-electromechanical systems) Innovations that Enhance Human Health and Safety

- To make all machines smarter, safer and more user and environmentally friendly, sensors are a must. Optical, acoustic, motion, and environment sensors are mostly made with either CIS or MEMS technologies. TSMC continues to put substantial effort into developing new CIS and MEMS technologies to enable customers to innovate new products for new applications. For CIS, TSMC and customers have extended applications from traditional RGB (red, green, blue) sensing to 3D depth sensing, optical fingerprint, and NIR machine vision, etc. For MEMS, TSMC and customers have extended applications from traditional motion sensing to microphone, bio-sensing, medical ultrasound actuators and more. TSMC CIS and MEMS technologies have made consumer electronics, mobile communication, automotive electronics, industrial, and medical devices smaller, faster, and more energy efficient, greatly enhancing human convenience, health and safety. For instance, TSMC customers' CIS and MEMS products are used in a number of advanced medical treatments as well as in preventative health care applications. Examples include early warning systems to minimize the injury from falls for the elderly, systems to detect physiological changes, car safety systems and other applications that significantly improve human health and safety.

### 7.2.3 Safety and Health

#### Safety and Health Management

TSMC's safety and health management is compliant with local and international standards and adheres to the management approach of "Plan, Do, Check, Act" to prevent accidents, promote employee safety and health, and protect Company assets. All TSMC fabs in Taiwan have also received TOSHMS (Taiwan Occupational Safety and Health Management System) certification since 2009. In 2018, the International Organization for Standardization released ISO 45001:2018, replacing OHSAS 18001, with major changes in the expansion of the scope, support and participation of the leadership, collection and planning of internal and external issues, expectation and demand of stakeholders, evaluation of risk inspection, communication and consultation of non-managers, application of performance indicator, and evaluation of corrective and preventive action. Meanwhile, ISO 45001 ensures the spirit of the system can

be effectively implemented at the management level through internal audit, automatic check, and security patrol. All fabs in Taiwan received ISO 45001 certification for occupational health and safety in 2019 and subsidiaries will begin the certification process in 2020.

Besides accident prevention, TSMC has established emergency response procedures to protect employees and contractors if a disaster should occur, as well as to prevent and/or reduce the negative impact on the community and the environment. TSMC communicates regularly with suppliers to ensure that potential risk in the operation of production equipment is minimized and that safety control procedures are followed rigorously during installation. The Company places stringent controls on high-risk operations and also evaluates the seismic tolerance of its facilities and equipment to reduce the risk of earthquake damage.

For epidemics, TSMC has established corporate-level prevention committees and procedures for emergency response to outbreaks of infectious diseases.

#### **Working Environment and Employee Safety and Health Protection**

The Company's ESH policy is focused on establishing a safe working environment, preventing occupational injury and illness, keeping employees healthy, enhancing every employee's awareness and sense of accountability to ESH, and building an ESH culture. TSMC safety and health management operations apply to the following:

#### **• Equipment Safety and Health Management**

In addition to meeting regulatory requirements and internal standards, as well as mitigating ESH-related risks when building or upgrading facilities, TSMC also maintains procedures governing new equipment and raw materials, requires safety approvals for bringing new tools online, updates safety rules, and implements seismic protection and other safety measures.

TSMC requires that all new tools meet SEMI-S8 requirements and that appropriate supplementary control measures be taken to reduce ergonomic risk. Moreover, the Company endeavors to automate 300mm front-opening unified pod (FOUP) transportation to prevent accumulative physical damage caused by repetitive manual handling of 300mm FOUPs. TSMC 300mm fabs have completed automatic transportation control.

#### **• Environmental, Safety and Health Evaluation of New Tools and New Chemical Substances**

As a technology leader in the global semiconductor industry, TSMC operates increasingly diversified process tools and introduces new chemicals in the R&D stage. Before using new tools or new chemicals, they are reviewed carefully by the new tools and new chemical review committee. The purpose is to ensure that new tools are compliant with the semiconductor industry's safety standards (such as SEMI S2) and that new chemicals' environmental, safety and health concerns can be well controlled, including engineering controls, application of personal protection equipment, and operational safety training during storage, transportation, usage and disposal.

#### **• General Safety Management, Training and Audit**

All TSMC manufacturing facilities hold environmental, safety and health committee meetings on a monthly basis. TSMC has adopted multiple preventive measures such as controls on high-risk work, contractor management, chemical safety management, personal protective equipment requirements, and safety audit management. In addition, the Company maintains detailed disaster response procedures and performs regular drills designed to minimize damage to employees and property, as well as the impact on society and the environment in the event of a disaster.

#### **• Working Environment Hazardous Factors Management**

TSMC conducts workplace hazard assessments to provide a comfortable and safe workplace to employees. The Company also educates and requires employees to use personal protective equipment (PPE) to prevent hazardous exposures.

The Company performs semi-annual workplace environment assessments of physical and chemical hazards, including CO<sub>2</sub> concentration, illumination, noise, and hazardous chemical substances regulated by local laws. In addition, TSMC has performed exposure assessments and has used hierarchy management control for chemicals with potential health hazards. If abnormal measurements occur, events happen, or an exposure assessment indicates there is an adverse health effect for employees, ESH professionals immediately conduct onsite observation and interventions to reduce the exposure to acceptable levels.

#### **• Health Promotion Program**

In order to establish the healthiest possible workplace and prevent from occurrence of occupational disease, TSMC formed a corporate-level committee to execute health promotion programs covering three scopes:

- (1) Exposure and health risk assessment: develop an exposure assessment system to identify high health risk employees.
- (2) Hazardous training and notification: use standardized training materials for employees and contractors in all TSMC fabs. Inform them of the health risks and prevention measures at the workplace before working or providing any services there.
- (3) Strengthen management of high health concerned chemicals: inform suppliers that all materials they provide to TSMC must comply with applicable laws including clear disclosure of any hazardous substances. Sampling raw materials used in the manufacturing process to confirm that they do not contain any carcinogenic, mutagenic or toxic-reproductive materials as claimed in supplier's safety data sheet (SDS).

#### **• Emergency Response**

The planning and execution of an effective emergency response should identify potential high-risk events via risk assessment and be prepared for various scenarios. It should focus on continuous improvement and practice drills covering all potentially serious events. TSMC's emergency response plans include procedures for rapid-response crisis management and disaster recovery to potential incidents.

All TSMC fabs conduct major annual emergency response exercises and evacuation drills. TSMC's onsite service contractors are also required to participate in emergency response planning and exercises to ensure cooperation in handling accidents and to effectively minimize any damage caused by disasters. At least every two years, each fab director invites fab management and support functions to participate in crisis management drills for potentially high-risk events such as earthquake, fire and flood (Tainan site). Since 2018, TSMC has conducted complex accident emergency response drills, which include simultaneous scenarios for earthquake, fire and chemical spill. In 2019, we completed 108 scenarios to ensure rapid response to emergencies so that losses can be minimized in occasions of real disasters.

In addition to the regular emergency response drills held by engineering and facilities departments each quarter, the Company's laboratory, canteen, dormitory, and shuttle bus personnel also hold emergency response drills to prepare for events such as earthquakes, chemical spills, ammonia release, fires and traffic accidents.

#### **• Emerging Infectious Disease Response**

TSMC has a dedicated corporate ESH organization to monitor emerging infectious diseases around the world, to assess any potential impact on the workplace, and to provide an appropriate strategic response plan. In previous outbreaks (such as SARS in 2003, the H1N1 influenza outbreak in 2009, MERS in 2015) and the current threat, COVID-19. TSMC abided by CDC's (Taiwan Centers for Disease Control) rules and convened the corporate influenza response committee to develop the Company's strategies. These strategies included educating employees in prevention and response, publishing guidelines for managers, establishing guidelines for employee sick leave due to flu, and installing alcohol-based hand sanitizers at appropriate locations. The Committee also monitors the status of employee leave due to illness and, at the same time, develops a continuity plan to address manpower shortages and minimize business impact.

#### **• Employee Physical and Mental Health Enhancement**

TSMC believes that employees' physical and mental health is not only fundamental to maintaining normal business operations but is also part of a corporation's responsibility. To protect and promote employee physical and mental health, TSMC fosters collaboration among the onsite industrial safety and environmental protection department, onsite medical personnel of the health center, and physicians of occupational medicine. TSMC strives to reduce cerebral and cardiovascular disease that might be induced or aggravated by overwork, night work or shift work. The Company conducts maternal health protection programs and prevention of cumulative trauma disorders as well. TSMC devotes significant resources to mental health awareness and related activities, which not only protect employees from hazards at work but also proactively promote employee health in general. In 2019, through planned personal health management, (1) 617 female employees participated in the maternal health program, the completion rate was 100%. 615 of them were at the first degree risk (there was no harm to the mother, infant, and baby). Two employees were classified as second degree risk (possible harm to the mother, infant, and baby) at the first assessment; after proper adjustments to their works, they were reclassified as the first degree after doctor's re-assessment. (2) By analyzing historical cerebral and cardiovascular cases of our employees, we modified disease assessment criteria with contracted doctors, and, combining internal annual health examination reports, as well as working hour's information, we were able to identify 1,330 employees that have middle to high risk for cerebral and cardiovascular diseases. These employees were provided with health education and medical assistance. Also, alone with their managers, they would receive suggested working hours

information in order to reduce disease risk. (3) 116 employees were in a high risk group for cumulative trauma disorders. Among them, one could have job-related risks. The Company has adjusted their job conditions to avoid possible risks. (4) As obesity has been considered as a precursor of diabetes, hyperlipidemia and hypertension, for seven consecutive years, TSMC has held weight-control program, which has been extended to 6 months from 3 months in 2019 in order to assist employees to cultivate their habits. A total of 1,250 employees have joined the program, and 450 of them stayed until the end, with total weight loss of 3,028 kilograms. Employees who had joined the program showed improvements in weight, waist circumference, cholesterol levels, blood sugar, blood pressure, and liver function. (5) We also conducted a lecture of "Medication Safety of Chinese Medicine" with total 112 participants.

#### 7.2.4 Supplier Management

##### Management Aspect

As a means of enhancing supply chain management, TSMC is committed to communicating with and encouraging its suppliers (including contractors) to improve their quality, cost effectiveness, delivery performance, and continuous improvement on environmental protection, safety and health. Through regular communication with senior managers, site audits and experience sharing, the Company collaborates with major suppliers and contractors to enhance partnerships and ensure continual improvement for better performance and increased joint contributions to society. As noted above, contractors performing high-risk activities must lay out clearly-defined safety precautions and preventative measures. In addition, contractors working on high-risk engineering projects must establish ISO 45001 or OHSAS 18001 systems and the workers must successfully complete work-related skill training. All contractors performing high-risk activities must get the certification of ISO 45001 before the end of 2021.

##### Supply Chain Sustainability

TSMC works with suppliers in several fields of sustainable development, such as greening the supply chain, carbon management for climate change, mitigation of fire risk, ESH management and business continuity plans in the event of a natural disaster.

Since becoming a full member of the Responsible Business Alliance (RBA) in 2015, TSMC has completed implementation of the RBA code of conduct throughout the Company by performing self-assessments at its facilities worldwide and reviewing policies and procedures in the areas of labor, health and safety, environment, ethics and management systems.

To enhance supply chain sustainability and streamline risk management, the Company is committed to collaborating with its suppliers to maintain full compliance with Taiwan's environment, safety, health and fire protection regulations. TSMC developed a supplier's code of conduct, which affirmed basic labor rights and standards for health, safety, environment, ethics and management systems. TSMC works with suppliers to inspect the risk and impact on the economy, the environment, and society and to make continuous improvement. The Company has lifted suppliers' performance of sustainability through experience sharing and training and hopes to establish a world-class semiconductor supply chain that exceeds international standards and serves as a global benchmark.

TSMC is subject to the U.S. Securities & Exchange Commission (SEC) disclosure rule on conflict minerals released under Rule 13p-1 of the U.S. Securities Exchange Act of 1934. As a recognized global leader in the high-tech supply chain, the Company acknowledges its corporate social responsibility to strive to procure conflict-free minerals in an effort to recognize humanitarian and ethical social principles that protect the dignity of all people. To this end, TSMC has implemented a series of compliance safeguards in accordance with leading industry practices such as adopting the due diligence framework in the OECD's Model Supply Chain Policy for a Responsible Global Supply Chain of Minerals from Conflict-Affected and High Risk Areas issued in 2011.

TSMC is one of the strongest supporters of the Responsible Business Alliance and the Global e-Sustainability Initiative (GeSI), which will help the Company's suppliers source conflict-free minerals through their jointly developed Responsible Minerals Initiative (RMI). Since 2011, TSMC has asked its suppliers to disclose information and make timely updates on smelters and mines. The Company encourages suppliers to source minerals from facilities or smelters that have received a "conflict-free" designation by a recognized industry group (such as the RBA) and also requires those who have not received such designation to become compliant with Responsible Minerals Initiative or an equivalent third party audit program. TSMC requires the use of tantalum, tin, tungsten and gold in its products that are conflict-free.

TSMC will continue to conduct the supplier survey annually and require suppliers to improve and expand their disclosure to fulfill regulatory and customer requirements. For further information, see the Company's Form SD filed with the U.S. SEC. ([https://www.tsmc.com/english/investorRelations/sec\\_filings.htm](https://www.tsmc.com/english/investorRelations/sec_filings.htm))

#### 7.3 TSMC Education and Culture Foundation

The TSMC Education and Culture Foundation believes in that education cultivates talents of the future while the talents determine the future of a nation. Therefore, in 2019 the Foundation provided more than NTD 96 million for multiple educational projects to help people develop various talents. Such projects will empower youth, create an educational platform and promote fine arts and literature. The Foundation aims to nurture and cultivate more talents of the future and provide motivational power for the common good of society.

##### Supporting the Younger Generation, Creating Sustainable Built Environments

The TSMC Education and Culture Foundation has long supported young people in the community. Since 2016, the Foundation has organized "TSMC Youth Dream Building Project," which helps young people realize their dreams and provides various resources such as professional skills training and publicity. With these efforts, the Foundation hopes to guide the young to explore their own potentials and boldly pursue their dreams. At the same time, having set up the "topical project," "TSMC Youth Dream Building Project" encourages young students to push the envelope, broaden the horizons of their dreams, and become more aware of social issues. The topic for 2019 "TSMC Youth Dream Building Project" is "Formulating a Waste-less City," guiding students to focus on environmental issues such as wasted resources. Nearly 100 teams from universities and colleges in the Taoyuan, Hsinchu and Maoli area and in the greater Tainan area enrolled in the competition, contending for the NTD 3 million prize money. In the competition, a great number of the teams proposed solutions to the environmental issues with innovation, energy and courage.

Apart from "TSMC Youth Dream Building Project," the Foundation also participated in the ATCC Case Competition for the first time. In 2019 competition attracted 540 teams from various colleges, whose innovative proposals encompassed solutions to social issues at all levels. Throughout the three months of the entire ATCC Case Competition process, the Foundation accompanied the youth each step of the way by offering opportunities for the students to visit TSMC corporate headquarters, organizing workshops, and introducing business mentors to the students – all to inspire creativity through a concerted effort. One of the Foundation's sponsored teams, Team Package Plus, led by Allen Yeh from the graduate school of the Department of International Business, National Chengchi University, won second place in the national competition for innovative, environmentally-friendly packaging and unique

business model to reduce the environmental impact made by the online shopping trend. Allen Yeh went even further to found a social enterprise to drive further positive social change by implementing their innovation and ideals.

##### Paying Attention to the Development in Education and Building an Education Platform

In response to the implementation of the new 12-year Curriculum for Basic Education (2019 National Curriculum Guidance) in Taiwan, the Foundation initiated a "New Curriculum: Safeguards to Protect Technology" report on the topic in collaboration with the United Daily News Group. This new series of reports investigates the impact brought on by the new curriculum. At the same time, the company offered an industrial perspective, thereby stimulating a dialogue between the educational system and the tech industries. Such a dialogue draws the public's attention and generates more discussions on this issue.

In addition to its emphasis on the development of educational system, the Foundation organizes events in the humanities and the sciences, builds a platform for exchanging ideas and provides students extracurricular opportunities to develop diverse interests, thereby broadening their horizons and exploring their potential. For the humanities, the Foundation has been holding TSMC Youth Literature Award since 2004 and TSMC Youth Calligraphy and Seal-Carving Competition since 2008 respectively. The two awards continue to encourage young people to demonstrate creativity in both literature and calligraphy and have become important cradles for nurturing domestic arts and literary talents. The number of applicants competing in the novella category of the year's TSMC Literature Award, with its global reach on the Chinese-writing scene, has hit a record high in 2019 as a total of 150 pieces of manuscripts were submitted in competition for the NTD one million prize money.

When it comes to science education, the Foundation has long funded the three major science camps for gifted and talented students in Taiwan: Wu Chien-Shiung Science Camp, Wu Ta-You Science Camp, and Madame Curie Chemistry Camp. These science camps have long nurtured talented youth in basic sciences for the nation. In 2019 "TSMC Cup – Competition of Scientific Short Talk" set the agenda on "gene editing". The competition hopes to trigger high school students' interests in sciences through media such as popular science books and films. It also encourages cross-disciplinary collaboration, publicizes and deepens the understanding of sciences among the public.

Furthermore, the Foundation has long cared for the educationally underprivileged. In 2019 the Foundation increased the number of low income student scholarships, as grants for National Cheng Kung University, National Sun Yat-sen University and National Chung Cheng University were added to the original National Tsing Hua University and National Central University grants. The scholarships open doors to the higher education for more students from low-income families. At the same time, the Foundation continues to work on the "Hope Reading Project" with CommonWealth Foundation. The cooperation with Junyi Academy, Teach for Taiwan Foundation (TFT) and BoYo Social Welfare Foundation works to eliminate the educational discrepancy between cities and rural areas through book donation, online courses and increased good teaching resources.

#### Host Fine-Art Events, Promote a Beautiful and Good Society

The Foundation is dedicated to promoting arts and culture and continues to host beautiful artistic and cultural events, create a stage for outstanding Taiwanese arts groups, and elevate the spiritual life of community residents. The Foundation cherishes the sophistication and beauty of traditional performing arts, thereby sponsoring the tour of Pai Hsien-yung's new Kunqu Classic series, performing pieces such as *The Story of Golden Lotus* and *The Jade Hairpin*. The Foundation has even brought the traditional art form of Kunqu to the campuses, inviting 150 National Hsinchu Senior High School students and 300 college students in the greater Taichung area to the performance. In doing so, the traditional theater can reach out to more young students and a wider public. More people can begin to appreciate the beauty of traditional theater.

The theme of 2019 TSMC Hsin-Chu Arts Festival, the annual high point of arts and cultural event in the Hsinchu community, is "Listening to the Muse." For the exhibition, the Foundation organized an exquisite and special exhibition on the legacy of the three past poet masters: Yu Kwang-chung, Luo Fu and Chou Meng-tieh. In this exhibition, manuscripts and items bequeathed by the poets demonstrate the joy of poetic beauty to the public. In addition, the TSMC Hsin-Chu Arts Festival features 61 first-class programs, such as a piano recital by the maestro Krystian Zimerman, a recital by Japanese virtuoso pianist Nobuyuki Tsujii, who is blind from birth, a

tour of children's plays tailored-made for children in rural area, GuoGuang Opera Company' masterpiece, *The Painting of 18 Lohans*, a celebration for the company's 20<sup>th</sup> anniversary. The TSMC Hsin-Chu Arts Festival opens the door for more than 42,000 people in the community to experience the arts.

#### 7.4 TSMC Charity Foundation

Since its establishment in 2017, the TSMC Charity Foundation has continually focused on extending the charitable programs and projects of its four main pillars of charity: disadvantaged care, solitary elderly care, filial piety promotion, and environmental protection. Under the leadership of its chairperson, Ms. Sophie Chang, the Foundation stands at the front lines, is attentive to social issues and events, and strives to close the wealth disparity in society through enhancement of educational energies in rural areas and provision of emergency assistance, thereby giving disadvantaged families and children from rural areas more opportunities to turn their lives around. The Foundation has also established a social welfare platform that gathers love from all corners of society, powers social revolution through charitable works, and works collaboratively to improve society.

The TSMC Charity Foundation continued to expand its scope of service in a variety of charitable endeavors in 2019 and initiated many new projects related to social welfare including the following:

- **Disadvantaged Care:** The Foundation focused on the two main care initiatives of "rural education" and "support for the disadvantaged," provided all types of assistance (including volunteer services, building repairs, online educational materials, off-grade foods, and other resources) to educational institutions and children in rural areas, worked to ensure that disadvantaged groups had equal opportunities to obtain education, and continued to visit and provide financial aid and daily supplies to high-risk disadvantaged families.

In 2019, the Foundation supplied tablets and educational courses to 21 locations and organized 11 teacher empowerment training sessions to increase the energy of different educational institutions, hoping to enhance the way disadvantaged children are educated, improve the

quality of the education they receive, and also provide resources such as building repairs and off-grade food. The Foundation's "Sending Love" program continued to be active, and Foundation staff conducted on-site visits to identify disadvantaged cases in the most need of financial support. The living conditions of these disadvantaged families were improved through charitable donations from both inside and outside TSMC. As of 2019, the Foundation has assisted a total of 128 families.

- **Solitary Elderly Care:** The Foundation enhanced the health and welfare of elderly people living on their own by collaborating with its Networking of Love partners to connect social welfare groups and medical institutions providing care to lonely seniors. In 2019, the Foundation helped to launch new intelligent medical systems at the Chiu Lin Yuan senior daycare center and the Zhubei Nursing Home to enhance medical quality and efficacy. Current Networking of Love partners include Taipei Veterans General Hospital, Miaoli General Hospital, Old Five Old Foundation, Feng Yuan Hospital, China Medical University Hospital, Lin Tseng Lien Welfare and Charity Foundation, Taiwan Puli Care Association, Sin-Lau Hospital, Tainan Hospital, Jianan Psychiatric Center, Mennonite Christian Hospital and the Mennonite Social Welfare Foundation, and Fooyin University.

- **Filial Piety Promotion:** The Foundation promotes and spreads the Eastern cultural value of filial piety as part of its efforts to reduce social risks and problems arising from ageing societies by raising generational awareness of filial piety. In 2019, the Foundation's filiality volunteers continued to visit elementary schools and spread concepts relating to filial piety. The TSMC Charity Foundation participated in the hosting of six parent-child filiality workshops, where parents and their children were brought closer together through interactive activities, which in turn helped to initiate cross-generational dialogue and embedded the spirit of filial piety in the hearts of participants.

- **Environmental Protection:** The Foundation promoted environmental education and knowledge in order to nurture the abilities of its employees to predict, prevent, and adapt to climate change. The Foundation continued its "Cherish Food Program" in 2019 and worked with many food companies

to donate off-grade foods to institutes who collaborated with the TSMC Charity Foundation in providing care for the disadvantaged, thus achieving its food waste reduction and environmental conservation goals. The Foundation has previously collaborated with food companies such as Chi Mei Frozen Food, Hunya Foods, Laurel Corporation, Lian Hwa Foods Corporation, Hsin Tung Yang Corporation, and Shih Chen Foods. TSMC's ecology volunteers continued to provide ecology tours at the Hsinchu 12B fab plant, the Taichung 15 fab plant, the Tainan 14 fab plant, and the Tainan Jacana Ecology Education Park, while TSMC's professional energy-saving volunteers assisted schools of all levels in conducting energy-saving assessments and improvements, with service locations covering Taipei, Hsinchu, Taichung, Tainan and Kaohsiung.

#### 7.5 TSMC i-Charity

Launched in 2014, the TSMC i-Charity platform is an internal interactive website that TSMC employees can use to propose care programs, share program results, provide responses and suggestions, and take advantage of timely online funding activities to give back to society.

In 2019, charitable contributions surpassed NTD 20 million, and a total of 18,000 people participated in the "Junyi Academy", "Teach for Taiwan", "Music education development program for the Taoshan Primary School Choir", and "Sending Love initiative for the St. Camillus Center for Intellectual Disability" programs.

The TSMC i-Charity platform accumulated more than NTD 110 million in charitable donations from 2014 to 2019. TSMC will continue to fulfill its commitments to society and encourage its employees to care for and contribute to society in different ways.

## 7.6 Social Responsibility Implementation Status as Required by the Taiwan Financial Supervisory Commission

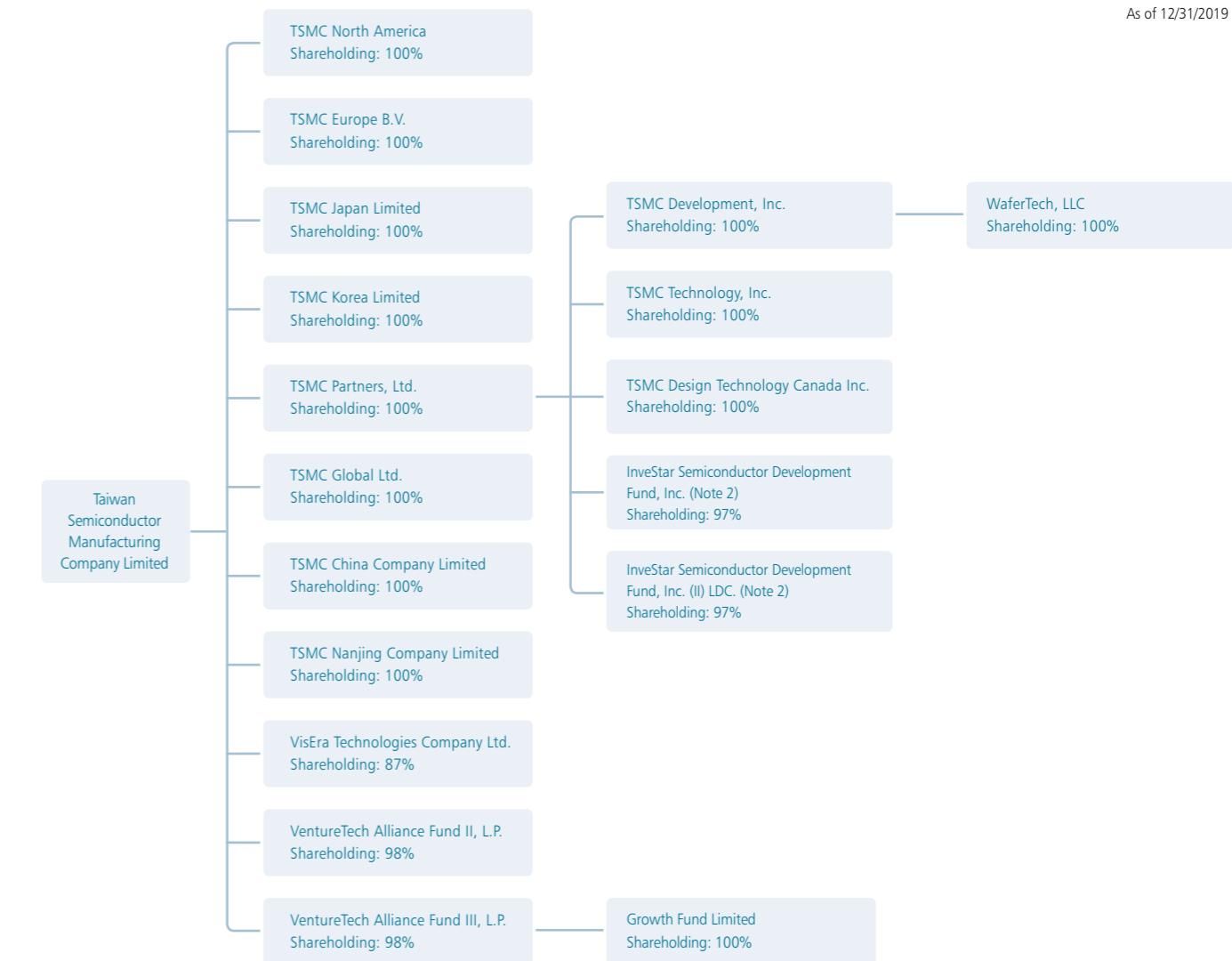
Assessment Item	Implementation Status			Non-implementation and Its Reason(s)
	Yes	No	Summary	
1. Does the Company follow materiality principle to conduct risk assessment for environmental, social and corporate governance topics related to company operation, and establish risk management related policy or strategy?	V		Please refer to "7. Corporate Social Responsibility" on pages 113-133 of this annual report.	None
2. Does the Company have a dedicated (or ad-hoc) CSR organization with Board of Directors authorization for senior management, which reports to the Board of Directors?	V		Please refer to "7. Corporate Social Responsibility" on pages 113-133 of this annual report.	None
3. Environmental Topic (1) Has the Company set an environmental management system designed to industry characteristics?  (2) Is the Company committed to improving resource efficiency and to the use of renewable materials with low environmental impact?  (3) Does the Company evaluate current and future climate change potential risks and opportunities and take measures related to climate related topics?  (4) Does the Company collect data for greenhouse gas emissions, water usage and waste quantity in the past two years, and set energy conservation, greenhouse gas emissions reduction, water usage reduction and other waste management policies?	V		Please refer to "7.2.1 Environmental Protection" on pages 119-123 of this annual report.	None
4. Social Topic (1) Does the Company set policies and procedures in compliance with regulations and internationally recognized human rights principles?  (2) Has the Company established appropriately managed employee welfare measures (include salary and compensation, leave and others), and link operational performance or achievements with employee salary and compensation?  (3) Does the Company provide employees with a safe and healthy working environment, with regular safety and health training?  (4) Has the Company established effective career development training plans?  (5) Does the Company's product and service comply with related regulations and international rules for customers' health and safety, privacy, sales, labelling and set policies to protect consumers' rights and consumer appeal procedures?  (6) Does the Company set supplier management policy and request suppliers to comply with related standards on the topics of environmental, occupational safety and health or labor right, and their implementation status?	V		(1) Please refer to "5.5 Human Capital" on pages 82-87 of this Annual Report.  (2) Please refer to "5.5 Human Capital" on pages 82-87 of this Annual Report.  (3) Please refer to "7.2.3 Safety and Health" on pages 125-128 of this Annual Report.  (4) Please refer to "5.5 Human Capital" on pages 82-87 of this Annual Report.  (5) Not applicable as TSMC is not an end product manufacturer.  (6) Please refer to "Supplier Management" on page 128 of this annual report.	None
5. Does the Company refer to international reporting rules or guidelines to publish CSR Report to disclose non-financial information of the Company? Has the said Report acquire 3 <sup>rd</sup> certification party verification or statement of assurance?	V		TSMC has published a "Corporate Social Responsibility Report" since 2008, and acquired 3 <sup>rd</sup> certification party verification or statement of assurance, and discloses this on the Company's website ( <a href="https://www.tsmc.com/english/csr/index.htm">https://www.tsmc.com/english/csr/index.htm</a> ).	None
6. If the company has established its corporate social responsibility code of practice according to "Listed Companies Corporate Social Responsibility Code of Practice," please describe the operational status and differences. TSMC follows the Corporate Social Responsibility Policy set by the Chairman, Dr. Mark Liu. For corporate social responsibility operational status, please refer to "7. Corporate Social Responsibility" on pages 113-133 of this annual report and corporate social responsibility related information in our website: <a href="https://www.tsmc.com/english/csr/index.htm">https://www.tsmc.com/english/csr/index.htm</a>				
7. Other important information to facilitate better understanding of the company's implementation of corporate social responsibility. Please refer to TSMC's website for its corporate social responsibility implementation status: <a href="https://www.tsmc.com/english/csr/index.htm">https://www.tsmc.com/english/csr/index.htm</a>				



# Subsidiary Information and Other Special Notes

## 8.1 Subsidiaries

### 8.1.1 TSMC Subsidiaries Chart (Note 1)



Note 1: TSMC SolarEurope GmbH has completed the liquidation procedures in March 2019.

On January 10, 2020, TSMC Design Technology Japan, Inc., a 100% owned subsidiary of TSMC, was established.

Note 2: The subsidiary is under liquidation procedures.

## 8.1.2 Business Scope of TSMC and Its Subsidiaries

TSMC and its subsidiaries strive to provide the best foundry services. Subsidiaries in North America, Europe, Japan, China and South Korea are dedicated to serving TSMC customers on a timely basis or providing wafer capacity for customers worldwide. Among the subsidiaries of TSMC, WaferTech in the United States and TSMC China provide additional 8-inch wafer capacity while TSMC Nanjing provides 12-inch wafer capacity. Other subsidiaries support the Company's core foundry business with related services such as design service and investment in start-up companies involved in design, manufacturing, and other related businesses in the semiconductor industry.

## 8.1.3 TSMC Subsidiaries

Unit: NT\$ (USD, EUR, JPY, KRW, RMB, CAD) thousands

Company (Note 1)	Date of Incorporation	Place of Registration	Capital Stock	Business Activities	As of 12/31/2019
TSMC North America	Jan. 18, 1988	San Jose, California, U.S.	US\$ 11,000	Selling and marketing of integrated circuits and semiconductor devices	
TSMC Europe B.V.	Mar. 04, 1994	Amsterdam, The Netherlands	EUR 100	Customer service and supporting activities	
TSMC Japan Limited	Sep. 10, 1997	Yokohama, Japan	JPY 300,000	Customer service and supporting activities	
TSMC Korea Limited	May 02, 2006	Seoul, Korea	KRW 400,000	Customer service and supporting activities	
TSMC China Company Limited	Aug. 04, 2003	Shanghai, China	RMB 4,502,080	Manufacturing, selling, testing, and computer-aided design of integrated circuits and other semiconductor devices	
TSMC Nanjing Company Limited	May 16, 2016	Nanjing, China	RMB 6,650,119	Manufacturing, selling, testing, and computer-aided design of integrated circuits and other semiconductor devices	
TSMC Technology, Inc.	Feb. 20, 1996	Delaware, U.S.	US\$ 0.001	Engineering support activities	
InveStar Semiconductor Development Fund, Inc. (Note 2)	Sep. 10, 1996	Cayman Islands	US\$ 489	Investing in new start-up technology companies	
InveStar Semiconductor Development Fund, Inc. (II) LDC. (Note 2)	Aug. 25, 2000	Cayman Islands	US\$ 0	Investing in new start-up technology companies	
TSMC Development, Inc.	Feb. 16, 1996	Delaware, U.S.	US\$ 0.001	Investing in companies involved in the manufacturing related business in the semiconductor industry	
WaferTech, LLC	Jun. 03, 1996	Delaware, U.S.	US\$ 0	Manufacturing, selling, and testing of integrated circuits and other semiconductor devices	
TSMC Partners, Ltd.	Mar. 26, 1998	British Virgin Islands	US\$ 988,268	Investing in companies involved in the design, manufacture, and other related business in the semiconductor industry and other investment activities	
TSMC Design Technology Canada Inc.	May 28, 2007	Ontario, Canada	CAD 2,434	Engineering support activities	
TSMC Global Ltd.	Jul. 13, 2006	British Virgin Islands	US\$ 11,284,000	Investment activities	
VentureTech Alliance Fund II, L.P.	Feb. 27, 2004	Cayman Islands	US\$ 3,487	Investing in new start-up technology companies	
VentureTech Alliance Fund III, L.P.	Mar. 25, 2006	Cayman Islands	US\$ 96,519	Investing in new start-up technology companies	
Growth Fund Limited	May 30, 2007	Cayman Islands	US\$ 2,504	Investing in new start-up technology companies	
VisEra Technologies Company Ltd.	Dec. 01, 2003	Hsinchu, Taiwan	NT\$ 2,911,531	Engaged in manufacturing electronic spare parts and in researching, developing, designing, manufacturing, selling, packaging and testing of color filter	

Note 1: On January 10, 2020, TSMC Design Technology Japan, Inc. was established in Yokohama, Japan with capital stock of JPY 150,000 thousands. It is engaged in engineering support activities.  
 Note 2: InveStar Semiconductor Development Fund, Inc. and InveStar Semiconductor Development Fund, Inc. (II) LDC. are under liquidation procedures.

## 8.1.4 Shareholders in Common of TSMC and Its Subsidiaries with Deemed Control and Subordination: None.

## 8.1.5 Rosters of Directors, Supervisors, and Presidents of TSMC's Subsidiaries

Unit: NT\$ (USD), except shareholding

As of 12/31/2019

Company (Note 1)	Title	Name	Shareholding	
			Shares (Investment Amount)	% (Investment Holding %)
TSMC North America	Director Director President	Sylvia Fang Rick Cassidy David Keller	TSMC holds 11,000,000 shares	100%
TSMC Europe B.V.	Director Director President	Wendell Huang Maria Marced Maria Marced	TSMC holds 200 shares	100%
TSMC Japan Limited	Director Director President	Sylvia Fang Makoto Onodera Makoto Onodera	TSMC holds 6,000 shares	100%
TSMC Korea Limited	Director Director Director	C.C. Pan Chih-Chun Tsai Wendell Huang	TSMC holds 80,000 shares	100%
TSMC China Company Limited	Chairman Director Director Supervisor President	F.C. Tseng J.K. Wang L.C. Tu Lora Ho L.C. Tu	(TSMC's investment US\$596,000,000)	(100%)
TSMC Nanjing Company Limited	Chairman Director Director Director Supervisor Supervisor President	Lora Ho J.K. Wang Cliff Hou Roger Luo Wendell Huang Sylvia Fang Roger Luo	(TSMC's investment US\$1,000,000,000)	(100%)
TSMC Technology, Inc.	Chairman Director President	Wendell Huang Cliff Hou Cliff Hou	TSMC Partners, Ltd. holds 10 shares	100%
InveStar Semiconductor Development Fund, Inc. (Note 2)	Director	Wendell Huang	TSMC Partners, Ltd. holds 582,523 shares	97.09%
InveStar Semiconductor Development Fund, Inc. (II) LDC (Note 2)	Director	Wendell Huang	TSMC Partners, Ltd. holds 9,298,625 shares	97.09%
TSMC Development, Inc.	Chairman Director President	Wendell Huang Sylvia Fang Wendell Huang	TSMC Partners, Ltd. holds 10 shares	100%
WaferTech, LLC	Director Director President	Y.L. Wang Wendell Huang Tsung-Chia Kuo	TSMC Development, Inc. holds 293,636,833 shares	100%

(Continued)

Company (Note 1)	Title	Name	Shareholding	
			Shares (Investment Amount)	% (Investment Holding %)
TSMC Partners, Ltd.	Director Director President	Wendell Huang Sylvia Fang Wendell Huang	- - TSMC holds 988,268,244 shares	- - 100%
TSMC Design Technology Canada Inc.	Director Director Director President	Cliff Hou Cormac Michael O'Connell Sylvia Fang Cliff Hou	- - - TSMC Partners, Ltd. holds 2,300,000 shares	- - - 100%
TSMC Global Ltd.	Director Director	Wendell Huang Sylvia Fang	- - TSMC holds 11,284 shares	- - 100%
VentureTech Alliance Fund II, L.P.	None	None	(TSMC's investment US\$3,189,066)	(98.00%)
VentureTech Alliance Fund III, L.P.	None	None	(TSMC's investment US\$94,589,012)	(98.00%)
Growth Fund Limited	None	None	(VentureTech Alliance Fund III, L.P.'s investment US\$2,503,768)	(100%)
VisEra Technologies Company Ltd.	Chairman Director Director Supervisor President	Robert Kuan C.S. Yoo George Liu Wendell Huang S.C. Hsin	54,600 shares - - - - TSMC holds 253,120,000 shares	0.02% - - - 86.94%

Note 1: On January 10, 2020, TSMC Design Technology Japan, Inc., a 100% owned subsidiary of TSMC, was established. Dr. Cliff Hou and Mr. Wendell Huang are the directors of TSMC Design Technology Japan, Inc.

Note 2: InveStar Semiconductor Development Fund, Inc. and InveStar Semiconductor Development Fund, Inc. (II) LDC. are under liquidation procedures.

### 8.1.6 Operational Highlights of TSMC Subsidiaries

Unit: NT\$ thousands, except EPS (NT\$)

Company	Capital Stock	Assets	Liabilities	Net Worth	Net Revenues	Income (Loss) from Operation	Net Income (Loss)	Basic Earnings (Loss) Per Share
TSMC North America	329,868	93,975,628	89,405,802	4,569,825	642,456,504	267,363	416,366	37.85
TSMC Europe B.V.	3,365	761,257	298,777	462,479	495,777	53,410	37,621	188,106.27
TSMC Japan Limited	82,530	211,952	69,332	142,620	231,708	9,358	3,254	542.33
TSMC Korea Limited	10,400	45,163	4,435	40,727	20,050	1,847	2,196	27.45
TSMC Development, Inc.	0.03	29,567,197	0	29,567,197	1,470,591	1,470,305	1,338,673	133,867,259.80
TSMC Partners, Ltd.	29,636,188	53,455,518	0	53,455,518	2,215,060	2,208,823	2,202,709	2.23
TSMC Global Ltd.	338,384,592	404,432,559	6,695,289	397,737,270	12,300,693	11,592,365	11,592,187	1,027,311.89
WaferTech, LLC	0	5,332,211	618,940	4,713,271	6,841,533	1,003,240	843,483	2.87
TSMC China Company Limited	19,380,554	60,103,992	2,745,525	57,358,467	16,218,476	3,255,953	4,037,216	NA
TSMC Nanjing Company Limited	28,627,434	49,441,326	28,032,476	21,408,850	18,312,861	1,340,599	1,289,672	NA
VisEra Technologies Company Ltd.	2,911,531	6,322,477	1,137,005	5,185,472	3,395,724	718,693	613,841	2.11
TSMC Technology, Inc.	0.03	1,316,214	645,676	670,538	2,444,373	116,339	100,661	10,066,067.10
TSMC Design Technology Canada Inc.	55,979	276,637	37,495	239,141	323,548	29,413	30,494	13.26
InveStar Semiconductor Development Fund, Inc.	14,663	0	0	0	0	10	10	0.02
InveStar Semiconductor Development Fund, Inc. (II) LDC.	0	0	0	0	0	0	0	0.00
VentureTech Alliance Fund II, L.P.	104,577	70,253	0	70,253	2,205	(2,899)	(3,409)	NA
VentureTech Alliance Fund III, L.P.	2,894,424	212,437	0	212,437	5,015	1,191	1,191	NA
Growth Fund Limited	75,083	124,648	0	124,648	0	(1,351)	(1,351)	NA

**8.2 Status of TSMC Common Shares and ADRs Acquired, Disposed of, and Held by Subsidiaries:** None.

### 8.3 Special Notes

**8.3.1 Private Placement Securities in 2019 and as of the Date of this Annual Report:** None.

**8.3.2 The Listing of Penalties, Major Deficits, and State of Any Efforts to Make Improvements, Arising from Any Legal Penalties Imposed by Regulatory Authorities on the Company or Its Employees, or any Company**

**Punishment toward Employees for Violating Internal Control Rules, Where Such Penalties or Punishments May Have Material Impacts on Shareholders' Interests or Securities Prices, in 2019 and as of the Date of this Annual Report:** None.

**8.3.3 Any Events in 2019 and as of the Date of this Annual Report that Had Material Impacts on Shareholders' Interests or Securities Prices as Stated in Item 3 Paragraph 2 of Article 36 of Securities and Exchange Law of Taiwan:** None.

**8.3.4 Other Necessary Supplement:** None.

# Contact Information

## Taiwan

### Corporate Headquarters & Fab 12A

8, Li-Hsin Rd. 6, Hsinchu Science Park, Hsinchu 30078, Taiwan, R.O.C.  
Tel: +886-3-5636688 Fax: +886-3-5637000

### R&D Center & Fab 12B

168, Park Ave. 2, Hsinchu Science Park, Hsinchu 30075, Taiwan, R.O.C.  
Tel: +886-3-5636688 Fax: +886-3-6687827

### Fab 2, Fab 5

121, Park Ave. 3, Hsinchu Science Park, Hsinchu 30077, Taiwan, R.O.C.  
Tel: +886-3-5636688 Fax: +886-3-5781546

### Fab 3

9, Creation Rd. 1, Hsinchu Science Park, Hsinchu 30077, Taiwan, R.O.C.  
Tel: +886-3-5636688 Fax: +886-3-5781548

### Fab 6

1, Nan-Ke North Rd., Tainan Science Park, Tainan 74144, Taiwan, R.O.C.  
Tel: +886-6-5056688 Fax: +886-6-5052057

### Fab 8

25, Li-Hsin Rd., Hsinchu Science Park, Hsinchu 30078, Taiwan, R.O.C.  
Tel: +886-3-5636688 Fax: +886-3-5662051

### Fab 14A

1-1, Nan-Ke North Rd., Tainan Science Park, Tainan 74144, Taiwan, R.O.C.  
Tel: +886-6-5056688 Fax: +886-6-5051262

### Fab 14B

17, Nan-Ke 9th Rd., Tainan Science Park, Tainan 74144, Taiwan, R.O.C.  
Tel: +886-6-5056688 Fax: +886-6-5055217

## Asia

### TSMC China Company Limited

4000, Wen Xiang Road, Songjiang, Shanghai, China  
Postcode: 201616  
Tel: +86-21-57768000 Fax: +86-21-57762525

### TSMC Design Technology Japan, Inc.

10F, Minatomirai Grand Central Tower, 4-6-2, Minatomirai, Nishi-ku,  
Yokohama, Kanagawa 220-0012, Japan  
Tel: +81-45-6820470 Fax: +81-45-6820673

### TSMC Nanjing Company Limited

16, Zifeng Road, Pukou Economic Development Zone, Nanjing  
Jiangsu Province, China  
Postcode: 211806  
Tel: +86-25-57668000 Fax: +86-25-57712395

### TSMC Japan Limited

21F, Queen's Tower C, 2-3-5, Minatomirai, Nishi-ku  
Yokohama, Kanagawa, 220-6221, Japan  
Tel: +81-45-6820470 Fax: +81-45-6820673

### TSMC Korea Limited

15F, AnnJay Tower, 208, Teheran-ro, Gangnam-gu  
Seoul 06220, Korea  
Tel: +82-2-20511688

### Fab 15A

1, Keya Rd. 6, Central Taiwan Science Park, Taichung 42882, Taiwan, R.O.C.  
Tel: +886-4-27026688 Fax: +886-4-25607548

### Fab 15B

1, Xinke Rd., Central Taiwan Science Park, Taichung 40763, Taiwan, R.O.C.  
Tel: +886-4-27026688 Fax: +886-4-24630372

### Fab 18

8, Beiyuan Rd. 2, Tainan Science Park, Tainan 74543, Taiwan, R.O.C.  
Tel: +886-6-5056688 Fax: +886-6-5050363

### Advanced Backend Fab 1

6, Creation Rd. 2, Hsinchu Science Park, Hsinchu 30077, Taiwan, R.O.C.  
Tel: +886-3-5636688 Fax: +886-3-5773628

### Advanced Backend Fab 2

1-1, Nan-Ke North Rd., Tainan Science Park, Tainan 74144, Taiwan, R.O.C.  
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### Advanced Backend Fab 3

101, Longyuan 6th Rd., Longtan Dist., Taoyuan City 32542, Taiwan R.O.C.  
Tel: +886-3-5636688 Fax: +886-3-4804250

### Advanced Backend Fab 5

5, Keya W. Rd., Central Taiwan Science Park, Taichung 42882, Taiwan, R.O.C.  
Tel: +886-4-27026688 Fax: +886-4-25609631

### VisEra Technologies Company Limited

12, Dusing Rd. 1, Hsinchu Science Park, Hsinchu City 30078, Taiwan R.O.C.  
Tel: +886-3-6668788 Fax: +886-3-6662858

## Europe / North America

### TSMC Europe B.V.

World Trade Center, Zuidplein 60, 1077 XV Amsterdam, The Netherlands  
Tel: +31-20-3059900

### TSMC Design Technology Canada Inc.

535 Legget Dr., Suite 600, Kanata, ON K2K 3B8, Canada  
Tel: +613-576-1990 Fax: +613-576-1999

### TSMC North America

2851 Junction Avenue, San Jose, CA 95134, U.S.A.  
Tel: +1-408-3828000 Fax: +1-408-3828008

### TSMC Technology, Inc

2851 Junction Avenue, San Jose, CA 95134, U.S.A.  
Tel: +1-408-3828000

### WaferTech L.L.C.

5509 N.W. Parker Street, Camas, WA 98607-9299 U.S.A.  
Tel: +1-360-8173000 Fax: +1-360-8173590

### TSMC Spokesperson

Name: Wendell Huang  
Title: Vice President & CFO  
Tel: +886-3-5636688 Fax: +886-3-5637000  
Email: press@tsmc.com

### TSMC Deputy Spokesperson

Name: Nina Kao  
Title: Head of PR Department  
Tel: +886-3-5636688 Fax: +886-3-5637000  
Email: press@tsmc.com

### Auditors

Company: Deloitte & Touche  
Auditors: Mei-Yen Chiang, Yu-Feng Huang  
Address: 20F, No. 100, Songren Rd., Xinyi Dist., Taipei 11073, Taiwan, R.O.C.  
Tel: +886-2-27259988 Fax: +886-2-40516888  
Website: http://www.deloitte.com.tw

### Common Share Transfer Agent and Registrar

Company: The Transfer Agency Department of CTBC Bank  
Address: 5F, 83, Sec. 1, Chung-Ching S. Rd., Taipei 100004, Taiwan, R.O.C.  
Tel: +886-2-66365566 Fax: +886-2-23116723  
Website: http://www.ctcbcbank.com

### ADR Depository Bank

Company: Citibank, N.A.  
Depository Receipts Services  
Address: 388 Greenwich Street, New York, NY 10013, U.S.A.  
Website: http://www.citi.com/dr  
Tel: +1-877-2484237 (toll free) Tel: +1-781-5754555 (out of US)  
Fax: +1-201-3243284  
E-mail: citibank@shareholders-online.com

TSMC's depository receipts of the common shares are listed on New York Stock Exchange (NYSE) under the symbol TSM. The information relating to TSM is available at http://www.nyse.com and http://mops.twse.com.tw



# TSMC Annual Report 2019 (II)

## Financial Statements





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**Taiwan Semiconductor Manufacturing  
Company Limited and Subsidiaries**

**Consolidated Financial Statements for the  
Years Ended December 31, 2019 and 2018 and  
Independent Auditors' Report**



## **REPRESENTATION LETTER**

The entities that are required to be included in the combined financial statements of Taiwan Semiconductor Manufacturing Company Limited as of and for the year ended December 31, 2019, under the Criteria Governing the Preparation of Affiliation Reports, Consolidated Business Reports and Consolidated Financial Statements of Affiliated Enterprises are the same as those included in the consolidated financial statements prepared in conformity with the International Financial Reporting Standard 10, “Consolidated Financial Statements.” In addition, the information required to be disclosed in the combined financial statements is included in the consolidated financial statements. Consequently, Taiwan Semiconductor Manufacturing Company Limited and Subsidiaries do not prepare a separate set of combined financial statements.

Very truly yours,

TAIWAN SEMICONDUCTOR MANUFACTURING COMPANY LIMITED

By

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MARK LIU  
Chairman

February 11, 2020

## INDEPENDENT AUDITORS' REPORT

The Board of Directors and Shareholders  
Taiwan Semiconductor Manufacturing Company Limited

### Opinion

We have audited the accompanying consolidated financial statements of Taiwan Semiconductor Manufacturing Company Limited and its subsidiaries (the "Company"), which comprise the consolidated balance sheets as of December 31, 2019 and 2018, and the consolidated statements of comprehensive income, changes in equity and cash flows for the years then ended, and the notes to the consolidated financial statements, including a summary of significant accounting policies.

In our opinion, the accompanying consolidated financial statements present fairly, in all material respects, the consolidated financial position of the Company as of December 31, 2019 and 2018, and its consolidated financial performance and its consolidated cash flows for the years then ended in accordance with the Regulations Governing the Preparation of Financial Reports by Securities Issuers and the International Financial Reporting Standards (IFRS), International Accounting Standards (IAS), IFRIC Interpretations (IFRIC), and SIC Interpretations (SIC) endorsed and issued into effect by the Financial Supervisory Commission of the Republic of China.

### Basis for Opinion

We conducted our audits in accordance with the Regulations Governing Auditing and Attestation of Financial Statements by Certified Public Accountants and auditing standards generally accepted in the Republic of China. Our responsibilities under those standards are further described in the Auditors' Responsibilities for the Audit of the Consolidated Financial Statements section of our report. We are independent of the Company in accordance with The Norm of Professional Ethics for Certified Public Accountant of the Republic of China and we have fulfilled our other ethical responsibilities in accordance with these requirements. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our opinion.

### Key Audit Matters

Key audit matters are those matters that, in our professional judgment, were of most significance in our audit of the consolidated financial statements for the year ended December 31, 2019. These matters were addressed in the context of our audit of the consolidated financial statements as a whole, and in forming our opinion thereon, and we do not provide a separate opinion on these matters.

Key audit matters for the Company's consolidated financial statements for the year ended December 31, 2019 are stated as follows:

**Property, plant and equipment (PP&E) – commencement of depreciation related to PP&E classified as equipment under installation and construction in progress (EUI/CIP)**

Refer to Notes 4, 5 and 14 to the consolidated financial statements.

The Company's evaluation of when to commence depreciation of EUI/CIP involves determining when the assets are available for their intended use. The criteria the Company uses to determine whether EUI/CIP are available for their intended use involves subjective judgements and assumptions about the conditions necessary for the assets to be capable of operating in the intended manner. Changes in these assumptions could have a significant impact on when depreciation is recognized.

Given the subjectivity in determining the date to commence depreciation of EUI/CIP, performing audit procedures to evaluate the reasonableness of the Company's judgements and assumptions required a high degree of auditor judgement. Consequently, the validity of commencement of depreciation related to PP&E classified as EUI/CIP is identified as a key audit matter.

Our audit procedures related to the evaluation of when to commence depreciation of EUI/CIP included the following, among others:

1. We read the Company's policy and understand the criteria used to determine when to commence depreciation.
2. We tested the effectiveness of the controls over the evaluation of when to commence depreciation of EUI/CIP.
3. We sampled EUI/CIP at year end and performed the following for each selection:
  - a. Evaluated whether the selection did not meet the criteria specified by the Company for commencement of depreciation.
  - b. Observed the assets and evaluated their status at year end.
4. We sampled and evaluated whether the selection of EUI/CIP met the criteria specified by the Company for commencement of depreciation during the year.
5. We sampled and evaluated whether the selection of EUI/CIP met the criteria specified by the Company for commencement of depreciation subsequent to year end.

**Other Matter**

We have also audited the parent company only financial statements of Taiwan Semiconductor Manufacturing Company Limited as of and for the years ended December 31, 2019 and 2018 on which we have issued an unmodified opinion.

**Responsibilities of Management and Those Charged with Governance for the Consolidated Financial Statements**

Management is responsible for the preparation and fair presentation of the consolidated financial statements in accordance with the Regulations Governing the Preparation of Financial Reports by Securities Issuers and the IFRS, IAS, IFRIC, and SIC endorsed and issued into effect by the Financial Supervisory Commission of the Republic of China, and for such internal control as management determines is necessary to enable the preparation of consolidated financial statements that are free from material misstatement, whether due to fraud or error.

In preparing the consolidated financial statements, management is responsible for assessing the Company's ability to continue as a going concern, disclosing, as applicable, matters related to going concern and using the going concern basis of accounting unless management either intends to liquidate the Company or to cease operations, or has no realistic alternative but to do so.

Those charged with governance (including members of the Audit Committee) are responsible for overseeing the Company's financial reporting process.

### **Auditors' Responsibilities for the Audit of the Consolidated Financial Statements**

Our objectives are to obtain reasonable assurance about whether the consolidated financial statements as a whole are free from material misstatement, whether due to fraud or error, and to issue an auditors' report that includes our opinion. Reasonable assurance is a high level of assurance, but is not a guarantee that an audit conducted in accordance with the auditing standards generally accepted in the Republic of China will always detect a material misstatement when it exists. Misstatements can arise from fraud or error and are considered material if, individually or in the aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of these consolidated financial statements.

As part of an audit in accordance with the auditing standards generally accepted in the Republic of China, we exercise professional judgment and maintain professional skepticism throughout the audit. We also:

1. Identify and assess the risks of material misstatement of the consolidated financial statements, whether due to fraud or error, design and perform audit procedures responsive to those risks, and obtain audit evidence that is sufficient and appropriate to provide a basis for our opinion. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal control.
2. Obtain an understanding of internal control relevant to the audit in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the Company's internal control.
3. Evaluate the appropriateness of accounting policies used and the reasonableness of accounting estimates and related disclosures made by management.
4. Conclude on the appropriateness of management's use of the going concern basis of accounting and, based on the audit evidence obtained, whether a material uncertainty exists related to events or conditions that may cast significant doubt on the Company's ability to continue as a going concern. If we conclude that a material uncertainty exists, we are required to draw attention in our auditors' report to the related disclosures in the consolidated financial statements or, if such disclosures are inadequate, to modify our opinion. Our conclusions are based on the audit evidence obtained up to the date of our auditors' report. However, future events or conditions may cause the Company to cease to continue as a going concern.
5. Evaluate the overall presentation, structure and content of the consolidated financial statements, including the disclosures, and whether the consolidated financial statements represent the underlying transactions and events in a manner that achieves fair presentation.
6. Obtain sufficient appropriate audit evidence regarding the financial information of the entities or business activities within the Company to express an opinion on the consolidated financial statements. We are responsible for the direction, supervision and performance of the group audit. We remain solely responsible for our audit opinion.

We communicate with those charged with governance regarding, among other matters, the planned scope and timing of the audit and significant audit findings, including any significant deficiencies in internal control that we identify during our audit.

We also provide those charged with governance with a statement that we have complied with relevant ethical requirements regarding independence, and to communicate with them all relationships and other matters that may reasonably be thought to bear on our independence, and where applicable, related safeguards.

From the matters communicated with those charged with governance, we determine those matters that were of most significance in the audit of the consolidated financial statements for the year ended December 31, 2019 and are therefore the key audit matters. We describe these matters in our auditors' report unless law or regulation precludes public disclosure about the matter or when, in extremely rare circumstances, we determine that a matter should not be communicated in our report because the adverse consequences of doing so would reasonably be expected to outweigh the public interest benefits of such communication.

The engagement partners on the audit resulting in this independent auditors' report are Mei Yen Chiang and Yu Feng Huang.

Deloitte & Touche  
Taipei, Taiwan  
Republic of China

February 11, 2020

#### Notice to Readers

*The accompanying consolidated financial statements are intended only to present the consolidated financial position, financial performance and cash flows in accordance with accounting principles and practices generally accepted in the Republic of China and not those of any other jurisdictions. The standards, procedures and practices to audit such consolidated financial statements are those generally applied in the Republic of China.*

*For the convenience of readers, the independent auditors' report and the accompanying consolidated financial statements have been translated into English from the original Chinese version prepared and used in the Republic of China. If there is any conflict between the English version and the original Chinese version or any difference in the interpretation of the two versions, the Chinese-language independent auditors' report and consolidated financial statements shall prevail.*

**Taiwan Semiconductor Manufacturing Company Limited and Subsidiaries**

**CONSOLIDATED BALANCE SHEETS**  
**(In Thousands of New Taiwan Dollars)**

ASSETS	December 31, 2019		December 31, 2018	
	Amount	%	Amount	%
<b>CURRENT ASSETS</b>				
Cash and cash equivalents (Note 6)	\$ 455,399,336	20	\$ 577,814,601	28
Financial assets at fair value through profit or loss (Note 7)	326,839	-	3,504,590	-
Financial assets at fair value through other comprehensive income (Note 8)	127,396,577	6	99,561,740	5
Financial assets at amortized cost (Note 9)	299,884	-	14,277,615	1
Hedging financial assets (Note 10)	25,884	-	23,497	-
Notes and accounts receivable, net (Note 11)	138,908,589	6	128,613,391	6
Receivables from related parties (Note 33)	862,070	-	584,412	-
Other receivables from related parties (Note 33)	51,653	-	65,028	-
Inventories (Notes 5 and 12)	82,981,196	4	103,230,976	5
Other financial assets (Note 34)	11,041,091	-	18,597,448	1
Other current assets	5,320,795	-	5,406,423	-
Total current assets	<u>822,613,914</u>	<u>36</u>	<u>951,679,721</u>	<u>46</u>
<b>NONCURRENT ASSETS</b>				
Financial assets at fair value through other comprehensive income (Note 8)	4,124,337	-	3,910,681	-
Financial assets at amortized cost (Note 9)	7,348,914	-	7,528,277	-
Investments accounted for using equity method (Note 13)	18,698,788	1	17,865,838	1
Property, plant and equipment (Notes 5 and 14)	1,352,377,405	60	1,072,050,279	51
Right-of-use assets (Notes 5 and 15)	17,232,402	1	-	-
Intangible assets (Notes 5 and 16)	20,653,028	1	17,002,137	1
Deferred income tax assets (Notes 5 and 27)	17,928,358	1	16,806,387	1
Refundable deposits	2,084,968	-	1,700,071	-
Other noncurrent assets	1,742,918	-	1,584,647	-
Total noncurrent assets	<u>1,442,191,118</u>	<u>64</u>	<u>1,138,448,317</u>	<u>54</u>
<b>TOTAL</b>	<b><u>\$ 2,264,805,032</u></b>	<b><u>100</u></b>	<b><u>\$ 2,090,128,038</u></b>	<b><u>100</u></b>
<b>LIABILITIES AND EQUITY</b>				
<b>CURRENT LIABILITIES</b>				
Short-term loans (Notes 17 and 30)	\$ 118,522,290	5	\$ 88,754,640	4
Financial liabilities at fair value through profit or loss (Note 7)	982,349	-	40,825	-
Hedging financial liabilities (Note 10)	1,798	-	155,832	-
Accounts payable	38,771,066	2	32,980,933	2
Payables to related parties (Note 33)	1,434,900	-	1,376,499	-
Salary and bonus payable	16,272,353	1	14,471,372	1
Accrued profit sharing bonus to employees and compensation to directors and supervisors (Note 29)	23,648,903	1	23,981,154	1
Payables to contractors and equipment suppliers	140,810,703	6	43,133,659	2
Cash dividends payable (Note 21)	129,651,902	6	-	-
Income tax payable (Notes 5 and 27)	32,466,156	1	38,987,053	2
Long-term liabilities - current portion (Notes 18 and 30)	31,800,000	1	34,900,000	2
Accrued expenses and other current liabilities (Notes 5, 15, 20, 22 and 30)	56,373,281	3	61,760,619	3
Total current liabilities	<u>590,735,701</u>	<u>26</u>	<u>340,542,586</u>	<u>17</u>
<b>NONCURRENT LIABILITIES</b>				
Bonds payable (Notes 18 and 30)	25,100,000	1	56,900,000	3
Deferred income tax liabilities (Notes 5 and 27)	344,393	-	233,284	-
Lease liabilities (Notes 5, 15 and 30)	15,041,833	1	-	-
Net defined benefit liability (Note 19)	9,182,496	-	9,651,405	-
Guarantee deposits (Notes 20 and 30)	176,904	-	3,353,378	-
Others	2,128,279	-	1,950,989	-
Total noncurrent liabilities	<u>51,973,905</u>	<u>2</u>	<u>72,089,056</u>	<u>3</u>
Total liabilities	<u>642,709,606</u>	<u>28</u>	<u>412,631,642</u>	<u>20</u>
<b>EQUITY ATTRIBUTABLE TO SHAREHOLDERS OF THE PARENT</b>				
Capital stock (Note 21)	<u>259,303,805</u>	<u>11</u>	<u>259,303,805</u>	<u>12</u>
Capital surplus (Note 21)	<u>56,339,709</u>	<u>3</u>	<u>56,315,932</u>	<u>3</u>
Retained earnings (Note 21)				
Appropriated as legal capital reserve	311,146,899	14	276,033,811	13
Appropriated as special capital reserve	10,675,106	-	26,907,527	1
Unappropriated earnings	1,011,512,974	45	1,073,706,503	52
Others (Note 21)	1,333,334,979	59	1,376,647,841	66
Equity attributable to shareholders of the parent	(27,568,369)	(1)	(15,449,913)	(1)
NON - CONTROLLING INTERESTS				
Total equity	<u>1,621,410,124</u>	<u>72</u>	<u>1,676,817,665</u>	<u>80</u>
<b>TOTAL</b>	<b><u>\$ 2,264,805,032</u></b>	<b><u>100</u></b>	<b><u>\$ 2,090,128,038</u></b>	<b><u>100</u></b>

The accompanying notes are an integral part of the consolidated financial statements.

# Taiwan Semiconductor Manufacturing Company Limited and Subsidiaries

## **CONSOLIDATED STATEMENTS OF COMPREHENSIVE INCOME** **(In Thousands of New Taiwan Dollars, Except Earnings Per Share)**

	<b>2019</b>	<b>2018</b>		
	<b>Amount</b>	<b>%</b>	<b>Amount</b>	<b>%</b>
NET REVENUE (Notes 5, 22, 33 and 39)	\$1,069,985,448	100	\$1,031,473,557	100
COST OF REVENUE (Notes 5, 12, 29, 33 and 37)	<u>577,286,947</u>	<u>54</u>	<u>533,487,516</u>	<u>52</u>
GROSS PROFIT BEFORE REALIZED (UNREALIZED) GROSS PROFIT ON SALES TO ASSOCIATES	492,698,501	46	497,986,041	48
REALIZED (UNREALIZED) GROSS PROFIT ON SALES TO ASSOCIATES	<u>3,395</u>	<u>-</u>	<u>(111,788)</u>	<u>-</u>
GROSS PROFIT	<u>492,701,896</u>	<u>46</u>	<u>497,874,253</u>	<u>48</u>
OPERATING EXPENSES (Notes 5, 29 and 33)				
Research and development	91,418,746	8	85,895,569	8
General and administrative	21,737,210	2	20,265,883	2
Marketing	<u>6,348,626</u>	<u>1</u>	<u>5,987,828</u>	<u>1</u>
Total operating expenses	<u>119,504,582</u>	<u>11</u>	<u>112,149,280</u>	<u>11</u>
OTHER OPERATING INCOME AND EXPENSES, NET (Notes 14, 15, 23 and 29)	<u>(496,224)</u>	<u>-</u>	<u>(2,101,449)</u>	<u>-</u>
INCOME FROM OPERATIONS (Note 39)	<u>372,701,090</u>	<u>35</u>	<u>383,623,524</u>	<u>37</u>
NON-OPERATING INCOME AND EXPENSES				
Share of profits of associates	2,844,222	-	3,057,781	-
Other income (Note 24)	16,606,669	1	14,852,814	2
Foreign exchange gain, net (Note 36)	2,095,217	-	2,438,171	-
Finance costs (Note 25)	(3,250,847)	-	(3,051,223)	-
Other gains and losses, net (Note 26)	<u>(1,151,015)</u>	<u>-</u>	<u>(3,410,804)</u>	<u>-</u>
Total non-operating income and expenses	<u>17,144,246</u>	<u>1</u>	<u>13,886,739</u>	<u>2</u>
INCOME BEFORE INCOME TAX	389,845,336	36	397,510,263	39
INCOME TAX EXPENSE (Notes 5 and 27)	<u>44,501,527</u>	<u>4</u>	<u>46,325,857</u>	<u>5</u>
NET INCOME	<u>345,343,809</u>	<u>32</u>	<u>351,184,406</u>	<u>34</u>

(Continued)

# Taiwan Semiconductor Manufacturing Company Limited and Subsidiaries

## **CONSOLIDATED STATEMENTS OF COMPREHENSIVE INCOME** **(In Thousands of New Taiwan Dollars, Except Earnings Per Share)**

	2019	2018		
	Amount	%	Amount	%
<b>OTHER COMPREHENSIVE INCOME (LOSS)</b>				
(Notes 5, 19, 21 and 27)				
Items that will not be reclassified subsequently to profit or loss:				
Remeasurement of defined benefit obligation	\$ 253,895	-	\$ (861,162)	-
Unrealized gain/(loss) on investments in equity instruments at fair value through other comprehensive income	334,327	-	(3,309,089)	-
Gain (loss) on hedging instruments	(109,592)	-	40,975	-
Share of other comprehensive loss of associates	(18,271)	-	(14,217)	-
Income tax benefit (expense) related to items that will not be reclassified subsequently	<u>(20,992)</u>	<u>--</u>	<u>195,729</u>	<u>--</u>
	<u>439,367</u>	<u>--</u>	<u>(3,947,764)</u>	<u>--</u>
Items that may be reclassified subsequently to profit or loss:				
Exchange differences arising on translation of foreign operations	(14,689,107)	(1)	14,562,386	1
Unrealized gain/(loss) on investments in debt instruments at fair value through other comprehensive income	2,566,373	-	(870,906)	-
Share of other comprehensive income (loss) of associates	<u>(140,195)</u>	<u>--</u>	<u>93,260</u>	<u>--</u>
	<u>(12,262,929)</u>	<u>(1)</u>	<u>13,784,740</u>	<u>1</u>
Other comprehensive income (loss) for the year, net of income tax	<u>(11,823,562)</u>	<u>(1)</u>	<u>9,836,976</u>	<u>1</u>
<b>TOTAL COMPREHENSIVE INCOME FOR THE YEAR</b>	<b><u>\$ 333,520,247</u></b>	<b><u>31</u></b>	<b><u>\$ 361,021,382</u></b>	<b><u>35</u></b>
<b>NET INCOME ATTRIBUTABLE TO:</b>				
Shareholders of the parent	\$ 345,263,668	32	\$ 351,130,884	34
Non-controlling interests	<u>80,141</u>	<u>--</u>	<u>53,522</u>	<u>--</u>
	<b><u>\$ 345,343,809</u></b>	<b><u>32</u></b>	<b><u>\$ 351,184,406</u></b>	<b><u>34</u></b>
<b>TOTAL COMPREHENSIVE INCOME ATTRIBUTABLE TO:</b>				
Shareholders of the parent	\$ 333,440,460	31	\$ 360,965,015	35
Non-controlling interests	<u>79,787</u>	<u>--</u>	<u>56,367</u>	<u>--</u>
	<b><u>\$ 333,520,247</u></b>	<b><u>31</u></b>	<b><u>\$ 361,021,382</u></b>	<b><u>35</u></b>

(Continued)

# Taiwan Semiconductor Manufacturing Company Limited and Subsidiaries

## CONSOLIDATED STATEMENTS OF COMPREHENSIVE INCOME (In Thousands of New Taiwan Dollars, Except Earnings Per Share)

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	2019	2018
	Income Attributable to Shareholders of the Parent	Income Attributable to Shareholders of the Parent
EARNINGS PER SHARE (NT\$, Note 28)		
Basic earnings per share	<u>\$ 13.32</u>	<u>\$ 13.54</u>
Diluted earnings per share	<u>\$ 13.32</u>	<u>\$ 13.54</u>

The accompanying notes are an integral part of the consolidated financial statements.

(Concluded)

**Taiwan Semiconductor Manufacturing Company Limited and Subsidiaries**  
**CONSOLIDATED STATEMENTS OF CHANGES IN EQUITY**  
 (In Thousands of New Taiwan Dollars)

Equity Attributable to Shareholders of the Parent										Others		
										Unrealized Gain (Loss) on Financial Assets at Fair Value Through Other Comprehensive Income	Total Non-controlling Interests	Total Equity
Capital Stock - Common Stock	Shares (In Thousands)	Amount	Capital Surplus	Legal Capital Reserve	Retained Earnings	Special Capital Reserve	Unappropriated Earnings	Total	Foreign Currency Translation Reserve	Stock-Based Employee Compensation	Total	Total
BALANCE, JANUARY 1, 2018	25,930,380	\$ 259,303,805	\$ 56,309,536	\$ 241,722,663	\$ -	\$ 993,195,668	\$ 123,918,331	\$ (26,697,680)	\$ (524,915)	\$ 4,226	\$ (27,228,659)	\$ 1,523,303,013
Appropriations of earnings	-	-	-	34,311,148	-	26,907,527	(34,311,148)	-	-	-	-	-
Legal capital reserve	-	-	-	-	-	(26,907,527)	(26,907,527)	-	-	-	-	-
Special capital reserve	-	-	-	-	-	(207,443,044)	(207,443,044)	-	-	-	-	-
Cash dividends to shareholders	-	-	-	-	-	(207,443,044)	(207,443,044)	-	-	-	-	-
<b>Total</b>												
Net income in 2018	-	-	-	-	-	35,130,894	35,130,894	-	-	-	-	-
Other comprehensive income (loss) in 2018, net of income tax	-	-	-	-	-	(765,274)	14,655,333	(4,097,465)	41,537	-	10,599,405	9,834,131
Total comprehensive income (loss) in 2018												
Disposal of investments in equity instruments at fair value through other comprehensive income	-	-	-	-	-	350,365,610	14,655,333	(4,097,465)	41,537	-	10,599,405	360,965,015
Basis adjustment for loss on hedging instruments	-	-	-	-	-	(1,193,056)	(1,193,056)	-	-	-	1,193,056	-
Adjustments to share of changes in equities of associates	-	-	-	-	-	-	-	-	(22,162)	(22,162)	-	(22,162)
From share of changes in equities of subsidiaries	-	-	(6,420)	-	-	-	-	-	8,447	8,447	-	2,027
Donation from shareholders	-	-	2,681	-	-	-	-	-	-	-	2,681	(2,681)
Decrease in non-controlling interests	-	-	10,135	-	-	-	-	-	-	10,135	6	10,141
BALANCE, DECEMBER 31, 2018	25,930,380	\$ 259,303,805	\$ 56,315,932	\$ 276,033,811	\$ 1,376,647,503	\$ 26,907,527	\$ 1,073,706,503	\$ (12,042,347)	\$ (3,429,324)	\$ 23,601	\$ (1,843)	\$ (15,449,913)
Appropriations of earnings	-	-	-	-	-	35,13,088	(35,13,088)	-	-	-	-	-
Legal capital reserve	-	-	-	-	-	(16,33,421)	(16,33,421)	-	-	-	-	-
Special capital reserve	-	-	-	-	-	(388,955,707)	(388,955,707)	-	-	-	-	-
Cash dividends to shareholders	-	-	-	-	-	(407,836,374)	(407,836,374)	-	-	-	-	-
<b>Total</b>												
Net income in 2019	-	-	-	-	-	345,263,668	345,263,668	-	-	-	345,263,668	801,141
Other comprehensive income (loss) in 2019, net of income tax	-	-	-	-	-	217,059	(14,829,053)	2,898,483	(109,697)	-	(11,823,208)	(354)
Total comprehensive income (loss) in 2019												
Disposal of investments in equity instruments at fair value through other comprehensive income	-	-	-	-	-	345,480,777	(14,829,053)	2,898,483	(109,697)	-	(12,040,267)	333,440,460
Basis adjustment for gain on hedging instruments	-	-	-	-	-	-	-	-	(162,118)	(162,118)	-	-
From share of changes in equities of associates	-	-	19,414	-	-	-	-	-	82,276	82,276	-	82,276
Donation from shareholders	-	-	370	-	-	-	-	-	-	-	370	(370)
Decrease in non-controlling interests	-	-	3,993	-	-	-	-	-	-	-	3,993	13
BALANCE, DECEMBER 31, 2019	25,930,380	\$ 259,303,805	\$ 56,315,932	\$ 276,033,811	\$ 1,376,647,503	\$ 26,907,527	\$ 1,073,706,503	\$ (24,871,400)	\$ (3,320)	\$ (190)	\$ 27,568,469	\$ 1,621,410,124
												\$ 685,302

The accompanying notes are an integral part of the consolidated financial statements.

# Taiwan Semiconductor Manufacturing Company Limited and Subsidiaries

## CONSOLIDATED STATEMENTS OF CASH FLOWS (In Thousands of New Taiwan Dollars)

	2019	2018
<b>CASH FLOWS FROM OPERATING ACTIVITIES</b>		
Income before income tax	\$ 389,845,336	\$ 397,510,263
Adjustments for:		
Depreciation expense	281,411,832	288,124,897
Amortization expense	5,472,409	4,421,405
Expected credit losses recognized (reversal) on investments in debt instruments	1,714	(2,383)
Finance costs	3,250,847	3,051,223
Share of profits of associates	(2,844,222)	(3,057,781)
Interest income	(16,189,374)	(14,694,456)
Share-based compensation	2,818	-
Loss on disposal or retirement of property, plant and equipment, net	949,965	1,005,644
Loss (gain) on disposal of intangible assets, net	2,377	(436)
Impairment loss (reversal of impairment loss) on property, plant and equipment	(301,384)	423,468
Loss on financial instruments at fair value through profit or loss, net	955,723	358,156
Loss (gain) on disposal of investments in debt instruments at fair value through other comprehensive income, net	(537,835)	989,138
Loss from disposal of subsidiaries	4,598	-
Unrealized (realized) gross profit on sales to associates	(3,395)	111,788
Loss (gain) on foreign exchange, net	(5,228,218)	2,916,659
Dividend income	(417,295)	(158,358)
Loss (gain) arising from fair value hedges, net	(13,091)	2,386
Gain on lease modification	(2,075)	-
Changes in operating assets and liabilities:		
Financial instruments at fair value through profit or loss	848,750	480,109
Notes and accounts receivable, net	(18,119,552)	(13,271,268)
Receivables from related parties	(277,658)	599,712
Other receivables from related parties	13,375	106,030
Inventories	20,249,780	(29,369,975)
Other financial assets	3,383,500	(4,601,295)
Other current assets	(76,263)	(513,051)
Other noncurrent assets	-	152,555
Accounts payable	5,860,068	4,540,583
Payables to related parties	58,401	(279,857)
Salary and bonus payable	1,800,981	216,501
Accrued profit sharing bonus to employees and compensation to directors and supervisors	(332,251)	562,019
Accrued expenses and other current liabilities	(2,372,032)	(20,226,384)
Net defined benefit liability	(215,014)	(60,461)
Cash generated from operations	<u>667,182,815</u>	<u>619,336,831</u>
Income taxes paid	<u>(52,044,071)</u>	<u>(45,382,523)</u>
Net cash generated by operating activities	<u>615,138,744</u>	<u>573,954,308</u>

(Continued)

# Taiwan Semiconductor Manufacturing Company Limited and Subsidiaries

## **CONSOLIDATED STATEMENTS OF CASH FLOWS** **(In Thousands of New Taiwan Dollars)**

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	<b>2019</b>	<b>2018</b>
<b>CASH FLOWS FROM INVESTING ACTIVITIES</b>		
Acquisitions of:		
Financial instruments at fair value through profit or loss	\$ (124,748)	\$ (310,478)
Financial assets at fair value through other comprehensive income	(257,558,240)	(96,412,786)
Financial assets at amortized cost	(313,958)	(2,294,098)
Property, plant and equipment	(460,422,150)	(315,581,881)
Intangible assets	(9,329,869)	(7,100,306)
Proceeds from disposal or redemption of:		
Financial instruments at fair value through profit or loss - debt instruments	2,418,153	487,216
Financial assets at fair value through other comprehensive income	230,444,486	86,639,322
Financial assets at amortized cost	14,349,190	2,032,442
Property, plant and equipment	287,318	181,450
Intangible assets	-	492
Proceeds from return of capital of investments in equity instruments at fair value through other comprehensive income	1,107	127,878
Derecognition of hedging financial instruments	(436,606)	250,538
Interest received	16,874,985	14,660,388
Proceeds from government grants - property, plant and equipment	2,565,338	-
Proceeds from government grants - land use right and others	850,623	-
Other dividends received	320,242	158,358
Dividends received from investments accounted for using equity method	1,718,954	3,262,910
Refundable deposits paid	(1,465,766)	(2,227,541)
Refundable deposits refunded	<u>1,019,294</u>	<u>1,857,188</u>
Net cash used in investing activities	<u>(458,801,647)</u>	<u>(314,268,908)</u>
<b>CASH FLOWS FROM FINANCING ACTIVITIES</b>		
Increase in short-term loans	31,804,302	23,922,975
Repayment of bonds	(34,900,000)	(58,024,900)
Repayment of the principal portion of lease liabilities	(2,930,589)	-
Interest paid	(3,597,145)	(3,233,331)
Guarantee deposits received	62,203	1,668,887
Guarantee deposits refunded	(701,269)	(1,948,106)
Cash dividends	(259,303,805)	(207,443,044)
Donation from shareholders	4,006	10,141
Decrease in non-controlling interests	<u>(75,869)</u>	<u>(77,413)</u>
Net cash used in financing activities	<u>(269,638,166)</u>	<u>(245,124,791)</u>

(Continued)

# Taiwan Semiconductor Manufacturing Company Limited and Subsidiaries

## CONSOLIDATED STATEMENTS OF CASH FLOWS (In Thousands of New Taiwan Dollars)

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	2019	2018
EFFECT OF EXCHANGE RATE CHANGES ON CASH AND CASH EQUIVALENTS	<u>\$ (9,114,196)</u>	<u>\$ 9,862,296</u>
NET INCREASE (DECREASE) IN CASH AND CASH EQUIVALENTS	(122,415,265)	24,422,905
CASH AND CASH EQUIVALENTS, BEGINNING OF YEAR	<u>577,814,601</u>	<u>553,391,696</u>
CASH AND CASH EQUIVALENTS, END OF YEAR	<u>\$ 455,399,336</u>	<u>\$ 577,814,601</u>

The accompanying notes are an integral part of the consolidated financial statements.

(Concluded)

# **Taiwan Semiconductor Manufacturing Company Limited and Subsidiaries**

## **NOTES TO CONSOLIDATED FINANCIAL STATEMENTS FOR THE YEARS ENDED DECEMBER 31, 2019 AND 2018** (Amounts in Thousands of New Taiwan Dollars, Unless Specified Otherwise)

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### **1. GENERAL**

Taiwan Semiconductor Manufacturing Company Limited (TSMC), a Republic of China (R.O.C.) corporation, was incorporated on February 21, 1987. TSMC is a dedicated foundry in the semiconductor industry which engages mainly in the manufacturing, selling, packaging, testing and computer-aided design of integrated circuits and other semiconductor devices and the manufacturing of masks.

On September 5, 1994, TSMC's shares were listed on the Taiwan Stock Exchange (TWSE). On October 8, 1997, TSMC listed some of its shares of stock on the New York Stock Exchange (NYSE) in the form of American Depository Shares (ADSs).

The address of its registered office and principal place of business is No. 8, Li-Hsin Rd. 6, Hsinchu Science Park, Taiwan. The principal operating activities of TSMC's subsidiaries are described in Note 4.

### **2. THE AUTHORIZATION OF FINANCIAL STATEMENTS**

The accompanying consolidated financial statements were approved and authorized for issue by the Board of Directors on February 11, 2020.

### **3. APPLICATION OF NEW AND REVISED INTERNATIONAL FINANCIAL REPORTING STANDARDS**

- a. Initial application of the amendments to the Regulations Governing the Preparation of Financial Reports by Securities Issuers and the International Financial Reporting Standards (IFRS), International Accounting Standards (IAS), IFRIC Interpretations (IFRIC), and SIC Interpretations (SIC) (collectively, "IFRSs") endorsed and issued into effect by the Financial Supervisory Commission (FSC)

Except for the following, the initial application of the amendments to the Regulations Governing the Preparation of Financial Reports by Securities Issuers and the IFRSs endorsed and issued into effect by the FSC did not have a significant effect on TSMC and its subsidiaries' (collectively as the "Company") accounting policies:

- 1) IFRS 16 "Leases"

IFRS 16 sets out the accounting standards for leases that supersedes IAS 17 "Leases", IFRIC 4 "Determining whether an Arrangement contains a Lease", and a number of related interpretations. Refer to Note 4 for information relating to the relevant accounting policies.

#### Definition of a lease

The Company applies the guidance of IFRS 16 in determining whether contracts are, or contain, a lease only to contracts entered into (or changed) on or after January 1, 2019. Contracts identified as containing a lease under IAS 17 and IFRIC 4 are not reassessed and are accounted for in accordance with the transitional provisions under IFRS 16.

### The Company as lessee

Except for payments for short-term leases which are recognized as expenses on a straight-line basis, the Company recognizes right-of-use assets and lease liabilities for all leases on the consolidated balance sheets. On the consolidated statements of comprehensive income, the Company presents the depreciation expense charged on right-of-use assets separately from the interest expense accrued on lease liabilities, which is computed using the effective interest method. On the consolidated statements of cash flows, cash payments for both the principal portion and the interest portion of lease liabilities are classified within financing activities.

The Company applies IFRS 16 retrospectively with the cumulative effect of the initial application recognized at the date of initial application but does not restate comparative information.

Leases agreements classified as operating leases under IAS 17, except for short-term leases, are measured at the present value of the remaining lease payments, discounted using the lessee's incremental borrowing rate on January 1, 2019. Right-of-use assets are measured at an amount equal to the lease liabilities, adjusted by the amount of any prepaid or accrued lease payments. Right-of-use assets are subject to impairment testing under IAS 36.

The Company applied the following practical expedients to measure right-of-use assets and lease liabilities on January 1, 2019:

- a) The Company applied a single discount rate to a portfolio of leases with reasonably similar characteristics to measure lease liabilities.
- b) The Company accounted for those leases for which the lease term ends on or before December 31, 2019 as short-term leases.
- c) Except for lease payments, the Company excluded incremental costs of obtaining the lease from right-of-use assets on January 1, 2019.
- d) The Company determined lease terms (e.g. lease periods) based on the projected status on January 1, 2019, to measure lease liabilities.

The weighted average lessee's incremental borrowing rate used by the Company to calculate lease liabilities recognized on January 1, 2019 is 1.46%. The reconciliation between the lease liabilities recognized and the future minimum lease payments of non-cancellable operating lease on December 31, 2018 is presented as follows:

The future minimum lease payments of non-cancellable operating lease on December 31, 2018	\$ 20,849,585
Less: Recognition exemption for short-term leases	<u>(3,189,821)</u>
Undiscounted gross amounts on January 1, 2019	<u>\$ 17,659,764</u>
Discounted using the incremental borrowing rate on January 1, 2019	\$ 16,465,599
Add: Adjustments as a result of a different treatment of extension and purchase options	<u>3,438,016</u>
Lease liabilities recognized on January 1, 2019	<u>\$ 19,903,615</u>

The Company as lessor

Except for sublease transactions, the Company does not make any adjustments for leases in which it is a lessor, and accounts for those leases under IFRS 16 starting from January 1, 2019. On the basis of the remaining contractual terms and conditions on January 1, 2019, all of the Company's subleases are classified as operating leases.

Impact on assets, liabilities and equity on January 1, 2019

	<b>Carrying Amount as of December 31, 2018</b>	<b>Adjustments Arising from Initial Application</b>	<b>Adjusted Carrying Amount as of January 1, 2019</b>
Other current assets	\$ 5,406,423	\$ (118,242)	\$ 5,288,181
Right-of-use assets	-	20,082,875	20,082,875
Other noncurrent assets	1,584,647	(77,171)	1,507,476
Total effect on assets		<u>\$ 19,887,462</u>	
Accrued expenses and other current liabilities	61,760,619	\$ 2,627,334	64,387,953
Lease liabilities - noncurrent	-	17,269,317	17,269,317
Other noncurrent liabilities	1,950,989	(9,189)	1,941,800
Total effect on liabilities		<u>\$ 19,887,462</u>	
Total effect on equity		<u>\$ _____-</u>	

- b. Amendments to the Regulations Governing the Preparation of Financial Reports by Securities Issuers for application starting from 2020 and the IFRSs issued by International Accounting Standards Board (IASB) and endorsed by the FSC with effective date starting 2020

<b>New, Revised or Amended Standards and Interpretations</b>	<b>Effective Date Issued by IASB</b>
Amendments to IFRS 3 "Definition of a Business"	January 1, 2020 (Note 1)
Amendments to IFRS 9, IAS 39 and IFRS 7 "Interest Rate Benchmark Reform"	January 1, 2020 (Note 2)
Amendments to IAS 1 and IAS 8 "Definition of Material"	January 1, 2020 (Note 3)

Note 1: The Company shall apply these amendments to business combinations for which the acquisition date is on or after the beginning of the first annual reporting period beginning on or after January 1, 2020 and to asset acquisitions that occur on or after the beginning of that period.

Note 2: The Company shall apply these amendments retrospectively for annual reporting periods beginning on or after January 1, 2020.

Note 3: The Company shall apply these amendments prospectively for annual reporting periods beginning on or after January 1, 2020.

- c. The IFRSs issued by IASB but not yet endorsed and issued into effect by the FSC

<u>New, Revised or Amended Standards and Interpretations</u>	<u>Effective Date Issued by IASB</u>
Amendments to IFRS 10 and IAS 28 “Sale or Contribution of Assets between an Investor and its Associate or Joint Venture”	To be determined by IASB
Amendments to IAS 1 “Classification of Liabilities as Current or Non-current”	January 1, 2022

As of the date the accompanying consolidated financial statements were authorized for issue, the Company continues in evaluating the impact on its financial position and financial performance as a result of the initial adoption of the aforementioned standards or interpretations. The related impact will be disclosed when the Company completes the evaluation.

#### **4. SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES**

For the convenience of readers, the accompanying consolidated financial statements have been translated into English from the original Chinese version prepared and used in the R.O.C. If there is any conflict between the English version and the original Chinese version or any difference in the interpretation of the two versions, the Chinese-language consolidated financial statements shall prevail.

##### **Statement of Compliance**

The accompanying consolidated financial statements have been prepared in conformity with the Regulations Governing the Preparation of Financial Reports by Securities Issuers and the IFRSs endorsed by the FSC with the effective dates (collectively, “Taiwan-IFRSs”).

##### **Basis of Preparation**

The accompanying consolidated financial statements have been prepared on the historical cost basis except for financial instruments that are measured at fair values, as explained in the accounting policies below. Historical cost is generally based on the fair value of the consideration given in exchange for the assets.

##### **Basis of Consolidation**

###### The basis for the consolidated financial statements

The consolidated financial statements incorporate the financial statements of TSMC and entities controlled by TSMC (its subsidiaries).

Income and expenses of subsidiaries acquired or disposed of are included in the consolidated statement of comprehensive income from the effective date of acquisition and up to the effective date of disposal, as appropriate. Total comprehensive income of subsidiaries is attributed to the shareholders of the parent and to the non-controlling interests even if this results in the non-controlling interests having a deficit balance.

When necessary, adjustments are made to the financial statements of subsidiaries to bring their accounting policies into line with those used by the Company.

All intra-group transactions, balances, income and expenses are eliminated in full on consolidation.

Changes in the Company’s ownership interests in subsidiaries that do not result in the Company losing control over the subsidiaries are accounted for as equity transactions. The carrying amounts of the Company’s interests and the non-controlling interests are adjusted to reflect the changes in their relative interests in the subsidiaries. Any difference between the amount by which the non-controlling interests are adjusted and the

fair value of the consideration paid or received is recognized directly in equity and attributed to shareholders of the parent.

When the Company loses control of a subsidiary, a gain or loss is recognized in profit or loss and is calculated as the difference between:

- a. the aggregate of the fair value of consideration received and the fair value of any retained interest at the date when control is lost; and
- b. the previous carrying amount of the assets (including goodwill), and liabilities of the subsidiary and any non-controlling interest.

The Company shall account for all amounts recognized in other comprehensive income in relation to the subsidiary on the same basis as would be required if the Company had directly disposed of the related assets and liabilities.

The fair value of any investment retained in the former subsidiary at the date when control is lost is regarded as the cost on initial recognition of an investment in an associate.

#### The subsidiaries in the consolidated financial statements

The detail information of the subsidiaries at the end of reporting period was as follows:

Name of Investor	Name of Investee	Main Businesses and Products	Establishment and Operating Location	Percentage of Ownership		Note
				December 31, 2019	December 31, 2018	
TSMC	TSMC North America	Selling and marketing of integrated circuits and other semiconductor devices	San Jose, California, U.S.A.	100%	100%	-
	TSMC Europe B.V. (TSMC Europe)	Customer service and supporting activities	Amsterdam, the Netherlands	100%	100%	a)
	TSMC Japan Limited (TSMC Japan)	Customer service and supporting activities	Yokohama, Japan	100%	100%	a)
	TSMC Korea Limited (TSMC Korea)	Customer service and supporting activities	Seoul, Korea	100%	100%	a)
	TSMC Partners, Ltd. (TSMC Partners)	Investing in companies involved in the design, manufacture, and other related business in the semiconductor industry and other investment activities	Tortola, British Virgin Islands	100%	100%	a)
	TSMC Global, Ltd. (TSMC Global)	Investment activities	Tortola, British Virgin Islands	100%	100%	-
	TSMC China Company Limited (TSMC China)	Manufacturing, selling, testing and computer-aided design of integrated circuits and other semiconductor devices	Shanghai, China	100%	100%	-
	TSMC Nanjing Company Limited (TSMC Nanjing)	Manufacturing, selling, testing and computer-aided design of integrated circuits and other semiconductor devices	Nanjing, China	100%	100%	b)
	VisEra Technologies Company Ltd. (VisEra Tech)	Engaged in manufacturing electronic spare parts and in researching, developing, designing, manufacturing, selling, packaging and testing of color filter	Hsin-Chu, Taiwan	87%	87%	-
	VentureTech Alliance Fund II, L.P. (VTAF II)	Investing in new start-up technology companies	Cayman Islands	98%	98%	a)
TSMC Partners	VentureTech Alliance Fund III, L.P. (VTAF III)	Investing in new start-up technology companies	Cayman Islands	98%	98%	a)
	TSMC Solar Europe GmbH	Selling of solar related products and providing customer service	Hamburg, Germany	-	100%	a), c)
	TSMC Development, Inc. (TSMC Development)	Investing in companies involved in the manufacturing related business in the semiconductor industry	Delaware, U.S.A.	100%	100%	-
	TSMC Technology, Inc. (TSMC Technology)	Engineering support activities	Delaware, U.S.A.	100%	100%	a)
	TSMC Design Technology Canada Inc. (TSMC Canada)	Engineering support activities	Ontario, Canada	100%	100%	a)
	InveStar Semiconductor Development Fund, Inc. (ISDF)	Investing in new start-up technology companies	Cayman Islands	97%	97%	a), d)
	InveStar Semiconductor Development Fund, Inc. (II) LDC. (ISDF II)	Investing in new start-up technology companies	Cayman Islands	97%	97%	a), d)
	TSMC Development	WaferTech, LLC (WaferTech)	Manufacturing, selling and testing of integrated circuits and other semiconductor devices	Washington, U.S.A.	100%	100%
	VTAF III	Growth Fund Limited (Growth Fund)	Investing in new start-up technology companies	Cayman Islands	100%	100%
						a)

Note a: This is an immaterial subsidiary for which the consolidated financial statements are not audited by the Company's independent auditors.

Note b: Under the investment agreement entered into with the municipal government of Nanjing, China, the Company will make an investment in Nanjing in the amount of approximately US\$3 billion to establish a subsidiary operating a 300mm wafer fab with the capacity of 20,000 12-inch wafers per month, and a design service center.

Note c: TSMC Solar Europe GmbH has completed the liquidation procedures in March 2019.

Note d: The subsidiary is under liquidation procedures.

## **Foreign Currencies**

The financial statements of each individual consolidated entity were expressed in the currency which reflected its primary economic environment (functional currency). The functional currency of TSMC and presentation currency of the consolidated financial statements are both New Taiwan Dollars (NT\$). In preparing the consolidated financial statements, the operating results and financial positions of each consolidated entity are translated into NT\$.

In preparing the financial statements of each individual consolidated entity, transactions in currencies other than the entity's functional currency (foreign currencies) are recognized at the rates of exchange prevailing at the dates of the transactions. At the end of each reporting period, monetary items denominated in foreign currencies are retranslated at the rates prevailing at that date. Such exchange differences are recognized in profit or loss in the year in which they arise. Non-monetary items measured at fair value that are denominated in foreign currencies are retranslated at the rates prevailing at the date when the fair value was determined. Exchange differences arising on the retranslation of non-monetary items are included in profit or loss for the year except for exchange differences arising on the retranslation of non-monetary items in respect of which gains and losses are recognized directly in other comprehensive income, in which case, the exchange differences are also recognized directly in other comprehensive income. Non-monetary items that are measured in terms of historical cost in foreign currencies are not retranslated.

For the purposes of presenting consolidated financial statements, the assets and liabilities of the Company's foreign operations are translated into NT\$ using exchange rates prevailing at the end of each reporting period. Income and expense items are translated at the average exchange rates for the period. Exchange differences arising, if any, are recognized in other comprehensive income and accumulated in equity (attributed to non-controlling interests as appropriate).

## **Classification of Current and Noncurrent Assets and Liabilities**

Current assets are assets held for trading purposes and assets expected to be converted to cash, sold or consumed within one year from the end of the reporting period. Current liabilities are obligations incurred for trading purposes and obligations expected to be settled within one year from the end of the reporting period. Assets and liabilities that are not classified as current are noncurrent assets and liabilities, respectively.

## **Cash Equivalents**

Cash equivalents, for the purpose of meeting short-term cash commitments, consist of highly liquid time deposits and investments that are readily convertible to known amounts of cash and which are subject to an insignificant risk of changes in value.

## **Financial Instruments**

Financial assets and liabilities shall be recognized when the Company becomes a party to the contractual provisions of the instruments.

Financial assets and liabilities are initially recognized at fair values. Transaction costs that are directly attributable to the acquisition or issue of financial assets and financial liabilities (other than financial assets and financial liabilities at fair value through profit or loss) are added to or deducted from the fair value of the financial assets or financial liabilities, as appropriate, on initial recognition. Transaction costs directly attributable to the acquisition of financial assets or financial liabilities at fair value through profit or loss are recognized immediately in profit or loss.

## **Financial Assets**

The classification of financial assets depends on the nature and purpose of the financial assets and is determined at the time of initial recognition. Regular way purchases or sales of financial assets are recognized and derecognized on a trade date or settlement date basis for which financial assets were classified in the same way, respectively. Regular way purchases or sales are purchases or sales of financial assets that require delivery of assets within the time frame established by regulation or convention in the marketplace.

### a. Category of financial assets and measurement

Financial assets are classified into the following categories: financial assets at FVTPL, investments in debt instruments and equity instruments at FVTOCI, and financial assets at amortized cost.

#### 1) Financial asset at FVTPL

For certain financial assets which include debt instruments that do not meet the criteria of amortized cost or FVTOCI, it is mandatorily required to measure them at FVTPL. Any gain or loss arising from remeasurement is recognized in profit or loss. The net gain or loss recognized in profit or loss incorporates any interest earned on the financial asset.

#### 2) Investments in debt instruments at FVTOCI

Debt instruments with contractual terms specifying that cash flows are solely payments of principal and interest on the principal amount outstanding, together with objective of collecting contractual cash flows and selling the financial assets, are measured at FVTOCI.

Interest income calculated using the effective interest method, foreign exchange gains and losses and impairment gains or losses on investments in debt instruments at FVTOCI are recognized in profit or loss. Other changes in the carrying amount of these debt instruments are recognized in other comprehensive income and will be reclassified to profit or loss when these debt instruments are disposed.

#### 3) Investments in equity instruments at FVTOCI

On initial recognition, the Company may irrevocably designate investments in equity investments that is not held for trading as at FVTOCI.

Investments in equity instruments at FVTOCI are subsequently measured at fair value with gains and losses arising from changes in fair value recognized in other comprehensive income and accumulated in other equity.

Dividends on these investments in equity instruments at FVTOCI are recognized in profit or loss when the Company's right to receive the dividends is established, unless the Company's rights clearly represent a recovery of part of the cost of the investment.

#### 4) Measured at amortized cost

Cash and cash equivalents, debt instrument investments, notes and accounts receivable (including related parties), other receivables and refundable deposits are measured at amortized cost.

Debt instruments with contractual terms specifying that cash flows are solely payments of principal and interest on the principal amount outstanding, together with objective of holding financial assets in order to collect contractual cash flows, are measured at amortized cost.

Subsequent to initial recognition, financial assets measured at amortized cost are measured at amortized cost, which equals to carrying amount determined by the effective interest method less any impairment loss.

b. Impairment of financial assets

At the end of each reporting period, a loss allowance for expected credit loss is recognized for financial assets at amortized cost (including accounts receivable) and for investments in debt instruments that are measured at FVTOCI.

The loss allowance for accounts receivable is measured at an amount equal to lifetime expected credit losses. For financial assets at amortized cost and investments in debt instruments that are measured at FVTOCI, when the credit risk on the financial instrument has not increased significantly since initial recognition, a loss allowance is recognized at an amount equal to expected credit loss resulting from possible default events of a financial instrument within 12 months after the reporting date. If, on the other hand, there has been a significant increase in credit risk since initial recognition, a loss allowance is recognized at an amount equal to expected credit loss resulting from all possible default events over the expected life of a financial instrument.

The Company recognizes an impairment loss in profit or loss for all financial instruments with a corresponding adjustment to their carrying amount through a loss allowance account, except for investments in debt instruments that are measured at FVTOCI, for which the loss allowance is recognized in other comprehensive income and does not reduce the carrying amount of the financial asset.

c. Derecognition of financial assets

The Company derecognizes a financial asset only when the contractual rights to the cash flows from the financial asset expire, or when it transfers the financial asset and substantially all the risks and rewards of ownership of the financial asset to another entity.

On derecognition of a financial asset at amortized cost in its entirety, the difference between the asset's carrying amount and the sum of the consideration received and receivable is recognized in profit or loss. On derecognition of an investment in a debt instrument at FVTOCI, the difference between the asset's carrying amount and the sum of the consideration received and receivable and the cumulative gain or loss that had been recognized in other comprehensive income is recognized in profit or loss. However, on derecognition of an investment in an equity instrument at FVTOCI, the cumulative gain or loss that had been recognized in other comprehensive income is transferred directly to retained earnings, without recycling through profit or loss.

## **Financial Liabilities and Equity Instruments**

### Classification as debt or equity

Debt and equity instruments issued by the Company are classified as either financial liabilities or as equity in accordance with the substance of the contractual arrangements and the definitions of a financial liability and an equity instrument.

### Equity instruments

An equity instrument is any contract that evidences a residual interest in the assets of an entity after deducting all of its liabilities. Equity instruments issued by the Company are recognized at the proceeds received, net of direct issue costs.

## Financial liabilities

Financial liabilities are subsequently measured either at amortized cost using effective interest method or at FVTPL.

Financial liabilities are classified as at fair value through profit or loss when the financial liability is either held for trading or is designated as at fair value through profit or loss.

Financial liabilities at fair value through profit or loss are stated at fair value, with any gains or losses arising on remeasurement recognized in profit or loss.

Financial liabilities other than those held for trading purposes and designated as at FVTPL are subsequently measured at amortized cost at the end of each reporting period.

## Derecognition of financial liabilities

The Company derecognizes financial liabilities when, and only when, the Company's obligations are discharged, cancelled or they expire. The difference between the carrying amount of the financial liability derecognized and the consideration paid and payable is recognized in profit or loss.

## **Derivative Financial Instruments**

Derivative financial instruments are initially recognized at fair value at the date the derivative contracts are entered into and are subsequently remeasured to their fair value at the end of each reporting period. The resulting gain or loss is recognized in profit or loss immediately unless the derivative financial instrument is designated and effective as a hedging instrument, in which event the timing of the recognition in profit or loss depends on the nature of the hedge relationship.

## **Hedge Accounting**

### a. Fair value hedge

The Company designates certain hedging instruments, such as interest rate futures contracts, to partially hedge against the fair value change caused by interest rates fluctuation in the Company's fixed income investments. Changes in the fair value of hedging instrument that are designated and qualify as fair value hedges are recognized in profit or loss immediately, together with any changes in the fair value of the hedged items that are attributable to the hedged risk.

### b. Cash flow hedge

The Company designates certain hedging instruments, such as forward exchange contracts and foreign currency deposits, to partially hedge its foreign exchange rate risks associated with certain highly probable forecast transactions (capital expenditures). The effective portion of changes in the fair value of hedging instruments is recognized in other comprehensive income. When the forecast transactions actually take place, the associated gains or losses that were recognized in other comprehensive income are removed from equity and included in the initial cost of the hedged items. The gains or losses from hedging instruments relating to the ineffective portion are recognized immediately in profit or loss.

The Company prospectively discontinues hedge accounting only when the hedging relationship ceases to meet the qualifying criteria; for instance when the hedging instrument expires or is sold, terminated or exercised.

## **Inventories**

Inventories are stated at the lower of cost or net realizable value. Inventories are recorded at standard cost and adjusted to approximate weighted-average cost at the end of the reporting period. Net realizable value

represents the estimated selling price of inventories less all estimated costs of completion and costs necessary to make the sale.

### **Investments Accounted for Using Equity Method**

Investments accounted for using the equity method are investments in associates.

An associate is an entity over which the Company has significant influence and that is neither a subsidiary nor a joint venture. Significant influence is the power to participate in the financial and operating policy decisions of the investee but is not control or joint control over those policies.

The operating results and assets and liabilities of associates are incorporated in these consolidated financial statements using the equity method of accounting. Under the equity method, an investment in an associate is initially recognized in the consolidated statements of financial position at cost and adjusted thereafter to recognize the Company's share of profit or loss and other comprehensive income of the associate as well as the distribution received. The Company also recognizes its share in the changes in the equities of associates.

Any excess of the cost of acquisition over the Company's share of the net fair value of the identifiable assets, liabilities and contingent liabilities of an associate recognized at the date of acquisition is recognized as goodwill, which is included within the carrying amount of the investment. Any excess of the Company's share of the net fair value of the identifiable assets, liabilities and contingent liabilities over the cost of acquisition, after reassessment, is recognized immediately in profit or loss.

When necessary, the entire carrying amount of the investment (including goodwill) is tested for impairment as a single asset by comparing its recoverable amount (higher of value in use and fair value less costs to sell) with its carrying amount. Any impairment loss recognized forms part of the carrying amount of the investment. Any reversal of that impairment loss is recognized to the extent that the recoverable amount of the investment subsequently increases.

The Company discontinues the use of the equity method from the date when the Company ceases to have significant influence over an associate. When the Company retains an interest in the former associate, the Company measures the retained interest at fair value at that date. The difference between the carrying amount of the associate at the date the equity method was discontinued, and the fair value of any retained interest and any proceeds from disposing of a part interest in the associate is included in the determination of the gain or loss on disposal of the associate. In addition, the Company shall account for all amounts recognized in other comprehensive income in relation to that associate on the same basis as would be required if the associate had directly disposed of the related assets or liabilities. If the Company's ownership interest in an associate is reduced as a result of disposal, but the investment continues to be an associate, the Company should reclassify to profit or loss only a proportionate amount of the gain or loss previously recognized in other comprehensive income.

When the Company subscribes to additional shares in an associate at a percentage different from its existing ownership percentage, the resulting carrying amount of the investment differs from the amount of the Company's proportionate interest in the net assets of the associate. The Company records such a difference as an adjustment to investments with the corresponding amount charged or credited to capital surplus. If the Company's ownership interest is reduced due to the additional subscription to the shares of associate by other investors, the proportionate amount of the gains or losses previously recognized in other comprehensive income in relation to that associate shall be reclassified to profit or loss on the same basis as would be required if the associate had directly disposed of the related assets or liabilities.

When a consolidated entity transacts with an associate, profits and losses resulting from the transactions with the associate are recognized in the Company's consolidated financial statements only to the extent of interests in the associate that are not owned by the Company.

## **Property, Plant and Equipment**

Property, plant and equipment are measured at cost less accumulated depreciation and accumulated impairment. Costs include any incremental costs that are directly attributable to the construction or acquisition of the item of property, plant and equipment.

Property, plant and equipment in the course of construction for production, supply or administrative purposes are carried at cost, less any recognized impairment loss. Such assets are classified to the appropriate categories of property, plant and equipment when completed and ready for intended use. Depreciation of these assets, on the same basis as other identical categories of property, plant and equipment, commences when the assets are available for their intended use.

Depreciation is recognized so as to write off the cost of the assets less their residual values over their useful lives, and it is computed using the straight-line method mainly over the following estimated useful lives: land improvements - 20 years; buildings (assets used by the Company and assets subject to operating leases) - 10 to 20 years; machinery and equipment - 5 years; and office equipment - 5 years. The estimated useful lives, residual values and depreciation method are reviewed at the end of each reporting period, with the effect of any changes in estimates accounted for on a prospective basis. Land is not depreciated.

An item of property, plant and equipment is derecognized upon disposal or when no future economic benefits are expected to arise from the continued use of the assets. Any gain or loss arising on the disposal or retirement of an item of property, plant and equipment is determined as the difference between the sales proceeds and the carrying amount of the asset and is recognized in profit or loss.

## **Leases**

### 2019

For a contract that contains a lease component and non-lease component, the Company may elect to account for the lease and non-lease components as a single lease component.

#### The Company as lessor

Rental income from operating lease is recognized on a straight-line basis over the term of the lease.

#### The Company as lessee

Except for payments for low-value asset leases and short-term leases (leases of machinery and equipment and others) which are recognized as expenses on a straight-line basis, the Company recognizes right-of-use assets and lease liabilities for all leases at the commencement date of the lease.

Right-of-use assets are measured at cost. The cost of right-of-use assets comprises the initial measurement of lease liabilities adjusted for lease payments made at or before the commencement date, plus an estimate of costs needed to restore the underlying assets. Subsequent measurement is calculated as cost less accumulated depreciation and accumulated impairment loss and adjusted for changes in lease liabilities as a result of lease term modifications or other related factors. Right-of-use assets are presented separately in the consolidated balance sheets.

Right-of-use assets are depreciated using the straight-line method from the commencement dates to the earlier of the end of the useful lives of the right-of-use assets or the end of the lease terms. If the lease transfers ownership of the underlying assets to the Company by the end of the lease terms or if the cost of right-of-use assets reflects that the Company will exercise a purchase option, the Company depreciates the right-of-use assets from the commencement dates to the end of the useful lives of the underlying assets.

Lease liabilities are measured at the present value of the lease payments. Lease payments comprise fixed payments, variable lease payments which depend on an index or a rate and the exercise price of a purchase option if the Company is reasonably certain to exercise that option. The lease payments are discounted using the lessee's incremental borrowing rates.

Subsequently, lease liabilities are measured at amortized cost using the effective interest method, with interest expense recognized over the lease terms. When there is a change in a lease term, a change in future lease payments resulting from a change in an index or a rate used to determine those payments, or a change in the assessment of an option to purchase an underlying asset, the Company remeasures the lease liabilities with a corresponding adjustment to the right-of-use assets. Lease liabilities are presented on a separate line in the consolidated balance sheets.

Variable lease payments that do not depend on an index or a rate are recognized as expenses in the periods in which they are incurred.

## 2018

Leases are classified as finance lease whenever the terms of the lease transfer substantially all the risks and rewards of ownership to the lessee. All other leases are classified as operating leases.

### The Company as lessor

Rental income from operating leases is recognized on a straight-line basis over the term of the lease.

### The Company as lessee

Operating lease payments are recognized as an expense on a straight-line basis over the lease term.

## **Intangible Assets**

### Goodwill

Goodwill arising on an acquisition of a business is carried at cost as established at the date of acquisition of the business less accumulated impairment losses, if any.

### Other intangible assets

Other separately acquired intangible assets with finite useful lives are carried at cost less accumulated amortization and accumulated impairment losses. Amortization is recognized using the straight-line method over the following estimated useful lives: Technology license fees - the estimated life of the technology or the term of the technology transfer contract; software and system design costs - 3 years or contract period; patent and others - the economic life or contract period. The estimated useful life and amortization method are reviewed at the end of each reporting period, with the effect of any changes in estimate being accounted for on a prospective basis.

## **Impairment of Tangible Assets, Right-of-use Assets and Intangible Assets**

### Goodwill

Goodwill is not amortized and instead is tested for impairment annually, or more frequently when there is an indication that the cash generating unit may be impaired. For the purpose of impairment testing, goodwill is allocated to each of the Company's cash-generating units or groups of cash-generating units that are expected to benefit from the synergies of the combination. If the recoverable amount of a cash-generating unit is less than its carrying amount, the difference is allocated first to reduce the carrying amount of any goodwill allocated to such cash generating unit and then to the other assets of the cash generating unit pro rata based on the carrying amount of each asset in the cash generating unit. Any impairment loss for goodwill is

recognized directly in profit or loss. An impairment loss recognized for goodwill is not reversed in subsequent periods.

#### Tangible assets, right-of-use assets and other intangible assets

At the end of each reporting period, the Company reviews the carrying amounts of its tangible assets (property, plant and equipment), right-of-use assets and other intangible assets to determine whether there is any indication that those assets have suffered an impairment loss. If any such indication exists, the recoverable amount of the asset is estimated in order to determine the extent of the impairment loss. When it is not possible to estimate the recoverable amount of an individual asset, the Company estimates the recoverable amount of the cash-generating unit to which the asset belongs. When a reasonable and consistent basis of allocation can be identified, corporate assets are also allocated to individual cash-generating units, or otherwise they are allocated to the smallest group of cash-generating units for which a reasonable and consistent allocation basis can be identified.

Recoverable amount is the higher of fair value less costs to sell and value in use. In assessing value in use, the estimated future cash flows are discounted to their present value using a pre-tax discount rate that reflects current market assessments of the time value of money and the risks specific to the asset for which the estimates of future cash flows have not been adjusted.

If the recoverable amount of an asset or cash-generating unit is estimated to be less than its carrying amount, the carrying amount of the asset or cash-generating unit is reduced to its recoverable amount. An impairment loss is recognized immediately in profit or loss.

When an impairment loss subsequently reverses, the carrying amount of the asset or a cash-generating unit is increased to the revised estimate of its recoverable amount, but the increased carrying amount does not exceed the carrying amount that would have been determined had no impairment loss been recognized for the asset or cash-generating unit in prior years. A reversal of an impairment loss is recognized immediately in profit or loss.

#### **Guarantee Deposit**

Guarantee deposit mainly consists of cash received under deposit agreements with customers to ensure they have access to the Company's specified capacity; and as guarantee of accounts receivable to ensure payment from customers. Cash received from customers is recorded as guarantee deposit upon receipt. Guarantee deposits are refunded to customers when terms and conditions set forth in the deposit agreements have been satisfied.

#### **Revenue Recognition**

The Company recognizes revenue when performance obligations are satisfied. The performance obligations are satisfied when customers obtain control of the promised goods which is generally when the goods are delivered to the customers' specified locations.

Revenue from sale of goods is measured at the fair value of the consideration received or receivable. Revenue is reduced for estimated customer returns, rebates and other similar allowances. Estimated sales returns and other allowances is generally made and adjusted based on historical experience and the consideration of varying contractual terms to recognize refund liabilities, which is classified under accrued expenses and other current liabilities.

In principle, payment term granted to customers is due 30 days from the invoice date or 30 days from the end of the month of when the invoice is issued. Due to the short term nature of the receivables from sale of goods with the immaterial discounted effect, the Company measures them at the original invoice amounts without discounting.

## **Employee Benefits**

### Short-term employee benefits

Liabilities recognized in respect of short-term employee benefits are measured at the undiscounted amount of the benefits expected to be paid in exchange for service rendered by employees.

### Retirement benefits

For defined contribution retirement benefit plans, payments to the benefit plan are recognized as an expense when the employees have rendered service entitling them to the contribution. For defined benefit retirement benefit plans, the cost of providing benefit is recognized based on actuarial calculations.

Defined benefit costs (including service cost, net interest and remeasurement) under the defined benefit retirement benefit plans are determined using the Projected Unit Credit Method. Service cost (including current service cost), and net interest on the net defined benefit liability (asset) are recognized as employee benefits expense in the period they occur. Remeasurement, comprising actuarial gains and losses and the return on plan assets (excluding interest), is recognized in other comprehensive income in the period in which they occur. Remeasurement recognized in other comprehensive income is reflected immediately in retained earnings and will not be reclassified to profit or loss.

Net defined benefit liability represents the actual deficit in the Company's defined benefit plan.

## **Taxation**

Income tax expense represents the sum of the tax currently payable and deferred tax.

### Current tax

Income tax on unappropriated earnings (excluding earnings from foreign consolidated subsidiaries) is expensed in the year the shareholders approved the appropriation of earnings which is the year subsequent to the year the earnings are generated.

Adjustments of prior years' tax liabilities are added to or deducted from the current year's tax provision.

### Deferred tax

Deferred tax is recognized on temporary differences between the carrying amounts of assets and liabilities in the consolidated financial statements and the corresponding tax bases used in the computation of taxable profit. Deferred tax liabilities are generally recognized for all taxable temporary differences. Deferred tax assets are generally recognized for all deductible temporary differences, net operating loss carryforwards and tax credits for research and development expenses to the extent that it is probable that taxable profits will be available against which those deductible temporary differences can be utilized.

Deferred tax liabilities are recognized for taxable temporary differences associated with investments in subsidiaries and associates, except where the Company is able to control the reversal of the temporary difference and it is probable that the temporary difference will not reverse in the foreseeable future. Deferred tax assets arising from deductible temporary differences associated with such investments are only recognized to the extent that it is probable that there will be sufficient taxable profits against which to utilize the benefits of the temporary differences and they are expected to reverse in the foreseeable future.

The carrying amount of deferred tax assets is reviewed at the end of each reporting period and reduced to the extent that it is no longer probable that sufficient taxable profits will be available to allow all or part of the deferred tax asset to be recovered. The deferred tax assets which originally not recognized is also reviewed at the end of each reporting period and recognized to the extent that it is probable that sufficient taxable profits will be available to allow all or part of the deferred tax asset to be recovered.

Deferred tax liabilities and assets are measured at the tax rates that are expected to apply in the year in which the liability is settled or the asset is realized, based on tax rates (and tax laws) that have been enacted or substantively enacted by the end of the reporting period. The measurement of deferred tax liabilities and assets reflects the tax consequences that would follow from the manner in which the Company expects, at the end of the reporting period, to recover or settle the carrying amount of its assets and liabilities.

#### Current and deferred tax for the year

Current and deferred tax are recognized in profit or loss, except when they relate to items that are recognized in other comprehensive income or directly in equity, in which case, the current and deferred tax are also recognized in other comprehensive income or directly in equity, respectively.

#### **Government Grants**

Government grants are not recognized until there is reasonable assurance that the Company will comply with the conditions attaching to them and that the grants will be received.

Government grants whose primary condition is that the Company should purchase, construct or otherwise acquire noncurrent assets (mainly including land use right and depreciable assets) are recognized as a deduction from the carrying amount of the related assets and recognized as a reduced depreciation or amortization charge in profit or loss over the contract period or useful lives of the related assets. Government grants that are receivables as compensation for expenses already incurred are deducted from incurred expenses in the period in which they become receivables.

### **5. CRITICAL ACCOUNTING JUDGMENTS AND KEY SOURCES OF ESTIMATION AND UNCERTAINTY**

In the application of the aforementioned Company's accounting policies, the Company is required to make judgments, estimates and assumptions about the carrying amounts of assets and liabilities that are not readily apparent from other sources. The estimates and associated assumptions are based on historical experience and other factors that are considered to be relevant. Actual results may differ from these estimates.

The estimates and underlying assumptions are reviewed on an ongoing basis. Revisions to accounting estimates are recognized in the year in which the estimate is revised if the revision affects only that year, or in the year of the revision and future years if the revision affects both current and future years.

#### Critical Accounting Judgments

##### **Revenue Recognition**

The Company recognizes revenue when the conditions described in Note 4 are satisfied.

##### **Commencement of Depreciation Related to Property, Plant and Equipment Classified as Equipment under Installation and Construction in Progress (EUI/CIP)**

As described in Note 4, commencement of depreciation related to EUI/CIP involves determining when the assets are available for their intended use. The criteria the Company uses to determine whether EUI/CIP are available for their intended use involves subjective judgements and assumptions about the conditions necessary for the assets to be capable of operating in the intended manner.

##### **Judgments on Lease Terms**

In determining a lease term, the Company considers all facts and circumstances that create an economic incentive to exercise or not to exercise an option, including any expected changes in facts and circumstances

from the commencement date until the exercise date of the option. Main factors considered include contractual terms and conditions covered by the optional periods, and the importance of the underlying asset to the lessee's operations, etc. The lease term is reassessed if a significant change in circumstances that are within the control of the Company occurs.

### **Key Sources of Estimation and Uncertainty**

#### **Estimation of Sales Returns and Allowances**

Sales returns and other allowance is estimated and recorded based on historical experience and in consideration of different contractual terms. The amount is deducted from revenue in the same period the related revenue is recorded. The Company periodically reviews the reasonableness of the estimates.

#### **Valuation of Inventory**

Inventories are stated at the lower of cost or net realizable value, and the Company uses estimate to determine the net realizable value of inventory at the end of each reporting period.

The Company estimates the net realizable value of inventory for normal waste, obsolescence and unmarketable items at the end of reporting period and then writes down the cost of inventories to net realizable value. The net realizable value of the inventory is determined mainly based on assumptions of future demand within a specific time horizon.

#### **Impairment of Tangible Assets, Right-of-use Assets and Intangible Assets Other than Goodwill**

In the process of evaluating the potential impairment of tangible assets, right-of-use assets and intangible assets other than goodwill, the Company determines the independent cash flows, useful lives, expected future revenue and expenses related to the specific asset groups with the consideration of the nature of semiconductor industry. Any change in these estimates based on changed economic conditions or business strategies could result in significant impairment charges or reversal in future years.

#### **Realization of Deferred Income Tax Assets**

Deferred tax assets are recognized to the extent that it is probable that future taxable profits will be available against which those deferred tax assets can be utilized. Assessment of the realization of the deferred tax assets requires subjective judgment and estimate, including the future revenue growth and profitability, tax holidays, the amount of tax credits can be utilized and feasible tax planning strategies. Any changes in the global economic environment, the industry trends and relevant laws and regulations could result in significant adjustments to the deferred tax assets.

#### **Determination of Lessees' Incremental Borrowing Rates**

In determining a lessee's incremental borrowing rate used in discounting lease payments, the Company mainly takes into account the market risk-free rates, the estimated lessee's credit spreads and secured status in a similar economic environment.

## **6. CASH AND CASH EQUIVALENTS**

	<b>December 31, 2019</b>	<b>December 31, 2018</b>
Cash and deposits in banks	\$ 452,734,378	\$ 575,825,502
Government bonds	2,188,149	-
Commercial paper	476,809	759,499
Repurchase agreements collateralized by corporate bonds	-----	1,229,600
	<u>\$ 455,399,336</u>	<u>\$ 577,814,601</u>

Deposits in banks consisted of highly liquid time deposits that were readily convertible to known amounts of cash and were subject to an insignificant risk of changes in value.

## 7. FINANCIAL ASSETS AND LIABILITIES AT FAIR VALUE THROUGH PROFIT OR LOSS

	December 31, 2019	December 31, 2018
<b><u>Financial assets</u></b>		
Mandatorily measured at FVTPL		
Forward exchange contracts	\$ 162,155	\$ 85,303
Convertible bonds	123,759	-
Agency mortgage-backed securities	<u>40,925</u>	<u>3,419,287</u>
	<u>\$ 326,839</u>	<u>\$ 3,504,590</u>
<b><u>Financial liabilities</u></b>		
Held for trading		
Forward exchange contracts	<u>\$ 982,349</u>	<u>\$ 40,825</u>

The Company entered into forward exchange contracts to manage exposures due to fluctuations of foreign exchange rates. These forward exchange contracts did not meet the criteria for hedge accounting. Therefore, the Company did not apply hedge accounting treatment for these forward exchange contracts.

Outstanding forward exchange contracts consisted of the following:

	<b>Maturity Date</b>	<b>Contract Amount (In Thousands)</b>
<b><u>December 31, 2019</u></b>		
Sell NT\$/Buy EUR	January 2020 to June 2020	NT\$84,690,438/EUR2,509,000
Sell NT\$/Buy JPY	January 2020 to March 2020	NT\$23,737,589/JPY85,600,000
Sell US\$/Buy JPY	January 2020	US\$6,209/JPY678,000
Sell US\$/Buy RMB	January 2020	US\$497,000/RMB3,493,919
Sell US\$/Buy NT\$	January 2020 to March 2020	US\$26,000/NT\$786,989
Sell JPY/Buy US\$	January 2020 to February 2020	JPY57,471,581/US\$526,368
<b><u>December 31, 2018</u></b>		
Sell NT\$/Buy EUR	January 2019 to March 2019	NT\$18,545,854/EUR527,000
Sell NT\$/Buy JPY	January 2019 to March 2019	NT\$4,757,858/JPY17,200,000
Sell US\$/Buy EUR	January 2019	US\$495/EUR434
Sell US\$/Buy JPY	January 2019	US\$175,591/JPY19,389,014
Sell US\$/Buy RMB	January 2019	US\$318,000/RMB2,188,747
Sell US\$/Buy NT\$	January 2019 to February 2019	US\$127,000/NT\$3,908,635
Sell RMB/Buy US\$	January 2019	RMB667,539/US\$97,000

## 8. FINANCIAL ASSETS AT FAIR VALUE THROUGH OTHER COMPREHENSIVE INCOME

	December 31, 2019	December 31, 2018
Investments in debt instruments at FVTOCI		
Agency bonds/Agency mortgage-backed securities	\$ 51,966,460	\$ 31,288,762
Corporate bonds	51,790,045	40,753,582
Government bonds	12,824,223	11,151,359
Asset-backed securities	10,815,849	15,670,295
Commercial paper	-	107,590
	<u>127,396,577</u>	<u>98,971,588</u>
Investments in equity instruments at FVTOCI		
Non-publicly traded equity investments	4,124,337	3,910,681
Publicly traded stocks	-	590,152
	<u>4,124,337</u>	<u>4,500,833</u>
	<u><u>\$ 131,520,914</u></u>	<u><u>\$ 103,472,421</u></u>
Current	\$ 127,396,577	\$ 99,561,740
Noncurrent	<u>4,124,337</u>	<u>3,910,681</u>
	<u><u>\$ 131,520,914</u></u>	<u><u>\$ 103,472,421</u></u>

These investments in equity instruments are held for medium to long-term purposes and therefore are accounted for as FVTOCI.

For the years ended December 31, 2019 and 2018, as the Company adjusted its investment portfolio or the non-publicly traded investee was merged, equity investments designated at FVTOCI were divested for NT\$873,470 thousand and NT\$840,605 thousand, respectively. The related other equity-unrealized gain/loss on financial assets at FVTOCI of NT\$156,770 thousand and NT\$1,193,056 thousand were transferred to increase and decrease retained earnings, respectively.

For dividends from equity investments designated as at FVTOCI recognized, please refer to Note 24. All the dividends are from investments held at the end of the reporting period.

As of December 31, 2019 and 2018, the cumulative loss allowance for expected credit loss of NT\$35,596 thousand and NT\$29,723 thousand are recognized under investments in debt instruments at FVTOCI, respectively. Refer to Note 32 for information relating to their credit risk management and expected credit loss.

## 9. FINANCIAL ASSETS AT AMORTIZED COST

	December 31, 2019	December 31, 2018
Corporate bonds	\$ 7,651,727	\$ 19,519,941
Commercial paper	-	2,294,098
Less: Allowance for impairment loss	<u>(2,929)</u>	<u>(8,147)</u>
	<u><u>\$ 7,648,798</u></u>	<u><u>\$ 21,805,892</u></u>
Current	\$ 299,884	\$ 14,277,615
Noncurrent	<u>7,348,914</u>	<u>7,528,277</u>
	<u><u>\$ 7,648,798</u></u>	<u><u>\$ 21,805,892</u></u>

Refer to Note 32 for information relating to credit risk management and expected credit loss for financial assets at amortized cost.

## 10. HEDGING FINANCIAL INSTRUMENTS

	December 31, 2019	December 31, 2018
<b><u>Financial assets- current</u></b>		
Fair value hedges		
Interest rate futures contracts	\$ 22,380	\$ -
Cash flow hedges		
Forward exchange contracts	<u>3,504</u>	<u>23,497</u>
	<u><u>\$ 25,884</u></u>	<u><u>\$ 23,497</u></u>
<b><u>Financial liabilities- current</u></b>		
Fair value hedges		
Interest rate futures contracts	\$ -	\$ 153,891
Cash flow hedges		
Forward exchange contracts	<u>1,798</u>	<u>1,941</u>
	<u><u>\$ 1,798</u></u>	<u><u>\$ 155,832</u></u>
<b><u>Fair value hedge</u></b>		

The Company entered into interest rate futures contracts, which are used to partially hedge against the fair value changes caused by interest rates fluctuation in the Company's fixed income investments. The hedge ratio is adjusted in response to the changes in the financial market and capped at 100%.

On the basis of economic relationships, the Company expects that the value of the interest rate futures contracts and the value of the hedged financial assets will change in opposite directions in response to movements in interest rates.

The main source of hedge ineffectiveness in these hedging relationships is the credit risk of the hedged financial assets, which is not reflected in the fair value of the interest rate futures contracts. No other sources of ineffectiveness emerged from these hedging relationships. Amount of hedge ineffectiveness recognized in profit or loss is classified under other gains and losses.

The following tables summarize the information relating to the hedges of interest rate risk.

December 31, 2019

<b>Hedging Instruments</b>	<b>Contract Amount (US\$ in Thousands)</b>	<b>Maturity</b>
US treasury bonds interest rate futures contracts	US\$122,200	March 2020

<b>Hedged Items</b>	<b>Asset Carrying Amount</b>	<b>Accumulated Amount of Fair Value Hedge Adjustments</b>
Financial assets at FVTOCI	\$ 7,364,727	\$ (22,380)

December 31, 2018

<b>Hedging Instruments</b>	<b>Contract Amount (US\$ in Thousands)</b>	<b>Maturity</b>
US treasury bonds interest rate futures contracts	US\$330,300	March 2019
<b>Hedged Items</b>	<b>Asset Carrying Amount</b>	<b>Accumulated Amount of Fair Value Hedge Adjustments</b>
Financial assets at FVTOCI	\$ 23,229,530	\$ (13,508)

The effect for the years ended December 31, 2019 and 2018 is detailed below:

<b>Hedging Instruments/Hedged Items</b>	<b>Increase (Decrease) in Value Used for Calculating Hedge Ineffectiveness</b>	
	<b>Years Ended December 31</b>	
	<b>2019</b>	<b>2018</b>
Hedging Instruments		
US treasury bonds interest rate futures contracts	\$ (164,740)	\$ 11,460
Hedged Items		
Financial assets at FVTOCI	<u>177,831</u>	<u>(13,846)</u>
	<u><u>\$ 13,091</u></u>	<u><u>\$ (2,386)</u></u>

#### Cash flow hedge

The Company entered into forward exchange contracts and foreign currency deposits to partially hedge foreign exchange rate risks associated with certain highly probable forecast transactions (capital expenditures). The hedge ratio is adjusted in response to the changes in the financial market and capped at 100%. The forward exchange contracts have maturities of 12 months or less.

On the basis of economic relationships, the Company expects that the value of forward exchange contracts and foreign currency deposits and the value of hedged transactions will change in opposite directions in response to movements in foreign exchange rates.

The main source of hedge ineffectiveness in these hedging relationships is driven by the effect of the counterparty's own credit risk on the fair value of forward exchange contracts and foreign currency deposits. No other sources of ineffectiveness emerged from these hedging relationships. For the years ended December 31, 2019 and 2018, refer to Note 21(d) for gain or loss arising from changes in the fair value of hedging instruments and the amount transferred to initial carrying amount of hedged items.

The following tables summarize the information relating to the hedges for foreign currency risk.

December 31, 2019

Hedging Instruments	Contract Amount (In Thousands)	Maturity	Balance in Other Equity (Continuing Hedges)
Forward exchange contracts	NT\$1,342,392 /EUR40,000	January 2020	\$ (3,820)

December 31, 2018

Hedging Instruments	Contract Amount (In Thousands)	Maturity	Balance in Other Equity (Continuing Hedges)
Forward exchange contracts	NT\$ 3,917,657 /EUR 112,000	February 2019 to April 2019	\$ 23,601

The effect for the years ended December 31, 2019 and 2018 is detailed below:

Hedging Instruments/Hedged Items	Increase (Decrease) in Value Used for Calculating Hedge Ineffectiveness	
	Years Ended December 31 2019	2018
Hedging Instruments		
Forward exchange contracts	\$ (109,592)	\$ 34,563
Foreign currency deposits	<u>-</u>	<u>6,412</u>
	<u><u>\$ (109,592)</u></u>	<u><u>\$ 40,975</u></u>
Hedged Items		
Forecast transaction (capital expenditures)	<u><u>\$ 109,592</u></u>	<u><u>\$ (40,975)</u></u>

## 11. NOTES AND ACCOUNTS RECEIVABLE, NET

	December 31, 2019	December 31, 2018
At amortized cost		
Notes and accounts receivable	\$ 135,978,049	\$ 125,025,575
Less: Loss allowance	<u>(325,325)</u>	<u>(7,253)</u>
	135,652,724	125,018,322
At FVTOCI	<u>3,255,865</u>	<u>3,595,069</u>
	<u><u>\$ 138,908,589</u></u>	<u><u>\$ 128,613,391</u></u>

The Company signed a contract with the bank to sell certain accounts receivable without recourse and transaction cost required. These accounts receivable are classified as at FVTOCI because they are held within a business model whose objective is achieved by both collecting contractual cash flows and selling financial assets.

In principle, the payment term granted to customers is due 30 days from the invoice date or 30 days from the end of the month when the invoice is issued. Aside from recognizing impairment loss for credit-impaired accounts receivable, the Company recognizes loss allowance based on the expected credit loss ratio of customers by different risk levels with consideration of factors of historical loss ratios and customers' financial conditions, competitiveness and business outlook. For accounts receivable past due over 90 days without collaterals or guarantees, the Company recognizes loss allowance at full amount.

#### Aging analysis of notes and accounts receivable

	<b>December 31, 2019</b>	<b>December 31, 2018</b>
Not past due	\$ 126,134,762	\$ 113,126,484
Past due		
Past due within 30 days	13,082,080	15,006,461
Past due 31-60 days	12,794	472,833
Past due 61-120 days	1,033	9,451
Past due over 121 days	3,245	5,415
Less: Loss allowance	<u>(325,325)</u>	<u>(7,253)</u>
	<u><u>\$ 138,908,589</u></u>	<u><u>\$ 128,613,391</u></u>

All of the Company's accounts receivable classified as at FVTOCI were not past due.

#### Movements of the loss allowance for accounts receivable

	<b>Years Ended December 31</b>	
	<b>2019</b>	<b>2018</b>
Balance, beginning of year	\$ 7,253	\$ 226,968
Provision (Reversal)	318,290	(219,714)
Effect of exchange rate changes	<u>(218)</u>	<u>(1)</u>
Balance, end of year	<u><u>\$ 325,325</u></u>	<u><u>\$ 7,253</u></u>

For the years ended December 31, 2019 and 2018, the changes in loss allowance were mainly due to the variations in the expected credit loss ratios and the balance of accounts receivable of different risk levels.

## **12. INVENTORIES**

	<b>December 31, 2019</b>	<b>December 31, 2018</b>
Finished goods	\$ 8,924,541	\$ 11,329,802
Work in process	51,969,105	72,071,861
Raw materials	16,552,275	15,233,877
Supplies and spare parts	<u>5,535,275</u>	<u>4,595,436</u>
	<u><u>\$ 82,981,196</u></u>	<u><u>\$ 103,230,976</u></u>

Reversal of write-down of inventories resulting from the increase in net realizable value and write-down of inventories to net realizable value were included in the cost of revenue, as illustrated below:

	<b>Years Ended December 31</b>	
	<b>2019</b>	<b>2018</b>
Inventory losses (reversal of write-down of inventories)	<u>\$ (1,983,048)</u>	<u>\$ 1,259,472</u>

The aforementioned inventory losses (reversal of write-down of inventories) exclude wafer contamination losses and computer virus outbreak losses. Please refer to related losses in Note 37.

### 13. INVESTMENTS ACCOUNTED FOR USING EQUITY METHOD

Associates consisted of the following:

Name of Associate	Principal Activities	Place of Incorporation and Operation	Carrying Amount		% of Ownership and Voting Rights Held by the Company	
			December 31, 2019	December 31, 2018	December 31, 2019	December 31, 2018
Vanguard International Semiconductor Corporation (VIS)	Manufacturing, selling, packaging, testing and computer-aided design of integrated circuits and other semiconductor devices and the manufacturing and design service of masks	Hsinchu, Taiwan	\$ 9,027,572	\$ 9,006,126	28%	28%
Systems on Silicon Manufacturing Company Pte Ltd. (SSMC)	Manufacturing and selling of integrated circuits and other semiconductor devices	Singapore	6,502,174	5,772,815	39%	39%
Xintec Inc. (Xintec)	Wafer level chip size packaging and wafer level post passivation interconnection service	Taoyuan, Taiwan	1,846,145	1,764,607	41%	41%
Global Unichip Corporation (GUC)	Researching, developing, manufacturing, testing and marketing of integrated circuits	Hsinchu, Taiwan	1,284,377	1,299,423	35%	35%
Mutual-Pak	Manufacturing of electronic parts, wholesaling and retailing of electronic materials, and researching, developing and testing of RFID	New Taipei, Taiwan	38,520	22,867	28%	39%
			<u>\$ 18,698,788</u>	<u>\$ 17,865,838</u>		

As of December 31, 2019 and 2018, no investments in associates are individually material to the Company. Please refer to the consolidated statements of comprehensive income for recognition of share of both profit (loss) and other comprehensive income (loss) of associates that are not individually material.

The market prices of the investments accounted for using the equity method in publicly traded stocks calculated by the closing price at the end of the reporting period are summarized as follows. The closing price represents the quoted price in active markets, the level 1 fair value measurement.

Name of Associate	December 31, 2019	December 31, 2018
VIS	\$ 36,812,923	\$ 27,621,298
GUC	\$ 11,251,774	\$ 9,617,699
Xintec	\$ 8,958,195	\$ 3,783,585

## 14. PROPERTY, PLANT AND EQUIPMENT

2019

**December 31,  
2019**

Assets used by the Company						\$ 1,352,313,861
Assets subject to operating leases						<u>63,544</u>
						<b><u>\$ 1,352,377,405</u></b>

### a. Assets used by the Company

	<b>Land and Land Improvements</b>	<b>Buildings</b>	<b>Machinery and Equipment</b>	<b>Office Equipment</b>	<b>Equipment under Installation and Construction in Progress</b>	<b>Total</b>
<b><u>Cost</u></b>						
Balance at January 1, 2019	\$ 4,011,353	\$ 418,151,675	\$ 2,728,760,127	\$ 48,382,279	\$ 172,910,989	\$ 3,372,216,423
Additions	-	21,448,528	179,798,420	7,415,036	355,621,089	564,283,073
Disposals or retirements	-	(158,970)	(17,381,538)	(1,043,398)	-	(18,583,906)
Transfers from right-of-use assets	-	-	619,779	-	-	619,779
Effect of disposal of subsidiary	-	-	-	(508)	-	(508)
Effect of exchange rate changes	(19,555)	(1,366,170)	(5,173,820)	(142,045)	(236,992)	(6,938,582)
Balance at December 31, 2019	<u>\$ 3,991,798</u>	<u>\$ 438,075,063</u>	<u>\$ 2,886,622,968</u>	<u>\$ 54,611,364</u>	<u>\$ 528,295,086</u>	<u>\$ 3,911,596,279</u>
<b><u>Accumulated depreciation and impairment</u></b>						
Balance at January 1, 2019	\$ 550,575	\$ 217,899,243	\$ 2,049,278,908	\$ 32,525,129	\$ -	\$ 2,300,253,855
Additions	1,633	26,026,642	246,724,229	6,012,497	-	278,765,001
Disposals or retirements	-	(144,402)	(12,880,817)	(1,042,131)	-	(14,067,350)
Transfers from right-of-use assets	-	-	20,659	-	-	20,659
Reversal of impairment	-	-	(301,384)	-	-	(301,384)
Effect of disposal of subsidiary	-	-	-	(508)	-	(508)
Effect of exchange rate changes	(13,518)	(722,093)	(4,575,652)	(76,592)	-	(5,387,855)
Balance at December 31, 2019	<u>\$ 538,690</u>	<u>\$ 243,059,390</u>	<u>\$ 2,278,265,943</u>	<u>\$ 37,418,395</u>	<u>\$ -</u>	<u>\$ 2,559,282,418</u>
Carrying amounts at December 31, 2019	<u>\$ 3,453,108</u>	<u>\$ 195,015,673</u>	<u>\$ 608,357,025</u>	<u>\$ 17,192,969</u>	<u>\$ 528,295,086</u>	<u>\$ 1,352,313,861</u>

The significant part of the Company's buildings includes main plants, mechanical and electrical power equipment and clean rooms, and the related depreciation is calculated using the estimated useful lives of 20 years, 10 years and 10 years, respectively.

In the first quarter of 2019, the Company recognized a reversal of impairment loss of NT\$301,384 thousand due to redeployment of certain idle machinery and equipment. Such reversal of impairment loss was recognized in other operating income and expenses.

b. Assets subject to operating leases

	<b>Buildings</b>
<u>Cost</u>	
Balance at January 1, 2019	<u>\$ 562,610</u>
Balance at December 31, 2019	<u>\$ 562,610</u>
<u>Accumulated depreciation</u>	
Balance at January 1, 2019	\$ 474,899
Additions	<u>24,167</u>
Balance at December 31, 2019	<u>\$ 499,066</u>
Carrying amounts at December 31, 2019	<u>\$ 63,544</u>

Operating leases relate to leases of buildings with lease terms between 1 to 5 years. The lessees do not have purchase options to acquire the assets at the expiry of the lease periods.

The maturity analysis of operating lease payments receivable for the buildings is as follows:

	<b>December 31, 2019</b>					
Year 1	\$ 18,450					
Year 2	16,992					
Year 3	<u>16,992</u>					
	<u>\$ 52,434</u>					
<u>2018</u>						
	<b>Land and Land Improvements</b>	<b>Buildings</b>	<b>Machinery and Equipment</b>	<b>Office Equipment</b>	<b>Equipment under Installation and Construction in Progress</b>	<b>Total</b>
<u>Cost</u>						
Balance at January 1, 2018	\$ 3,983,243	\$ 379,134,613	\$ 2,487,752,265	\$ 42,391,516	\$ 167,353,490	\$ 3,080,615,127
Additions	-	40,396,404	247,042,281	6,773,376	5,812,340	300,024,401
Disposals or retirements	-	(410,891)	(5,972,482)	(790,793)	-	(7,174,166)
Effect of exchange rate changes	<u>28,110</u>	<u>(405,841)</u>	<u>(61,937)</u>	<u>8,180</u>	<u>(254,841)</u>	<u>(686,329)</u>
Balance at December 31, 2018	<u>\$ 4,011,353</u>	<u>\$ 418,714,285</u>	<u>\$ 2,728,760,127</u>	<u>\$ 48,382,279</u>	<u>\$ 172,910,989</u>	<u>\$ 3,372,779,033</u>
<u>Accumulated depreciation and impairment</u>						
Balance at January 1, 2018	\$ 510,498	\$ 194,446,521	\$ 1,795,448,842	\$ 27,666,944	\$ -	\$ 2,018,072,805
Additions	20,900	24,293,366	258,195,315	5,615,316	-	288,124,897
Disposals or retirements	-	(398,955)	(4,773,589)	(789,993)	-	(5,962,537)
Impairment	-	-	423,468	-	-	423,468
Effect of exchange rate changes	<u>19,177</u>	<u>33,210</u>	<u>(15,128)</u>	<u>32,862</u>	<u>-</u>	<u>70,121</u>
Balance at December 31, 2018	<u>\$ 550,575</u>	<u>\$ 218,374,142</u>	<u>\$ 2,049,278,908</u>	<u>\$ 32,525,129</u>	<u>\$ -</u>	<u>\$ 2,300,728,754</u>
Carrying amounts at December 31, 2018	<u>\$ 3,460,778</u>	<u>\$ 200,340,143</u>	<u>\$ 679,481,219</u>	<u>\$ 15,857,150</u>	<u>\$ 172,910,989</u>	<u>\$ 1,072,050,279</u>

The significant part of the Company's buildings includes main plants, mechanical and electrical power equipment and clean rooms, and the related depreciation is calculated using the estimated useful lives of 20 years, 10 years and 10 years, respectively.

For the year ended December 31, 2018, the Company recognized an impairment loss of NT\$423,468 thousand for certain machinery and equipment that was assessed to have no future use, and the recoverable amount of certain machinery and equipment was nil. Such impairment loss was recognized in other operating income and expenses.

## 15. LEASE ARRANGEMENTS

2019

a. Right-of-use assets

	<b>December 31, 2019</b>
<u>Carrying amounts</u>	
Land	\$ 14,064,036
Buildings	2,351,809
Machinery and equipment	775,809
Office equipment	<u>40,748</u>
	<u>\$ 17,232,402</u>
	<b>Year Ended December 31, 2019</b>
Additions to right-of-use assets	<u>\$ 1,032,985</u>
	<b>Year Ended December 31, 2019</b>
Depreciation of right-of-use assets	
Land	\$ 957,065
Buildings	458,772
Machinery and equipment	1,184,374
Office equipment	<u>22,453</u>
	<u>\$ 2,622,664</u>
Income from subleasing right-of-use assets (classified under other operating income and expenses, net)	<u>\$ 55,026</u>
b. Lease liabilities	
	<b>December 31, 2019</b>
<u>Carrying amounts</u>	
Current portion (classified under accrued expenses and other current liabilities)	\$ 2,275,084
Noncurrent portion	<u>15,041,833</u>
	<u>\$ 17,316,917</u>

Ranges of discount rates for lease liabilities are as follows:

	<b>December 31, 2019</b>
Land	0.67%-2.14%
Buildings	0.67%-3.88%
Machinery and equipment	3.24%
Office equipment	0.64%-3.88%

c. Material terms of right-of-use assets

The Company leases land and buildings mainly for the use of plants and offices with lease terms of 1 to 36 years. The lease contracts for land located in the R.O.C. specify that lease payments will be adjusted every 2 years on the basis of changes in announced land value prices. The Company does not have purchase options to acquire the leasehold land and buildings at the end of the lease terms.

The Company leases machinery and equipment for use in operation with lease terms of 2 years. The Company has purchase options to acquire leasehold machinery and equipment at the end of the lease terms.

d. Subleases of right-of-use assets

The Company subleases its right-of-use assets for buildings under operating leases with lease terms of 1 to 5 years.

The maturity analysis of lease payments receivable under operating subleases is as follows:

	<b>December 31, 2019</b>
Year 1	\$ 58,569
Year 2	<u>1,885</u>
	<u>\$ 60,454</u>

e. Other lease information

	<b>Year Ended December 31, 2019</b>
Expenses relating to short-term leases	<u>\$ 5,007,057</u>
Expenses relating to low-value asset leases	<u>\$ 492</u>
Expenses relating to variable lease payments not included in the measurement of lease liabilities	<u>\$ 195,062</u>
	<b>Year Ended December 31, 2019</b>
Total cash outflow for leases	<u>\$ 7,724,421</u>

2018

The Company's major operating leases are arrangements on several parcels of land, machinery and equipment and office premises.

The Company expensed the lease payments as follows:

	<b>Year Ended December 31, 2018</b>
Minimum lease payments	<u>\$ 4,243,091</u>
Future minimum lease payments under non-cancellable operating leases are as follows:	
	<b>December 31, 2018</b>
Not later than 1 year	\$ 5,824,119
Later than 1 year and not later than 5 years	5,834,884
Later than 5 years	<u>9,190,582</u>
	<u>\$ 20,849,585</u>

## 16. INTANGIBLE ASSETS

	Goodwill	Technology License Fees	Software and System Design Costs	Patent and Others	Total
<u>Cost</u>					
Balance at January 1, 2019	\$ 5,795,488	\$ 10,974,458	\$ 29,594,483	\$ 7,656,524	\$ 54,020,953
Additions	-	4,879,562	3,710,381	647,755	9,237,698
Disposals or retirements	-	-	(260,904)	-	(260,904)
Effect of exchange rate changes	<u>(102,112)</u>	<u>931</u>	<u>(19,950)</u>	<u>(1,283)</u>	<u>(122,414)</u>
Balance at December 31, 2019	<u><u>\$ 5,693,376</u></u>	<u><u>\$ 15,854,951</u></u>	<u><u>\$ 33,024,010</u></u>	<u><u>\$ 8,302,996</u></u>	<u><u>\$ 62,875,333</u></u>
<u>Accumulated amortization and impairment</u>					
Balance at January 1, 2019	\$ -	\$ 8,756,005	\$ 23,023,498	\$ 5,239,313	\$ 37,018,816
Additions	-	1,066,834	3,747,343	658,232	5,472,409
Disposals or retirements	-	-	(258,527)	-	(258,527)
Effect of exchange rate changes	-	<u>931</u>	<u>(10,247)</u>	<u>(1,077)</u>	<u>(10,393)</u>
Balance at December 31, 2019	<u><u>\$ -</u></u>	<u><u>\$ 9,823,770</u></u>	<u><u>\$ 26,502,067</u></u>	<u><u>\$ 5,896,468</u></u>	<u><u>\$ 42,222,305</u></u>
Carrying amounts at December 31, 2019	<u><u>\$ 5,693,376</u></u>	<u><u>\$ 6,031,181</u></u>	<u><u>\$ 6,521,943</u></u>	<u><u>\$ 2,406,528</u></u>	<u><u>\$ 20,653,028</u></u>
					(Continued)

<u>Cost</u>	<b>Goodwill</b>	<b>Technology License Fees</b>	<b>Software and System Design Costs</b>	<b>Patent and Others</b>	<b>Total</b>
Balance at January 1, 2018	\$ 5,648,702	\$ 10,443,257	\$ 25,186,218	\$ 5,716,146	\$ 46,994,323
Additions	-	533,669	4,601,885	1,969,439	7,104,993
Disposals or retirements	-	-	(186,671)	(31,183)	(217,854)
Effect of exchange rate changes	146,786	(2,468)	(6,949)	2,122	139,491
Balance at December 31, 2018	<u>\$ 5,795,488</u>	<u>\$ 10,974,458</u>	<u>\$ 29,594,483</u>	<u>\$ 7,656,524</u>	<u>\$ 54,020,953</u>
<u>Accumulated amortization and impairment</u>					
Balance at January 1, 2018	\$ -	\$ 7,694,857	\$ 20,376,693	\$ 4,747,633	\$ 32,819,183
Additions	-	1,063,616	2,835,265	522,524	4,421,405
Disposals or retirements	-	-	(186,615)	(31,183)	(217,798)
Effect of exchange rate changes	-	(2,468)	(1,845)	339	(3,974)
Balance at December 31, 2018	<u>\$ -</u>	<u>\$ 8,756,005</u>	<u>\$ 23,023,498</u>	<u>\$ 5,239,313</u>	<u>\$ 37,018,816</u>
Carrying amounts at December 31, 2018	<u>\$ 5,795,488</u>	<u>\$ 2,218,453</u>	<u>\$ 6,570,985</u>	<u>\$ 2,417,211</u>	<u>\$ 17,002,137</u>
					(Concluded)

The Company's goodwill has been tested for impairment at the end of the annual reporting period and the recoverable amount is determined based on the value in use. The value in use was calculated based on the cash flow forecast from the financial budgets covering the future five-year period, and the Company used annual discount rates of 8.0% and 9.0% in its test of impairment as of December 31, 2019 and 2018, respectively, to reflect the relevant specific risk in the cash-generating unit.

For the years ended December 31, 2019 and 2018, the Company did not recognize any impairment loss on goodwill.

## 17. SHORT-TERM LOANS

	<b>December 31, 2019</b>	<b>December 31, 2018</b>
Unsecured loans		
Amount	<u>\$ 118,522,290</u>	<u>\$ 88,754,640</u>
Original loan content		
US\$ (in thousands)	\$ 2,370,000	\$ 2,610,000
EUR (in thousands)	1,410,000	242,000
Annual interest rate	0.01%-2.22%	0.01%-3.22%
Maturity date	Due by May 2020	Due by January 2019

## 18. BONDS PAYABLE

	<b>December 31, 2019</b>	<b>December 31, 2018</b>
Domestic unsecured bonds	\$ 56,900,000	\$ 91,800,000
Less: Current portion	<u>(31,800,000)</u>	<u>(34,900,000)</u>
	<u>\$ 25,100,000</u>	<u>\$ 56,900,000</u>

The major terms of domestic unsecured bonds are as follows:

<b>Issuance</b>	<b>Tranche</b>	<b>Issuance Period</b>	<b>Total Amount</b>	<b>Coupon Rate</b>	<b>Repayment and Interest Payment</b>
100-1	B	September 2011 to September 2018	\$ 7,500,000	1.63%	Bullet repayment; interest payable annually
100-2	B	January 2012 to January 2019	7,000,000	1.46%	The same as above
101-1	B	August 2012 to August 2019	9,000,000	1.40%	The same as above
101-2	B	September 2012 to September 2019	9,000,000	1.39%	The same as above
101-3	-	October 2012 to October 2022	4,400,000	1.53%	The same as above
101-4	A	January 2013 to January 2018	10,600,000	1.23%	The same as above
	B	January 2013 to January 2020	10,000,000	1.35%	The same as above
	C	January 2013 to January 2023	3,000,000	1.49%	The same as above
102-1	A	February 2013 to February 2018	6,200,000	1.23%	The same as above
	B	February 2013 to February 2020	11,600,000	1.38%	The same as above
	C	February 2013 to February 2023	3,600,000	1.50%	The same as above
102-2	A	July 2013 to July 2020	10,200,000	1.50%	The same as above
	B	July 2013 to July 2023	3,500,000	1.70%	The same as above
102-3	B	August 2013 to August 2019	8,500,000	1.52%	The same as above
102-4	C	September 2013 to March 2019	1,400,000	1.60%	Bullet repayment; interest payable annually (interest for the six months prior to maturity will accrue on the basis of actual days and be repayable at maturity)
	D	September 2013 to March 2021	2,600,000	1.85%	The same as above
	E	September 2013 to March 2023	5,400,000	2.05%	The same as above
	F	September 2013 to September 2023	2,600,000	2.10%	Bullet repayment; interest payable annually

The major terms of overseas unsecured bonds are as follows:

Issuance Period	Total Amount (US\$ in Thousands)	Coupon Rate	Repayment and Interest Payment
April 2013 to April 2018	US\$1,150,000	1.625%	Bullet repayment; interest payable semi-annually

## 19. RETIREMENT BENEFIT PLANS

### a. Defined contribution plans

The plan under the R.O.C. Labor Pension Act (the “Act”) is deemed a defined contribution plan. Pursuant to the Act, TSMC and VisEra Tech have made monthly contributions equal to 6% of each employee’s monthly salary to employees’ pension accounts. Furthermore, TSMC North America, TSMC China, TSMC Nanjing, TSMC Europe, TSMC Canada and TSMC Technology also make monthly contributions at certain percentages of the basic salary of their employees. Accordingly, the Company recognized expenses of NT\$2,609,733 thousand and NT\$2,568,945 thousand for the years ended December 31, 2019 and 2018, respectively.

### b. Defined benefit plans

TSMC has defined benefit plans under the R.O.C. Labor Standards Law that provide benefits based on an employee’s length of service and average monthly salary for the six-month period prior to retirement. The Company contributes an amount equal to 2% of salaries paid each month to their respective pension funds (the Funds), which are administered by the Labor Pension Fund Supervisory Committee (the Committee) and deposited in the Committee’s name in the Bank of Taiwan. Before the end of each year, the Company assesses the balance in the Funds. If the amount of the balance in the Funds is inadequate to pay retirement benefits for employees who conform to retirement requirements in the next year, the Company is required to fund the difference in one appropriation that should be made before the end of March of the next year. The Funds are operated and managed by the government’s designated authorities; as such, the Company does not have any right to intervene in the investments of the Funds.

Amounts recognized in respect of these defined benefit plans were as follows:

	<b>Years Ended December 31</b>	
	<b>2019</b>	<b>2018</b>
Current service cost	\$ 135,645	\$ 137,758
Net interest expense	<u>123,951</u>	<u>144,108</u>
Components of defined benefit costs recognized in profit or loss	<u>259,596</u>	<u>281,866</u>
Remeasurement on the net defined benefit liability:		
Return on plan assets (excluding amounts included in net interest expense)	(124,344)	(71,288)
Actuarial loss (gain) arising from experience adjustments	(438,009)	334,630
Actuarial gain arising from changes in demographic assumptions	(233,239)	-
Actuarial loss arising from changes in financial assumptions	<u>541,697</u>	<u>597,820</u>
Components of defined benefit costs recognized in other comprehensive income	<u>(253,895)</u>	<u>861,162</u>
Total	<u>\$ 5,701</u>	<u>\$ 1,143,028</u>

The pension costs of the aforementioned defined benefit plans were recognized in profit or loss by the following categories:

	<b>Years Ended December 31</b>	
	<b>2019</b>	<b>2018</b>
Cost of revenue	\$ 157,845	\$ 177,772
Research and development expenses	72,686	79,143
General and administrative expenses	25,063	20,591
Marketing expenses	<u>4,002</u>	<u>4,360</u>
	<u><u>\$ 259,596</u></u>	<u><u>\$ 281,866</u></u>

The amounts arising from the defined benefit obligation of the Company were as follows:

	<b>December 31, 2019</b>	<b>December 31, 2018</b>
Present value of defined benefit obligation	\$ 13,484,090	\$ 13,662,684
Fair value of plan assets	<u>(4,301,594)</u>	<u>(4,011,279)</u>
Net defined benefit liability	<u><u>\$ 9,182,496</u></u>	<u><u>\$ 9,651,405</u></u>

Movements in the present value of the defined benefit obligation were as follows:

	<b>Years Ended December 31</b>	
	<b>2019</b>	<b>2018</b>
Balance, beginning of year	\$ 13,662,684	\$ 12,774,593
Current service cost	135,645	137,758
Interest expense	175,401	207,804
Remeasurement:		
Actuarial loss (gain) arising from experience adjustments	(438,009)	334,630
Actuarial gain arising from changes in demographic assumptions	(233,239)	-
Actuarial loss arising from changes in financial assumptions	541,697	597,820
Benefits paid from plan assets	(344,131)	(274,326)
Benefits paid directly by the Company	<u>(15,958)</u>	<u>(115,595)</u>
Balance, end of year	<u><u>\$ 13,484,090</u></u>	<u><u>\$ 13,662,684</u></u>

Movements in the fair value of the plan assets were as follows:

	<b>Years Ended December 31</b>	
	<b>2019</b>	<b>2018</b>
Balance, beginning of year	\$ 4,011,279	\$ 3,923,889
Interest income	51,450	63,696
Remeasurement:		
Return on plan assets (excluding amounts included in net interest expense)	124,344	71,288
Contributions from employer	458,652	226,732
Benefits paid from plan assets	<u>(344,131)</u>	<u>(274,326)</u>
Balance, end of year	<u><u>\$ 4,301,594</u></u>	<u><u>\$ 4,011,279</u></u>

The fair value of the plan assets by major categories at the end of reporting period was as follows:

	<b>December 31, 2019</b>	<b>December 31, 2018</b>
Cash	\$ 713,204	\$ 756,126
Equity instruments	2,313,828	2,148,040
Debt instruments	<u>1,274,562</u>	<u>1,107,113</u>
	<u><u>\$ 4,301,594</u></u>	<u><u>\$ 4,011,279</u></u>

The actuarial valuations of the present value of the defined benefit obligation were carried out by qualified actuaries. The principal assumptions of the actuarial valuation were as follows:

	<b>Measurement Date</b>	
	<b>December 31, 2019</b>	<b>December 31, 2018</b>
Discount rate	0.90%	1.30%
Future salary increase rate	3.00%	3.00%

Through the defined benefit plans under the R.O.C. Labor Standards Law, the Company is exposed to the following risks:

- 1) Investment risk: The pension funds are invested in equity and debt securities, bank deposits, etc. The investment is conducted at the discretion of the government's designated authorities or under the mandated management. However, under the R.O.C. Labor Standards Law, the rate of return on assets shall not be less than the average interest rate on a two-year time deposit published by the local banks and the government is responsible for any shortfall in the event that the rate of return is less than the required rate of return.
- 2) Interest risk: A decrease in the government bond interest rate will increase the present value of the defined benefit obligation; however, this will be partially offset by an increase in the return on the debt investments of the plan assets.

Assuming a hypothetical decrease in interest rate at the end of the reporting period contributed to a decrease of 0.5% in the discount rate and all other assumptions were held constant, the present value of the defined benefit obligation would increase by NT\$724,963 thousand and NT\$921,750 thousand as of December 31, 2019 and 2018, respectively.

- 3) Salary risk: The present value of the defined benefit obligation is calculated by reference to the future salaries of plan participants. As such, an increase in the salary of the plan participants will increase the present value of the defined benefit obligation.

Assuming the expected salary rate increases by 0.5% at the end of the reporting period and all other assumptions were held constant, the present value of the defined benefit obligation would increase by NT\$706,502 thousand and NT\$901,629 thousand as of December 31, 2019 and 2018, respectively.

The sensitivity analysis presented above may not be representative of the actual change in the defined benefit obligation as it is unlikely that the change in assumptions would occur in isolation of one another as some of the assumptions may be correlated.

Furthermore, in presenting the above sensitivity analysis, the present value of the defined benefit obligation has been calculated using the projected unit credit method at the end of the reporting period, which is the same as that applied in calculating the defined benefit obligation liability.

The Company expects to make contributions of NT\$230,864 thousand to the defined benefit plans in the next year starting from December 31, 2019. The weighted average duration of the defined benefit obligation is 10 years.

## 20. GUARANTEE DEPOSITS

	December 31, 2019	December 31, 2018
Capacity guarantee	\$ 1,499,400	\$ 9,289,628
Receivables guarantee	-	653,686
Others	<u>230,481</u>	<u>245,731</u>
	<u><u>\$ 1,729,881</u></u>	<u><u>\$ 10,189,045</u></u>
Current portion (classified under accrued expenses and other current liabilities)	\$ 1,552,977	\$ 6,835,667
Noncurrent portion	<u>176,904</u>	<u>3,353,378</u>
	<u><u>\$ 1,729,881</u></u>	<u><u>\$ 10,189,045</u></u>

Some of guarantee deposits were refunded to customers by offsetting related accounts receivable.

## 21. EQUITY

### a. Capital stock

	December 31, 2019	December 31, 2018
Authorized shares (in thousands)	28,050,000	28,050,000
Authorized capital	<u>\$ 280,500,000</u>	<u>\$ 280,500,000</u>
Issued and paid shares (in thousands)	<u>25,930,380</u>	<u>25,930,380</u>
Issued capital	<u><u>\$ 259,303,805</u></u>	<u><u>\$ 259,303,805</u></u>

A holder of issued common shares with par value of NT\$10 per share is entitled to vote and to receive dividends.

The authorized shares include 500,000 thousand shares allocated for the exercise of employee stock options.

As of December 31, 2019, 1,065,122 thousand ADSs of TSMC were traded on the NYSE. The number of common shares represented by the ADSs was 5,325,610 thousand shares (one ADS represents five common shares).

b. Capital surplus

	<b>December 31, 2019</b>	<b>December 31, 2018</b>
Additional paid-in capital	\$ 24,184,939	\$ 24,184,939
From merger	22,804,510	22,804,510
From convertible bonds	8,892,847	8,892,847
From share of changes in equities of subsidiaries	121,843	121,473
From share of changes in equities of associates	302,234	282,820
Donations	33,336	29,343
	<u>\$ 56,339,709</u>	<u>\$ 56,315,932</u>

Under the relevant laws, the capital surplus generated from donations and the excess of the issuance price over the par value of capital stock (including the stock issued for new capital, mergers and convertible bonds) may be used to offset a deficit; in addition, when the Company has no deficit, such capital surplus may be distributed as cash dividends or stock dividends up to a certain percentage of TSMC's paid-in capital. The capital surplus from share of changes in equities of subsidiaries and associates and dividend of a claim extinguished by a prescription may be used to offset a deficit; however, when generated from issuance of restricted shares for employees, such capital surplus may not be used for any purpose.

c. Retained earnings and dividend policy

The amendments to TSMC's Articles of Incorporation had been approved by TSMC's shareholders in its meeting held on June 5, 2019, which stipulate that earnings distribution may be made on a quarterly basis after the close of each quarter. Distribution of earnings by way of cash dividends should be approved by TSMC's Board of Directors and reported to TSMC's shareholders in its meeting.

TSMC's amended Articles of Incorporation provide that, when allocating earnings, TSMC shall first estimate and reserve the taxes to be paid, offset its losses, set aside a legal capital reserve at 10% of the remaining earnings (until the accumulated legal capital reserve equals TSMC's paid-in capital), then set aside a special capital reserve in accordance with relevant laws or regulations or as requested by the authorities in charge. Any balance left over shall be allocated according to relevant laws and the TSMC's Articles of Incorporation.

TSMC's Articles of Incorporation also provide that profits of TSMC may be distributed by way of cash dividend and/or stock dividend. However, distribution of earnings shall be made preferably by way of cash dividend. Distribution of earnings may also be made by way of stock dividend, provided that the ratio for stock dividend shall not exceed 50% of the total distribution.

The reserve may be used to offset a deficit, or be distributed as dividends in cash or stocks for the portion in excess of 25% of the paid-in capital if the Company incurs no loss.

Pursuant to existing regulations, the Company is required to set aside additional special capital reserve equivalent to the net debit balance of the other components of stockholders' equity, such as the accumulated balance of foreign currency translation reserve, unrealized valuation gain or loss from fair value through other comprehensive income financial assets, unrealized valuation gain or loss from available-for-sale financial assets, gain or loss from changes in fair value of hedging instruments in cash flow hedges, etc. For the subsequent decrease in the deduction amount to stockholders' equity, any special reserve appropriated may be reversed to the extent that the net debit balance reverses.

The appropriations of 2018 and 2017 earnings have been approved by TSMC's shareholders in its meetings held on June 5, 2019 and June 5, 2018, respectively. The appropriations and cash dividends per share were as follows:

	Appropriation of Earnings		Cash Dividends Per Share (NT\$)	
	For Fiscal Year 2018	For Fiscal Year 2017	For Fiscal Year 2018	For Fiscal Year 2017
Legal capital reserve	<u>\$ 35,113,088</u>	<u>\$ 34,311,148</u>		
Special capital reserve	<u>\$ (11,459,458)</u>	<u>\$ 26,907,527</u>		
Cash dividends to shareholders	<u>\$207,443,044</u>	<u>\$207,443,044</u>	\$8.0	\$8.0

The appropriations of 2019 earnings for each quarter have been approved by TSMC's Board of Directors in its meeting. The appropriations and cash dividends per share were as follows:

Resolution Date of TSMC's Board of Directors in its meeting	Fourth Quarter of 2019	Third Quarter of 2019	Second Quarter of 2019	First Quarter of 2019
	February 11, 2020	November 12, 2019	August 13, 2019	June 5, 2019
Special capital reserve	<u>\$ 16,893,073</u>	<u>\$ 3,289,166</u>	<u>\$ (3,338,190)</u>	<u>\$ (4,723,939)</u>
Cash dividends to shareholders	<u>\$ 64,825,951</u>	<u>\$ 64,825,951</u>	<u>\$ 64,825,951</u>	<u>\$ 51,860,761</u>
Cash dividends per share (NT\$)	<u>\$ 2.5</u>	<u>\$ 2.5</u>	<u>\$ 2.5</u>	<u>\$ 2.0</u>

d. Others

Changes in others were as follows:

	Year Ended December 31, 2019				
	Foreign Currency Translation Reserve	Unrealized Gain (Loss) on Financial Assets at FVTOCI	Gain (Loss) on Hedging Instruments	Unearned Stock-Based Employee Compensation	Total
Balance, beginning of year	\$ (12,042,347)	\$ (3,429,324)	\$ 23,601	\$ (1,843)	\$ (15,449,913)
Exchange differences arising on translation of foreign operations	(14,693,561)	-	-	-	(14,693,561)
Unrealized gain (loss) on financial assets at FVTOCI					
Equity instruments	-	334,537	-	-	334,537
Debt instruments	-	3,097,329	-	-	3,097,329
Cumulative unrealized gain (loss) of equity instruments transferred to retained earnings due to disposal	-	(162,118)	-	-	(162,118)
Cumulative unrealized gain (loss) of debt instruments transferred to profit or loss due to disposal	-	(537,835)	-	-	(537,835)
Loss allowance adjustments from debt instruments	-	6,879	-	-	6,879
Other comprehensive income transferred to profit or loss due to disposal of subsidiary	4,598	-	-	-	4,598
Gain (loss) arising on changes in the fair value of hedging instruments	-	-	(109,592)	-	(109,592)
Transferred to initial carrying amount of hedged items	-	-	82,276	-	82,276
Share of other comprehensive income (loss) of associates	(140,090)	(11,903)	(105)	-	(152,098)
Share of unearned stock-based employee compensation of associates	-	-	-	1,653	1,653
Income tax effect	-	9,476	-	-	9,476
Balance, end of year	<u>\$ (26,871,400)</u>	<u>\$ (692,959)</u>	<u>\$ (3,820)</u>	<u>\$ (190)</u>	<u>\$ (27,568,369)</u>

	Year Ended December 31, 2018				
	Foreign Currency Translation Reserve	Unrealized Gain (Loss) on Financial Assets at FVTOCI	Unrealized Gain (Loss) on Hedging Instruments	Unearned Stock-Based Employee Compensation	Total
Balance, beginning of year	\$ (26,697,680)	\$ (524,915)	\$ 4,226	\$ (10,290)	\$ (27,228,659)
Exchange differences arising on translation of foreign operations	14,562,073	-	-	-	14,562,073
Unrealized gain (loss) on financial assets at FVTOCI					
Equity instruments	-	(3,311,621)	-	-	(3,311,621)
Debt instruments	-	(1,858,054)	-	-	(1,858,054)
Cumulative unrealized gain (loss) of equity instruments transferred to retained earnings due to disposal	-	1,193,056	-	-	1,193,056
Cumulative unrealized gain (loss) of debt instruments transferred to profit or loss due to disposal	-	989,138	-	-	989,138
Loss allowance adjustments from debt instruments	-	(1,990)	-	-	(1,990)
Gain (loss) arising on changes in the fair value of hedging instruments	-	-	40,975	-	40,975
Transferred to initial carrying amount of hedged items	-	-	(22,162)	-	(22,162)
Share of other comprehensive income (loss) of associates	93,260	(6,766)	-	-	86,494
Share of unearned stock-based employee compensation of associates	-	-	-	8,447	8,447
Income tax effect	—	91,828	562	—	92,390
Balance, end of year	<u><u>\$ (12,042,347)</u></u>	<u><u>\$ (3,429,324)</u></u>	<u><u>\$ 23,601</u></u>	<u><u>\$ (1,843)</u></u>	<u><u>\$ (15,449,913)</u></u>

The aforementioned other equity includes the changes in other equities of TSMC and TSMC's share of its subsidiaries and associates.

## 22. NET REVENUE

- a. Disaggregation of revenue from contracts with customers

Product	Years Ended December 31	
	2019	2018
Wafer	\$ 927,317,351	\$ 911,296,364
Others	<u>142,668,097</u>	<u>120,177,193</u>
	<u><u>\$ 1,069,985,448</u></u>	<u><u>\$ 1,031,473,557</u></u>

Geography	Years Ended December 31	
	2019	2018
Taiwan	\$ 84,255,256	\$ 78,260,773
United States	634,713,043	632,821,464
China	208,101,401	175,794,228
Europe, the Middle East and Africa	67,568,157	71,068,438
Japan	57,468,605	58,125,879
Others	<u>17,878,986</u>	<u>15,402,775</u>
	<u><u>\$ 1,069,985,448</u></u>	<u><u>\$ 1,031,473,557</u></u>

The Company categorized the net revenue mainly based on the countries where the customers are headquartered.

Platform	Years Ended December 31	
	2019	2018
Smartphone	\$ 523,612,863	\$ 466,452,280
High Performance Computing	315,822,311	341,910,195
Internet of Things	86,342,707	65,091,314
Automotive	47,914,518	51,709,787
Digital Consumer Electronics	53,733,395	58,470,179
Others	42,559,654	47,839,802
	<u>\$ 1,069,985,448</u>	<u>\$ 1,031,473,557</u>
Resolution	Years Ended December 31	
	2019	2018
7-nanometer	\$ 249,548,139	\$ 81,680,746
10-nanometer	23,266,355	96,989,486
16-nanometer	186,700,858	187,370,567
20-nanometer	9,535,831	23,618,466
28-nanometer	149,578,719	178,440,396
40/45-nanometer	93,366,285	101,801,017
65-nanometer	69,250,008	76,122,259
90-nanometer	25,624,251	36,652,061
0.11/0.13 micron	22,947,287	20,677,658
0.15/0.18 micron	77,564,492	81,182,646
0.25 micron and above	19,935,126	26,761,062
Wafer revenue	<u>\$ 927,317,351</u>	<u>\$ 911,296,364</u>

Starting the first quarter of 2019, the Company reported its net revenue breakdown by platform, instead of by application. The Company believes this change better represents the Company's results.

Commencing in 2018, the Company began to break down the net revenue by product, by geography, by resolution and by customer based on a new method which associates most estimated sales returns and allowances with individual sales transactions, as opposed to the previous method which allocated sales returns and allowances based on the aforementioned gross revenue. The Company believes the new method provides a more relevant breakdown than the previous one.

b. Contract balances

	December 31, 2019	December 31, 2018	January 1, 2018
Contract liabilities (classified under accrued expenses and other current liabilities)	<u>\$ 6,784,323</u>	<u>\$ 4,684,024</u>	<u>\$ 32,434,829</u>

The changes in the contract liability balances primarily result from the timing difference between the satisfaction of performance obligation and the customer's payment.

The Company recognized revenue from the beginning balance of contract liability, which amounted to NT\$3,876,603 thousand and NT\$31,769,970 thousand for the years ended December 31, 2019 and 2018, respectively.

c. Refund liabilities

Estimated sales returns and other allowances is made and adjusted based on historical experience and the consideration of varying contractual terms, which amounted to NT\$36,211,421 thousand and NT\$55,405,973 thousand for the years ended December 31, 2019 and 2018, respectively. As of December 31, 2019 and 2018, the aforementioned refund liabilities amounted to NT\$19,620,159 thousand and NT\$22,672,634 thousand (classified under accrued expenses and other current liabilities), respectively.

### **23. OTHER OPERATING INCOME AND EXPENSES, NET**

	<b>Years Ended December 31</b>	
	<b>2019</b>	<b>2018</b>
Loss on disposal or retirement of property, plant and equipment, net	\$ (949,965)	\$ (1,005,644)
Reversal of impairment loss (impairment loss) on property, plant and equipment	301,384	(423,468)
Others	<u>152,357</u>	<u>(672,337)</u>
	<u><u>\$ (496,224)</u></u>	<u><u>\$ (2,101,449)</u></u>

### **24. OTHER INCOME**

	<b>Years Ended December 31</b>	
	<b>2019</b>	<b>2018</b>
Interest income		
Bank deposits	\$ 11,454,032	\$ 10,310,738
Financial assets at FVTPL	339,480	382,673
Financial assets at FVTOCI	3,476,192	3,078,604
Financial assets at amortized cost	<u>919,670</u>	<u>922,441</u>
	<u>16,189,374</u>	<u>14,694,456</u>
Dividend income	<u>417,295</u>	<u>158,358</u>
	<u><u>\$ 16,606,669</u></u>	<u><u>\$ 14,852,814</u></u>

### **25. FINANCE COSTS**

	<b>Years Ended December 31</b>	
	<b>2019</b>	<b>2018</b>
Interest expense		
Bank loans	\$ 1,869,335	\$ 1,417,287
Corporate bonds	1,139,935	1,633,775
Lease liabilities	240,927	-
Others	<u>650</u>	<u>161</u>
	<u><u>\$ 3,250,847</u></u>	<u><u>\$ 3,051,223</u></u>

## 26. OTHER GAINS AND LOSSES, NET

	<b>Years Ended December 31</b>	
	<b>2019</b>	<b>2018</b>
Gain (loss) on disposal of financial assets, net		
Investments in debt instruments at FVTOCI	\$ 537,835	\$ (989,138)
Loss on disposal of subsidiaries	(4,598)	-
Loss on financial instruments at FVTPL, net		
Mandatorily measured at FVTPL	(2,360,699)	(2,293,895)
Gain (loss) arising from fair value hedges, net	13,091	(2,386)
The reversal (accrual) of expected credit loss of financial assets		
Investments in debt instruments at FVTOCI	(6,879)	1,990
Financial assets at amortized cost	5,165	393
Other gains (losses), net	<u>665,070</u>	<u>(127,768)</u>
	<u><u>\$ (1,151,015)</u></u>	<u><u>\$ (3,410,804)</u></u>

## 27. INCOME TAX

- a. Income tax expense recognized in profit or loss

Income tax expense consisted of the following:

	<b>Years Ended December 31</b>	
	<b>2019</b>	<b>2018</b>
Current income tax expense		
Current tax expense recognized in the current year	\$ 45,411,178	\$ 51,710,319
Income tax adjustments on prior years	196,882	(989,984)
Other income tax adjustments	<u>(41,465)</u>	<u>152,884</u>
	<u><u>45,566,595</u></u>	<u><u>50,873,219</u></u>
Deferred income tax benefit		
Effect of tax rate changes	-	(1,474,808)
The origination and reversal of temporary differences	<u>(1,065,068)</u>	<u>(3,072,554)</u>
	<u><u>(1,065,068)</u></u>	<u><u>(4,547,362)</u></u>
Income tax expense recognized in profit or loss	<u><u>\$ 44,501,527</u></u>	<u><u>\$ 46,325,857</u></u>

A reconciliation of income before income tax and income tax expense recognized in profit or loss was as follows:

	<b>Years Ended December 31</b>	
	<b>2019</b>	<b>2018</b>
Income before tax	<u><u>\$ 389,845,336</u></u>	<u><u>\$ 397,510,263</u></u>
Income tax expense at the statutory rate	\$ 79,053,188	\$ 80,865,915
Tax effect of adjusting items:		
Nondeductible (deductible) items in determining taxable income	(4,180,168)	2,539,966
Tax-exempt income	(39,808,121)	(54,543,521)
Additional income tax under the Alternative Minimum Tax Act	10,367,916	21,455,854
Additional income tax on unappropriated earnings	5,903,794	7,420,479
		(Continued)

	<b>Years Ended December 31</b>	
	<b>2019</b>	<b>2018</b>
Effect of tax rate changes on deferred income tax	\$ -	\$ (1,474,808)
The origination and reversal of temporary differences	(1,065,068)	(3,072,554)
Income tax credits	<u>(5,925,431)</u>	<u>(6,028,374)</u>
	44,346,110	47,162,957
Income tax adjustments on prior years	196,882	(989,984)
Other income tax adjustments	<u>(41,465)</u>	<u>152,884</u>
Income tax expense recognized in profit or loss	<u>\$ 44,501,527</u>	<u>\$ 46,325,857</u>
		(Concluded)

Under the amendment to the R.O.C Statute of Industrial Innovation in 2019, the amounts of unappropriated earnings in 2018 and thereafter used for building or purchasing specific assets or technologies can qualify for deduction when computing the income tax on unappropriated earnings.

In 2018, the Income Tax Law in the R.O.C. was amended and, starting from 2018, the corporate income tax rate was adjusted from 17% to 20%. In addition, the tax rate for 2018 unappropriated earnings was reduced from 10% to 5%.

For other jurisdictions, taxes are calculated using the applicable tax rate for each individual jurisdiction.

b. Income tax expense recognized in other comprehensive income

	<b>Years Ended December 31</b>	
	<b>2019</b>	<b>2018</b>
Deferred income tax benefit (expense)		
Related to remeasurement of defined benefit obligation	\$ (30,468)	\$ 103,339
Related to unrealized gain/loss on investments in equity instruments at FVTOCI	9,476	91,828
Related to gain/loss on cash flow hedges	<u>-</u>	<u>562</u>
	<u>\$ (20,992)</u>	<u>\$ 195,729</u>

c. Deferred income tax balance

The analysis of deferred income tax assets and liabilities was as follows:

	<b>December 31, 2019</b>	<b>December 31, 2018</b>
<u>Deferred income tax assets</u>		
Temporary differences		
Depreciation	\$ 13,547,220	\$ 11,839,221
Refund liability	2,150,352	2,594,003
Net defined benefit liability	1,016,248	1,084,874
Unrealized loss on inventories	469,430	750,995
Deferred compensation cost	323,093	271,711
Investments in equity instruments at FVTOCI	65,740	56,191
Others	<u>356,275</u>	<u>209,392</u>
	<u>\$ 17,928,358</u>	<u>\$ 16,806,387</u>
		(Continued)

**December 31,  
2019**      **December 31,  
2018**

Deferred income tax liabilities

Temporary differences						
Unrealized exchange gains			\$ (333,606)		\$ (61,677)	
Others			(10,787)		(171,607)	
			\$ (344,393)		\$ (233,284)	
						(Concluded)

	Year Ended December 31, 2019			
	Recognized in	Other Comprehensive Income	Effect of Exchange Rate Changes	Balance, End of Year
Balance, Beginning of Year	Profit or Loss			

Deferred income tax assets

Temporary differences						
Depreciation	\$ 11,839,221	\$ 1,727,762	\$ -	\$ (19,763)	\$ 13,547,220	
Refund liability	2,594,003	(443,194)	-	(457)	2,150,352	
Net defined benefit liability	1,084,874	(38,158)	(30,468)	-	1,016,248	
Unrealized loss on inventories	750,995	(280,734)	-	(831)	469,430	
Deferred compensation cost	271,711	59,365	-	(7,983)	323,093	
Investments in equity instruments at FVTOCI	56,191	73	9,476	-	65,740	
Others	<u>209,392</u>	<u>151,063</u>	<u>-</u>	<u>(4,180)</u>	<u>356,275</u>	
	<u><u>\$ 16,806,387</u></u>	<u><u>\$ 1,176,177</u></u>	<u><u>\$ (20,992)</u></u>	<u><u>\$ (33,214)</u></u>	<u><u>\$ 17,928,358</u></u>	

Deferred income tax liabilities

Temporary differences						
Unrealized exchange gains	\$ (61,677)	\$ (271,929)	\$ -	\$ -	\$ (333,606)	
Others	<u>(171,607)</u>	<u>160,820</u>	<u>-</u>	<u>-</u>	<u>(10,787)</u>	
	<u><u>\$ (233,284)</u></u>	<u><u>\$ (111,109)</u></u>	<u><u>\$ -</u></u>	<u><u>\$ -</u></u>	<u><u>\$ (344,393)</u></u>	

	Year Ended December 31, 2018			
	Recognized in	Other Comprehensive Income	Effect of Exchange Rate Changes	Balance, End of Year
Balance, Beginning of Year	Profit or Loss			

Deferred income tax assets

Temporary differences						
Depreciation	\$ 8,401,266	\$ 3,430,421	\$ -	\$ 7,534	\$ 11,839,221	
Refund liability	1,637,713	954,976	-	1,314	2,594,003	
Net defined benefit liability	975,324	6,211	103,339	-	1,084,874	
Unrealized loss on inventories	629,442	120,644	-	909	750,995	
Deferred compensation cost	266,521	(4,718)	-	9,908	271,711	
Investments in equity instruments at FVTOCI	-	-	56,191	-	56,191	
Others	<u>195,197</u>	<u>7,106</u>	<u>-</u>	<u>7,089</u>	<u>209,392</u>	
	<u><u>\$ 12,105,463</u></u>	<u><u>\$ 4,514,640</u></u>	<u><u>\$ 159,530</u></u>	<u><u>\$ 26,754</u></u>	<u><u>\$ 16,806,387</u></u>	

Deferred income tax liabilities

Temporary differences						
Unrealized exchange gains	\$ (169,480)	\$ 107,803	\$ -	\$ -	\$ (61,677)	
Investments in equity instruments at FVTOCI	(95,421)	-	95,421	-	-	
Others	<u>(37,304)</u>	<u>(75,081)</u>	<u>(59,222)</u>	<u>-</u>	<u>(171,607)</u>	
	<u><u>\$ (302,205)</u></u>	<u><u>\$ 32,722</u></u>	<u><u>\$ 36,199</u></u>	<u><u>\$ -</u></u>	<u><u>\$ (233,284)</u></u>	

- d. The deductible temporary differences for which no deferred income tax assets have been recognized

As of December 31, 2019 and 2018, the aggregate deductible temporary differences for which no deferred income tax assets have been recognized amounted to NT\$33,445,504 thousand and NT\$20,060,918 thousand, respectively.

- e. Unused tax-exemption information

As of December 31, 2019, the profits generated from the following projects of TSMC are exempt from income tax for a five-year period:

**Tax-exemption Period**

Construction and expansion of 2009 by TSMC	2018 to 2022
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- f. The information of unrecognized deferred income tax liabilities associated with investments

As of December 31, 2019 and 2018, the aggregate taxable temporary differences associated with investments in subsidiaries not recognized as deferred income tax liabilities amounted to NT\$131,085,673 thousand and NT\$112,893,001 thousand, respectively.

- g. Income tax examination

The tax authorities have examined income tax returns of TSMC through 2017. All investment tax credit adjustments assessed by the tax authorities have been recognized accordingly.

## **28. EARNINGS PER SHARE**

	<b>Years Ended December 31</b>	
	<b>2019</b>	<b>2018</b>
Basic EPS	\$ 13.32	\$ 13.54
Diluted EPS	<u>\$ 13.32</u>	<u>\$ 13.54</u>

EPS is computed as follows:

	Amounts (Numerator)	Number of Shares (Denominator) (In Thousands)	EPS (NT\$)
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### Year Ended December 31, 2019

#### Basic/Diluted EPS

Net income available to common shareholders of the parent	<u>\$ 345,263,668</u>	<u>25,930,380</u>	<u>\$ 13.32</u>
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### Year Ended December 31, 2018

#### Basic/Diluted EPS

Net income available to common shareholders of the parent	<u>\$ 351,130,884</u>	<u>25,930,380</u>	<u>\$ 13.54</u>
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## 29. ADDITIONAL INFORMATION OF EXPENSES BY NATURE

	<b>Years Ended December 31</b>	
	<b>2019</b>	<b>2018</b>
a. Depreciation of property, plant and equipment and right-of-use assets		
Recognized in cost of revenue	\$ 256,530,964	\$ 264,804,741
Recognized in operating expenses	24,856,701	23,292,299
Recognized in other operating income and expenses	<u>24,167</u>	<u>27,857</u>
	<u><u>\$ 281,411,832</u></u>	<u><u>\$ 288,124,897</u></u>
b. Amortization of intangible assets		
Recognized in cost of revenue	\$ 3,069,901	\$ 2,073,480
Recognized in operating expenses	<u>2,402,508</u>	<u>2,347,925</u>
	<u><u>\$ 5,472,409</u></u>	<u><u>\$ 4,421,405</u></u>
c. Research and development costs expensed as incurred	<u><u>\$ 91,418,746</u></u>	<u><u>\$ 85,895,569</u></u>
d. Employee benefits expenses		
Post-employment benefits		
Defined contribution plans	\$ 2,609,733	\$ 2,568,945
Defined benefit plans	<u>259,596</u>	<u>281,866</u>
	<u><u>2,869,329</u></u>	<u><u>2,850,811</u></u>
Other employee benefits	<u>107,115,281</u>	<u>105,364,132</u>
	<u><u>\$ 109,984,610</u></u>	<u><u>\$ 108,214,943</u></u>
Employee benefits expense summarized by function		
Recognized in cost of revenue	\$ 64,701,955	\$ 63,597,704
Recognized in operating expenses	<u>45,282,655</u>	<u>44,617,239</u>
	<u><u>\$ 109,984,610</u></u>	<u><u>\$ 108,214,943</u></u>

According to TSMC's Articles of Incorporation, TSMC shall allocate compensation to directors and profit sharing bonus to employees of TSMC not more than 0.3% and not less than 1% of annual profits during the period, respectively.

TSMC accrued profit sharing bonus to employees based on a percentage of net income before income tax, profit sharing bonus to employees and compensation to directors during the period, which amounted to NT\$23,165,745 thousand and NT\$23,570,040 thousand for the years ended December 31, 2019 and 2018, respectively; compensation to directors was expensed based on estimated amount payable. If there is a change in the proposed amounts after the annual consolidated financial statements are authorized for issue, the differences are recorded as a change in accounting estimate.

TSMC's profit sharing bonus to employees and compensation to directors in the amounts of NT\$23,165,745 thousand and NT\$360,404 thousand in cash for 2019, respectively, profit sharing bonus to employees and compensation to directors in the amounts of NT\$23,570,040 thousand and NT\$349,272 thousand in cash for 2018, respectively, and profit sharing bonus to employees and compensation to directors in the amounts of NT\$23,019,082 thousand and NT\$368,919 thousand in cash for 2017, respectively, had been approved by the Board of Directors of TSMC held on February 11, 2020, February 19, 2019 and February 13, 2018,

respectively. There is no significant difference between the aforementioned approved amounts and the amounts charged against earnings of 2019, 2018 and 2017, respectively.

The information about the appropriations of TSMC's profit sharing bonus to employees and compensation to directors is available at the Market Observation Post System website.

### 30. CASH FLOW INFORMATION

#### a. Non-cash transactions

	<b>Years Ended December 31</b>	
	<b>2019</b>	<b>2018</b>
Additions of property, plant and equipment	\$ 564,283,073	\$ 300,024,401
Changes in other financial assets	472,504	1,555,387
Exchange of assets	(3,287,138)	-
Changes in payables to contractors and equipment suppliers	(100,964,013)	13,979,931
Transferred to initial carrying amount of hedged items	(82,276)	22,162
Payments for acquisition of property, plant and equipment	<u>\$ 460,422,150</u>	<u>\$ 315,581,881</u>
Acquisition of financial assets at FVTOCI	\$ 257,824,493	\$ 100,759,582
Changes in other financial assets	-	(23,775)
Changes in accrued expenses and other current liabilities	<u>(266,253)</u>	<u>(4,323,021)</u>
Payments for acquisition of financial assets at FVTOCI	<u>\$ 257,558,240</u>	<u>\$ 96,412,786</u>
Disposal of financial assets at FVTOCI	\$ 229,525,134	\$ 90,545,153
Changes in other financial assets	919,352	(3,905,831)
Proceeds from disposal of financial assets at FVTOCI	<u>\$ 230,444,486</u>	<u>\$ 86,639,322</u>

#### b. Reconciliation of liabilities arising from financing activities

	Balance as of January 1, 2019	Financing Cash Flow	<b>Non-cash changes</b>			Balance as of December 31, 2019
			Foreign Exchange Movement	Leases Modifications	Other Changes (Note)	
Short-term loans	\$ 88,754,640	\$ 31,804,302	\$ (2,036,652)	\$ -	\$ -	\$ 118,522,290
Guarantee deposits	10,189,045	(639,066)	4,474	-	(7,824,572)	1,729,881
Lease liabilities	19,903,615	(3,174,032)	(73,290)	419,697	240,927	17,316,917
Bonds payable	<u>91,800,000</u>	<u>(34,900,000)</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>56,900,000</u>
Total	<u><u>\$ 210,647,300</u></u>	<u><u>\$ (6,908,796)</u></u>	<u><u>\$ (2,105,468)</u></u>	<u><u>\$ 419,697</u></u>	<u><u>\$ (7,583,645)</u></u>	<u><u>\$ 194,469,088</u></u>

	Balance as of January 1, 2018	Financing Cash Flow	<b>Non-cash changes</b>			Balance as of December 31, 2018
			Foreign Exchange Movement	Other Changes (Note)		
Short-term loans	\$ 63,766,850	\$ 23,922,975	\$ 1,064,815	\$ -	\$ 88,754,640	
Guarantee deposits	16,080,619	(279,219)	423,545	(6,035,900)	10,189,045	
Bonds payable	<u>150,201,122</u>	<u>(58,024,900)</u>	<u>(382,878)</u>	<u>6,656</u>	<u>91,800,000</u>	
Total	<u><u>\$ 230,048,591</u></u>	<u><u>\$ (34,381,144)</u></u>	<u><u>\$ 1,105,482</u></u>	<u><u>\$ (6,029,244)</u></u>	<u><u>\$ 190,743,685</u></u>	

Note: Other changes include guarantee deposits refunded to customers by offsetting related accounts receivable, financial cost of lease liabilities and amortization of bonds payable.

## **31. CAPITAL MANAGEMENT**

The Company requires significant amounts of capital to build and expand its production facilities and acquire additional equipment. In consideration of the industry dynamics, the Company manages its capital in a manner to ensure that it has sufficient and necessary financial resources to fund its working capital needs, capital asset purchases, research and development activities, dividend payments, debt service requirements and other business requirements associated with its existing operations over the next 12 months.

## **32. FINANCIAL INSTRUMENTS**

### a. Categories of financial instruments

	<b>December 31, 2019</b>	<b>December 31, 2018</b>
Financial assets		
FVTPL (Note 1)	\$ 326,839	\$ 3,504,590
FVTOCI (Note 2)	134,776,779	107,067,490
Hedging financial assets	25,884	23,497
Amortized cost (Note 3)	<u>612,740,640</u>	<u>745,585,774</u>
	<u>\$ 747,870,142</u>	<u>\$ 856,181,351</u>
Financial liabilities		
FVTPL (Note 4)	\$ 982,349	\$ 40,825
Hedging financial liabilities	1,798	155,832
Amortized cost (Note 5)	<u>533,581,640</u>	<u>318,475,704</u>
	<u>\$ 534,565,787</u>	<u>\$ 318,672,361</u>

Note 1: Financial assets mandatorily measured at FVTPL.

Note 2: Including notes and accounts receivable (net), equity and debt investments.

Note 3: Including cash and cash equivalents, financial assets at amortized cost, notes and accounts receivable (including related parties), other receivables and refundable deposits.

Note 4: Held for trading.

Note 5: Including short-term loans, accounts payable (including related parties), payables to contractors and equipment suppliers, cash dividends payable, accrued expenses and other current liabilities, bonds payable and guarantee deposits.

### b. Financial risk management objectives

The Company seeks to ensure that sufficient cost-efficient funding is readily available when needed. The Company manages its exposure to foreign currency risk, interest rate risk, equity price risk, credit risk and liquidity risk with the objective to reduce the potentially adverse effects the market uncertainties may have on its financial performance.

The plans for material treasury activities are reviewed by Audit Committees and/or Board of Directors in accordance with procedures required by relevant regulations or internal controls. During the implementation of such plans, the corporate treasury function must comply with certain treasury procedures that provide guiding principles for overall financial risk management and segregation of duties.

c. Market risk

The Company is exposed to the financial market risks, primarily changes in foreign currency exchange rates, interest rates and equity investment prices. A portion of these risks is hedged.

Foreign currency risk

The majority of the Company's revenue is denominated in U.S. dollar and over one-half of its capital expenditures are denominated in currencies other than NT dollar, primarily in U.S. dollar, Japanese yen and Euro. As a result, any significant fluctuations to its disadvantage in exchanges rate of NT dollar against such currencies, in particular a weakening of U.S. dollar against NT dollar, would have an adverse impact on the revenue and operating profit as expressed in NT dollar. The Company uses foreign currency derivative contracts, such as currency forwards or currency swaps, to protect against currency exchange rate risks associated with non-NT dollar-denominated assets and liabilities and certain forecasted transactions. The Company utilizes U.S. dollar denominated debt to partially offset currency risk arising from U.S. dollar denominated receivables for balance sheet hedges. These hedges reduce, but do not entirely eliminate, the financial impact on the Company caused by the effect of foreign currency exchange rate movements on the assets and liabilities.

Based on a sensitivity analysis performed on the Company's total monetary assets and liabilities for the years ended December 31, 2019 and 2018, a hypothetical adverse foreign currency exchange rate change of 10% would have decreased its net income by NT\$2,137,338 thousand and NT\$506,369 thousand, respectively, and decreased its other comprehensive income by NT\$107,690 thousand and NT\$315,571 thousand, respectively, after taking into account hedges and offsetting positions.

Interest rate risk

The Company is exposed to interest rate risks primarily related to its investment portfolio and bank loans. Changes in interest rates affect the interest earned on the Company's cash and cash equivalents as well as fixed income securities and the fair value of those securities as well as the interest paid on its bank loans. Because all of the Company's bonds issued are fixed-rate and measured at amortized cost, changes in interest rates would not affect the cash flows and the fair value.

The Company's cash and cash equivalents as well as fixed income investments in both fixed- and floating-rate securities carry a degree of interest rate risk. The majority of the Company's fixed income investments are fixed-rate securities and classified as FVTOCI, and may have their fair value adversely affected due to a rise in interest rates, while cash and cash equivalents as well as floating-rate securities may generate less interest income than predicted if interest rates fall. The Company has entered, and may enter in the future, into interest rate futures to partially hedge the fair value change in its fixed income investments. However, these hedges can offset only a small portion of the financial impact from movements in interest rates.

Based on a sensitivity analysis performed on fixed income investments at the end of the reporting period, an interest rate increase of 100 basis points (1.00%) across all maturities would have decreased the fair value by NT\$3,517,424 thousand and NT\$2,697,715 thousand for the years ended December 31, 2019 and 2018, respectively. The decreases were composed of NT\$3,516,604 thousand decrease and NT\$2,449,954 thousand decrease in other comprehensive income, and NT\$820 thousand decrease and NT\$247,761 thousand decrease in net income for the years ended December 31, 2019 and 2018, respectively.

As for the Company's bank loans, all of them are floating-rate loans. A rise in interest rates may incur higher interest expense than predicted.

#### Other price risk

The Company is exposed to equity price risk arising from financial assets at FVTOCI.

Assuming a hypothetical decrease of 10% in prices of the equity investments at the end of the reporting period for the years ended December 31, 2019 and 2018, the other comprehensive income would have decreased by NT\$401,879 thousand and NT\$427,101 thousand, respectively.

#### d. Credit risk management

Credit risk refers to the risk that a counterparty will default on its contractual obligations resulting in financial losses to the Company. The Company is exposed to credit risks from operating activities, primarily trade receivables, and from investing activities, primarily deposits, fixed-income investments and other financial instruments with banks. Credit risk is managed separately for business related and financial related exposures. As of the end of the reporting period, the Company's maximum credit risk exposure is equal to the carrying amount of financial assets.

##### Business related credit risk

The Company's trade receivables are from its customers worldwide. The majority of the Company's outstanding trade receivables are not covered by collaterals or guarantees. While the Company has procedures to monitor and manage credit risk exposure on trade receivables, there is no assurance such procedures will effectively eliminate losses resulting from its credit risk. This risk is heightened during periods when economic conditions worsen.

As of December 31, 2019 and 2018, the Company's ten largest customers accounted for 79% of accounts receivable in both years. The Company considers the concentration of credit risk for the remaining accounts receivable not material.

##### Financial credit risk

The Company mitigates its financial credit risk by selecting counterparties with investment-grade credit ratings and by limiting the exposure to any individual counterparty. The Company regularly monitors and reviews the limit applied to counterparties and adjusts the limit according to market conditions and the credit standing of the counterparties.

The risk management of expected credit loss for financial assets at amortized cost and investments in debt instruments at FVTOCI is as follows:

The Company only invests in debt instruments that are rated as investment grade or higher. The credit rating information is supplied by external rating agencies. The Company assesses whether there has been a significant increase in credit risk since initial recognition by reviewing changes in external credit ratings, financial market conditions and material information of the bond issuers.

The Company assesses the 12-month expected credit loss and lifetime expected credit loss based on the probability of default and loss given default provided by external credit rating agencies. The current credit risk assessment policies are as follows:

<b>Category</b>	<b>Description</b>	<b>Basis for Recognizing Expected Credit Loss</b>	<b>Expected Credit Loss Ratio</b>
Performing	Credit rating on trade date and valuation date: (1) Within investment grade (2) Between BB+ and BB-	12 months expected credit loss	0-0.1%
Doubtful	Credit rating on trade date and valuation date: (1) From investment grade to non-investment grade (2) From BB+~BB- to B+~CCC-	Lifetime expected credit loss-not credit impaired	-
In default	Credit rating CC or below	Lifetime expected credit loss-credit impaired	-
Write-off	There is evidence indicating that the debtor is in severe financial difficulty and the Company has no realistic prospect of recovery	Amount is written off	-

For the years ended December 31, 2019 and 2018, the expected credit loss increases NT\$655 thousand and decreases NT\$1,040 thousand, respectively. The changes are mainly due to investment portfolio adjustment.

#### e. Liquidity risk management

The objective of liquidity risk management is to ensure the Company has sufficient liquidity to fund its business operations over the next 12 months. The Company manages its liquidity risk by maintaining adequate cash and cash equivalent, debt investment at FVTPL, financial assets at FVTOCI-current, and financial assets amortized at cost-current.

The table below summarizes the maturity profile of the Company's financial liabilities based on contractual undiscounted payments, including principal and interest.

	<b>Less Than 1 Year</b>	<b>1-3 Years</b>	<b>3-5 Years</b>	<b>More Than 5 Years</b>	<b>Total</b>
<u>December 31, 2019</u>					
<u>Non-derivative financial liabilities</u>					
Short-term loans	\$ 118,562,641	\$ -	\$ -	\$ -	\$ 118,562,641
Accounts payable (including related parties)	40,205,966	-	-	-	40,205,966
Payables to contractors and equipment suppliers	140,810,703	-	-	-	140,810,703
Accrued expenses and other current liabilities	45,760,898	-	-	-	45,760,898
Bonds payable	32,338,853	7,777,715	18,203,601	-	58,320,169
Lease liabilities (including those classified under accrued expenses and other current liabilities)	2,475,177	2,782,860	2,484,478	10,947,730	18,690,245
Guarantee deposits (including those classified under accrued expenses and other current liabilities)	<u>1,552,977</u>	<u>121,047</u>	<u>55,501</u>	<u>356</u>	<u>1,729,881</u>
	<u>381,707,215</u>	<u>10,681,622</u>	<u>20,743,580</u>	<u>10,948,086</u>	<u>424,080,503</u>
(Continued)					

	<b>Less Than 1 Year</b>	<b>1-3 Years</b>	<b>3-5 Years</b>	<b>More Than 5 Years</b>	<b>Total</b>
<b><u>Derivative financial instruments</u></b>					
Forward exchange contracts					
Outflows	\$ 141,450,762	\$ -	\$ -	\$ -	\$ 141,450,762
Inflows	<u>(141,128,914)</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>(141,128,914)</u>
	<u>321,848</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>321,848</u>
	<u><u>\$ 382,029,063</u></u>	<u><u>\$ 10,681,622</u></u>	<u><u>\$ 20,743,580</u></u>	<u><u>\$ 10,948,086</u></u>	<u><u>\$ 424,402,351</u></u>
					(Concluded)

Additional information about the maturity analysis for lease liabilities:

	<b>Less than 5 Years</b>	<b>5-10 Years</b>	<b>10-15 Years</b>	<b>15-20 Years</b>	<b>More Than 20 Years</b>
Lease liabilities	<u>\$ 7,742,515</u>	<u>\$ 5,581,116</u>	<u>\$ 3,691,272</u>	<u>\$ 1,600,962</u>	<u>\$ 74,380</u>
	<b>Less Than 1 Year</b>	<b>1-3 Years</b>	<b>3-5 Years</b>	<b>More Than 5 Years</b>	<b>Total</b>

December 31, 2018

**Non-derivative financial liabilities**

Short-term loans	\$ 88,810,737	\$ -	\$ -	\$ -	\$ 88,810,737
Accounts payable (including related parties)	34,357,432	-	-	-	34,357,432
Payables to contractors and equipment suppliers	43,133,659	-	-	-	43,133,659
Accrued expenses and other current liabilities	50,240,928	-	-	-	50,240,928
Bonds payable	36,039,935	35,340,742	22,979,426	-	94,360,103
Guarantee deposits (including those classified under accrued expenses and other current liabilities)	<u>6,835,667</u>	<u>2,891,663</u>	<u>461,715</u>	<u>-</u>	<u>10,189,045</u>
	<u><u>259,418,358</u></u>	<u><u>38,232,405</u></u>	<u><u>23,441,141</u></u>	<u><u>-</u></u>	<u><u>321,091,904</u></u>

**Derivative financial instruments**

Forward exchange contracts					
Outflows	49,302,325	-	-	-	49,302,325
Inflows	<u>(49,393,679)</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>(49,393,679)</u>
	<u>(91,354)</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>(91,354)</u>
	<u><u>\$ 259,327,004</u></u>	<u><u>\$ 38,232,405</u></u>	<u><u>\$ 23,441,141</u></u>	<u><u>\$ -</u></u>	<u><u>\$ 321,000,550</u></u>

**f. Fair value of financial instruments**

1) Fair value measurements recognized in the consolidated balance sheets

Fair value measurements are grouped into Levels 1 to 3 based on the degree to which the fair value is observable:

- Level 1 fair value measurements are those derived from quoted prices (unadjusted) in active markets for identical assets or liabilities;
- Level 2 fair value measurements are those derived from inputs other than quoted prices included within Level 1 that are observable for the asset or liability, either directly (i.e. as prices) or indirectly (i.e. derived from prices); and
- Level 3 fair value measurements are those derived from valuation techniques that include inputs for the asset or liability that are not based on observable market data (unobservable inputs).

The timing of transfers between levels within the fair value hierarchy is at the end of reporting period.

2) Fair value of financial instruments that are measured at fair value on a recurring basis

Fair value hierarchy

The following table presents the Company's financial assets and liabilities measured at fair value on a recurring basis:

	December 31, 2019			
	Level 1	Level 2	Level 3	Total
<u>Financial assets at FVTPL</u>				
Mandatorily measured at FVTPL				
Forward exchange contracts	\$ -	\$ 162,155	\$ -	\$ 162,155
Convertible bonds	-	-	123,759	123,759
Agency mortgage-backed securities	—	40,925	—	40,925
	<u>\$ -</u>	<u>\$ 203,080</u>	<u>\$ 123,759</u>	<u>\$ 326,839</u>
<u>Financial assets at FVTOCI</u>				
Investments in debt instruments				
Agency bonds/Agency mortgage-backed securities	\$ -	\$ 51,966,460	\$ -	\$ 51,966,460
Corporate bonds	-	51,790,045	-	51,790,045
Government bonds	12,678,086	146,137	-	12,824,223
Asset-backed securities	-	10,815,849	-	10,815,849
Investments in equity instruments				
Non-publicly traded equity investments	-	39,196	4,085,141	4,124,337
Notes and accounts receivable, net	—	<u>3,255,865</u>	—	<u>3,255,865</u>
	<u>\$ 12,678,086</u>	<u>\$ 118,013,552</u>	<u>\$ 4,085,141</u>	<u>\$ 134,776,779</u>
<u>Hedging financial assets</u>				
Fair value hedges				
Interest rate futures contracts	\$ 22,380	\$ -	\$ -	\$ 22,380
Cash flow hedges				
Forward exchange contracts	—	3,504	—	3,504
	<u>\$ 22,380</u>	<u>\$ 3,504</u>	<u>\$ -</u>	<u>\$ 25,884</u>
<u>Financial liabilities at FVTPL</u>				
Held for trading				
Forward exchange contracts	<u>\$ -</u>	<u>\$ 982,349</u>	<u>\$ -</u>	<u>\$ 982,349</u>
<u>Hedging financial liabilities</u>				
Cash flow hedges				
Forward exchange contracts	<u>\$ -</u>	<u>\$ 1,798</u>	<u>\$ -</u>	<u>\$ 1,798</u>

	December 31, 2018			
	Level 1	Level 2	Level 3	Total
<u>Financial assets at FVTPL</u>				
Mandatorily measured at FVTPL				
Agency mortgage-backed securities	\$ -	\$ 3,419,287	\$ -	\$ 3,419,287
Forward exchange contracts	_____ -	_____ 85,303	_____ -	_____ 85,303
	<u>\$ _____ -</u>	<u>\$ 3,504,590</u>	<u>\$ _____ -</u>	<u>\$ 3,504,590</u>
<u>Financial assets at FVTOCI</u>				
Investments in debt instruments				
Corporate bonds	\$ -	\$ 40,753,582	\$ -	\$ 40,753,582
Agency bonds/Agency mortgage-backed securities	-	31,288,762	-	31,288,762
Asset-backed securities	-	15,670,295	-	15,670,295
Government bonds	11,006,167	145,192	-	11,151,359
Commercial paper	-	107,590	-	107,590
Investments in equity instruments				
Non-publicly traded equity investments	-	-	3,910,681	3,910,681
Publicly traded stocks	590,152	-	-	590,152
Notes and accounts receivable, net	_____ -	<u>3,595,069</u>	_____ -	<u>3,595,069</u>
	<u>\$ 11,596,319</u>	<u>\$ 91,560,490</u>	<u>\$ 3,910,681</u>	<u>\$ 107,067,490</u>
<u>Hedging financial assets</u>				
Cash flow hedges				
Forward exchange contracts	<u>\$ _____ -</u>	<u>\$ 23,497</u>	<u>\$ _____ -</u>	<u>\$ 23,497</u>
<u>Financial liabilities at FVTPL</u>				
Held for trading				
Forward exchange contracts	<u>\$ _____ -</u>	<u>\$ 40,825</u>	<u>\$ _____ -</u>	<u>\$ 40,825</u>
<u>Hedging financial liabilities</u>				
Fair value hedges				
Interest rate futures contracts	\$ 153,891	\$ -	\$ -	\$ 153,891
Cash flow hedges				
Forward exchange contracts	_____ -	<u>1,941</u>	_____ -	<u>1,941</u>
	<u>\$ 153,891</u>	<u>\$ 1,941</u>	<u>\$ _____ -</u>	<u>\$ 155,832</u>
<u>Reconciliation of Level 3 fair value measurements of financial assets</u>				
The financial assets measured at Level 3 fair value were financial assets at FVTPL and equity investments classified as financial assets at FVTOCI. Reconciliations for the years ended December 31, 2019 and 2018 were as follows:				
	Years Ended December 31			
	2019	2018		
Balance, beginning of year		\$ 3,910,681	\$ 5,841,384	
Additions		372,315	212,488	
Recognized in other comprehensive income		129,497	(2,141,421)	
Disposals and proceeds from return of capital of investments		(76,532)	(175,731)	
Transfers out of level 3 (Note)		(43,610)	-	
Effect of exchange rate changes		(83,451)	173,961	
Balance, end of year		<u>\$ 4,208,900</u>	<u>\$ 3,910,681</u>	

Note: The transfer from level 3 to level 2 is because observable market data became available for the equity investments.

Valuation techniques and assumptions used in Level 2 fair value measurement

The fair values of financial assets and financial liabilities are determined as follows:

- The fair values of corporate bonds, agency bonds, agency mortgage-backed securities, asset-backed securities, government bonds, commercial papers and non-publicly traded equity investments are determined by quoted market prices provided by third party pricing services.
- Forward exchange contracts are measured using forward exchange rates and the discounted curves that are derived from quoted market prices.
- The fair value of accounts receivables classified as at FVTOCI are determined by the present value of future cash flows based on the discount rate that reflects the credit risk of counterparties.

Valuation techniques and assumptions used in Level 3 fair value measurement

The fair values of non-publicly traded equity investments are mainly determined by using the asset approach, income approach and market approach.

The asset approach takes into account the net asset value measured at the fair value by independent parties. On December 31, 2019 and 2018, the Company uses unobservable inputs derived from discount for lack of marketability by 10%. When other inputs remain equal, the fair value will decrease by NT\$34,843 thousand and NT\$31,420 thousand if discounts for lack of marketability increase by 1%.

The income approach utilizes discounted cash flows to determine the present value of the expected future economic benefits that will be derived from the investment. On December 31, 2019 and 2018, the Company uses unobservable inputs, which include expected returns, discount rate of 10%, discount for lack of marketability of 10%, and discounts for lack of control of 10%.

For the remaining few investments, the market approach is used to arrive at their fair values, for which the recent financing activities of investees, the market transaction prices of the similar companies and market conditions are considered.

In addition, the fair values of convertible bonds are determined by the present value of future cash flow based on a discount rate reflecting issuer's credit spread and market conditions, combined with the fair value of conversion option estimated by the option pricing model considering recent financing activities of the investee and market transaction prices of the similar companies.

3) Fair value of financial instruments that are not measured at fair value

Except as detailed in the following table, the Company considers that the carrying amounts of financial instruments in the consolidated financial statements that are not measured at fair value approximate their fair values.

Fair value hierarchy

The table below sets out the fair value hierarchy for the Company's assets and liabilities which are not required to measure at fair value:

	<b>December 31, 2019</b>	
	Carrying Amount	Level 2 Fair Value
<b>Financial assets</b>		
Financial assets at amortized costs		
Corporate bonds	<u>\$ 7,648,798</u>	<u>\$ 7,718,731</u>
<b>Financial liabilities</b>		
Financial liabilities at amortized costs		
Bonds payable	<u>\$ 56,900,000</u>	<u>\$ 57,739,115</u>
	<b>December 31, 2018</b>	
	Carrying Amount	Level 2 Fair Value
<b>Financial assets</b>		
Financial assets at amortized costs		
Corporate bonds	<u>\$ 19,511,794</u>	<u>\$ 19,554,553</u>
Commercial paper	<u>2,294,098</u>	<u>2,296,188</u>
	<u><u>\$ 21,805,892</u></u>	<u><u>\$ 21,850,741</u></u>
<b>Financial liabilities</b>		
Financial liabilities at amortized costs		
Bonds payable	<u>\$ 91,800,000</u>	<u>\$ 93,171,255</u>

Valuation techniques and assumptions used in Level 2 fair value measurement

The fair value of corporate bonds is determined by quoted market prices provided by third party pricing services.

The fair value of commercial paper is determined by the present value of future cash flows based on the discounted curves that are derived from the quoted market prices.

The fair value of the Company's bonds payable is determined by quoted market prices provided by third party pricing services.

### 33. RELATED PARTY TRANSACTIONS

Intercompany balances and transactions between TSMC and its subsidiaries, which are related parties of TSMC, have been eliminated upon consolidation; therefore those items are not disclosed in this note. The following is a summary of significant transactions between the Company and other related parties:

- a. Related party name and categories

<b>Related Party Name</b>	<b>Related Party Categories</b>
GUC	Associates
VIS	Associates
SSMC	Associates
Xintec	Associates
TSMC Education and Culture Foundation	Other related parties
TSMC Charity Foundation	Other related parties

- b. Net revenue

<u>Item</u>	<u>Related Party Categories</u>	<b>Years Ended December 31</b>	
		<b>2019</b>	<b>2018</b>
Net revenue from sale of goods	Associates Other related parties	\$ 6,253,895 _____ -	\$ 8,980,079 _____ 330
		<u>\$ 6,253,895</u>	<u>\$ 8,980,409</u>
Net revenue from royalties	Associates	<u>\$ 183,583</u>	<u>\$ 362,259</u>

- c. Purchases

<u>Related Party Categories</u>	<b>Years Ended December 31</b>	
	<b>2019</b>	<b>2018</b>
Associates	<u>\$ 6,301,417</u>	<u>\$ 8,809,533</u>

- d. Receivables from related parties

<u>Item</u>	<u>Related Party Name/Categories</u>	<b>December 31,</b>	
		<b>2019</b>	<b>2018</b>
Receivables from related parties	GUC Xintec	\$ 741,898 _____ 120,172	\$ 481,934 _____ 102,478
		<u>\$ 862,070</u>	<u>\$ 584,412</u>

(Continued)

		<b>December 31, 2019</b>	<b>December 31, 2018</b>
<u>Item</u>	<u>Related Party Name/Categories</u>		
Other receivables from related parties	SSMC VIS Other associates	\$ 46,506 3,920 1,227  \$ 51,653	\$ 53,780 10,423 825  \$ 65,028
			(Concluded)

e. Payables to related parties

		<b>December 31, 2019</b>	<b>December 31, 2018</b>
<u>Item</u>	<u>Related Party Name/Categories</u>		
Payables to related parties	Xintec SSMC VIS Others	\$ 736,860 487,944 153,977 56,119  \$ 1,434,900	\$ 649,812 362,564 357,080 7,043  \$ 1,376,499

f. Others

		<b>Years Ended December 31</b>	
		<b>2019</b>	<b>2018</b>
<u>Item</u>	<u>Related Party Categories</u>		
Manufacturing expenses	Associates	\$ 2,822,989	\$ 2,974,581
Research and development expenses	Associates	\$ 163,425	\$ 83,145
General and administrative expenses	Other related parties	\$ 120,000	\$ 120,756

The sales prices and payment terms to related parties were not significantly different from those of sales to third parties. For other related party transactions, price and terms were determined in accordance with mutual agreements.

The Company leased factory and office from associates. The lease terms and prices were both determined in accordance with mutual agreements. The rental expenses were paid to associates monthly; the related expenses were both classified under manufacturing expenses.

g. Compensation of key management personnel

The compensation to directors and other key management personnel for the years ended December 31, 2019 and 2018 were as follows:

	<b>Years Ended December 31</b>	
	<b>2019</b>	<b>2018</b>
Short-term employee benefits	\$ 1,922,191	\$ 2,004,881
Post-employment benefits	<u>2,686</u>	<u>3,383</u>
	<u><u>\$ 1,924,877</u></u>	<u><u>\$ 2,008,264</u></u>

The compensation to directors and other key management personnel were determined by the Compensation Committee of TSMC in accordance with the individual performance and the market trends.

#### **34. PLEDGED ASSETS**

The Company provided certificate of deposits recorded in other financial assets as collateral mainly for building lease agreements. As of December 31, 2019 and 2018, the aforementioned other financial assets amounted to NT\$114,467 thousand and NT\$124,244 thousand, respectively.

#### **35. SIGNIFICANT CONTINGENT LIABILITIES AND UNRECOGNIZED COMMITMENTS**

Significant contingent liabilities and unrecognized commitments of the Company as of the end of the reporting period, excluding those disclosed in other notes, were as follows:

- a. Under a technical cooperation agreement with Industrial Technology Research Institute, the R.O.C. Government or its designee approved by TSMC can use up to 35% of TSMC's capacity provided TSMC's outstanding commitments to its customers are not prejudiced. The term of this agreement is for five years beginning from January 1, 1987 and is automatically renewed for successive periods of five years unless otherwise terminated by either party with one year prior notice. As of December 31, 2019, the R.O.C. Government did not invoke such right.
- b. Under a Shareholders Agreement entered into with Philips and EDB Investments Pte Ltd. on March 30, 1999, the parties formed a joint venture company, SSMC, which is an integrated circuit foundry in Singapore. TSMC's equity interest in SSMC was 32%. Nevertheless, in September 2006, Philips spun-off its semiconductor subsidiary which was renamed as NXP B.V. Further, TSMC and NXP B.V. purchased all the SSMC shares owned by EDB Investments Pte Ltd. pro rata according to the Shareholders Agreement on November 15, 2006. After the purchase, TSMC and NXP B.V. currently own approximately 39% and 61% of the SSMC shares, respectively. TSMC and NXP B.V. are required, in the aggregate, to purchase at least 70% of SSMC's capacity, but TSMC alone is not required to purchase more than 28% of the capacity. If any party defaults on the commitment and the capacity utilization of SSMC falls below a specific percentage of its capacity, the defaulting party is required to compensate SSMC for all related unavoidable costs. There was no default from the aforementioned commitment as of December 31, 2019.
- c. In February 2019, Innovative Foundry Technologies LLC ("IFT") filed a complaint in the U.S. District Court for the District of Delaware alleging that TSMC and TSMC Technology Inc. infringe five U.S. patents. IFT also filed a complaint in the U.S. International Trade Commission (the "ITC") alleging that TSMC, TSMC North America, TSMC Technology Inc., and other companies infringe the same patents. The ITC instituted an investigation in March 2019. Both parties agreed to end the dispute and the ITC terminated the investigation in October 2019. The pending litigation in the U.S. District Court for the District of Delaware was dismissed at the same time.

- d. On September 28, 2017, TSMC was contacted by the European Commission (the “Commission”), which has asked us for information and documents concerning alleged anti-competitive practices in relation to semiconductor sales. We are cooperating with the Commission to provide the requested information and documents. In light of the fact that this proceeding is still in its preliminary stage, it is premature to predict how the case will proceed, the outcome of the proceeding or its impact.
- e. TSMC entered into long-term purchase agreements of material with multiple suppliers. The relative minimum purchase quantity and price are specified in the agreements.
- f. TSMC entered into a long-term purchase agreement of equipment. The relative purchase quantity and price are specified in the agreement.
- g. TSMC entered into long-term energy purchase agreements with multiple suppliers. The relative purchase period, quantity and price are specified in the agreements.
- h. Amounts available under unused letters of credit as of December 31, 2019 and 2018 were NT\$59,976 thousand and NT\$70,702 thousand, respectively.

### **36. EXCHANGE RATE INFORMATION OF FOREIGN-CURRENCY FINANCIAL ASSETS AND LIABILITIES**

The following information was summarized according to the foreign currencies other than the functional currency of the Company. The exchange rates disclosed were used to translate the foreign currencies into the functional currency. The significant financial assets and liabilities denominated in foreign currencies were as follows:

<b>Foreign Currencies (In Thousands)</b>	<b>Exchange Rate (Note 1)</b>	<b>Carrying Amount (In Thousands)</b>
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December 31, 2019

#### Financial assets

##### Monetary items

USD	\$ 4,725,056	29.988	\$ 141,694,967
USD	455,984	6.966(Note 2)	13,674,047
EUR	3,638	33.653	122,418
JPY	72,369,239	0.2751	19,908,778

#### Financial liabilities

##### Monetary items

USD	6,018,287	29.988	180,476,401
EUR	2,551,824	33.653	85,876,547
JPY	101,455,514	0.2751	27,910,412

(Continued)

	<b>Foreign Currencies (In Thousands)</b>	<b>Exchange Rate (Note 1)</b>	<b>Carrying Amount (In Thousands)</b>
<u>December 31, 2018</u>			
<u>Financial assets</u>			
Monetary items			
USD	\$ 4,618,566	30.740	\$ 141,974,734
USD	343,132	6.866 (Note 2)	10,547,875
EUR	7,561	35.22	266,307
JPY	490,635	0.2783	136,544
Non-monetary items			
HKD	144,567	3.93	568,150
<u>Financial liabilities</u>			
Monetary items			
USD	4,323,763	30.740	132,912,486
EUR	477,776	35.22	16,827,260
JPY	35,084,436	0.2783	9,763,999
			(Concluded)

Note 1: Except as otherwise noted, exchange rate represents the number of NT dollar for which one foreign currency could be exchanged.

Note 2: The exchange rate represents the number of RMB for which one U.S. dollar could be exchanged.

Please refer to the consolidated statements of comprehensive income for the total of realized and unrealized foreign exchange gain and loss for the years ended December 31, 2019 and 2018, respectively. Since there were varieties of foreign currency transactions and functional currencies within the subsidiaries of the Company, the Company was unable to disclose foreign exchange gain (loss) towards each foreign currency with significant impact.

## 37. SIGNIFICANT OPERATION LOSSES

On January 19, 2019, the Company discovered a wafer contamination issue in a fab in Taiwan caused by a batch of unqualified photoresist materials. After investigation, the Company immediately stopped using the unqualified materials. An estimated loss of NT\$3,400,000 thousand related to this event was recognized in cost of revenue for the three months ended March 31, 2019.

The Company experienced a computer virus outbreak on August 3, 2018, which affected a number of computer systems and fab tools, and consequently impacted wafer production in Taiwan. All the impacted tools have been recovered by August 6, 2018. The Company recognized a loss of NT\$2,596,046 thousand related to this incident for the three months ended September 30, 2018, which was included in cost of revenue.

## 38. ADDITIONAL DISCLOSURES

Following are the additional disclosures required by the Securities and Futures Bureau for TSMC:

- a. Financings provided: Please see Table 1 attached;
- b. Endorsement/guarantee provided: Please see Table 2 attached;

- c. Marketable securities held (excluding investments in subsidiaries and associates): Please see Table 3 attached;
- d. Marketable securities acquired and disposed of at costs or prices of at least NT\$300 million or 20% of the paid-in capital: Please see Table 4 attached;
- e. Acquisition of individual real estate properties at costs of at least NT\$300 million or 20% of the paid-in capital: Please see Table 5 attached;
- f. Disposal of individual real estate properties at prices of at least NT\$300 million or 20% of the paid-in capital: None;
- g. Total purchases from or sales to related parties of at least NT\$100 million or 20% of the paid-in capital: Please see Table 6 attached;
- h. Receivables from related parties amounting to at least NT\$100 million or 20% of the paid-in capital: Please see Table 7 attached;
- i. Information about the derivative financial instruments transaction: Please see Notes 7 and 10;
- j. Others: The business relationship between the parent and the subsidiaries and significant transactions between them: Please see Table 8 attached;
- k. Names, locations, and related information of investees over which TSMC exercises significant influence (excluding information on investment in mainland China): Please see Table 9 attached;
- l. Information on investment in mainland China
  - 1) The name of the investee in mainland China, the main businesses and products, its issued capital, method of investment, information on inflow or outflow of capital, percentage of ownership, income (losses) of the investee, share of profits/losses of investee, ending balance, amount received as dividends from the investee, and the limitation on investee: Please see Table 10 attached.
  - 2) Significant direct or indirect transactions with the investee, its prices and terms of payment, unrealized gain or loss, and other related information which is helpful to understand the impact of investment in mainland China on financial reports: Please see Table 8 attached.

## **39. OPERATING SEGMENTS INFORMATION**

- a. Operating segments, segment revenue and operating results

TSMC's chief operating decision makers periodically review operating results, focusing on operating income generated by foundry segment. Operating results are used for resource allocation and/or performance assessment. As a result, the Company has only one operating segment, the foundry segment. The foundry segment engages mainly in the manufacturing, selling, packaging, testing and computer-aided design of integrated circuits and other semiconductor devices and the manufacturing of masks.

The basis for the measurement of income from operations is the same as that for the preparation of financial statements. Please refer to the consolidated statements of comprehensive income for the related segment revenue and operating results.

b. Geographic and major customers information were as follows:

1) Geographic information

<b>Noncurrent Assets</b>	<b>December 31, 2019</b>	<b>December 31, 2018</b>
Taiwan	\$1,344,352,664	\$1,039,471,321
United States	8,850,099	7,569,797
China	38,586,614	43,574,538
Europe, the Middle East and Africa	186,238	8,269
Japan	27,074	13,138
Others	3,064	-
	<u>\$1,392,005,753</u>	<u>\$1,090,637,063</u>

Noncurrent assets include property, plant and equipment, right-of-use assets, intangible assets and other noncurrent assets.

2) Major customers representing at least 10% of net revenue

	<b>Years Ended December 31</b>			
	<b>2019</b>	<b>%</b>	<b>2018</b>	<b>%</b>
	<b>Amount</b>		<b>Amount</b>	<b>%</b>
Customer A	\$ 247,213,291	23	\$ 224,690,695	22
Customer B	152,876,885	14	83,885,616	8

TABLE 1

**Taiwan Semiconductor Manufacturing Company Limited and Subsidiaries**

**FINANCINGS PROVIDED  
FOR THE YEAR ENDED DECEMBER 31, 2019**

(Amounts in Thousands of New Taiwan Dollars, Unless Specified Otherwise)

No.	Financing Company	Counter-party	Financial Statement Account	Related Party	Maximum Balance for the Period Foreign Currencies in Thousands (Note 3)	Ending Balance (Foreign Currencies in Thousands) (Note 3)	Amount Actually Drawn (Foreign Currencies in Thousands)	Nature for Financing (Note 4)	Reason for Financing (Note 4)	Allowance for Bad Debt	Collateral Item	Value	Financing Limits for Each Borrowing Company (Notes 1 and 2)	Financing Company's Total Financing Amount Limits (Notes 1 and 2)
1	TSMC China	TSMC Nanjing	Other receivables from related parties	Yes	\$ 44,497,832 (RMB 7,000,000& USS 479,000)	\$ 38,903,568 (RMB 6,000,000& USS 436,000)	\$ 24,102,968 (RMB 5,000,000& USS 29,988,000)	1.50-1.96% The need for long-term financing	\$ - The need for short-term financing	\$ - Operating capital	\$ - Operating capital	\$ 57,358,467 - - - 397,737,270	\$ 57,358,467 - - - 397,737,270	
2	TSMC Global	TSMC	Other receivables from related parties	Yes	(USS 1,500,000)	(USS 1,000,000)	(USS 1,000,000)	0.00% The need for short-term financing	-	-	-	-		

Note 1 : The total amount available for lending purpose shall not exceed the net worth of TSMC China. The total amount for lending to a company for funding for a short-term period shall not exceed ten percent (10%) of the net worth of TSMC China. In addition, the total amount lendable to any one borrower shall be no more than thirty percent (30%) of the borrower's net worth. The above restriction does not apply to the subsidiaries whose voting shares are 100% owned, directly or indirectly, by TSMC. However, the total amount lendable to any such subsidiary of TSMC shall not exceed forty percent (40%) of the net worth of TSMC China. When there is a lending for funding needs by TSMC China to TSMC, or to the subsidiaries whose voting shares are 100% owned, directly or indirectly, by TSMC, which are not located in Taiwan, the lending will not be subject to the restriction set forth in the above paragraph. Notwithstanding the foregoing, the aggregate amount available for lending to such borrowers and the total amount lendable to each of such borrowers still shall not exceed the net worth of TSMC China.

Note 2 : The total amount available for lending purpose shall not exceed the net worth of TSMC Global. The total amount for lending to a company for funding for a short-term period shall not exceed ten percent (10%) of the net worth of TSMC Global. In addition, the total amount lendable to any one borrower shall be no more than thirty percent (30%) of the borrower's net worth. While TSMC, or its foreign subsidiaries in which TSMC directly or indirectly holds 100% of the voting shares will not be subject to this restriction, their total borrowing amount still shall not exceed the net worth of TSMC Global. Notwithstanding the foregoing, the aggregate amount available for lending to Taiwan companies other than TSMC shall not exceed forty percent (40%) of the net worth of TSMC Global.

Note 3 : The maximum balance for the period and ending balance represent the amounts approved by the Board of Directors.

Note 4 : The restriction of the term of each loan for funding not exceeding one year shall not apply to inter-company loans for funding between offshore subsidiaries in which the Company holds, directly or indirectly, 100% of the voting shares.

TABLE 2

**Taiwan Semiconductor Manufacturing Company Limited and Subsidiaries**  
**ENDORSEMENTS/GUARANTEES PROVIDED**  
**FOR THE YEAR ENDED DECEMBER 31, 2019**  
*(Amounts in Thousands of New Taiwan Dollars, Unless Specified Otherwise)*

No.	Endorsement/ Guarantee Provider	Guaranteed Party	Limits on Endorsement/ Guarantee Amount Provided to Each Guaranteed Party (Notes 1 and 2)	Maximum Balance for the Period (US\$ in Thousands) (Note 3)	Ending Balance (US\$ in Thousands) (Note 3)	Amount Actually Drawn (US\$ in Thousands)	Amount of Endorsement/ Guarantee Collateralized by Properties	Maximum Endorsement/ Guarantee Amount Allowable (Note 2)	Ratio of Accumulated Endorsement/ Guarantee to Net Equity per Latest Financial Statements	Guarante Provided by Parent Company	Guarante Provided by A Subsidiary	Guarantee Provided to Subsidiaries in Mainland China
0	TSMC	TSMC North America	Subsidiary	\$ 405,352,531 (US\$ 83,213)	\$ 2,495,400 (US\$ 83,213)	\$ 2,495,400 (US\$ 83,213)	\$ 2,495,400 (US\$ 83,213)	\$ 405,352,531	0.15%	Yes	No	No

Note 1: The total amount of the guarantee provided by TSMC to any individual entity shall not exceed ten percent (10%) of TSMC's net worth, or the net worth of such entity. However, subsidiaries whose voting shares are 100% owned, directly or indirectly, by TSMC are not subject to the above restrictions after the approval of the Board of Directors.

Note 2: The total amount of guarantee shall not exceed twenty-five percent (25%) of TSMC's net worth.

Note 3: The maximum balance for the period and ending balance represent the amounts approved by the Board of Directors.

**Taiwan Semiconductor Manufacturing Company Limited and Subsidiaries**  
**MARKETABLE SECURITIES HELD**  
**DECEMBER 31, 2019**  
**(Amounts in Thousands of New Taiwan Dollars, Unless Specified Otherwise)**

**TABLE 3**

Held Company Name	Marketable Securities Type and Name	Relationship with the Company	Financial Statement Account	Shares/Units (In Thousands)	Carrying Value (Foreign Currencies in Thousands)	Percentage of Ownership (%)	Fair Value (Foreign Currencies in Thousands)	Note
TSMC	Non-publicly traded equity investments United Industrial Gases Co., Ltd.	-	Financial assets at fair value through other comprehensive income "n"	21,230	\$ 468,428	10	\$ 468,428	
	Shin-Etsu Handotai Taiwan Co., Ltd.	-		10,500	318,276	7	318,276	
	Global Investment Holding Inc.	-		11,124	81,529	6	81,529	
	W.K. Technology Fund IV	-		806	5,157	2	5,157	
	Crimson Asia Capital	-		"n"	2,621	1	2,621	
	Horizon Ventures Fund	-		"n"	1,100	12	1,100	
TSMC Partners	Convertible bonds Inpria Corporation	-	Financial assets at fair value through Profit or Loss	-	US\$ 4,127	-	US\$ 4,127	
	Non-publicly traded equity investments Shanghai Walden Venture Capital Enterprise	-	Financial assets at fair value through other comprehensive income "n"	-	US\$ 10,380	6	US\$ 10,380	
	China Walden Venture Investments II, L.P.	-		-	US\$ 9,474	9	US\$ 9,474	
	China Walden Venture Investments III, L.P.	-		-	US\$ 3,298	4	US\$ 3,298	
	Tela Innovations	-		10,440	-	25	-	
	Meube Inc.	-		6,333	-	12	-	
TSMC Global	Corporate bond Bank of America Corp	-	Financial assets at fair value through other comprehensive income "n"	-	US\$ 46,671	N/A	US\$ 46,671	
	Goldman Sachs Group Inc/The Morgan Stanley	-		-	US\$ 39,686	N/A	US\$ 39,686	
	Citigroup Inc	-		-	US\$ 39,419	N/A	US\$ 39,419	
	AbbVie Inc	-		-	US\$ 38,637	N/A	US\$ 38,637	
	JPMorgan Chase & Co	-		-	US\$ 31,425	N/A	US\$ 31,425	
	AT&T Inc	-		-	US\$ 30,678	N/A	US\$ 30,678	
	CVS Health Corp	-		-	US\$ 26,140	N/A	US\$ 26,140	
	Bristol-Myers Squibb Co	-		-	US\$ 22,242	N/A	US\$ 22,242	
	Mitsubishi UFJ Financial Group Inc	-		-	US\$ 21,666	N/A	US\$ 21,666	
	Wells Fargo & Co	-		-	US\$ 21,332	N/A	US\$ 21,332	
	HSBC Holdings PLC	-		-	US\$ 21,303	N/A	US\$ 21,303	
	Apple Inc	-		-	US\$ 20,102	N/A	US\$ 20,102	
	Sumitomo Mitsui Financial Group Inc	-		-	US\$ 19,886	N/A	US\$ 19,886	
	Toronto-Dominion Bank/The Credit Agricole SA/London	-		-	US\$ 19,176	N/A	US\$ 19,176	
	Verizon Communications Inc	-		-	US\$ 18,018	N/A	US\$ 18,018	
	BNP Paribas SA	-		-	US\$ 14,904	N/A	US\$ 14,904	
	UBS Group Funding Switzerland AG	-		-	US\$ 14,058	N/A	US\$ 14,058	
	Banco Santander SA	-		-	US\$ 13,092	N/A	US\$ 13,092	
	United Technologies Corp	-		-	US\$ 12,932	N/A	US\$ 12,932	
	ERAC USA Finance LLC	-		-	US\$ 12,837	N/A	US\$ 12,837	
	Banque Federative du Credit Mutuel SA	-		-	US\$ 12,108	N/A	US\$ 12,108	
		"n"		-	US\$ 11,904	N/A	US\$ 11,904	
		"n"		-	US\$ 11,752	N/A	US\$ 11,752	

(Continued)

Held Company Name	Marketable Securities Type and Name	Relationship with the Company	Financial Statement Account	Shares/Units (In Thousands)	Carrying Value (Foreign Currencies in Thousands)	Percentage of Ownership (%)	Fair Value (Foreign Currencies in Thousands)	Note
TSMC Global	American International Group Inc	-	Financial assets at fair value through other comprehensive income	"	US\$ 11,423	N/A	US\$ 11,423	
	Equifax Inc	-	Financial assets at fair value through other comprehensive income	"	US\$ 11,001	N/A	US\$ 11,001	
	Ryder System Inc	-	-	-	US\$ 10,892	N/A	US\$ 10,892	
	BPCE SA	-	-	-	US\$ 10,887	N/A	US\$ 10,887	
	BAT Capital Corp	-	-	-	US\$ 10,843	N/A	US\$ 10,843	
	Reliance Standard Life Global Funding II	-	-	-	US\$ 10,682	N/A	US\$ 10,682	
	DTE Energy Co	-	-	-	US\$ 10,681	N/A	US\$ 10,681	
	Hewlett Packard Enterprise Co	-	-	-	US\$ 10,661	N/A	US\$ 10,661	
	Penske Truck Leasing Co Lp / PTL Finance Corp	-	-	-	US\$ 10,612	N/A	US\$ 10,612	
	International Business Machines Corp	-	-	-	US\$ 10,414	N/A	US\$ 10,414	
	Macquarie Group Ltd	-	-	-	US\$ 10,344	N/A	US\$ 10,344	
	Mizuho Financial Group Inc	-	-	-	US\$ 10,307	N/A	US\$ 10,307	
	Skandinaviska Enskilda Banken AB	-	-	-	US\$ 9,827	N/A	US\$ 9,827	
	Nordea Bank Abp	-	-	-	US\$ 9,458	N/A	US\$ 9,458	
	NexEdra Energy Capital Holdings Inc	-	-	-	US\$ 9,420	N/A	US\$ 9,420	
	SMEC Aviation Capital Finance DAC	-	-	-	US\$ 9,414	N/A	US\$ 9,414	
	Fiserv Inc	-	-	-	US\$ 9,174	N/A	US\$ 9,174	
	Lloyds Banking Group PLC	-	-	-	US\$ 9,106	N/A	US\$ 9,106	
	Cox Communications Inc	-	-	-	US\$ 9,062	N/A	US\$ 9,062	
	Western Union Co/The	-	-	-	US\$ 8,991	N/A	US\$ 8,991	
	Tyson Foods Inc	-	-	-	US\$ 8,944	N/A	US\$ 8,944	
	PNC Bank NA	-	-	-	US\$ 8,913	N/A	US\$ 8,913	
	Suncorp-Metway Ltd	-	-	-	US\$ 8,869	N/A	US\$ 8,869	
	Bank of Montreal	-	-	-	US\$ 8,551	N/A	US\$ 8,551	
	Comcast Corp	-	-	-	US\$ 8,514	N/A	US\$ 8,514	
	Capital One NA	-	-	-	US\$ 8,484	N/A	US\$ 8,484	
	Midwest Connector Capital Co LLC	-	-	-	US\$ 8,412	N/A	US\$ 8,412	
	Santander UK PLC	-	-	-	US\$ 8,272	N/A	US\$ 8,272	
	Scenite Group Trust 1 / Scenite Group Trust 2	-	-	-	US\$ 8,248	N/A	US\$ 8,248	
	Metropolitan Life Global Funding I	-	-	-	US\$ 8,222	N/A	US\$ 8,222	
	Credit Suisse AG/New York, NY	-	-	-	US\$ 8,031	N/A	US\$ 8,031	
	Athene Global Funding	-	-	-	US\$ 7,999	N/A	US\$ 7,999	
	Societe Generale SA	-	-	-	US\$ 7,825	N/A	US\$ 7,825	
	NatWest Markets PLC	-	-	-	US\$ 7,816	N/A	US\$ 7,816	
	Altria Group Inc	-	-	-	US\$ 7,805	N/A	US\$ 7,805	
	Dominion Energy Gas Holdings LLC	-	-	-	US\$ 7,681	N/A	US\$ 7,681	
	Air Lease Corp	-	-	-	US\$ 7,675	N/A	US\$ 7,675	
	Tencent Holdings Ltd	-	-	-	US\$ 7,612	N/A	US\$ 7,612	
	Microsoft Corp	-	-	-	US\$ 7,455	N/A	US\$ 7,455	
	BG Energy Capital PLC	-	-	-	US\$ 7,346	N/A	US\$ 7,346	
	Prudential Funding LLC	-	-	-	US\$ 7,333	N/A	US\$ 7,333	
	Fox Corp	-	-	-	US\$ 7,331	N/A	US\$ 7,331	
	BP Capital Markets America Inc	-	-	-	US\$ 7,280	N/A	US\$ 7,280	
	ANZ New Zealand Intl Ltd/London	-	-	-	US\$ 7,259	N/A	US\$ 7,259	
	Jackson National Life Global Funding	-	-	-	US\$ 7,203	N/A	US\$ 7,203	
	Huntington Bancshares Inc/OH	-	-	-	US\$ 7,160	N/A	US\$ 7,160	
	Shire Acquisitions Investments Ireland DAC	-	-	-	US\$ 6,972	N/A	US\$ 6,972	
	Wells Fargo Bank NA	-	-	-	US\$ 6,958	N/A	US\$ 6,958	
	New York Life Global Funding	-	-	-	US\$ 6,947	N/A	US\$ 6,947	
	ING Group NV	-	-	-	US\$ 6,874	N/A	US\$ 6,874	
	Kinder Morgan Energy Partners LP	-	-	-	US\$ 6,842	N/A	US\$ 6,842	
	SunTrust Bank/Atlanta GA	-	-	-	US\$ 6,680	N/A	US\$ 6,680	

(Continued)

Held Company Name	Marketable Securities Type and Name	Relationship with the Company	Financial Statement Account	Shares/Units (In Thousands)	Carrying Value (Foreign Currencies in Thousands)	Percentage of Ownership (%)	Fair Value (Foreign Currencies in Thousands)	Note
TSMC Global	Daimler Finance North America LLC	-	Financial assets at fair value through other comprehensive income	-	US\$ 6,536	N/A	US\$ 6,536	
	Regions Financial Corp	-	Financial assets at fair value through other comprehensive income	-	US\$ 6,384	N/A	US\$ 6,384	
	Credit Suisse Group Funding Guernsey Ltd	-	Financial assets at fair value through other comprehensive income	-	US\$ 6,344	N/A	US\$ 6,344	
	General Dynamics Corp	-	Financial assets at fair value through other comprehensive income	-	US\$ 6,297	N/A	US\$ 6,297	
	Anheuser-Busch InBev Worldwide Inc	-	Financial assets at fair value through other comprehensive income	-	US\$ 6,276	N/A	US\$ 6,276	
	DNB Bank ASA	-	Financial assets at fair value through other comprehensive income	-	US\$ 6,252	N/A	US\$ 6,252	
	American Express Co	-	Financial assets at fair value through other comprehensive income	-	US\$ 6,239	N/A	US\$ 6,239	
	AIG Global Funding	-	Financial assets at fair value through other comprehensive income	-	US\$ 6,199	N/A	US\$ 6,199	
	Panasonic Corp	-	Financial assets at fair value through other comprehensive income	-	US\$ 6,104	N/A	US\$ 6,104	
	Canadian Imperial Bank of Commerce	-	Financial assets at fair value through other comprehensive income	-	US\$ 6,036	N/A	US\$ 6,036	
	Reckitt Benckiser Treasury Services PLC	-	Financial assets at fair value through other comprehensive income	-	US\$ 6,029	N/A	US\$ 6,029	
	Fortive Corp	-	Financial assets at fair value through other comprehensive income	-	US\$ 6,025	N/A	US\$ 6,025	
	Royal Bank of Canada	-	Financial assets at fair value through other comprehensive income	-	US\$ 6,010	N/A	US\$ 6,010	
	Macquarie Bank Ltd	-	Financial assets at fair value through other comprehensive income	-	US\$ 5,983	N/A	US\$ 5,983	
	Analog Devices Inc	-	Financial assets at fair value through other comprehensive income	-	US\$ 5,969	N/A	US\$ 5,969	
	Bank of Nova Scotia/The	-	Financial assets at fair value through other comprehensive income	-	US\$ 5,958	N/A	US\$ 5,958	
	WPP Finance 2010	-	Financial assets at fair value through other comprehensive income	-	US\$ 5,927	N/A	US\$ 5,927	
	Capital One Financial Corp	-	Financial assets at fair value through other comprehensive income	-	US\$ 5,848	N/A	US\$ 5,848	
	Roper Technologies Inc	-	Financial assets at fair value through other comprehensive income	-	US\$ 5,717	N/A	US\$ 5,717	
	Intesa Sanpaolo SpA	-	Financial assets at fair value through other comprehensive income	-	US\$ 5,678	N/A	US\$ 5,678	
	Barclays Bank PLC	-	Financial assets at fair value through other comprehensive income	-	US\$ 5,645	N/A	US\$ 5,645	
	Alabama Power Co	-	Financial assets at fair value through other comprehensive income	-	US\$ 5,623	N/A	US\$ 5,623	
	Anheuser-Busch InBev Finance Inc	-	Financial assets at fair value through other comprehensive income	-	US\$ 5,618	N/A	US\$ 5,618	
	Shell International Finance BV	-	Financial assets at fair value through other comprehensive income	-	US\$ 5,595	N/A	US\$ 5,595	
	Bayer US Finance II LLC	-	Financial assets at fair value through other comprehensive income	-	US\$ 5,510	N/A	US\$ 5,510	
	Cigna Corp	-	Financial assets at fair value through other comprehensive income	-	US\$ 5,475	N/A	US\$ 5,475	
	Sompo International Holdings Ltd	-	Financial assets at fair value through other comprehensive income	-	US\$ 5,275	N/A	US\$ 5,275	
	Takeda Pharmaceutical Co Ltd	-	Financial assets at fair value through other comprehensive income	-	US\$ 5,245	N/A	US\$ 5,245	
	Laboratory Corp of America Holdings	-	Financial assets at fair value through other comprehensive income	-	US\$ 5,230	N/A	US\$ 5,230	
	Lloyds Bank PLC	-	Financial assets at fair value through other comprehensive income	-	US\$ 5,202	N/A	US\$ 5,202	
	CNA Financial Corp	-	Financial assets at fair value through other comprehensive income	-	US\$ 5,173	N/A	US\$ 5,173	
	Cooperative Rabobank UA	-	Financial assets at fair value through other comprehensive income	-	US\$ 5,124	N/A	US\$ 5,124	
	BMW US Capital LLC	-	Financial assets at fair value through other comprehensive income	-	US\$ 5,112	N/A	US\$ 5,112	
	Saudi Arabian Oil Co	-	Financial assets at fair value through other comprehensive income	-	US\$ 5,096	N/A	US\$ 5,096	
	BB&T Corp	-	Financial assets at fair value through other comprehensive income	-	US\$ 5,041	N/A	US\$ 5,041	
	Thermo Fisher Scientific Inc	-	Financial assets at fair value through other comprehensive income	-	US\$ 5,029	N/A	US\$ 5,029	
	Five Corners Funding Trust	-	Financial assets at fair value through other comprehensive income	-	US\$ 4,888	N/A	US\$ 4,888	
	Enel Finance International NV	-	Financial assets at fair value through other comprehensive income	-	US\$ 4,888	N/A	US\$ 4,888	
	Vodafone Group PLC	-	Financial assets at fair value through other comprehensive income	-	US\$ 4,807	N/A	US\$ 4,807	
	Credit Suisse Group AG	-	Financial assets at fair value through other comprehensive income	-	US\$ 4,574	N/A	US\$ 4,574	
	Standard Chartered PLC	-	Financial assets at fair value through other comprehensive income	-	US\$ 4,529	N/A	US\$ 4,529	
	Principia Life Global Funding II	-	Financial assets at fair value through other comprehensive income	-	US\$ 4,476	N/A	US\$ 4,476	
	American Express Credit Corp	-	Financial assets at fair value through other comprehensive income	-	US\$ 4,463	N/A	US\$ 4,463	
	NiSource Inc	-	Financial assets at fair value through other comprehensive income	-	US\$ 4,456	N/A	US\$ 4,456	
	ABN AMRO Bank NV	-	Financial assets at fair value through other comprehensive income	-	US\$ 4,444	N/A	US\$ 4,444	
	Svenska Handelsbanken AB	-	Financial assets at fair value through other comprehensive income	-	US\$ 4,398	N/A	US\$ 4,398	
	Sempra Energy	-	Financial assets at fair value through other comprehensive income	-	US\$ 4,353	N/A	US\$ 4,353	

(Continued)

Held Company Name	Marketable Securities Type and Name	Relationship with the Company	Financial Statement Account	December 31, 2019			Fair Value (Foreign Currencies in Thousands)	Note
				Shares/Units (In Thousands)	Carrying Value (Foreign Currencies in Thousands)	Percentage of Ownership (%)		
TSMC Global	Westpac Banking Corp	-	-	-	US\$ 4,350	N/A	US\$ 4,350	
	Mariott International Inc/MD		Financial assets at fair value through other comprehensive income	"	US\$ 4,334	N/A	US\$ 4,334	
	Duke Energy Corp			"	US\$ 4,262	N/A	US\$ 4,262	
	Verisk Analytics Inc			"	US\$ 4,200	N/A	US\$ 4,200	
	Husky Energy Inc			"	US\$ 4,182	N/A	US\$ 4,182	
	Exxon Corp			"	US\$ 4,087	N/A	US\$ 4,087	
	CenterPoint Energy Inc			"	US\$ 4,052	N/A	US\$ 4,052	
	Intercontinental Exchange Inc			"	US\$ 4,043	N/A	US\$ 4,043	
	Alimentation Couche-Tard Inc			"	US\$ 4,003	N/A	US\$ 4,003	
	HCP Inc			"	US\$ 3,989	N/A	US\$ 3,989	
	European Bank for Reconstruction & Development			"	US\$ 3,973	N/A	US\$ 3,973	
	GE Capital International Funding Co Unlimited Co			"	US\$ 3,953	N/A	US\$ 3,953	
	Citizens Bank NA/Providence RI			"	US\$ 3,912	N/A	US\$ 3,912	
	BOC Aviation Ltd			"	US\$ 3,901	N/A	US\$ 3,901	
	Volkswagen Group of America Finance LLC			"	US\$ 3,896	N/A	US\$ 3,896	
	Nationwide Building Society			"	US\$ 3,836	N/A	US\$ 3,836	
	MPX LP			"	US\$ 3,795	N/A	US\$ 3,795	
	Monongahela Power Co			"	US\$ 3,717	N/A	US\$ 3,717	
	Asian Development Bank			"	US\$ 3,628	N/A	US\$ 3,628	
	Charles Schwab Corp/The			"	US\$ 3,524	N/A	US\$ 3,524	
	Dominion Energy Inc			"	US\$ 3,488	N/A	US\$ 3,488	
	Commonwealth Bank of Australia			"	US\$ 3,421	N/A	US\$ 3,421	
	KeyBank NA/Cleveland OH			"	US\$ 3,324	N/A	US\$ 3,324	
	WECC Energy Group Inc			"	US\$ 3,293	N/A	US\$ 3,293	
	General Electric Co			"	US\$ 3,250	N/A	US\$ 3,250	
	Walt Disney Co/The			"	US\$ 3,246	N/A	US\$ 3,246	
	ONE Gas Inc			"	US\$ 3,224	N/A	US\$ 3,224	
	Boeing Co/The			"	US\$ 3,214	N/A	US\$ 3,214	
	Nutrien Ltd			"	US\$ 3,188	N/A	US\$ 3,188	
	Hyundai Capital America			"	US\$ 3,187	N/A	US\$ 3,187	
	Inter-American Development Bank			"	US\$ 3,168	N/A	US\$ 3,168	
	AutoZone Inc			"	US\$ 3,167	N/A	US\$ 3,167	
	People's United Financial Inc			"	US\$ 3,117	N/A	US\$ 3,117	
	Textron Inc			"	US\$ 3,072	N/A	US\$ 3,072	
	McKesson Corp			"	US\$ 3,071	N/A	US\$ 3,071	
	Zions Bancorp NA			"	US\$ 3,070	N/A	US\$ 3,070	
	Ameren Corp			"	US\$ 3,049	N/A	US\$ 3,049	
	Rockwell Collins Inc			"	US\$ 3,040	N/A	US\$ 3,040	
	Oncor Electric Delivery Co LLC			"	US\$ 3,038	N/A	US\$ 3,038	
	DuPont de Nemours Inc			"	US\$ 3,037	N/A	US\$ 3,037	
	Xcel Energy Inc			"	US\$ 3,015	N/A	US\$ 3,015	
	Duke Energy Florida LLC			"	US\$ 3,002	N/A	US\$ 3,002	
	Cooperative Rabobank UA/NY			"	US\$ 2,980	N/A	US\$ 2,980	
	Canadian Natural Resources Ltd			"	US\$ 2,921	N/A	US\$ 2,921	
	Reynolds American Inc			"	US\$ 2,921	N/A	US\$ 2,921	
	Danske Bank A/S			"	US\$ 2,903	N/A	US\$ 2,903	
	MUFG Union Bank NA			"	US\$ 2,893	N/A	US\$ 2,893	
	RELEX Capital Inc			"	US\$ 2,875	N/A	US\$ 2,875	
	Barrick Gold Corp			"	US\$ 2,862	N/A	US\$ 2,862	
	Royal Bank of Scotland Group PLC			"	US\$ 2,848	N/A	US\$ 2,848	
	Compass Bank			"	US\$ 2,794	N/A	US\$ 2,794	
	Ventas Realty LP			"	US\$ 2,771	N/A	US\$ 2,771	

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Held Company Name	Marketable Securities Type and Name	Relationship with the Company	Financial Statement Account	December 31, 2019			Fair Value (Foreign Currencies in Thousands)	Note
				Shares/Units (In Thousands)	Carrying Value (Foreign Currencies in Thousands)	Percentage of Ownership (%)		
TSMC Global	Dow Chemical Co/The	-	Financial assets at fair value through other comprehensive income	n	-	US\$ 2,740	N/A	US\$ 2,740
	Public Service Enterprise Group Inc	-		n	-	US\$ 2,728	N/A	US\$ 2,728
	Nuveen Finance LLC	-		n	-	US\$ 2,717	N/A	US\$ 2,717
	John Deere Capital Corp	-		n	-	US\$ 2,698	N/A	US\$ 2,698
	Quest Diagnostics Inc	-		n	-	US\$ 2,695	N/A	US\$ 2,695
	Huntington National Bank/The	-		n	-	US\$ 2,668	N/A	US\$ 2,668
	Newcrest Finance Pty Ltd	-		n	-	US\$ 2,668	N/A	US\$ 2,668
	Enterprise Products Operating LLC	-		n	-	US\$ 2,622	N/A	US\$ 2,622
	Deutsche Telekom International Finance BV	-		n	-	US\$ 2,615	N/A	US\$ 2,615
	Echelon Generation Co LLC	-		n	-	US\$ 2,601	N/A	US\$ 2,601
	AvalonBay Communities Inc	-		n	-	US\$ 2,564	N/A	US\$ 2,564
	GlassoSmithKline Capital PLC	-		n	-	US\$ 2,555	N/A	US\$ 2,555
	Seven & i Holdings Co Ltd	-		n	-	US\$ 2,550	N/A	US\$ 2,550
	UBS Group AG	-		n	-	US\$ 2,540	N/A	US\$ 2,540
	Barclays PLC	-		n	-	US\$ 2,527	N/A	US\$ 2,527
	Entergy Corp	-		n	-	US\$ 2,527	N/A	US\$ 2,527
	Delta Air Lines 2007-1 Class A Pass Through Trust	-		n	-	US\$ 2,524	N/A	US\$ 2,524
	3M Co	-		n	-	US\$ 2,507	N/A	US\$ 2,507
	Simon Property Group LP	-		n	-	US\$ 2,494	N/A	US\$ 2,494
	Venras Realty LP / Venras Capital Corp	-		n	-	US\$ 2,450	N/A	US\$ 2,450
	Northrop Grumman Corp	-		n	-	US\$ 2,435	N/A	US\$ 2,435
	Berkshire Hathaway Energy Co	-		n	-	US\$ 2,424	N/A	US\$ 2,424
	Baidu Inc	-		n	-	US\$ 2,374	N/A	US\$ 2,374
	Berkshire Hathaway Inc	-		n	-	US\$ 2,373	N/A	US\$ 2,373
	Antennex Inc	-		n	-	US\$ 2,352	N/A	US\$ 2,352
	Eastman Chemical Co	-		n	-	US\$ 2,307	N/A	US\$ 2,307
	NBCUniversal Media LLC	-		n	-	US\$ 2,269	N/A	US\$ 2,269
	Cinhas Corp No 2	-		n	-	US\$ 2,244	N/A	US\$ 2,244
	Marathon Petroleum Corp	-		n	-	US\$ 2,242	N/A	US\$ 2,242
	Actina Inc	-		n	-	US\$ 2,235	N/A	US\$ 2,235
	Unum Group	-		n	-	US\$ 2,219	N/A	US\$ 2,219
	National Bank of Canada	-		n	-	US\$ 2,209	N/A	US\$ 2,209
	PSEG Power LLC	-		n	-	US\$ 2,193	N/A	US\$ 2,193
	Southern California Edison Co	-		n	-	US\$ 2,175	N/A	US\$ 2,175
	QUALCOMM Inc	-		n	-	US\$ 2,164	N/A	US\$ 2,164
	US Bank NA/Cincinnati OH	-		n	-	US\$ 2,163	N/A	US\$ 2,163
	Lincoln National Corp	-		n	-	US\$ 2,162	N/A	US\$ 2,162
	American Airlines 2013-2 Class A Pass Through Trust	-		n	-	US\$ 2,159	N/A	US\$ 2,159
	Suncor Energy Inc	-		n	-	US\$ 2,122	N/A	US\$ 2,122
	ASB Bank Ltd	-		n	-	US\$ 2,120	N/A	US\$ 2,120
	Ingersoll-Rand Luxembourg Finance SA	-		n	-	US\$ 2,099	N/A	US\$ 2,099
	San Diego Gas & Electric Co	-		n	-	US\$ 2,092	N/A	US\$ 2,092
	Woolworths Group Ltd	-		n	-	US\$ 2,072	N/A	US\$ 2,072
	WR Berkley Corp	-		n	-	US\$ 2,045	N/A	US\$ 2,045
	AstraZeneca PLC	-		n	-	US\$ 2,041	N/A	US\$ 2,041
	US Bancorp	-		n	-	US\$ 2,028	N/A	US\$ 2,028
	Pricoa Global Funding I	-		n	-	US\$ 2,015	N/A	US\$ 2,015
	Oracle Corp	-		n	-	US\$ 2,004	N/A	US\$ 2,004
	CK Hutchison International 16 Ltd	-		n	-	US\$ 1,984	N/A	US\$ 1,984
	Avangrid Inc	-		n	-	US\$ 1,960	N/A	US\$ 1,960
	Bank of New York Mellon Corp/The	-		n	-	US\$ 1,956	N/A	US\$ 1,956
	Kinder Morgan Inc/DE	-		n	-	US\$ 1,949	N/A	US\$ 1,949

(Continued)

Held Company Name	Marketable Securities Type and Name	Relationship with the Company	Financial Statement Account	Shares/Units (In Thousands)	Carrying Value (Foreign Currencies in Thousands)	Percentage of Ownership (%)	Fair Value (Foreign Currencies in Thousands)	Note
TSMC Global	CenterPoint Energy Resources Corp	-	Financial assets at fair value through other comprehensive income	-	US\$ 1,918	N/A	US\$ 1,918	
Australia & New Zealand Banking Group Ltd/New York NY	Kroger Co/The	-	Financial assets at fair value through other comprehensive income	-	US\$ 1,906	N/A	US\$ 1,906	
BP Capital Markets PLC	Sydney Airport Finance Co/Pty Ltd	-	Financial assets at fair value through other comprehensive income	-	US\$ 1,904	N/A	US\$ 1,904	
Bank of New Zealand	Discover Bank	-	Financial assets at fair value through other comprehensive income	-	US\$ 1,900	N/A	US\$ 1,900	
WestRock RKT LLC	Philip Morris International Inc	-	Financial assets at fair value through other comprehensive income	-	US\$ 1,886	N/A	US\$ 1,886	
McCormick & Co Inc/MD	Equinor ASA	-	Financial assets at fair value through other comprehensive income	-	US\$ 1,866	N/A	US\$ 1,866	
General Mills Inc	Public Service Co of Oklahoma	-	Financial assets at fair value through other comprehensive income	-	US\$ 1,831	N/A	US\$ 1,831	
PPL Capital Funding Inc	Wisconsin Public Service Corp	-	Financial assets at fair value through other comprehensive income	-	US\$ 1,791	N/A	US\$ 1,791	
ITC Holdings Corp	Spectra Energy Partners LP	-	Financial assets at fair value through other comprehensive income	-	US\$ 1,772	N/A	US\$ 1,772	
Toyota Industries Corp	Mondelēz International Holdings Netherlands BV	-	Financial assets at fair value through other comprehensive income	-	US\$ 1,760	N/A	US\$ 1,760	
Southern Co/The	Walgreens Boots Alliance Inc	-	Financial assets at fair value through other comprehensive income	-	US\$ 1,751	N/A	US\$ 1,751	
Brookfield Finance Inc	UnitedHealth Group Inc	-	Financial assets at fair value through other comprehensive income	-	US\$ 1,744	N/A	US\$ 1,744	
LyondellBasell Industries NV	Xylem Inc/NY	-	Financial assets at fair value through other comprehensive income	-	US\$ 1,741	N/A	US\$ 1,741	
Suntory Holdings Ltd	Nestle Holdings Inc	-	Financial assets at fair value through other comprehensive income	-	US\$ 1,722	N/A	US\$ 1,722	
CK Hutchison International 19 Ltd	NTT Finance Corp	-	Financial assets at fair value through other comprehensive income	-	US\$ 1,711	N/A	US\$ 1,711	
Trust F/1401	Activision Blizzard Inc	-	Financial assets at fair value through other comprehensive income	-	US\$ 1,670	N/A	US\$ 1,670	
Mastercard Inc	Public Service Electric & Gas Co	-	Financial assets at fair value through other comprehensive income	-	US\$ 1,661	N/A	US\$ 1,661	
Realty Income Corp	KEB Hana Bank	-	Financial assets at fair value through other comprehensive income	-	US\$ 1,657	N/A	US\$ 1,657	
AlA Group Ltd	Guardian Life Global Funding	-	Financial assets at fair value through other comprehensive income	-	US\$ 1,650	N/A	US\$ 1,650	
Protective Life Global Funding	Sinopec Group Overseas Development 2015 Ltd	-	Financial assets at fair value through other comprehensive income	-	US\$ 1,593	N/A	US\$ 1,593	
Prudential Financial Inc	Georgia Power Co	-	Financial assets at fair value through other comprehensive income	-	US\$ 1,572	N/A	US\$ 1,572	
HSBC Bank PLC	Mastercard Inc	-	Financial assets at fair value through other comprehensive income	-	US\$ 1,572	N/A	US\$ 1,572	
Westlake Chemical Corp	Realty Income Corp	-	Financial assets at fair value through other comprehensive income	-	US\$ 1,559	N/A	US\$ 1,559	
Texas Eastern Transmission LP	AlA Group Ltd	-	Financial assets at fair value through other comprehensive income	-	US\$ 1,538	N/A	US\$ 1,538	
Daiwa Securities Group Inc	Protective Life Global Funding	-	Financial assets at fair value through other comprehensive income	-	US\$ 1,525	N/A	US\$ 1,525	
Citizens Financial Group Inc	Prudential Financial Inc	-	Financial assets at fair value through other comprehensive income	-	US\$ 1,523	N/A	US\$ 1,523	
CNOOC Curtis Funding No 1 Pty Ltd	Activision Blizzard Inc	-	Financial assets at fair value through other comprehensive income	-	US\$ 1,500	N/A	US\$ 1,500	
Baker Hughes a GE Co LLC / Baker Hughes Co-Obligor Inc	Public Service Electric & Gas Co	-	Financial assets at fair value through other comprehensive income	-	US\$ 1,517	N/A	US\$ 1,517	
Permud Ricard SA	KEB Hana Bank	-	Financial assets at fair value through other comprehensive income	-	US\$ 1,516	N/A	US\$ 1,516	
Americorp Financial Inc	Realty Income Corp	-	Financial assets at fair value through other comprehensive income	-	US\$ 1,504	N/A	US\$ 1,504	
Essex Portfolio LP	AlA Group Ltd	-	Financial assets at fair value through other comprehensive income	-	US\$ 1,502	N/A	US\$ 1,502	
Ontario Teachers Cadillac Fairview Properties Trust	Protective Life Global Funding	-	Financial assets at fair value through other comprehensive income	-	US\$ 1,501	N/A	US\$ 1,501	
	Prudential Financial Inc	-	Financial assets at fair value through other comprehensive income	-	US\$ 1,461	N/A	US\$ 1,461	
	Activision Blizzard Inc	-	Financial assets at fair value through other comprehensive income	-	US\$ 1,458	N/A	US\$ 1,458	
	Public Service Electric & Gas Co	-	Financial assets at fair value through other comprehensive income	-	US\$ 1,438	N/A	US\$ 1,438	
	KEB Hana Bank	-	Financial assets at fair value through other comprehensive income	-	US\$ 1,432	N/A	US\$ 1,432	
	Realty Income Corp	-	Financial assets at fair value through other comprehensive income	-	US\$ 1,415	N/A	US\$ 1,415	
	AlA Group Ltd	-	Financial assets at fair value through other comprehensive income	-	US\$ 1,488	N/A	US\$ 1,488	
	Protective Life Global Funding	-	Financial assets at fair value through other comprehensive income	-	US\$ 1,412	N/A	US\$ 1,412	
	Prudential Financial Inc	-	Financial assets at fair value through other comprehensive income	-	US\$ 1,410	N/A	US\$ 1,410	
	Activision Blizzard Inc	-	Financial assets at fair value through other comprehensive income	-	US\$ 1,390	N/A	US\$ 1,390	
	Public Service Electric & Gas Co	-	Financial assets at fair value through other comprehensive income	-	US\$ 1,387	N/A	US\$ 1,387	
	KEB Hana Bank	-	Financial assets at fair value through other comprehensive income	-	US\$ 1,357	N/A	US\$ 1,357	
	Realty Income Corp	-	Financial assets at fair value through other comprehensive income	-	US\$ 1,355	N/A	US\$ 1,355	
	AlA Group Ltd	-	Financial assets at fair value through other comprehensive income	-	US\$ 1,343	N/A	US\$ 1,343	
	Protective Life Global Funding	-	Financial assets at fair value through other comprehensive income	-	US\$ 1,326	N/A	US\$ 1,326	

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Held Company Name	Marketable Securities Type and Name	Relationship with the Company	Financial Statement Account	December 31, 2019			Fair Value (Foreign Currencies in Thousands)	Note
				Shares/Units (In Thousands)	Carrying Value (Foreign Currencies in Thousands)	Percentage of Ownership (%)		
TSMC Global	Energy Arkansas LLC	-	Financial assets at fair value through other comprehensive income	-	USS 1,315	N/A	USS 1,315	
	JPMorgan Chase Bank NA	"	"	-	USS 1,304	N/A	USS 1,304	
	Interpublic Group of Cos Inc/The American Electric Power Co Inc	"	"	-	USS 1,289	N/A	USS 1,289	
	Santander UK Group Holdings PLC	"	"	-	USS 1,274	N/A	USS 1,274	
	State Street Corp	"	"	-	USS 1,228	N/A	USS 1,228	
	Cardinal Health Inc	"	"	-	USS 1,201	N/A	USS 1,201	
	Aviation Capital Group LLC	"	"	-	USS 1,201	N/A	USS 1,201	
	Sprint Spectrum Co LLC / Sprint Spectrum Co III LLC	"	"	-	USS 1,193	N/A	USS 1,193	
	UDR Inc	"	"	-	USS 1,192	N/A	USS 1,192	
	Regions Bank/Birmingham AL	"	"	-	USS 1,190	N/A	USS 1,190	
	Magellan Midstream Partners LP	"	"	-	USS 1,178	N/A	USS 1,178	
	Johnson Controls International plc	"	"	-	USS 1,162	N/A	USS 1,162	
	Cleveland Electric Illuminating Co/The Trans-Canada PipeLines Ltd	"	"	-	USS 1,149	N/A	USS 1,149	
	API Pipelines Ltd	"	"	-	USS 1,144	N/A	USS 1,144	
	National Australia Bank Ltd/New York	"	"	-	USS 1,140	N/A	USS 1,140	
	Manulife Financial Corp	"	"	-	USS 1,139	N/A	USS 1,139	
	WP Carey Inc	"	"	-	USS 1,135	N/A	USS 1,135	
	CMS Energy Corp	"	"	-	USS 1,122	N/A	USS 1,122	
	Alexandria Real Estate Equities Inc	"	"	-	USS 1,068	N/A	USS 1,068	
	Union Pacific Corp	"	"	-	USS 1,053	N/A	USS 1,053	
	Baltimore Gas & Electric Co	"	"	-	USS 1,051	N/A	USS 1,051	
	Cigna Holding Co	"	"	-	USS 1,042	N/A	USS 1,042	
	DH Europe Finance II Sarl	"	"	-	USS 1,037	N/A	USS 1,037	
	Weyrhaeuser Co	"	"	-	USS 1,033	N/A	USS 1,033	
	Entergy Mississippi LLC	"	"	-	USS 1,026	N/A	USS 1,026	
	Toyota Motor Credit Corp	"	"	-	USS 1,026	N/A	USS 1,026	
	Continental Airlines 2012-1 Class A Pass Through Trust	"	"	-	USS 1,024	N/A	USS 1,024	
	Loews Corp	"	"	-	USS 1,020	N/A	USS 1,020	
	Amazon.com Inc	"	"	-	USS 1,019	N/A	USS 1,019	
	Toyota Motor Finance Netherlands BV	"	"	-	USS 1,018	N/A	USS 1,018	
	Corp Nacional del Cobre de Chile	"	"	-	USS 1,011	N/A	USS 1,011	
	Republic Services Inc	"	"	-	USS 1,009	N/A	USS 1,009	
	Commonwealth Edison Co	"	"	-	USS 1,007	N/A	USS 1,007	
	Kimco Realty Corp	"	"	-	USS 1,007	N/A	USS 1,007	
	African Development Bank	"	"	-	USS 1,003	N/A	USS 1,003	
	UBS AG/Stamford CT	"	"	-	USS 1,001	N/A	USS 1,001	
	Gilead Sciences Inc	"	"	-	USS 998	N/A	USS 998	
	MetLife Inc	"	"	-	USS 996	N/A	USS 996	
	BBVA USA	"	"	-	USS 992	N/A	USS 992	
	British Airways 2013-1 Class A Pass Through Trust	"	"	-	USS 988	N/A	USS 988	
	Lockheed Martin Corp	"	"	-	USS 903	N/A	USS 903	
	MassMutual Global Funding II	"	"	-	USS 900	N/A	USS 900	
	CA Inc	"	"	-	USS 887	N/A	USS 887	
	CBSS Corp	"	"	-	USS 878	N/A	USS 878	
	Coca-Cola Femsa SAB de CV	"	"	-	USS 866	N/A	USS 866	
	CNOOC Finance 2011 Ltd	"	"	-	USS 843	N/A	USS 843	

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Held Company Name	Marketable Securities Type and Name	Relationship with the Company	Financial Statement Account	December 31, 2019			Fair Value (Foreign Currencies in Thousands)	Note
				Shares/Units (In Thousands)	Carrying Value (Foreign Currencies in Thousands)	Percentage of Ownership (%)		
TSMC Global	ONEOK Partners LP	-	-	-	-	-	US\$ 824	N/A
	Sinope Capital 2013 Ltd	-	Financial assets at fair value through other comprehensive income	"	US\$ 814	N/A	US\$ 814	
	Nationwide Financial Services Inc	-		"	US\$ 779	N/A	US\$ 779	
	AXIS Specialty Finance LLC	-		"	US\$ 762	N/A	US\$ 762	
	PayPal Holdings Inc	-		"	US\$ 755	N/A	US\$ 755	
	Pinnacle West Capital Corp	-		"	US\$ 751	N/A	US\$ 751	
	Warner Media LLC	-		"	US\$ 742	N/A	US\$ 742	
	BNZ International Funding Ltd/London	-		"	US\$ 724	N/A	US\$ 724	
	BAE Systems Holdings Inc	-		"	US\$ 705	N/A	US\$ 705	
	Phillips 66	-		"	US\$ 705	N/A	US\$ 705	
	Southern California Gas Co	-		"	US\$ 704	N/A	US\$ 704	
	Aon Corp	-		"	US\$ 665	N/A	US\$ 665	
	Digital Realty Trust LP	-		"	US\$ 657	N/A	US\$ 657	
	Ohio Power Co	-		"	US\$ 636	N/A	US\$ 636	
	Fifth Third Bank/Cincinnati OH	-		"	US\$ 635	N/A	US\$ 635	
	OneBeacon US Holdings Inc	-		"	US\$ 627	N/A	US\$ 627	
	Norfolk Southern Railway Co	-		"	US\$ 621	N/A	US\$ 621	
	RBC USA Holdco Corp	-		"	US\$ 614	N/A	US\$ 614	
	Apiv Corp	-		"	US\$ 609	N/A	US\$ 609	
	Toledo Edison Co/The	-		"	US\$ 588	N/A	US\$ 588	
	Pioneer Natural Resources Co	-		"	US\$ 608	N/A	US\$ 608	
	American Water Capital Corp	-		"	US\$ 603	N/A	US\$ 603	
	Nissan Motor Acceptance Corp	-		"	US\$ 600	N/A	US\$ 600	
	Enervy Inc	-		"	US\$ 593	N/A	US\$ 593	
	ViacomCBS Inc	-		"	US\$ 588	N/A	US\$ 588	
	Duke Energy Progress LLC	-		"	US\$ 575	N/A	US\$ 575	
	Sweelbank AB	-		"	US\$ 575	N/A	US\$ 575	
	Continental Airlines 2007-1 Class A Pass Through Trust	-		"	US\$ 572	N/A	US\$ 572	
	ABC Inc	-		"	US\$ 550	N/A	US\$ 550	
	Juniper Networks Inc	-		"	US\$ 541	N/A	US\$ 541	
	Amgen Inc	-		"	US\$ 541	N/A	US\$ 541	
	Ingersoll-Rand Global Holding Co Ltd	-		"	US\$ 530	N/A	US\$ 530	
	Aflac Inc	-		"	US\$ 525	N/A	US\$ 525	
	Regency Centers Corp	-		"	US\$ 521	N/A	US\$ 521	
	salesforce.com Inc	-		"	US\$ 519	N/A	US\$ 519	
	TTX Co	-		"	US\$ 511	N/A	US\$ 511	
	Nomura Holdings Inc	-		"	US\$ 504	N/A	US\$ 504	
	Hanwha Energy USA Holdings Corp	-		"	US\$ 502	N/A	US\$ 502	
	PNC Financial Services Group Inc/The Caterpillar Financial Services Corp	-		"	US\$ 502	N/A	US\$ 502	
	Danone SA	-		"	US\$ 500	N/A	US\$ 500	
	National Oilwell Varco Inc	-		"	US\$ 495	N/A	US\$ 495	
	Duke Energy Carolinas LLC	-		"	US\$ 465	N/A	US\$ 465	
	BAT International Finance PLC	-		"	US\$ 462	N/A	US\$ 462	
	United Overseas Bank Ltd	-		"	US\$ 462	N/A	US\$ 462	
	Narragansett Electric Co/The Duke Realty LP	-		"	US\$ 452	N/A	US\$ 452	
	Liberty Property LP	-		"	US\$ 425	N/A	US\$ 425	
	Boston Properties LP	-		"	US\$ 417	N/A	US\$ 417	
	Newmont Goldcorp Corp	-		"	US\$ 408	N/A	US\$ 408	
	Eaton Electric Holdings LLC	-		"	US\$ 406	N/A	US\$ 406	
	Comerica Bank	-		"	US\$ 405	N/A	US\$ 405	

(Continued)

Held Company Name	Marketable Securities Type and Name	Relationship with the Company	Financial Statement Account	Shares/Units (In Thousands)	Carrying Value (Foreign Currencies in Thousands)	Percentage of Ownership (%)	Fair Value (Foreign Currencies in Thousands)	Note
TSMC Global	Southern Power Co	-	Financial assets at fair value through other comprehensive income	"	-	US\$ 404	N/A	US\$ 404
	Canadian Pacific Railway Co	-		"	US\$ 400	N/A	US\$ 400	
	Fidelity National Information Services Inc	-		"	US\$ 399	N/A	US\$ 399	
	AXA Equitable Holdings Inc	-		"	US\$ 393	N/A	US\$ 393	
	Metropolitan Edison Co	-		"	US\$ 388	N/A	US\$ 388	
	StanCorp Financial Group Inc	-		"	US\$ 386	N/A	US\$ 386	
	Principal Financial Group Inc	-		"	US\$ 359	N/A	US\$ 359	
	Continental Airlines 2000-1 Class A-1 Pass Through Trust	-		"	US\$ 312	N/A	US\$ 312	
	Chubb INA Holdings Inc	-		"	US\$ 308	N/A	US\$ 308	
	America Movil SAB de CV	-		"	US\$ 307	N/A	US\$ 307	
	Alibaba Group Holding Ltd	-		"	US\$ 306	N/A	US\$ 306	
	CommonSpirit Health	-		"	US\$ 303	N/A	US\$ 303	
	Schlumberger Finance Canada Ltd	-		"	US\$ 300	N/A	US\$ 300	
	Manufacturers & Traders Trust Co	-		"	US\$ 300	N/A	US\$ 300	
	Eli Lilly & Co	-		"	US\$ 299	N/A	US\$ 299	
	Home Depot Inc/The	-		"	US\$ 284	N/A	US\$ 284	
	Southern Natural Gas Co LLC / Southern Natural Issuing Corp	-		"	US\$ 282	N/A	US\$ 282	
	Archer-Daniels-Midland Co	-		"	US\$ 258	N/A	US\$ 258	
	Bank of America NA	-		"	US\$ 257	N/A	US\$ 257	
	Grupo Bimbo SAB de CV	-		"	US\$ 252	N/A	US\$ 252	
	Aon PLC	-		"	US\$ 248	N/A	US\$ 248	
	Telstra Corp Ltd	-		"	US\$ 209	N/A	US\$ 209	
	US Airways 2013-1 Class A Pass Through Trust	-		"	US\$ 209	N/A	US\$ 209	
	Halliburton Co	-		"	US\$ 208	N/A	US\$ 208	
	Waste Management Inc	-		"	US\$ 207	N/A	US\$ 207	
	QNB Finance Ltd	-		"	US\$ 207	N/A	US\$ 207	
	WestRock MWV LLC	-		"	US\$ 201	N/A	US\$ 201	
	Glencore Funding LLC	-		"	US\$ 200	N/A	US\$ 200	
	Nucor Corp	-		"	US\$ 185	N/A	US\$ 185	
	American Airlines 2011-1 Class A Pass Through Trust	-		"	US\$ 111	N/A	US\$ 111	
	Wells Fargo & Co	-		"	US\$ 160,098	N/A	US\$ 161,794	
	JPMorgan Chase & Co.	-		"	US\$ 84,967	N/A	US\$ 85,578	
	Industrial and Commercial Bank of China	-		"	US\$ 9,996	N/A	US\$ 10,022	
	Government bond	-	Financial assets at fair value through other comprehensive income	"	US\$ 419,942	N/A	US\$ 419,942	
	United States Treasury Note/Bond	-		"	US\$ 3,501	N/A	US\$ 3,501	
	Abu Dhabi Government International Bond	-		"	US\$ 2,830	N/A	US\$ 2,830	
	United States Treasury Inflation Indexed Bonds	-		"	US\$ 1,372	N/A	US\$ 1,372	
	Qatar Government International Bond	-		"				
	Agency bonds/Agency mortgage-backed securities	-	Financial assets at fair value through Profit or Loss	"	US\$ 1,365	N/A	US\$ 1,365	
	Freddie Mac Multifamily Structured Pass Through Certificates	-	Financial assets at fair value through other comprehensive income	"	US\$ 761,352	N/A	US\$ 761,352	
	Fannie Mae Pool	-		"	US\$ 176,379	N/A	US\$ 176,379	
	Fannie Mae REMICs	-		"	US\$ 164,994	N/A	US\$ 164,994	
	Freddie Mac REMICs	-		"	US\$ 164,081	N/A	US\$ 164,081	
	Freddie Mac Gold Pool	-		"	US\$ 152,833	N/A	US\$ 152,833	
	Ginnie Mae IIF Pool	-		"	US\$ 129,835	N/A	US\$ 129,835	
	Freddie Mac Pool	-		"	US\$ 56,856	N/A	US\$ 56,856	
	Fannie Mae or Freddie Mac	-		"	US\$ 54,891	N/A	US\$ 54,891	
	Government National Mortgage Association	-		"	US\$ 33,108	N/A	US\$ 33,108	

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Held Company Name	Marketable Securities Type and Name	Relationship with the Company	Financial Statement Account	Shares/Units (In Thousands)	Carrying Value (Foreign Currencies in Thousands)	Percentage of Ownership (%)	Fair Value (Foreign Currencies in Thousands)	Note
TSMC Global	Fannie Mae-Aces	-	Financial assets at fair value through other comprehensive income	-	US\$ 21,409	N/A	US\$ 21,409	
	Freddie Mac Strips	-	Financial assets at fair value through other comprehensive income	-	US\$ 3,041	N/A	US\$ 3,041	
	Federal Home Loan Bank Discount Notes	-	Financial assets at fair value through other comprehensive income	-	US\$ 2,696	N/A	US\$ 2,696	
	Freddie Mac Multifamily Structured Pass Through Certificates	-	Financial assets at fair value through other comprehensive income	-	US\$ 2,160	N/A	US\$ 2,160	
	Korea Hydro & Nuclear Power Co Ltd	-	Financial assets at fair value through other comprehensive income	-	US\$ 1,970	N/A	US\$ 1,970	
	Federal Farm Credit Banks Funding Corp	-	Financial assets at fair value through other comprehensive income	-	US\$ 1,099	N/A	US\$ 1,099	
	Denver City & County Housing Authority	-	Financial assets at fair value through other comprehensive income	-	US\$ 996	N/A	US\$ 996	
	Ginnie Mae I Pool	-	Financial assets at fair value through other comprehensive income	-	US\$ 970	N/A	US\$ 970	
	FHLB-MC-GNMA	-	Financial assets at fair value through other comprehensive income	-	US\$ 860	N/A	US\$ 860	
	Oregon Health & Science University	-	Financial assets at fair value through other comprehensive income	-	US\$ 789	N/A	US\$ 789	
	NCUA Guaranteed Notes Trust 2010-R2	-	Financial assets at fair value through other comprehensive income	-	US\$ 668	N/A	US\$ 668	
	FRESB 2019-SB61 Mortgage Trust	-	Financial assets at fair value through other comprehensive income	-	US\$ 667	N/A	US\$ 667	
	Freddie Mac Non Gold Pool	-	Financial assets at fair value through other comprehensive income	-	US\$ 499	N/A	US\$ 499	
	FRESB 2019-SB60 Mortgage Trust	-	Financial assets at fair value through other comprehensive income	-	US\$ 415	N/A	US\$ 415	
	NCUA Guaranteed Notes Trust 2010-R1	-	Financial assets at fair value through other comprehensive income	-	US\$ 222	N/A	US\$ 222	
	Fannie Mae Benchmark REMIC	-	Financial assets at fair value through other comprehensive income	-	US\$ 116	N/A	US\$ 116	
	Asset-backed securities	-	Financial assets at fair value through other comprehensive income	-	US\$ 9,925	N/A	US\$ 9,925	
	Hyundai Auto Receivables Trust 2017-A	-	Financial assets at fair value through other comprehensive income	-	US\$ 7,321	N/A	US\$ 7,321	
	Citibank Credit Card Issuance Trust	-	Financial assets at fair value through other comprehensive income	-	US\$ 7,036	N/A	US\$ 7,036	
	Citigroup Commercial Mortgage Trust 2014-GC21	-	Financial assets at fair value through other comprehensive income	-	US\$ 6,845	N/A	US\$ 6,845	
	CGIBBB Commercial Mortgage Trust 2017-BIOC	-	Financial assets at fair value through other comprehensive income	-	US\$ 6,248	N/A	US\$ 6,248	
	Benchmark 2019-B11 Mortgage Trust	-	Financial assets at fair value through other comprehensive income	-	US\$ 6,084	N/A	US\$ 6,084	
	Ford Credit Auto Owner Trust 2017-A	-	Financial assets at fair value through other comprehensive income	-	US\$ 6,075	N/A	US\$ 6,075	
	Wells Fargo Commercial Mortgage Trust 2016-C35	-	Financial assets at fair value through other comprehensive income	-	US\$ 6,070	N/A	US\$ 6,070	
	UBS-B-Barclays Commercial Mortgage Trust 2012-C2	-	Financial assets at fair value through other comprehensive income	-	US\$ 6,041	N/A	US\$ 6,041	
	Morgan Stanley Bank of America Merrill Lynch Trust 2016-C29	-	Financial assets at fair value through other comprehensive income	-	US\$ 6,022	N/A	US\$ 6,022	
	Ford -Credit Auto Owner Trust 2016-REV1	-	Financial assets at fair value through other comprehensive income	-	US\$ 5,924	N/A	US\$ 5,924	
	CD 2019-CD8 Mortgage Trust	-	Financial assets at fair value through other comprehensive income	-	US\$ 5,678	N/A	US\$ 5,678	
	Wells Fargo Commercial Mortgage Trust 2019-C53	-	Financial assets at fair value through other comprehensive income	-	US\$ 5,648	N/A	US\$ 5,648	
	WFRRBS Commercial Mortgage Trust 2013-C13	-	Financial assets at fair value through other comprehensive income	-	US\$ 5,472	N/A	US\$ 5,472	
	BBGMS 2018-TALL Mortgage Trust	-	Financial assets at fair value through other comprehensive income	-	US\$ 5,238	N/A	US\$ 5,238	
	COM 2015-CCRE24 Mortgage Trust	-	Financial assets at fair value through other comprehensive income	-	US\$ 5,079	N/A	US\$ 5,079	
	Hyundai Auto Lease Securitization Trust 2018-A	-	Financial assets at fair value through other comprehensive income	-	US\$ 5,030	N/A	US\$ 5,030	
	Morgan Stanley Bank of America Merrill Lynch Trust 2016-C30	-	Financial assets at fair value through other comprehensive income	-	US\$ 5,012	N/A	US\$ 5,012	
	Morgan Stanley Bank of America Merrill Lynch Trust 2013-C10	-	Financial assets at fair value through other comprehensive income	-	US\$ 4,922	N/A	US\$ 4,922	
	Ford Credit Auto Owner Trust 2015-REV1	-	Financial assets at fair value through other comprehensive income	-	US\$ 4,705	N/A	US\$ 4,705	
	MRCLD 2019-MARK Mortgage Trust	-	Financial assets at fair value through other comprehensive income	-	US\$ 4,518	N/A	US\$ 4,518	
	BANK 2019-BNCK22	-	Financial assets at fair value through other comprehensive income	-	US\$ 4,502	N/A	US\$ 4,502	
	Hyundai Auto Receivables Trust 2016-B	-	Financial assets at fair value through other comprehensive income	-	US\$ 4,263	N/A	US\$ 4,263	
	Morgan Stanley Bank of America Merrill Lynch Trust 2013-C7	-	Financial assets at fair value through other comprehensive income	-	US\$ 4,241	N/A	US\$ 4,241	
	Mercedes-Benz Auto Lease Trust 2019-B	-	Financial assets at fair value through other comprehensive income	-	US\$ 4,180	N/A	US\$ 4,180	
	JPMBBB Commercial Mortgage Securities Trust 2015-C28	-	Financial assets at fair value through other comprehensive income	-	US\$ 4,178	N/A	US\$ 4,178	
	Hyundai Auto Receivables Trust 2016-A	-	Financial assets at fair value through other comprehensive income	-	US\$ 4,164	N/A	US\$ 4,164	
	GM Financial Consumer Automobile Receivables Trust 2018-1	-	Financial assets at fair value through other comprehensive income	-	US\$ 4,163	N/A	US\$ 4,163	
	UBS Commercial Mortgage Trust 2018-C10	-	Financial assets at fair value through other comprehensive income	-	US\$ 4,151	N/A	US\$ 4,151	
	JPMMC Commercial Mortgage Securities Trust 2017-JP7	-	Financial assets at fair value through other comprehensive income	-	US\$ 4,107	N/A	US\$ 4,107	
	BANK 2017-BNKK6	-	Financial assets at fair value through other comprehensive income	-	US\$ 4,104	N/A	US\$ 4,104	
	BANK 2019-BNKL7	-	Financial assets at fair value through other comprehensive income	-	US\$ 4,099	N/A	US\$ 4,099	
	BX Commercial Mortgage Trust 2018-IND	-	Financial assets at fair value through other comprehensive income	-	US\$ 3,992	N/A	US\$ 3,992	
	American Express Credit Account Master Trust	-	Financial assets at fair value through other comprehensive income	-	US\$ 3,804	N/A	US\$ 3,804	

(Continued)

Held Company Name	Marketable Securities Type and Name	Relationship with the Company	Financial Statement Account	Shares/Units (In Thousands)	Carrying Value (Foreign Currencies in Thousands)	Percentage of Ownership (%)	Fair Value (Foreign Currencies in Thousands)	Note
TSMC Global	Enterprise Fleet Financing 2019-2 LLC	-	Financial assets at fair value through other comprehensive income	-	US\$ 3,763	N/A	US\$ 3,763	
	Barclays Commercial Mortgage Trust 2019-C5	-		-	US\$ 3,720	N/A	US\$ 3,720	
	Citigroup Commercial Mortgage Trust 2019-C7	-		-	US\$ 3,685	N/A	US\$ 3,685	
	BANK 2019-BN123	-		-	US\$ 3,640	N/A	US\$ 3,640	
	JP Morgan Chase Commercial Mortgage Securities Trust 2012-LC9	-		-	US\$ 3,381	N/A	US\$ 3,381	
	UBS-Barclays Commercial Mortgage Trust 2013-C6	-		-	US\$ 3,327	N/A	US\$ 3,327	
	GS Mortgage Securities Trust 2012-GG6	-		-	US\$ 3,194	N/A	US\$ 3,194	
	Ford Credit Auto Lease Trust 2019-B	-		-	US\$ 3,122	N/A	US\$ 3,122	
	Toyota Auto Receivables 2017-A Owner Trust	-		-	US\$ 3,108	N/A	US\$ 3,108	
	Nissan Auto Lease Trust 2017-B	-		-	US\$ 3,072	N/A	US\$ 3,072	
	UBS-Barclays Commercial Mortgage Trust 2012-C3	-		-	US\$ 3,061	N/A	US\$ 3,061	
	Toyota Auto Receivables 2018-D Owner Trust	-		-	US\$ 3,059	N/A	US\$ 3,059	
	J.P. Morgan Chase Commercial Mortgage Securities Trust 2016-WK1	-		-	US\$ 3,020	N/A	US\$ 3,020	
	Wells Fargo Commercial Mortgage Trust 2017-C40	-		-	US\$ 3,017	N/A	US\$ 3,017	
	Citigroup Commercial Mortgage Trust 2016-P5	-		-	US\$ 3,008	N/A	US\$ 3,008	
	GS Mortgage Securities Corp Trust 2018-RIVP	-		-	US\$ 3,003	N/A	US\$ 3,003	
	GM Financial Consumer Automobile Receivables Trust 2017-2	-		-	US\$ 2,995	N/A	US\$ 2,995	
	Morgan Stanley Capital I Trust 2017-HI	-		-	US\$ 2,966	N/A	US\$ 2,966	
	Hyundai Auto Receivables Trust 2018-A	-		-	US\$ 2,915	N/A	US\$ 2,915	
	Nissan Auto Lease Trust 2019-B	-		-	US\$ 2,885	N/A	US\$ 2,885	
	Citigroup Commercial Mortgage Trust 2016-C3	-		-	US\$ 2,760	N/A	US\$ 2,760	
	GS Mortgage Securities Trust 2013-GC12	-		-	US\$ 2,660	N/A	US\$ 2,660	
	GS Mortgage Securities Trust 2011-GC3	-		-	US\$ 2,626	N/A	US\$ 2,626	
	BANK 2019-BN124	-		-	US\$ 2,606	N/A	US\$ 2,606	
	Morgan Stanley Bank of America Merrill Lynch Trust 2012-C6	-		-	US\$ 2,536	N/A	US\$ 2,536	
	ARI Fleet Lease Trust 2019-A	-		-	US\$ 2,408	N/A	US\$ 2,408	
	Nissan Auto Lease Trust 2019-A	-		-	US\$ 2,350	N/A	US\$ 2,350	
	UBS Commercial Mortgage Trust 2018-C11	-		-	US\$ 2,179	N/A	US\$ 2,179	
	Morgan Stanley Capital I Trust 2018-H3	-		-	US\$ 2,134	N/A	US\$ 2,134	
	BEICHMARK 2018-B4	-		-	US\$ 2,125	N/A	US\$ 2,125	
	COMM 2013-CCRE12 Mortgage Trust	-		-	US\$ 2,112	N/A	US\$ 2,112	
	Ford Credit Auto Owner Trust 2019-A	-		-	US\$ 2,088	N/A	US\$ 2,088	
	Wells Fargo Commercial Mortgage Trust 2017-P8	-		-	US\$ 2,059	N/A	US\$ 2,059	
	JPMDDB Commercial Mortgage Securities Trust 2017-C7	-		-	US\$ 2,044	N/A	US\$ 2,044	
	WFBBB Commercial Mortgage Trust 2013-C17	-		-	US\$ 2,044	N/A	US\$ 2,044	
	JPMBB Commercial Mortgage Securities Trust 2014-C19	-		-	US\$ 2,032	N/A	US\$ 2,032	
	Morgan Stanley Bank of America Merrill Lynch Trust 2016-C31	-		-	US\$ 2,027	N/A	US\$ 2,027	
	GM Financial Consumer Automobile 2017-I	-		-	US\$ 2,001	N/A	US\$ 2,001	
	COMM 2014-CCRE17 Mortgage Trust	-		-	US\$ 2,000	N/A	US\$ 2,000	
	GS Mortgage Securities Trust 2014-GC22	-		-	US\$ 1,961	N/A	US\$ 1,961	
	Mercedes-Benz Auto Lease Trust 2018-B	-		-	US\$ 1,961	N/A	US\$ 1,961	
	GS Mortgage Securities Trust 2015-GC34	-		-	US\$ 1,905	N/A	US\$ 1,905	
	Chesapeake Funding II LLC	-		-	US\$ 1,903	N/A	US\$ 1,903	
	Morgan Stanley Bank of America Merrill Lynch Trust 2013-C8	-		-	US\$ 1,831	N/A	US\$ 1,831	
	Citigroup Commercial Mortgage Trust 2015-GC35	-		-	US\$ 1,791	N/A	US\$ 1,791	
	Morgan Stanley Capital I Trust 2019-H6	-		-	US\$ 1,772	N/A	US\$ 1,772	
	GM Financial Automobile Leasing Trust 2019-1	-		-	US\$ 1,647	N/A	US\$ 1,647	
	JPMBB Commercial Mortgage Securities Trust 2013-C12	-		-	US\$ 1,544	N/A	US\$ 1,544	
	Wells Fargo Commercial Mortgage Trust 2015-IC20	-		-	US\$ 1,498	N/A	US\$ 1,498	
	Morgan Stanley Bank of America Merrill Lynch Trust 2015-C24	-		-	US\$ 1,492	N/A	US\$ 1,492	
	Citigroup Commercial Mortgage Trust 2015-GC27	-		-	US\$ 1,458	N/A	US\$ 1,458	

(Continued)

Held Company Name	Marketable Securities Type and Name	Relationship with the Company	Financial Statement Account	Shares/Units (In Thousands)	Carrying Value (Foreign Currencies in Thousands)	Percentage of Ownership (%)	Fair Value (Foreign Currencies in Thousands)	Note
TSMC Global	WFRRBS Commercial Mortgage Trust 2013-C14	-	Financial assets at fair value through other comprehensive income	-	US\$ 1,454	N/A	US\$ 1,454	
	GS Mortgage Securities Trust 2014-CG24	-	Financial assets at fair value through other comprehensive income	-	US\$ 1,452	N/A	US\$ 1,452	
	Morgan Stanley Bank of America Merrill Lynch Trust 2013-C12	-	-	-	US\$ 1,438	N/A	US\$ 1,438	
	Honda Auto Receivables 2017-3 Owner Trust	-	-	-	US\$ 1,425	N/A	US\$ 1,425	
	Wells Fargo Commercial Mortgage Trust 2016-C36	-	-	-	US\$ 1,403	N/A	US\$ 1,403	
	Benchmark 2019-B14 Mortgage Trust	-	-	-	US\$ 1,381	N/A	US\$ 1,381	
	Hertz Fleet Lease Funding LP	-	-	-	US\$ 1,372	N/A	US\$ 1,372	
	Hyundai Auto Receivables Trust 2019-B	-	-	-	US\$ 1,286	N/A	US\$ 1,286	
	Wells Fargo Commercial Mortgage Trust 2012-1C5	-	-	-	US\$ 1,268	N/A	US\$ 1,268	
	COMMM 2013-1C6 Mortgage Trust	-	-	-	US\$ 1,238	N/A	US\$ 1,238	
	GS Mortgage Securities Trust 2019-GSA1	-	-	-	US\$ 1,233	N/A	US\$ 1,233	
	GS Mortgage Securities Corp II	-	-	-	US\$ 1,226	N/A	US\$ 1,226	
	GM Financial Automobile Leasing Trust 2019-4	-	-	-	US\$ 1,194	N/A	US\$ 1,194	
	JPMDDB Commercial Mortgage Securities Trust 2016-C2	-	-	-	US\$ 1,192	N/A	US\$ 1,192	
	Benchmark 2019-B9 Mortgage Trust	-	-	-	US\$ 1,160	N/A	US\$ 1,160	
	Morgan Stanley Capital I Trust 2016-UB11	-	-	-	US\$ 1,105	N/A	US\$ 1,105	
	JPMCC Commercial Mortgage Securities Trust 2017-JP5	-	-	-	US\$ 1,073	N/A	US\$ 1,073	
	Morgan Stanley Bank of America Merrill Lynch Trust 2013-C13	-	-	-	US\$ 1,048	N/A	US\$ 1,048	
	UBS-Baird's Commercial Mortgage Trust 2013-C5	-	-	-	US\$ 1,032	N/A	US\$ 1,032	
	COMMM 2015-PC1 Mortgage Trust	-	-	-	US\$ 1,032	N/A	US\$ 1,032	
	WFRRBS Commercial Mortgage Trust 2011-C4	-	-	-	US\$ 1,027	N/A	US\$ 1,027	
	Ford Credit Auto Lease Trust 2019-A	-	-	-	US\$ 1,013	N/A	US\$ 1,013	
	BMW Vehicle Lease Trust 2019-1	-	-	-	US\$ 1,012	N/A	US\$ 1,012	
	Ford Credit Auto Owner Trust 2017-REVI	-	-	-	US\$ 1,012	N/A	US\$ 1,012	
	Benchmark 2019-B15 Mortgage Trust	-	-	-	US\$ 998	N/A	US\$ 998	
	BBCMMS MORTGAGE TRUST 2017-C1	-	-	-	US\$ 998	N/A	US\$ 998	
	Citigroup Commercial Mortgage Trust 2013-GC11	-	-	-	US\$ 959	N/A	US\$ 959	
	Citigroup Commercial Mortgage Trust 2014-GC23	-	-	-	US\$ 951	N/A	US\$ 951	
	COMMM 2012-CCRE5 Mortgage Trust	-	-	-	US\$ 918	N/A	US\$ 918	
	Cantor Commercial Real Estate Lending 2019-CF1	-	-	-	US\$ 916	N/A	US\$ 916	
	280 Park Avenue 2017-280P Mortgage Trust	-	-	-	US\$ 830	N/A	US\$ 830	
	GM Financial Automobile Leasing Trust 2019-2	-	-	-	US\$ 823	N/A	US\$ 823	
	Ford Credit Auto Lease Trust	-	-	-	US\$ 798	N/A	US\$ 798	
	GM Financial Automobile Leasing Trust 2018-1	-	-	-	US\$ 759	N/A	US\$ 759	
	Morgan Stanley Bank of America Merrill Lynch Trust 2015-C20	-	-	-	US\$ 759	N/A	US\$ 759	
	GM Financial Consumer Automobile Receivables Trust 2018-2	-	-	-	US\$ 756	N/A	US\$ 756	
	Toyota Auto Receivables 2016-B Owner Trust	-	-	-	US\$ 741	N/A	US\$ 741	
	COMMM 2015-CCRE22 Mortgage Trust	-	-	-	US\$ 720	N/A	US\$ 720	
	Wells Fargo Commercial Mortgage Trust 2015-NX53	-	-	-	US\$ 703	N/A	US\$ 703	
	Wells Fargo Commercial Mortgage Trust 2015-C28	-	-	-	US\$ 702	N/A	US\$ 702	
	COMMM 2013-CCRE5 Mortgage Trust	-	-	-	US\$ 701	N/A	US\$ 701	
	CFCRE Commercial Mortgage Trust 2014-C1	-	-	-	US\$ 696	N/A	US\$ 696	
	GM Financial Automobile Leasing Trust 2019-3	-	-	-	US\$ 650	N/A	US\$ 650	
	Mercedes-Benz Auto Lease Trust 2019-A	-	-	-	US\$ 620	N/A	US\$ 620	
	JP Morgan Chase Commercial Mortgage Securities Trust 2012-WLDN	-	-	-	US\$ 603	N/A	US\$ 603	
	JPMDDB Commercial Mortgage Securities Trust 2019-COR6	-	-	-	US\$ 597	N/A	US\$ 597	
	Citigroup Commercial Mortgage Trust 2014-GC19	-	-	-	US\$ 576	N/A	US\$ 576	
	DBIBBS 2011-1LC2 Mortgage Trust	-	-	-	US\$ 510	N/A	US\$ 510	
	Nissan Auto Receivables 2019-C Owner Trust	-	-	-	US\$ 485	N/A	US\$ 485	
	Mercedes-Benz Auto Lease Trust 2018-A	-	-	-	US\$ 482	N/A	US\$ 482	
	GS Mortgage Securities Trust 2014-GC26	-	-	-	US\$ 465	N/A	US\$ 465	

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Held Company Name	Marketable Securities Type and Name	Relationship with the Company	Financial Statement Account		Carrying Value (Foreign Currencies in Thousands)	Percentage of Ownership (%)	Fair Value (Foreign Currencies in Thousands)	Note
			Shares/Units (In Thousands)					
TSMC Global	GM Financial Consumer Automobile Receivables Trust 2019-3	-	Financial assets at fair value through other comprehensive income	"	-	443	N/A	443
	Hyundai Auto Lease Securitization Trust 2017-C	-		"	US\$ 410	N/A	US\$ 410	
	WFRBS Commercial Mortgage Trust 2014-C25	-		"	US\$ 408	N/A	US\$ 408	
	Ford Credit Auto Lease Trust 2017-B	-		"	US\$ 380	N/A	US\$ 380	
	Hyundai Auto Receivables Trust 2015-C	-		"	US\$ 365	N/A	US\$ 365	
	GM Financial Automobile Leasing Trust 2018-2	-		"	US\$ 351	N/A	US\$ 351	
	Morgan Stanley Bank of America Merrill Lynch Trust 2012-C5	-		"	US\$ 350	N/A	US\$ 350	
	COMM 2015-CCRE126 Mortgage Trust	-		"	US\$ 349	N/A	US\$ 349	
	GM Financial Automobile Leasing Trust 2018-3	-		"	US\$ 339	N/A	US\$ 339	
	JPMBB Commercial Mortgage Securities Trust 2015-C31	-		"	US\$ 325	N/A	US\$ 325	
	Ford Credit Auto Owner Trust 2017-B	-		"	US\$ 301	N/A	US\$ 301	
	Toyota Auto Receivables 2018-B Owner Trust	-		"	US\$ 283	N/A	US\$ 283	
	BMW Vehicle Lease Trust 2017-2	-		"	US\$ 189	N/A	US\$ 189	
	COMM 2015-DC1 Mortgage Trust	-		"	US\$ 180	N/A	US\$ 180	
	Wells Fargo Commercial Mortgage Trust 2015-NXKS1	-		"	US\$ 103	N/A	US\$ 103	
	Wells Fargo Commercial Mortgagge Trust 2015-SGI	-		"	US\$ 100	N/A	US\$ 100	
	COMM 2014-CCRE15 Mortgage Trust	-		"	US\$ 46	N/A	US\$ 46	
	Nissan Auto Receivables 2016-B Owner Trust	-		"	US\$ 36	N/A	US\$ 36	
	WFRBS Commercial Mortgage Trust 2011-C5	-		"	US\$ 31	N/A	US\$ 31	
	GS Mortgage Securities Trust 2010-C2	-		"	US\$ 21	N/A	US\$ 21	
	Morgan Stanley Bank of America Merrill Lynch Trust 2014-C18	-		"	US\$ 20	N/A	US\$ 20	
	GS Mortgage Securities Trust 2010-C1	-		"	US\$ 9	N/A	US\$ 9	
	Non-publicly traded equity investments	-	Financial assets at fair value through other comprehensive income	"	US\$ 78,403	4	US\$ 78,403	
	Primavera Capital Fund II L.P.	-		"	1,019	US\$ 1,307	4	US\$ 1,307
	Non-publicly traded equity investments	-	Financial assets at fair value through other comprehensive income	"	1,085	US\$ 362	20	US\$ 362
	Sentelic	-		"	4	-	-	-
	Aether Systems, Inc.	-		"	4,147	US\$ 174	14	US\$ 174
	5V Technologies, Inc.	-		"	1,952	US\$ 800	-	US\$ 800
	Non-publicly traded equity investments	-	Financial assets at fair value through other comprehensive income	"	230	US\$ 1,560	-	US\$ 1,560
	LiquidLeds Lighting Corp.	-		"	221	US\$ 1,501	-	US\$ 1,501
	Neocomis, Inc.	-		"	237	US\$ 775	-	US\$ 775
	Non-publicly traded equity investments	-	Financial assets at fair value through other comprehensive income	"	127	US\$ 250	-	US\$ 250
VTAF II	Innovium, Inc.	-		"				
	CNEX Labs, Inc.	-		"				
	Astera Labs, Inc.	-		"				
Growth Fund	(Concluded)							

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TABLE 4

**Taiwan Semiconductor Manufacturing Company Limited and Subsidiaries**

MARKETABLE SECURITIES ACQUIRED AND DISPOSED OF AT COSTS OR PRICES OF AT LEAST NTS300 MILLION OR 20% OF THE PAID-IN CAPITAL  
 FOR THE YEAR ENDED DECEMBER 31, 2019  
 (Amounts in Thousands of New Taiwan Dollars, Unless Specified Otherwise)

Company Name	Marketable Securities Type and Name	Financial Statement Account	Counter-party	Nature of Relationship	Beginning Balance		Acquisition		Disposal		Ending Balance (Note) Shares/Units (In Thousands)	Shares/Units (In Thousands)	Amount
					Shares/Units (In Thousands)	Amount	Shares/Units (In Thousands)	Amount	Carrying Value	Gain/Loss on Disposal			
TSMC	Commercial paper Taiwan Power Company	Financial assets at amortized cost	"	-	180	\$ 1,795,261	-	\$ -	180	\$ 1,800,000	\$ -	-	\$ -
	CPC Corporation, Taiwan			-	50	498,837	-	-	50	500,000	50,000	-	-
	Publicly traded stocks Semiconductor Manufacturing International Corporation	Financial assets at fair value through other comprehensive income	-	-	21,105	568,150	-	-	21,105	775,282	522,975	252,307	-
TSMC Global	Corporate bond Bank of America Corp	Financial assets at fair value through other comprehensive income	-	-	US\$ 44,755	-	US\$ 26,624	-	US\$ 26,924	US\$ 26,897	US\$ 27	-	US\$ 46,084
	Citigroup Inc	US\$ 28,602	-	US\$ 27,307	-	US\$ 21,481	US\$ 17,687	US\$ 17,576	US\$ 111	US\$ 21,386	95	-	US\$ 35,512
	AbiVie Inc	US\$ 11,504	-	US\$ 36,780	-	US\$ 14,343	US\$ 14,218	US\$ 125	US\$ 125	US\$ 14,343	111	-	US\$ 31,425
	AT&T Inc	US\$ 23,123	-	US\$ 16,412	-	US\$ 5,709	US\$ 5,703	US\$ 6	US\$ 6	US\$ 5,703	6	-	US\$ 26,140
	Goldman Sachs Group Inc/The	US\$ 17,619	-	US\$ 12,935	-	US\$ 31,861	US\$ 31,310	US\$ 551	US\$ 551	US\$ 31,861	551	-	US\$ 25,789
	CVS Health Corp	US\$ 27,238	-	US\$ 25,647	-	US\$ 4,409	US\$ 4,342	US\$ 67	US\$ 67	US\$ 4,409	67	-	US\$ 22,242
	Bristol-Myers Squibb Co	"	-	US\$ 25,338	-	US\$ 2,670	US\$ 2,646	US\$ 24	US\$ 24	US\$ 2,670	24	-	US\$ 21,666
	Mitsubishi UFJ Financial Group Inc	US\$ 9,547	-	US\$ 13,962	-	US\$ 10,973	US\$ 10,974	US\$ 1(1)	US\$ 1(1)	US\$ 10,973	1(1)	-	US\$ 21,332
	JPMorgan Chase & Co	US\$ 16,577	-	US\$ 14,544	-	US\$ 16,990	US\$ 16,874	US\$ 116	US\$ 116	US\$ 16,990	116	-	US\$ 20,825
	Morgan Stanley	US\$ 19,581	-	US\$ 17,212	-	US\$ 9,205	US\$ 9,074	US\$ 131	US\$ 131	US\$ 9,205	131	-	US\$ 20,421
	HSBC Holdings PLC	US\$ 15,571	-	US\$ 13,265	-	US\$ 3,939	US\$ 3,997	US\$ (58)	US\$ (58)	US\$ 3,939	551	-	US\$ 20,102
	Apple Inc	US\$ 12,585	-	US\$ 10,796	-	US\$ 8,327	US\$ 8,288	US\$ 39	US\$ 39	US\$ 8,327	39	-	US\$ 19,886
	Sumitomo Mitsui Financial Group Inc	US\$ 10,008	-	US\$ 16,956	-	US\$ 7,656	US\$ 7,669	US\$ 96	US\$ 96	US\$ 7,656	96	-	US\$ 19,176
	Toronto-Dominion Bank/The	US\$ 5,000	-	US\$ 17,437	-	US\$ 12,478	US\$ 12,447	US\$ 31	US\$ 31	US\$ 12,478	31	-	US\$ 15,017
	Verizon Communications Inc	US\$ 15,927	-	US\$ 9,920	-	US\$ 8,113	US\$ 8,15	US\$ (2)	US\$ (2)	US\$ 8,113	815	-	US\$ 14,058
	Wells Fargo & Co	US\$ 576	-	US\$ 11,967	-	US\$ 7,610	US\$ 7,463	US\$ 147	US\$ 147	US\$ 7,610	147	-	US\$ 11,864
	Morgan Stanley	US\$ 8,928	-	US\$ 10,113	-	US\$ 4,096	US\$ 4,088	US\$ 8	US\$ 8	US\$ 4,096	8	-	US\$ 11,837
	Banque Federative du Credit Mutuel SA	US\$ 4,028	-	US\$ 11,726	-	US\$ 10,471	US\$ 10,247	US\$ 34	US\$ 34	US\$ 10,471	34	-	US\$ 11,752
	American International Group Inc	US\$ 10,737	-	US\$ 10,471	-	US\$ 10,748	US\$ -	US\$ -	US\$ -	US\$ 10,748	-	-	US\$ 11,423
	Equifax Inc	US\$ 174	-	US\$ 11,957	-	US\$ 6,218	US\$ 6,121	US\$ 97	US\$ 97	US\$ 6,218	97	-	US\$ 11,001
	Ryder System Inc	US\$ 4,778	-	US\$ 13,545	-	US\$ 3,265	US\$ 3,266	US\$ (1)	US\$ (1)	US\$ 3,265	3,266	-	US\$ 10,892
	International Business Machines Corp	"	-	US\$ 15,881	-	US\$ 11,397	US\$ 11,366	US\$ 31	US\$ 31	US\$ 11,397	31	-	US\$ 10,144
	NextEra Energy Capital Holdings Inc	US\$ 4,706	-	US\$ 12,324	-	US\$ 4,902	US\$ 4,770	US\$ 132	US\$ 132	US\$ 4,902	132	-	US\$ 9,420
	Fiserv Inc	US\$ 1,455	-	US\$ 18,894	-	US\$ 14,933	US\$ 14,452	US\$ 481	US\$ 481	US\$ 14,933	481	-	US\$ 9,174
	Comcast Corp	US\$ 3,773	-	US\$ 25,423	-	US\$ 23,845	US\$ 23,737	US\$ 108	US\$ 108	US\$ 23,845	108	-	US\$ 8,514
	JPMorgan Chase & Co	"	-	US\$ 11,641	-	US\$ 6,093	US\$ 5,824	US\$ 269	US\$ 269	US\$ 6,093	269	-	US\$ 7,849
	Anheuser-Busch InBev	"	-	US\$ 10,414	-	US\$ 9,023	US\$ 8,890	US\$ 133	US\$ 133	US\$ 9,023	133	-	US\$ 6,276
	Worldwide Inc	US\$ 4,547	-	US\$ 10,719	-	US\$ 7,387	US\$ 7,428	US\$ (41)	US\$ (41)	US\$ 7,387	70	-	US\$ 3,246
	American Express Co	"	-	US\$ 6,644	-	US\$ 12,403	US\$ 12,333	US\$ 70	US\$ 70	US\$ 12,403	70	-	US\$ 3,187

(Continued)

Company Name	Marketable Securities Type and Name	Financial Statement Account	Counter-party	Nature of Relationship	Shares/Units (In Thousands)	Amount	Beginning Balance	Shares/Units (In Thousands)	Amount	Acquisition	Shares/Units (In Thousands)	Amount	Disposal	Carrying Value	Gain/Loss on Disposal	Shares/Units (In Thousands)	Ending Balance (Note) Amount
TSMC Global	AXA Equitable Holdings Inc			Financial assets at fair value through other comprehensive income	-	-	US\$ 5,662	-	US\$ 6,917	-	US\$ 12,532	US\$ 12,265	US\$ 267	-	US\$ 393		
	Ford Motor Credit Co LLC				-	-	US\$ 10,153	-	US\$ -	-	US\$ 10,252	US\$ 10,454	US\$ (202)	-	US\$ -		
	European Investment Bank				-	-	US\$ 3,903	-	US\$ 7,177	-	US\$ 11,181	US\$ 11,123	US\$ 58	-	US\$ -		
	Wells Fargo & Co			Financial assets at amortized cost	-	-	US\$ 149,941	-	US\$ 10,187	-	US\$ -	-	US\$ -	-	US\$ 160,098		
	JPMorgan Chase & Co.			"	-	-	US\$ 124,948	-	US\$ -	-	US\$ 40,000	US\$ 40,000	US\$ -	-	US\$ 84,967		
	Goldman Sachs Group, Inc.			"	-	-	US\$ 99,900	-	US\$ -	-	US\$ 100,000	US\$ 100,000	US\$ -	-	US\$ -		
	Bank of Nova Scotia			"	-	-	US\$ 49,976	-	US\$ -	-	US\$ 50,000	US\$ 50,000	US\$ -	-	US\$ -		
	Commonwealth Bank of Australia			"	-	-	US\$ 49,994	-	US\$ -	-	US\$ 50,000	US\$ 50,000	US\$ -	-	US\$ -		
	Westpac Banking Corp.			"	-	-	US\$ 99,987	-	US\$ -	-	US\$ 100,000	US\$ 100,000	US\$ -	-	US\$ -		
	National Australia Bank			"	-	-	US\$ 49,994	-	US\$ -	-	US\$ 50,000	US\$ 50,000	US\$ -	-	US\$ -		
	Government bond				-	-	US\$ 283,314	-	US\$ 1,330,414	-	US\$ 1,201,895	US\$ 1,197,309	US\$ 4,586	-	US\$ 419,942		
	United States Treasury Note/Bond			Financial assets at fair value through other comprehensive income	-	-	US\$ 2,248	-	US\$ 30,306	-	US\$ 30,583	US\$ 30,575	US\$ 8	-	US\$ -		
	United States Treasury Bill			"	-	-	US\$ -	-	US\$ 50,193	-	US\$ 50,290	US\$ 50,290	US\$ -	-	US\$ -		
	United States Cash Management Bill			"	-	-	US\$ 68,164	-	US\$ -	-	US\$ 68,186	US\$ 68,239	US\$ (53)	-	US\$ -		
	United States Treasury Floating Rate Note			"	-	-	US\$ -	-	US\$ 43,868	-	US\$ 448	US\$ 460	US\$ (12)	-	US\$ 43,455		
	Agency bonds/Agency mortgage-backed securities			Financial assets at fair value through other comprehensive income	-	-	US\$ -	-	US\$ 41,510	-	US\$ 1,017	US\$ 1,047	US\$ (30)	-	US\$ 40,438		
	Fannie Mae Pool			"	-	-	US\$ -	-	US\$ 30,338	-	US\$ 917	US\$ 941	US\$ (24)	-	US\$ 29,463		
	Fannie Mae Pool			"	-	-	US\$ -	-	US\$ 27,922	-	US\$ 3,876	US\$ 3,876	US\$ (6)	-	US\$ 23,932		
	GNMA II Pool MAG155			"	-	-	US\$ -	-	US\$ 24,616	-	US\$ 1,759	US\$ 1,855	US\$ (96)	-	US\$ 22,981		
	Fannie Mae Pool			"	-	-	US\$ -	-	US\$ 23,956	-	US\$ 1,506	US\$ 1,572	US\$ (66)	-	US\$ 22,677		
	Fannie Mae Pool			"	-	-	US\$ -	-	US\$ 22,063	-	US\$ 1,716	US\$ 1,771	US\$ (55)	-	US\$ 20,518		
	FNMA TBA 30 Yr 4.5			"	-	-	US\$ -	-	US\$ 466,768	-	US\$ 446,909	US\$ 446,629	US\$ 280	-	US\$ 20,165		
	Fannie Mae Pool			"	-	-	US\$ -	-	US\$ 21,757	-	US\$ 2,297	US\$ 2,329	US\$ (32)	-	US\$ 19,901		
	Freddie Mac Gold Pool			"	-	-	US\$ -	-	US\$ 20,910	-	US\$ 1,702	US\$ 1,770	US\$ (68)	-	US\$ 19,392		
	Fannie Mae Pool			"	-	-	US\$ -	-	US\$ 18,806	-	US\$ -	US\$ -	US\$ -	-	US\$ 18,834		
	Freddie Mac Gold Pool			"	-	-	US\$ -	-	US\$ 19,929	-	US\$ 1,965	US\$ 2,050	US\$ (85)	-	US\$ 18,011		
	Fannie Mae Pool			"	-	-	US\$ -	-	US\$ 18,859	-	US\$ 1,475	US\$ 1,582	US\$ (107)	-	US\$ 17,529		
	ENNMA TBA 30 Yr 4.5			"	-	-	US\$ -	-	US\$ 251,219	-	US\$ 233,880	US\$ 233,875	US\$ 5	-	US\$ 17,372		
	GNMA II Pool MAG090			"	-	-	US\$ -	-	US\$ 17,117	-	US\$ 155	US\$ 161	US\$ (6)	-	US\$ 16,840		
	Fannie Mae Pool			"	-	-	US\$ -	-	US\$ 19,603	-	US\$ 3,315	US\$ 3,436	US\$ (121)	-	US\$ 16,230		
	Freddie Mac Gold Pool			"	-	-	US\$ -	-	US\$ 16,126	-	US\$ -	US\$ -	US\$ -	-	US\$ 16,122		
	Fannie Mae Pool			"	-	-	US\$ -	-	US\$ 206,260	-	US\$ 191,534	US\$ 191,171	US\$ 363	-	US\$ 15,095		
	FNMA II TBA 30 Yr 3.5			"	-	-	US\$ -	-	US\$ 15,995	-	US\$ 1,319	US\$ 1,349	US\$ (30)	-	US\$ 14,828		
	Freddie Mac Gold Pool			"	-	-	US\$ -	-	US\$ 17,665	-	US\$ 3,584	US\$ 3,755	US\$ (171)	-	US\$ 13,966		
	Freddie Mac Gold Pool			"	-	-	US\$ -	-	US\$ 13,217	-	US\$ -	US\$ -	US\$ -	-	US\$ 13,261		
	Fannie Mae Pool			"	-	-	US\$ -	-	US\$ 14,044	-	US\$ 1,004	US\$ 1,028	US\$ (24)	-	US\$ 13,152		
	Freddie Mac Gold Pool			"	-	-	US\$ -	-	US\$ 16,635	-	US\$ 3,686	US\$ 3,832	US\$ (146)	-	US\$ 12,793		
	GNMA II Pool MAG264			"	-	-	US\$ -	-	US\$ 12,611	-	US\$ -	US\$ -	US\$ -	-	US\$ 12,628		
	Freddie Mac Gold Pool			"	-	-	US\$ -	-	US\$ 13,778	-	US\$ 1,615	US\$ 1,636	US\$ (21)	-	US\$ 12,480		
	Freddie Mac Gold Pool			"	-	-	US\$ -	-	US\$ 12,394	-	US\$ 148	US\$ 158	US\$ (10)	-	US\$ 12,281		
	Fannie Mae Pool			"	-	-	US\$ -	-	US\$ 14,112	-	US\$ 2,091	US\$ 2,197	US\$ (106)	-	US\$ 11,962		
	Fannie Mae Pool			"	-	-	US\$ -	-	US\$ 12,515	-	US\$ 1,472	US\$ 1,497	US\$ (25)	-	US\$ 11,248		
	GNMA II TBA 30 Yr 3.5			"	-	-	US\$ -	-	US\$ 1,157	-	US\$ 261,544	US\$ 261,292	US\$ 252	-	US\$ 10,517		

(Continued)

Company Name	Marketable Securities Type and Name	Financial Statement Account	Counter-party	Nature of Relationship	Beginning Balance		Shares/Units (In Thousands)	Amount	Acquisition		Shares/Units (In Thousands)	Amount	Disposal		Shares/Units (In Thousands)	Amount	Ending Balance (Note)
					Shares/Units (In Thousands)	Amount			Shares/Units (In Thousands)	Amount			Carrying Value	Gain/Loss on Disposal			
TSMC Global	Fannie Mae			Financial assets at fair value through other comprehensive income	-	-	USS 1,889	-	USS 10,203	-	USS 1,938	USS 1,918	USS 20	-	USS 10,258	-	
	Fannie Mae Pool			"	-	-	USS -	USS 10,110	-	USS 38	USS 39	USS (1)	-	USS 10,057	-		
	Fannie Mae Pool			"	-	-	USS -	USS 10,205	-	USS 471	USS 486	USS (15)	-	USS 9,703	-		
	Fannie Mae Pool			"	-	-	USS -	USS 11,094	-	USS 1,529	USS 1,594	USS (65)	-	USS 9,596	-		
	Fannie Mae Pool			"	-	-	USS -	USS 10,064	-	USS 642	USS 652	USS (10)	-	USS 9,384	-		
	Fannie Mae Pool			"	-	-	USS -	USS 10,212	-	USS 1,100	USS 1,118	USS (18)	-	USS 9,306	-		
	FNMA TBA 30 Yr 3.5			"	-	-	USS -	USS 622,622	-	USS 613,991	USS 613,385	USS 606	-	USS 629,59	-		
	Fannie Mae			"	USS 9,370	-	USS -	USS 9,467	-	USS 10,271	USS 10,267	USS 4	-	USS 8,700	-		
	Fannie Mae Pool			"	-	-	USS -	USS 28,050	-	USS 19,505	USS 19,498	USS 7	-	USS 8,538	-		
	GNMA II TBA 30 Yr 4.5			"	USS 587	-	USS -	USS 37,238	-	USS 30,291	USS 30,323	USS (32)	-	USS 7,496	-		
	Fannie Mae-Acs			"	-	-	USS -	USS 11,110	-	USS 4,196	USS 4,077	USS 119	-	USS 7,112	-		
	Fannie Mae			"	USS 11,146	-	USS -	USS 6,657	-	USS 11,945	USS 11,922	USS 23	-	USS 6,200	-		
	Freddie Mac Gold Pool			"	USS -	-	USS -	USS 21,042	-	USS 16,462	USS 16,381	USS 81	-	USS 4,05	-		
	FNMA TBA 30 Yr 5			"	USS 24,761	-	USS -	USS 112,529	-	USS 133,871	USS 133,727	USS 144	-	USS 3,603	-		
	FNMA TBA 15 Yr 3			"	USS -	-	USS -	USS 142,803	-	USS 138,801	USS 138,711	USS 90	-	USS 3,073	-		
	Freddie Mac Gold Pool			"	-	-	USS -	USS 23,067	-	USS 20,672	USS 20,453	USS 219	-	USS 2,673	-		
	Fannie Mae-Acs			"	USS -	-	USS -	USS 19,910	-	USS 18,513	USS 17,849	USS 664	-	USS 2,181	-		
	FNMA TBA 30 Yr 3			"	USS -	-	USS -	USS 274,335	-	USS 272,691	USS 272,314	USS 377	-	USS 2,028	-		
	FNMA Pool BM4493			"	USS 16,915	-	USS -	USS 1,795	-	USS 17,390	USS 17,262	USS 128	-	USS 1,588	-		
	Freddie Mac Multifamily Structured Pass Through Certificates			"	USS -	-	USS -	USS 33,864	-	USS 32,603	USS 32,603	USS 1,02	-	USS 1,321	-		
	Government National Mortgage Association			"	USS 16,485	-	USS -	USS 860	-	USS 17,209	USS 16,942	USS 267	-	USS 763	-		
	Government National Mortgage Association			"	USS 10,590	-	USS -	USS 665	-	USS 10,652	USS 10,728	USS (76)	-	USS 640	-		
	Fannie Mae or Freddie Mac Freddie Mac Gold Pool			"	USS 360	-	USS -	USS 11,135	-	USS 11,138	USS 11,127	USS 11	-	USS 367	-		
	Government National Mortgage Association			"	USS 15,253	-	USS -	USS 19,951	-	USS 20,336	USS 19,929	USS 407	-	USS -	-		
	Government National Mortgage Association			"	USS 12,897	-	USS -	USS -	-	USS 15,929	USS 15,671	USS 258	-	USS -	-		
	Fannie Mae Pool			"	USS -	-	USS -	USS 11,390	-	USS 13,248	USS 13,269	USS (21)	-	USS -	-		
	Freddie Mac Multifamily Structured Pass Through Certificates			"	USS -	-	USS -	USS 9,824	-	USS 10,426	USS 9,819	USS 607	-	USS -	-		
	FED HMLN PC Pool G61603			"	USS 25,515	-	USS -	USS -	-	USS 25,966	USS 25,627	USS 339	-	USS -	-		
	Freddie Mac Gold Pool			"	USS -	-	USS -	USS 19,788	-	USS 19,817	USS 19,783	USS 34	-	USS -	-		
	Freddie Mac Pool			"	USS -	-	USS -	USS 19,993	-	USS 20,102	USS 19,993	USS 109	-	USS -	-		
	Freddie Mac Gold Pool			"	USS -	-	USS -	USS 31,117	-	USS 30,924	USS 31,115	USS (191)	-	USS -	-		
	Freddie Mac Gold Pool			"	USS -	-	USS -	USS 19,999	-	USS 20,332	USS 19,982	USS 350	-	USS -	-		
	Freddie Mac Gold Pool			"	USS -	-	USS -	USS 14,988	-	USS 15,037	USS 14,987	USS 50	-	USS -	-		
	FNMA Pool BM4495			"	USS -	-	USS -	USS 27,324	-	USS 28,065	USS 27,635	USS 430	-	USS -	-		
	FED HMLN PC Pool G61592			"	USS -	-	USS -	USS 21,507	-	USS 21,673	USS 21,448	USS 225	-	USS -	-		
	Fannie Mae Pool			"	USS -	-	USS -	USS 23,009	-	USS 23,035	USS 23,003	USS 32	-	USS -	-		
	FED HMLN PC Pool G61654			"	USS -	-	USS -	USS 18,555	-	USS 18,833	USS 18,606	USS 277	-	USS -	-		
	GNMA II Pool MA5468			"	USS 17,490	-	USS -	USS -	-	USS 17,460	USS 17,591	USS (131)	-	USS -	-		
	Fannie Mae-Acs			"	USS -	-	USS -	USS 10,575	-	USS 11,022	USS 10,560	USS 462	-	USS -	-		
	FNMA Pool CA2169			"	USS -	-	USS -	USS 13,859	-	USS 13,966	USS 13,892	USS 74	-	USS -	-		
	Fannie Mae Pool			"	USS -	-	USS -	USS 9,743	-	USS 9,881	USS 10,148	USS (267)	-	USS -	-		
	FED HMLN PC Pool G61553			"	USS 15,045	-	USS -	USS -	-	USS 15,177	USS 15,109	USS 68	-	USS -	-		
	Freddie Mac Gold Pool			"	USS 15	-	USS -	USS 10,296	-	USS 10,337	USS 10,289	USS 48	-	USS -	-		
	FHLMC TBA 30 Yr 3			"	USS 2,020	-	USS -	USS 51,813	-	USS 52,028	USS 51,828	USS 200	-	USS -	-		
	FNMA TBA 15 Yr 3.5			"	-	-	USS -	USS 48,272	-	USS 50,364	USS 50,283	USS 81	-	USS -	-		

(Continued)

Company Name	Marketable Securities Type and Name	Financial Statement Account	Counter-party	Nature of Relationship	Beginning Balance		Shares/Units (In Thousands)	Amount	Acquisition	Shares/Units (In Thousands)	Amount	Disposal	Carrying Value	Gain/Loss on Disposal	Shares/Units (In Thousands)	Amount	Ending Balance (Note)
					Shares/Units (In Thousands)	Amount											
TSMC Global	Fannie Mae or Freddie Mac	Financial assets at fair value through other comprehensive income	"	-	-	US\$ -	-	US\$ 76,846	-	US\$ 76,925	US\$ 76,846	US\$ 79	-	US\$ -	-	US\$ -	
	Fannie Mae or Freddie Mac	"	"	-	-	US\$ -	-	US\$ 16,687	-	US\$ 16,688	US\$ 16,688	US\$ 164	-	US\$ -	-	US\$ -	
	Freddie Mac Gold Pool	"	"	-	-	US\$ -	-	US\$ 24,951	-	US\$ 25,391	US\$ 24,902	US\$ 489	-	US\$ -	-	US\$ -	
	Fannie Mae Pool	"	"	-	-	US\$ -	-	US\$ 14,610	-	US\$ 14,728	US\$ 14,594	US\$ 134	-	US\$ -	-	US\$ -	
	Freddie Mac Gold Pool	"	"	-	-	US\$ -	-	US\$ 61,366	-	US\$ 61,130	US\$ 61,332	US\$ (202)	-	US\$ -	-	US\$ -	
	Fannie Mae Pool	"	"	-	-	US\$ -	-	US\$ 38,655	-	US\$ 50,926	US\$ 50,878	US\$ 48	-	US\$ -	-	US\$ -	
	GNMA II TBA 30 Yr 5	"	"	-	-	US\$ 12,209	-	US\$ -	-	US\$ 25,161	US\$ 25,104	US\$ 57	-	US\$ -	-	US\$ -	
	FNMA Pool CA2352	"	"	-	-	US\$ 25,130	-	US\$ -	-	US\$ 15,615	US\$ 15,461	US\$ 154	-	US\$ -	-	US\$ -	
	Fannie Mae Pool	"	"	-	-	US\$ -	-	US\$ 15,430	-	US\$ 61,671	US\$ 63,840	US\$ 49	-	US\$ -	-	US\$ -	
	GNMA II TBA 30 Yr 4	"	"	-	-	US\$ 2,129	-	US\$ -	-	US\$ 22,196	US\$ 21,977	US\$ 219	-	US\$ -	-	US\$ -	
	Fannie Mae Pool	"	"	-	-	US\$ -	-	US\$ 21,932	-	US\$ -	-	US\$ -	-	US\$ -	-	US\$ -	
	Fannie Mae Pool	"	"	-	-	US\$ -	-	US\$ 40,059	-	US\$ 41,005	US\$ 41,421	US\$ (416)	-	US\$ -	-	US\$ -	
	FNMA Pool BM1948	"	"	-	-	US\$ -	-	US\$ 26,046	-	US\$ 26,835	US\$ 26,938	US\$ (103)	-	US\$ -	-	US\$ -	
	Freddie Mac Gold Pool	"	"	-	-	US\$ -	-	US\$ -	-	US\$ 15,441	US\$ 15,631	US\$ 171	-	US\$ -	-	US\$ -	
	Fannie Mae Pool	"	"	-	-	US\$ -	-	US\$ -	-	US\$ 16,982	US\$ 17,040	US\$ 82	-	US\$ -	-	US\$ -	
	Fannie Mae Pool	"	"	-	-	US\$ -	-	US\$ -	-	US\$ 12,893	US\$ 13,190	US\$ 301	-	US\$ -	-	US\$ -	
	Fannie Mae Pool	"	"	-	-	US\$ -	-	US\$ 26,015	-	US\$ 26,560	US\$ 26,015	US\$ 545	-	US\$ -	-	US\$ -	
	FNMA Pool BM4681	"	"	-	-	US\$ 31,784	-	US\$ -	-	US\$ 32,259	US\$ 31,819	US\$ 440	-	US\$ -	-	US\$ -	
	Freddie Mac Multifamily Structured Pass Through Certificates	"	"	-	-	US\$ 513	-	US\$ 10,877	-	US\$ 11,560	US\$ 11,380	US\$ 180	-	US\$ -	-	US\$ -	
	Asset-backed securities																
	Hyundai Auto Receivables Trust	Financial assets at fair value through other comprehensive income	"	-	-	US\$ -	-	US\$ 9,921	-	US\$ -	US\$ -	US\$ -	-	US\$ -	-	US\$ 9,925	
	Citibank Credit Card Issuance Trust American Express Credit Account	"	"	-	-	US\$ 68,487	-	US\$ 2,693	-	US\$ 64,194	US\$ 64,146	US\$ 48	-	US\$ -	-	US\$ 7,321	
	Master Trust American Express Credit Account	"	"	-	-	US\$ 27,285	-	US\$ 1,300	-	US\$ 26,647	US\$ 26,678	US\$ (31)	-	US\$ -	-	US\$ 2,070	
	Master Trust American Express Credit Account	"	"	-	-	US\$ 8,861	-	US\$ 2,055	-	US\$ 10,143	US\$ 10,116	US\$ 27	-	US\$ -	-	US\$ 865	
	Discover Card Execution Note Trust	"	"	-	-	US\$ 37,495	-	US\$ 868	-	US\$ 38,510	US\$ 38,529	US\$ (19)	-	US\$ -	-	US\$ -	
	Ford Credit Floorplan Master Owner Trust A Chase Issuance Trust	"	"	-	-	US\$ 26,702	-	US\$ -	-	US\$ 26,696	US\$ 26,748	US\$ (52)	-	US\$ -	-	US\$ -	
				-	-	US\$ 43,604	-	US\$ -	-	US\$ 43,763	US\$ 43,697	US\$ 66	-	US\$ -	-	US\$ -	

Note: The ending balance includes the amortization of premium/discount on bonds investments, share of profits/losses of investees and other related adjustment.

(Concluded)

**TABLE 5****Taiwan Semiconductor Manufacturing Company Limited and Subsidiaries**

**ACQUISITION OF INDIVIDUAL REAL ESTATE PROPERTIES AT COSTS OF AT LEAST NTS300 MILLION OR 20% OF THE PAID-IN CAPITAL  
FOR THE YEAR ENDED DECEMBER 31, 2019**  
(Amounts in Thousands of New Taiwan Dollars, Unless Specified Otherwise)

Company Name	Types of Property	Transaction Date	Transaction Amount (Foreign Currencies in Thousands)	Payment Term	Counter-party	Nature of Relationships	Owner	Relationships	Transfer Date	Amount	Price Reference	Purpose of Acquisition	Other Terms
TSMC	Fab	September 11, 2018 to August 12, 2019	\$ 1,008,210	Monthly settlement by the construction progress and acceptance	KEDGE Construction Co., Ltd.	-	N/A	N/A	N/A	N/A	Price comparison and price negotiation	Manufacturing purpose	None
	Fab	March 25, 2019	888,800	Monthly settlement by the construction progress and acceptance	PAN ASIA Corp.	-	N/A	N/A	N/A	N/A	Price comparison and price negotiation	Manufacturing purpose	None
	Fab	June 27, 2019 to October 2, 2019	348,935	Based on the terms in the purchase order	Fu Tsu Construction Co., Ltd.	-	N/A	N/A	N/A	N/A	Price comparison and price negotiation	Manufacturing purpose	None
	Fab	November 12, 2019	74,800,000	Based on the terms in the purchase order	72 counterparties, including:  Lead-Fu Industrials Corporation San Fu Chemical Co., Ltd. Chenfull International Co., Ltd. Shihlin Electric & Engineering Corporation TASA Construction Corporation China Steel Structure Co., Ltd. Capital Machinery Limited Fu Tsu Construction Co., Ltd. Mandartech Interiors Inc. Techgo Industrial Co., Ltd. Ovivo Taiwan Co., Ltd. Cica-Huntek Chemical Technology Taiwan Co., Ltd. Cheng Deh Fire Protection Industrial Corp. Zhao-Cheng Corp.	-	N/A	N/A	N/A	N/A	Price comparison and price negotiation	Manufacturing purpose	None

(Continued)

Company Name	Types of Property	Transaction Date	Transaction Amount (Foreign Currencies in Thousands)	Payment Term	Counter-party	Nature of Relationships	Prior Transaction of Related Counter-party			Price Reference	Purpose of Acquisition	Other Terms
							Owner	Relationships	Transfer Date			
TSMC	Fab				Jinn-Clean-Air Solution Tech.Servies Co., Ltd. Mega Union Technology Incorporated Am-Power Machine International Enterprise Co., Ltd. Markitech International Corp. ABB Ltd. Siemens Limited Hueng Luei Process Industry Co., Ltd. Jusun Instruments Co., Ltd. Weltall Technology Corporation Allis Electric Co., Ltd. Air Liquide Far Eastern Ltd. L&K Engineering Co., Ltd. Hsieh Kun Co., Ltd. Taiwan Purific Corp. Solomon Technology Corporation Exyte Taiwan Co., Ltd. Pan Asia (Engineers & Constructors) Corporation Evergreen Steel Corporation Atlas Copco Taiwan Ltd. Trusval Technology Co., Ltd. Yangtch Engineering Co., Ltd. Schneider Electric Taiwan Co., Ltd. Chun Yuan Steel Industry Co., Ltd. Yankey Engineering Co., Ltd. Ying Pao Technology Inc. Swift Engineering Co., Ltd. Chen Yuan International Co., Ltd. Uangyh-Tech Industrial Co., Ltd. Kedge Construction Co., Ltd. Taiwan Gleno Enterprise Co., Ltd.							

(Continued)

Company Name	Types of Property	Transaction Date	Transaction Amount (Foreign Currencies in Thousands)	Payment Term	Counter-party	Nature of Relationships	Prior Transaction of Related Counter-party		Price Reference	Purpose of Acquisition	Other Terms
							Owner	Relationships			
TSMC	Fab				Unelectra International Corp. JG Environmental Technology Co., Ltd. Fortune Electric Co., Ltd. Desicent Technology Corporation Organo Technology Co., Ltd. Ingersoll-Rand Southeast Asia (Pte) Ltd. Taiwan Branch (Singapore) Da-Cin Construction Co., Ltd. Wholotech System Hitech Limited United Integrated Services Co., Ltd. Hantech Engineering Co., Ltd. Kinetics Technology Corporation Versum Materials Taiwan Co., Ltd. Confederate Technology Co., Ltd. Atlas Technology Corp. Accudevice Co., Ltd.						

(Concluded)

TABLE 6

## Taiwan Semiconductor Manufacturing Company Limited and Subsidiaries

**TOTAL PURCHASES FROM OR SALES TO RELATED PARTIES OF AT LEAST NTS\$100 MILLION OR 20% OF THE PAID-IN CAPITAL  
FOR THE YEAR ENDED DECEMBER 31, 2019**  
**(Amounts in Thousands of New Taiwan Dollars, Unless Specified Otherwise)**

Company Name	Related Party	Nature of Relationships	Purchases/ Sales	Transaction Details		Abnormal Transaction Unit Price	Notes/Accounts Payable or Receivable	% to Total	Note
				Amount (Foreign Currencies in Thousands)	% to Total	Payment Terms			
TSMC	TSMC North America GUC	Subsidiary Associate	Sales	\$ 636,441,507	58	Net 30 days from invoice date (Note)	-	\$ 81,732,281	62
	TSMC Nanjing	Subsidiary	Sales	4,024,495	-	Net 30 days from the end of the month of when invoice is issued	-	458,292	-
	TSMC China	Subsidiary	Purchases	16,970,404	18	Net 30 days from the end of the month of when invoice is issued	-	(1,266,002)	3
	WaferTech	Indirect subsidiary	Purchases	16,584,706	17	Net 30 days from the end of the month of when invoice is issued	-	(1,538,971)	4
	SSMC	Associate	Purchases	6,864,201	7	Net 30 days from the end of the month of when invoice is issued	-	(1,097,625)	3
	VIS	Associate	Purchases	3,208,817	4	Net 30 days from the end of the month of when invoice is issued	-	(487,944)	1
			Sales	3,092,600	3	Net 30 days from the end of the month of when invoice is issued	-	(153,977)	-
	Associate of TSMC		Sales	1,628,944	-	Net 30 days from invoice date	-	283,472	-
	Xintec	Associate of TSMC	Sales	(USS 52,821)	17	Net 30 days from the end of the month of when invoice is issued	-	(USS 9,453)	18
								120,172	

Note : The tenor is 30 days from TSMC's invoice date or determined by the payment terms granted to its clients by TSMC North America.

TABLE 7

Taiwan Semiconductor Manufacturing Company Limited and Subsidiaries

RECEIVABLES FROM RELATED PARTIES AMOUNTING TO AT LEAST NTS100 MILLION OR 20% OF THE PAID-IN CAPITAL  
DECEMBER 31, 2019  
(Amounts in Thousands of New Taiwan Dollars, Unless Specified Otherwise)

Company Name	Related Party	Nature of Relationships	Ending Balance (Foreign Currencies in Thousands)	Turnover Days (Note 1)	Amount	Overdue Action Taken		Amounts Received in Subsequent Period	Allowance for Bad Debts
						Overdue	Action Taken		
TSMC	TSMC North America	Subsidiary	\$ 82,53,5007	48	\$ 1,109,577	-	-	\$ 30,688,822	\$ -
	TSMC Nanjing	Subsidiary	101,559	Note 2	-	-	-	-	-
	GUC	Associate	458,292	38	32,753	-	-	32,753	-
TSMC North America	GUC	Associate of TSMC	(US\$ 284,674	45	24,377	-	-	24,377	-
			9,493)		813)			(US\$ 813)	
TSMC China	TSMC Nanjing	The same parent company	24,20,0839	Note 2	-	-	-	-	-
	TSMC	Parent company	(RMB 5,621,827)		-	-	-	-	-
			1,538,971	32	-	-	-	-	-
	TSMC	Parent company	(RMB 357,502)		-	-	-	-	-
	Xintec	Associate of TSMC	1,266,002	19	-	-	-	-	-
			(RMB 294,092)		-	-	-	-	-
VisEra Tech	TSMC	The ultimate parent of the Company	120,172	36	-	-	-	-	-
TSMC Technology	TSMC	The ultimate parent of the Company	249,993	Note 2	-	-	-	-	-
			(US\$ 8,336)		-	-	-	-	-
WaferTech	TSMC	The ultimate parent of the Company	1,097,625	59	598,169	-	-	598,169	-
			(US\$ 36,602)		(US\$ 19,947)			(US\$ 19,947)	

Note 1 : The calculation of turnover days excludes other receivables from related parties.

Note 2 : The ending balance is primarily consisted of other receivables, which is not applicable for the calculation of turnover days.

TABLE 8

**Taiwan Semiconductor Manufacturing Company Limited and Subsidiaries**  
**INTERCOMPANY RELATIONSHIPS AND SIGNIFICANT INTERCOMPANY TRANSACTIONS**  
**FOR THE YEAR ENDED DECEMBER 31, 2019**  
*(Amounts in Thousands of New Taiwan Dollars)*

No.	Company Name	Counter Party	Nature of Relationship (Note 1)	Intercompany Transactions			
				Financial Statements Item	Amount	Terms (Note 2)	Percentage of Consolidated Net Revenue or Total Assets
0	TSMC	TSMC North America	1	Net revenue from sale of goods Receivables from related parties Other receivables from related parties	\$ 636,441,507 81,732,281 802,726	- -	59% 4%
	TSMC Japan		1	Marketing expenses - commission	228,535	-	-
	TSMC Europe		1	Marketing expenses - commission	439,147	-	-
	TSMC China		1	Purchases Marketing expenses - commission Payables to related parties	16,584,706 170,743 1,538,971	- - -	2%
	TSMC Nanjing		1	Purchases Proceeds from disposal of property, plant and equipment Other receivables from related parties Payables to related parties	16,970,404 1,096,516 101,559 1,266,002	- - - -	2%
	TSMC Canada		1	Research and development expenses	323,216	-	-
	TSMC Technology		1	Research and development expenses	2,438,466	-	-
	WaferTech		1	Purchases Payables to related parties	249,993 6,864,201 1,097,625	- - -	-
1	TSMC China	TSMC Nanjing	3	Other receivables from related parties	24,200,839	-	1%

Note 1: No. 1 represents the transactions from parent company to subsidiary.

No. 3 represents the transactions between subsidiaries.

Note 2: The sales prices and payment terms of intercompany sales are not significantly different from those to third parties. For other intercompany transactions, prices and terms are determined in accordance with mutual agreements.

TABLE 9

**Taiwan Semiconductor Manufacturing Company Limited and Subsidiaries**  
**NAMES, LOCATIONS, AND RELATED INFORMATION OF INVESTEES OVER WHICH THE COMPANY EXERCISES SIGNIFICANT INFLUENCE (EXCLUDING INFORMATION ON INVESTMENT IN MAINLAND CHINA)**  
**FOR THE YEAR ENDED DECEMBER 31, 2019**  
**(Amounts in Thousands of New Taiwan Dollars, Unless Specified Otherwise)**

Investor Company	Investee Company	Location	Main Businesses and Products	Original Investment Amount			Balance as of December 31, 2019			Share of Profits/Losses of Investee (Foreign Currencies in Thousands)	Net Income (Losses) of the Investee (Foreign Currencies in Thousands)	Carrying Value (Foreign Currencies in Thousands)	Percentage of Ownership	Note
				December 31, 2019 (Foreign Currencies in Thousands)	December 31, 2018 (Foreign Currencies in Thousands)	Shares (in Thousands)	December 31, 2019 (Foreign Currencies in Thousands)	December 31, 2018 (Foreign Currencies in Thousands)						
TSMC	TSMC Global TSMC Partners	Tortola, British Virgin Islands Tortola, British Virgin Islands	Investment activities Investing in companies involved in the design, manufacture and other related business in the semiconductor industry and other investment activities	\$ 355,162,309 31,456,130	\$ 355,162,309 31,456,130	988,268 11	100	\$ 397,737,270 53,388,267	\$ 11,592,187 2,202,709	\$ 11,592,187 2,202,709	Subsidiary Subsidiary			
VIS		Hsin-Chu, Taiwan	Manufacturing, selling, packaging, testing and computer-aided design of integrated circuits and other semiconductor devices and the manufacturing and design service of masks and other semiconductor devices	10,180,677	10,180,677	464,223	28	9,027,572	5,860,497	1,654,799	Associate			
SSMC	TSMC North America	Singapore	Selling and marketing of integrated circuits and other semiconductor devices	5,120,028	5,120,028	314	39	6,502,174	2,286,743	887,028	Associate			
	VisEra Tech	San Jose, California, U.S.A	Engaged in manufacturing electronic spare parts and in researching, developing, designing, manufacturing, selling or integrated circuits and other semiconductor devices	333,718	333,718	11,000	100	4,569,825	416,366	416,366	Subsidiary			
Xintec		Hsin-Chu, Taiwan	Engaged in manufacturing electronic spare parts and in researching, developing, designing, manufacturing, selling, packaging and testing of color filter	5,005,171	5,005,171	253,120	87	4,541,741	613,841	533,656	Subsidiary			
GLC		Taoyuan, Taiwan	Wafer level chip size packaging and wafer level post passivation interconnection service	1,988,317	1,988,317	111,282	41	1,846,145	181,978	75,329	Associate			
TSMC Europe		Hsin-Chu, Taiwan	Researching, developing, manufacturing, testing and marketing of integrated circuits	386,568	386,568	46,688	35	1,284,377	633,467	220,700	Associate			
VTAF II		Amsterdam, Netherlands	Customer service and supporting activities	15,749	15,749	-	100	462,479	37,621	37,621	Subsidiary			
TSMC Japan		Cayman Islands	Investing in new start-up technology companies	1,318,846	1,308,244	-	98	231,504	1,191	1,168	Subsidiary			
VIAF II		Yokohama, Japan	Customer service and supporting activities	83,760	83,760	6	100	142,620	3,254	3,254	Subsidiary			
TSMC Korea		Cayman Islands	Investing in new start-up technology companies	260,300	278,800	-	98	75,095	(3,409)	(3,409)	Subsidiary			
TSMC Solar Europe GmbH		Seoul, Korea	Customer service and supporting activities	13,656	13,656	80	100	40,727	2,196	2,196	Subsidiary			
TSMC Partners	TSMC Development	Hamburg, Germany	Selling of solar related products and providing customer service	-	25,266	-	-	-	-	-	-			
		Delaware, U.S.A	Investing in companies involved in the manufacturing related business in the semiconductor industry	17,601,121	17,601,121	-	100	29,825,099	1,338,673	Note 2	Subsidiary			
TSMC Technology			Engineering support activities	428,289	428,289	-	100	670,538	100,661	100,661	Note 2	Subsidiary		
TSMC Canada			Engineering support activities	(USS 14,282)	(USS 14,282)	(USS 68,972)	2,300	(USS 223,360)	(USS 30,494	(USS 30,494	Note 2	Subsidiary		
ISDF			Investing in new start-up technology companies	(USS 2,300)	(USS 2,300)	(USS 2,300)	583	(USS 7,975)	(USS 987)	(USS 987)	Note 2	Subsidiary		
ISDF II		Cayman Islands	Investing in new start-up technology companies	-	(USS 14,250)	(USS 4,751)	97	-	-	-	-	Note 2	Subsidiary	
VTAF III	Growth Fund	Cayman Islands	Investing in new start-up technology companies	75,083	64,587	-	100	124,648	(1,351)	(1,351)	Note 2	Subsidiary		
	Mutual-Pak	New Taipei, Taiwan	Manufacturing of electronic parts, wholesaling and retailing of electronic materials, and researching, developing and testing of RFID	(USS 2,504)	(USS 2,154)	(USS 47,781)	28	(USS 38,520)	(USS 20,941)	(USS 20,941)	Note 2	Associate		
				(USS 1,593)	(USS 1,593)	(USS 1,593)		(USS 1,285)	(USS 671)	(USS 671)				

(Continued)

Investor Company	Investee Company	Location	Main Businesses and Products	Original Investment Amount		Balance as of December 31, 2019		Share of Profits/Losses of investee (Note 1) (Foreign Currencies in Thousands)	Note
				December 31, 2019 (Foreign Currencies in Thousands)	December 31, 2018 (Foreign Currencies in Thousands)	Shares (in Thousands)	Percentage of Ownership	Carrying Value (Foreign Currencies in Thousands)	
TSMC Development	WaferTech	Washington, U.S.A	Manufacturing, selling and testing of integrated circuits and other semiconductor devices	\$ -	\$ -	293,637	100	4,402,646 (USS 146,814) (USS 27,526)	Note 2 Subsidiary
								843,483	

Note 1 : The share of profits/losses of investee includes the effect of unrealized gross profit on intercompany transactions.

Note 2 : The share of profits/losses of the investee company is not reflected herein as such amount is already included in the share of profits/losses of the investor company.

(Concluded)

TABLE 10

**Taiwan Semiconductor Manufacturing Company Limited and Subsidiaries**

**INFORMATION ON INVESTMENT IN MAINLAND CHINA  
FOR YEAR ENDED DECEMBER 31, 2019  
(Amounts in Thousands of New Taiwan Dollars, Unless Specified Otherwise)**

Investee Company	Main Businesses and Products	Total Amount of Paid-in Capital (RMB in Thousands)	Method of Investment	Accumulated Investment Flows		Net Income (Losses) of the Investee Company	Percentage of Ownership	Share of Profits/Losses	Carrying Amount as of December 31, 2019	Accumulated Inward Remittance of Earnings as of December 31, 2019
				Outflow of Investment from Taiwan as of January 1, 2019 (US\$ in Thousands)	Inflow					
TSMC China	Manufacturing, selling, testing and computer-aided design of integrated circuits and other semiconductor devices	\$ 18,939,667 (RMB 4,502,080)	Note 1	\$ 18,939,667 (US\$ 596,000)	\$ -	\$ 18,939,667 (US\$ 596,000)	100%	\$ 4,037,216 (Note 2)	\$ 4,037,216 (Note 2)	\$ 57,289,154
TSMC Nanjing	Manufacturing, selling, testing and computer-aided design of integrated circuits and other semiconductor devices	\$ 30,521,412 (RMB 6,650,119)	Note 1	\$ 30,521,412 (US\$ 1,000,000)	\$ -	\$ 30,521,412 (US\$ 1,000,000)	100%	\$ 1,289,672 (Note 2)	\$ 1,289,672 (Note 2)	\$ 21,364,939

Accumulated Investment in Mainland China as of December 31, 2019 (US\$ in Thousands)	Investment Amounts Authorized by Investment Commission, MOEA (US\$ in thousands)	Upper Limit on Investment
\$ 49,461,079 (US\$ 1,596,000)	\$ 119,412,667 (US\$ 3,596,000)	\$ 973,257,256 (Note 3)

Note 1: TSMC directly invested US\$596,000 thousand in TSMC China and US\$1,000,000 thousand in TSMC Nanjing.

Note 2: Amount was recognized based on the audited financial statements.

Note 3: The upper limit on investment in mainland China is determined by sixty percent (60%) of the Company's consolidated net worth.

**Taiwan Semiconductor Manufacturing  
Company Limited**

**Parent Company Only Financial Statements for the  
Years Ended December 31, 2019 and 2018 and  
Independent Auditors' Report**

### INDEPENDENT AUDITORS' REPORT

The Board of Directors and Shareholders  
Taiwan Semiconductor Manufacturing Company Limited

#### Opinion

We have audited the accompanying parent company only financial statements of Taiwan Semiconductor Manufacturing Company Limited (the "Company"), which comprise the parent company only balance sheets as of December 31, 2019 and 2018, and the parent company only statements of comprehensive income, changes in equity and cash flows for the years then ended, and the notes to the parent company only financial statements, including a summary of significant accounting policies.

In our opinion, the accompanying parent company only financial statements present fairly, in all material respects, the accompanying parent company only financial position of the Company as of December 31, 2019 and 2018, and its parent company only financial performance and its parent company only cash flows for the years then ended in accordance with the Regulations Governing the Preparation of Financial Reports by Securities Issuers.

#### Basis for Opinion

We conducted our audits in accordance with the Regulations Governing Auditing and Attestation of Financial Statements by Certified Public Accountants and auditing standards generally accepted in the Republic of China. Our responsibilities under those standards are further described in the Auditors' Responsibilities for the Audit of the Parent Company Only Financial Statements section of our report. We are independent of the Company in accordance with The Norm of Professional Ethics for Certified Public Accountant of the Republic of China, and we have fulfilled our other ethical responsibilities in accordance with these requirements. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our opinion.

#### Key Audit Matters

Key audit matters are those matters that, in our professional judgment, were of most significance in our audit of the parent company only financial statements for the year ended December 31, 2019. These matters were addressed in the context of our audit of the parent company only financial statements as a whole, and in forming our opinion thereon, and we do not provide a separate opinion on these matters.

Key audit matters for the Company's parent company only financial statements for the year ended December 31, 2019 are stated as follows:

Property, plant and equipment (PP&E) – commencement of depreciation related to PP&E classified as equipment under installation and construction in progress (EUI/CIP)

Refer to Notes 4, 5 and 12 to the parent company only financial statements.

The Company's evaluation of when to commence depreciation of EUI/CIP involves determining when the assets are available for their intended use. The criteria the Company uses to determine whether EUI/CIP are available for their intended use involves subjective judgements and assumptions about the conditions necessary for the

assets to be capable of operating in the intended manner. Changes in these assumptions could have a significant impact on when depreciation is recognized.

Given the subjectivity in determining the date to commence depreciation of EUI/CIP, performing audit procedures to evaluate the reasonableness of the Company's judgements and assumptions required a high degree of auditor judgement. Consequently, the validity of commencement of depreciation related to PP&E classified as EUI/CIP is identified as a key audit matter.

Our audit procedures related to the evaluation of when to commence depreciation of EUI/CIP included the following, among others:

1. We read the Company's policy and understand the criteria used to determine when to commence depreciation.
2. We tested the effectiveness of the controls over the evaluation of when to commence depreciation of EUI/CIP.
3. We sampled EUI/CIP at year end and performed the following for each selection:
  - a. Evaluated whether the selection did not meet the criteria specified by the Company for commencement of depreciation.
  - b. Observed the assets and evaluated their status at year end.
4. We sampled and evaluated whether the selection of EUI/CIP met the criteria specified by the Company for commencement of depreciation during the year.
5. We sampled and evaluated whether the selection of EUI/CIP met the criteria specified by the Company for commencement of depreciation subsequent to year end.

#### **Responsibilities of Management and Those Charged with Governance for the Parent Company Only Financial Statements**

Management is responsible for the preparation and fair presentation of the parent company only financial statements in accordance with the Regulations Governing the Preparation of Financial Reports by Securities Issuers, and for such internal control as management determines is necessary to enable the preparation of parent company only financial statements that are free from material misstatement, whether due to fraud or error.

In preparing the parent company only financial statements, management is responsible for assessing the Company's ability to continue as a going concern, disclosing, as applicable, matters related to going concern and using the going concern basis of accounting unless management either intends to liquidate the Company or to cease operations, or has no realistic alternative but to do so.

Those charged with governance (including members of the Audit Committee) are responsible for overseeing the Company's financial reporting process.

#### **Auditors' Responsibilities for the Audit of the Parent Company Only Financial Statements**

Our objectives are to obtain reasonable assurance about whether the parent company only financial statements as a whole are free from material misstatement, whether due to fraud or error, and to issue an auditors' report that includes our opinion. Reasonable assurance is a high level of assurance, but is not a guarantee that an audit conducted in accordance with the auditing standards generally accepted in the Republic of China will always detect a material misstatement when it exists. Misstatements can arise from fraud or error and are considered material if, individually or in the aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of these parent company only financial statements.

As part of an audit in accordance with the auditing standards generally accepted in the Republic of China, we exercise professional judgment and maintain professional skepticism throughout the audit. We also:

1. Identify and assess the risks of material misstatement of the parent company only financial statements, whether due to fraud or error, design and perform audit procedures responsive to those risks, and obtain audit evidence that is sufficient and appropriate to provide a basis for our opinion. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal control.
2. Obtain an understanding of internal control relevant to the audit in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the Company's internal control.
3. Evaluate the appropriateness of accounting policies used and the reasonableness of accounting estimates and related disclosures made by management.
4. Conclude on the appropriateness of management's use of the going concern basis of accounting and, based on the audit evidence obtained, whether a material uncertainty exists related to events or conditions that may cast significant doubt on the Company's ability to continue as a going concern. If we conclude that a material uncertainty exists, we are required to draw attention in our auditors' report to the related disclosures in the parent company only financial statements or, if such disclosures are inadequate, to modify our opinion. Our conclusions are based on the audit evidence obtained up to the date of our auditors' report. However, future events or conditions may cause the Company to cease to continue as a going concern.
5. Evaluate the overall presentation, structure and content of the parent company only financial statements, including the disclosures, and whether the parent company only financial statements represent the underlying transactions and events in a manner that achieves fair presentation.
6. Obtain sufficient appropriate audit evidence regarding the financial information of the entities or business activities within the Company to express an opinion on the parent company only financial statements. We are responsible for the direction, supervision and performance of the group audit. We remain solely responsible for our audit opinion.

We communicate with those charged with governance regarding, among other matters, the planned scope and timing of the audit and significant audit findings, including any significant deficiencies in internal control that we identify during our audit.

We also provide those charged with governance with a statement that we have complied with relevant ethical requirements regarding independence, and to communicate with them all relationships and other matters that may reasonably be thought to bear on our independence, and where applicable, related safeguards.

From the matters communicated with those charged with governance, we determine those matters that were of most significance in the audit of the parent company only financial statements for the year ended December 31, 2019 and are therefore the key audit matters. We describe these matters in our auditors' report unless law or regulation precludes public disclosure about the matter or when, in extremely rare circumstances, we determine that a matter should not be communicated in our report because the adverse consequences of doing so would reasonably be expected to outweigh the public interest benefits of such communication.

The engagement partners on the audit resulting in this independent auditors' report are Mei Yen Chiang and Yu Feng Huang.



Deloitte & Touche  
Taipei, Taiwan  
Republic of China



February 11, 2020

#### Notice to Readers

*The accompanying financial statements are intended only to present the financial position, financial performance and cash flows in accordance with accounting principles and practices generally accepted in the Republic of China and not those of any other jurisdictions. The standards, procedures and practices to audit such financial statements are those generally applied in the Republic of China.*

*For the convenience of readers, the independent auditors' report and the accompanying financial statements have been translated into English from the original Chinese version prepared and used in the Republic of China. If there is any conflict between the English version and the original Chinese version or any difference in the interpretation of the two versions, the Chinese-language independent auditors' report and financial statements shall prevail.*

# Taiwan Semiconductor Manufacturing Company Limited

## PARENT COMPANY ONLY BALANCE SHEETS (In Thousands of New Taiwan Dollars)

	December 31, 2019		December 31, 2018	
	Amount	%	Amount	%
<b>ASSETS</b>				
CURRENT ASSETS				
Cash and cash equivalents (Note 6)	\$ 141,450,698	6	\$ 240,202,525	12
Financial assets at fair value through profit or loss (Note 7)	27,481	-	54,115	-
Financial assets at fair value through other comprehensive income	-	-	568,150	-
Financial assets at amortized cost	-	-	2,294,098	-
Hedging financial assets (Note 8)	3,504	-	23,497	-
Notes and accounts receivable, net (Note 9)	49,124,933	2	36,685,389	2
Receivables from related parties (Note 31)	82,194,501	4	86,452,584	4
Other receivables from related parties (Note 31)	968,123	-	1,234,662	-
Inventories (Notes 5 and 10)	76,263,851	4	98,088,160	5
Other financial assets	358,245	-	178,008	-
Other current assets	4,726,789	-	4,184,918	-
Total current assets	<u>355,118,125</u>	<u>16</u>	<u>469,966,106</u>	<u>23</u>
NONCURRENT ASSETS				
Financial assets at fair value through other comprehensive income	877,110	-	963,610	-
Investments accounted for using equity method (Note 11)	558,503,889	24	549,560,884	26
Property, plant and equipment (Notes 5 and 12)	1,310,900,634	57	1,025,286,941	49
Right-of-use assets (Notes 5 and 13)	15,030,020	1	-	-
Intangible assets (Notes 5 and 14)	16,271,444	1	12,429,930	1
Deferred income tax assets (Notes 5 and 25)	16,728,622	1	15,586,674	1
Refundable deposits and others	2,046,228	-	1,666,863	-
Total noncurrent assets	<u>1,920,357,947</u>	<u>84</u>	<u>1,605,494,902</u>	<u>77</u>
<b>TOTAL</b>	<b><u>\$ 2,275,476,072</u></b>	<b><u>100</u></b>	<b><u>\$ 2,075,461,008</u></b>	<b><u>100</u></b>
<b>LIABILITIES AND EQUITY</b>				
CURRENT LIABILITIES				
Short-term loans (Notes 15 and 28)	\$ 148,510,290	7	\$ 91,982,340	4
Financial liabilities at fair value through profit or loss (Note 7)	982,302	-	30,232	-
Hedging financial liabilities (Note 8)	1,798	-	1,941	-
Accounts payable	36,029,135	2	30,472,292	2
Payables to related parties (Note 31)	5,716,635	-	4,546,752	-
Salary and bonus payable	14,215,161	1	12,442,707	1
Accrued profit sharing bonus to employees and compensation to directors (Note 27)	23,526,149	1	23,919,312	1
Payables to contractors and equipment suppliers	139,754,491	6	41,279,910	2
Cash dividends payable (Note 19)	129,651,902	6	-	-
Income tax payable (Notes 5 and 25)	32,241,052	1	38,706,990	2
Long-term liabilities - current portion (Notes 16 and 28)	31,800,000	1	34,900,000	2
Accrued expenses and other current liabilities (Notes 5, 13, 18, 20, 28 and 31)	43,111,632	2	49,778,042	2
Total current liabilities	<u>605,540,547</u>	<u>27</u>	<u>328,060,518</u>	<u>16</u>
NONCURRENT LIABILITIES				
Bonds payable (Notes 16 and 28)	25,100,000	1	56,900,000	3
Deferred income tax liabilities (Notes 5 and 25)	333,606	-	233,284	-
Lease liabilities (Notes 5, 13 and 28)	13,300,263	1	-	-
Net defined benefit liability (Note 17)	9,182,496	-	9,651,405	1
Guarantee deposits (Notes 18 and 28)	170,446	-	3,346,648	-
Others	438,590	-	451,488	-
Total noncurrent liabilities	<u>48,525,401</u>	<u>2</u>	<u>70,582,825</u>	<u>4</u>
Total liabilities	<u>654,065,948</u>	<u>29</u>	<u>398,643,343</u>	<u>20</u>
EQUITY ATTRIBUTABLE TO SHAREHOLDERS OF THE PARENT				
Capital stock (Note 19)	259,303,805	11	259,303,805	12
Capital surplus (Note 19)	56,339,709	2	56,315,932	3
Retained earnings (Note 19)				
Appropriated as legal capital reserve	311,146,899	14	276,033,811	13
Appropriated as special capital reserve	10,675,106	-	26,907,527	1
Unappropriated earnings	1,011,512,974	45	1,073,706,503	52
Others (Note 19)	1,333,334,979	59	1,376,647,841	66
Total equity	<u>(27,568,369)</u>	<u>(1)</u>	<u>(15,449,913)</u>	<u>(1)</u>
<b>TOTAL</b>	<b><u>\$ 2,275,476,072</u></b>	<b><u>100</u></b>	<b><u>\$ 2,075,461,008</u></b>	<b><u>100</u></b>

The accompanying notes are an integral part of the parent company only financial statements.

# Taiwan Semiconductor Manufacturing Company Limited

## PARENT COMPANY ONLY STATEMENTS OF COMPREHENSIVE INCOME (In Thousands of New Taiwan Dollars, Except Earnings Per Share)

	2019	2018		
	Amount	%	Amount	%
NET REVENUE (Notes 5, 20 and 31)	\$1,059,646,793	100	\$1,023,925,713	100
COST OF REVENUE (Notes 5, 10, 27, 31 and 34)	<u>579,507,047</u>	<u>55</u>	<u>530,861,166</u>	<u>52</u>
GROSS PROFIT BEFORE REALIZED (UNREALIZED) GROSS PROFIT ON SALES TO SUBSIDIARIES AND ASSOCIATES	480,139,746	45	493,064,547	48
REALIZED (UNREALIZED) GROSS PROFIT ON SALES TO SUBSIDIARIES AND ASSOCIATES	<u>3,395</u>	<u>-</u>	<u>(109,046)</u>	<u>-</u>
GROSS PROFIT	<u>480,143,141</u>	<u>45</u>	<u>492,955,501</u>	<u>48</u>
OPERATING EXPENSES (Notes 5, 27 and 31)				
Research and development	90,482,815	8	84,944,461	8
General and administrative	20,353,327	2	19,113,298	2
Marketing	<u>3,231,777</u>	<u>-</u>	<u>3,201,670</u>	<u>-</u>
Total operating expenses	<u>114,067,919</u>	<u>10</u>	<u>107,259,429</u>	<u>10</u>
OTHER OPERATING INCOME AND EXPENSES, NET (Notes 12, 13, 21 and 27)	<u>(151,230)</u>	<u>-</u>	<u>(1,668,234)</u>	<u>-</u>
INCOME FROM OPERATIONS	<u>365,923,992</u>	<u>35</u>	<u>384,027,838</u>	<u>38</u>
NON-OPERATING INCOME AND EXPENSES				
Share of profits of subsidiaries and associates (Note 11)	22,906,788	2	12,509,959	1
Other income (Note 22)	2,180,251	-	2,005,107	-
Foreign exchange gain, net (Note 33)	1,994,370	-	1,927,029	-
Finance costs (Note 23)	(3,191,609)	-	(2,903,454)	-
Other gains and losses (Note 24)	<u>(1,068,573)</u>	<u>-</u>	<u>(1,368,326)</u>	<u>-</u>
Total non-operating income and expenses	<u>22,821,227</u>	<u>2</u>	<u>12,170,315</u>	<u>1</u>
INCOME BEFORE INCOME TAX	388,745,219	37	396,198,153	39
INCOME TAX EXPENSE (Notes 5 and 25)	<u>43,481,551</u>	<u>4</u>	<u>45,067,269</u>	<u>5</u>
NET INCOME	<u>345,263,668</u>	<u>33</u>	<u>351,130,884</u>	<u>34</u>

(Continued)

# Taiwan Semiconductor Manufacturing Company Limited

## PARENT COMPANY ONLY STATEMENTS OF COMPREHENSIVE INCOME (In Thousands of New Taiwan Dollars, Except Earnings Per Share)

	2019		2018	
	Amount	%	Amount	%
<b>OTHER COMPREHENSIVE INCOME (LOSS)</b>				
(Notes 5, 17, 19 and 25)				
Items that will not be reclassified subsequently to profit or loss:				
Remeasurement of defined benefit obligation	\$ 253,895	-	\$ (861,162)	-
Unrealized gain/(loss) on investments in equity instruments at fair value through other comprehensive income	121,740	-	(1,189,957)	-
Gain (loss) on hedging instruments	(109,592)	-	40,975	-
Share of other comprehensive income (loss) of subsidiaries and associates	194,524	-	(2,135,880)	-
Income tax benefit (expense) related to items that will not be reclassified subsequently	(20,992)	-	195,729	-
	<u>439,575</u>	<u>-</u>	<u>(3,950,295)</u>	<u>-</u>
Items that may be reclassified subsequently to profit or loss:				
Exchange differences arising on translation of foreign operations	(14,698,117)	(2)	14,578,483	1
Share of other comprehensive income (loss) of subsidiaries and associates	2,435,334	-	(794,057)	-
	<u>(12,262,783)</u>	<u>(2)</u>	<u>13,784,426</u>	<u>1</u>
Other comprehensive income (loss) for the year, net of income tax	<u>(11,823,208)</u>	<u>(2)</u>	<u>9,834,131</u>	<u>1</u>
<b>TOTAL COMPREHENSIVE INCOME FOR THE YEAR</b>	<u><u>\$ 333,440,460</u></u>	<u><u>31</u></u>	<u><u>\$ 360,965,015</u></u>	<u><u>35</u></u>
<b>EARNINGS PER SHARE (NT\$, Note 26)</b>				
Basic earnings per share	<u><u>\$ 13.32</u></u>		<u><u>\$ 13.54</u></u>	
Diluted earnings per share	<u><u>\$ 13.32</u></u>		<u><u>\$ 13.54</u></u>	

The accompanying notes are an integral part of the parent company only financial statements.

(Concluded)

**Taiwan Semiconductor Manufacturing Company Limited**  
**PARENT COMPANY ONLY STATEMENTS OF CHANGES IN EQUITY**  
 (In Thousands of New Taiwan Dollars)

	Others					
	Capital Stock – Common Stock (In Thousands)	Amount	Capital Surplus	Legal Capital Reserve	Retained Earnings Unappropriated Earnings	Foreign Currency Translation Reserve
BALANCE, JANUARY 1, 2018	\$ 25,930,380	\$ 259,303,805	\$ 56,309,536	\$ 241,722,663	\$ 993,105,668	\$ 1,234,918,331
Appropriations of prior year's earnings	-	-	-	34,311,148	(34,311,148)	-
Legal capital reserve	-	-	-	26,907,527	(26,907,527)	-
Special capital reserve	-	-	-	(20,443,044)	(20,443,044)	-
Cash dividends to shareholders	-	-	-	(26,907,527)	(26,907,527)	-
Total	-	-	-	-	-	-
Net income in 2018	-	-	-	-	351,130,884	-
Other comprehensive income (loss) in 2018, net of income tax	-	-	-	(765,274)	14,655,333	-
Total comprehensive income (loss) in 2018	-	-	-	-	14,655,333	-
Disposal of investments in equity instruments at fair value through other comprehensive income	-	-	-	-	-	-
Basis adjustment for gain (loss) on hedging instruments	-	-	-	-	-	-
Adjustments to share of changes in equities of associates	-	-	(6,420)	-	-	-
From share of changes in equities of subsidiaries	-	-	2,681	-	-	-
Donation from shareholders	-	-	10,135	-	-	-
BALANCE, DECEMBER 31, 2018	25,930,380	259,303,805	56,315,932	276,033,811	26,907,527	1,071,706,503
Appropriations of prior year's earnings	-	-	-	35,113,088	(16,232,421)	(35,113,088)
Legal capital reserve	-	-	-	(16,232,421)	(16,232,421)	-
Special capital reserve	-	-	-	(388,955,707)	(388,955,707)	-
Cash dividends to shareholders	-	-	-	(407,836,374)	(407,836,374)	-
Total	-	-	-	-	-	-
Net income in 2019	-	-	-	-	345,263,668	-
Other comprehensive income (loss) in 2019, net of income tax	-	-	-	217,059	(14,829,051)	2,898,483
Total comprehensive income (loss) in 2019	-	-	-	-	(14,829,051)	(109,697)
Disposal of investments in equity instruments at fair value through other comprehensive income	-	-	-	345,460,727	(14,829,051)	2,898,483
Basis adjustment for gain (loss) on hedging instruments	-	-	-	-	-	(109,697)
Adjustments to share of changes in equities of associates	-	-	-	-	-	(12,040,267)
From share of changes in equities of subsidiaries	-	-	-	-	-	(12,040,267)
Donation from shareholders	-	-	-	162,118	(162,118)	-
BALANCE, DECEMBER 31, 2019	25,930,380	259,303,805	56,339,709	\$ 311,468,99	\$ 10,675,006	\$ 1,333,344,979
Unrealized Gain (loss) on Assets at Fair Value Through Other Comprehensive Income						\$ (26,871,400)
Gain (Loss) on Hedging Instruments						\$ (3,520)
Unearned Stock-Based Employee Compensation						\$ (10,290)
Total						\$ (27,228,659)
Total Equity						\$ 1,523,303,013

The accompanying notes are an integral part of the parent company only financial statements.

# Taiwan Semiconductor Manufacturing Company Limited

## PARENT COMPANY ONLY STATEMENTS OF CASH FLOWS (In Thousands of New Taiwan Dollars)

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	2019	2018
<b>CASH FLOWS FROM OPERATING ACTIVITIES</b>		
Income before income tax	\$ 388,745,219	\$ 396,198,153
Adjustments for:		
Depreciation expense	267,464,543	274,340,540
Amortization expense	5,338,886	4,352,847
Finance costs	3,191,609	2,903,454
Share of profits of subsidiaries and associates	(22,906,788)	(12,509,959)
Interest income	(2,002,877)	(1,847,202)
Loss on disposal or retirement of property, plant and equipment, net	582,289	557,598
Gain on disposal of intangible assets, net	(6,183)	(5,933)
Impairment loss (reversal of impairment loss) on property, plant and equipment	(301,384)	423,468
Loss (gain) on financial instruments at fair value through profit or loss, net	18,291	(17,729)
Gain on disposal of investments accounted for using equity method, net	(15,200)	-
Unrealized (realized) gross profit on sales to subsidiaries and associates	(3,395)	109,046
Gain (loss) on foreign exchange, net	(6,289,978)	2,732,445
Dividend income	(177,374)	(157,905)
Gain on lease modification	(2,555)	-
Changes in operating assets and liabilities:		
Financial instruments at fair value through profit or loss	964,207	301,714
Notes and accounts receivable, net	(20,264,116)	(15,821,089)
Receivables from related parties	4,258,083	5,689,253
Other receivables from related parties	442,439	216,794
Inventories	21,824,309	(27,790,715)
Other financial assets	(211,869)	(26,762)
Other current assets	(515,166)	(1,685,193)
Accounts payable	5,626,778	4,839,526
Payables to related parties	1,169,883	(282,912)
Salary and bonus payable	1,772,454	159,386
Accrued profit sharing bonus to employees and compensation to directors	(393,163)	531,310
Accrued expenses and other current liabilities	(3,618,263)	(21,092,059)
Net defined benefit liability	(215,014)	(60,461)
Cash generated from operations	<u>644,475,665</u>	<u>612,057,615</u>
Income taxes paid	<u>(51,043,594)</u>	<u>(43,956,272)</u>
Net cash generated by operating activities	<u>593,432,071</u>	<u>568,101,343</u>

(Continued)

# Taiwan Semiconductor Manufacturing Company Limited

## PARENT COMPANY ONLY STATEMENTS OF CASH FLOWS (In Thousands of New Taiwan Dollars)

	2019	2018
<b>CASH FLOWS FROM INVESTING ACTIVITIES</b>		
Acquisitions of:		
Financial assets at amortized cost	\$ -	\$ (2,294,098)
Property, plant and equipment	(450,287,869)	(298,099,157)
Intangible assets	(9,252,712)	(6,885,163)
Proceeds from disposal or redemption of:		
Financial assets at fair value through other comprehensive income	775,282	651,971
Property, plant and equipment	1,118,338	4,707,118
Intangible assets	-	15,881
Proceeds from return of capital of financial assets carried at cost	2,300,000	-
Proceeds from return of capital of investments in equity instruments at fair value through other comprehensive income	1,107	3,456
Derecognition of hedging financial instruments	(93,536)	57,954
Interest received	2,016,735	1,815,330
Other dividends received	177,374	157,905
Dividends received from investments accounted for using equity method	2,225,194	3,769,150
Refundable deposits paid	(1,447,188)	(2,218,292)
Refundable deposits refunded	<u>1,007,262</u>	<u>1,762,043</u>
Net cash used in investing activities	<u>(451,460,013)</u>	<u>(296,555,902)</u>
<b>CASH FLOWS FROM FINANCING ACTIVITIES</b>		
Increase in short-term loans	59,615,602	27,154,770
Repayment of bonds	(34,900,000)	(24,300,000)
Repayment of the principal portion of lease liabilities	(2,630,308)	-
Interest paid	(3,536,180)	(2,957,663)
Guarantee deposits received	23,063	1,625,526
Guarantee deposits refunded	(4,061)	(120,717)
Cash dividends	(259,303,805)	(207,443,044)
Payment of partial acquisition of interests in subsidiaries	(10,602)	(64,633,400)
Proceeds from partial disposal of interests in subsidiaries	18,500	144,676
Donation from shareholders	<u>3,906</u>	<u>10,095</u>
Net cash used in financing activities	<u>(240,723,885)</u>	<u>(270,519,757)</u>
NET INCREASE (DECREASE) IN CASH AND CASH EQUIVALENTS	(98,751,827)	1,025,684
CASH AND CASH EQUIVALENTS, BEGINNING OF YEAR	<u>240,202,525</u>	<u>239,176,841</u>
CASH AND CASH EQUIVALENTS, END OF YEAR	<u>\$ 141,450,698</u>	<u>\$ 240,202,525</u>

The accompanying notes are an integral part of the parent company only financial statements.

(Concluded)

# **Taiwan Semiconductor Manufacturing Company Limited**

## **NOTES TO PARENT COMPANY ONLY FINANCIAL STATEMENTS FOR THE YEARS ENDED DECEMBER 31, 2019 AND 2018** (Amounts in Thousands of New Taiwan Dollars, Unless Specified Otherwise)

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### **1. GENERAL**

Taiwan Semiconductor Manufacturing Company Limited (the “Company” or “TSMC”), a Republic of China (R.O.C.) corporation, was incorporated on February 21, 1987. The Company is a dedicated foundry in the semiconductor industry which engages mainly in the manufacturing, selling, packaging, testing and computer-aided design of integrated circuits and other semiconductor devices and the manufacturing of masks.

On September 5, 1994, the Company’s shares were listed on the Taiwan Stock Exchange (TWSE). On October 8, 1997, the Company listed some of its shares of stock on the New York Stock Exchange (NYSE) in the form of American Depository Shares (ADSs).

The address of its registered office and principal place of business is No. 8, Li-Hsin Rd. 6, Hsinchu Science Park, Taiwan.

### **2. THE AUTHORIZATION OF FINANCIAL STATEMENTS**

The accompanying parent company only financial statements were approved and authorized for issue by the Board of Directors on February 11, 2020.

### **3. APPLICATION OF NEW AND REVISED INTERNATIONAL FINANCIAL REPORTING STANDARDS**

- a. Initial application of the amendments to the Regulations Governing the Preparation of Financial Reports by Securities Issuers and the International Financial Reporting Standards (IFRS), International Accounting Standards (IAS), IFRIC Interpretations (IFRIC), and SIC Interpretations (SIC) (collectively, “IFRSs”) endorsed and issued into effect by the Financial Supervisory Commission (FSC)

Except for the following, the initial application of the amendments to the Regulations Governing the Preparation of Financial Reports by Securities Issuers and the IFRSs endorsed and issued into effect by the FSC did not have a significant effect on the Company’s accounting policies:

- 1) IFRS 16 “Leases”

IFRS 16 sets out the accounting standards for leases that supersedes IAS 17 “Leases”, IFRIC 4 “Determining whether an Arrangement contains a Lease”, and a number of related interpretations. Refer to Note 4 for information relating to the relevant accounting policies.

#### Definition of a lease

The Company applies the guidance of IFRS 16 in determining whether contracts are, or contain, a lease only to contracts entered into (or changed) on or after January 1, 2019. Contracts identified as containing a lease under IAS 17 and IFRIC 4 are not reassessed and are accounted for in accordance with the transitional provisions under IFRS 16.

### The Company as lessee

Except for payments for short-term leases which are recognized as expenses on a straight-line basis, the Company recognizes right-of-use assets and lease liabilities for all leases on the parent company only balance sheets. On the parent company only statements of comprehensive income, the Company presents the depreciation expense charged on right-of-use assets separately from the interest expense accrued on lease liabilities, which is computed using the effective interest method. On the parent company only statements of cash flows, cash payments for both the principal portion and the interest portion of lease liabilities are classified within financing activities.

The Company applies IFRS 16 retrospectively with the cumulative effect of the initial application recognized at the date of initial application but does not restate comparative information.

Leases agreements classified as operating leases under IAS 17, except for short-term leases, are measured at the present value of the remaining lease payments, discounted using the lessee's incremental borrowing rate on January 1, 2019. Right-of-use assets are measured at an amount equal to the lease liabilities, adjusted by the amount of any prepaid or accrued lease payments. Right-of-use assets are subject to impairment testing under IAS 36.

The Company applied the following practical expedients to measure right-of-use assets and lease liabilities on January 1, 2019:

- a) The Company applied a single discount rate to a portfolio of leases with reasonably similar characteristics to measure lease liabilities.
- b) The Company accounted for those leases for which the lease term ends on or before December 31, 2019 as short-term leases.
- c) Except for lease payments, the Company excluded incremental costs of obtaining the lease from right-of-use assets on January 1, 2019.
- d) The Company determined lease terms (e.g. lease periods) based on the projected status on January 1, 2019, to measure lease liabilities.

The weighted average lessee's incremental borrowing rate used by the Company to calculate lease liabilities recognized on January 1, 2019 is 1.25%. The reconciliation between the lease liabilities recognized and the future minimum lease payments of non-cancellable operating lease on December 31, 2018 is presented as follows:

The future minimum lease payments of non-cancellable operating lease on December 31, 2018	\$ 18,721,881
Less: Recognition exemption for short-term leases	<u>(3,163,562)</u>
Undiscounted gross amounts on January 1, 2019	<u>\$ 15,558,319</u>
Discounted using the incremental borrowing rate on January 1, 2019	\$ 14,652,188
Add: Adjustments as a result of a different treatment of extension and purchase options	<u>3,106,390</u>
Lease liabilities recognized on January 1, 2019	<u>\$ 17,758,578</u>

The Company as lessor

Except for sublease transactions, the Company does not make any adjustments for leases in which it is a lessor, and accounts for those leases under IFRS 16 starting from January 1, 2019. On the basis of the remaining contractual terms and conditions on January 1, 2019, all of the Company's subleases are classified as operating leases.

Impact on assets, liabilities and equity on January 1, 2019

	<b>Carrying Amount as of December 31, 2018</b>	<b>Adjustments Arising from Initial Application</b>	<b>Adjusted Carrying Amount as of January 1, 2019</b>
Other current assets	\$ 4,184,918	\$ (6,783)	\$ 4,178,135
Right-of-use assets	-	17,831,257	17,831,257
Refundable deposits and others	1,666,863	(966)	1,665,897
 Total effect on assets		<u><b>\$ 17,823,508</b></u>	
 Accrued expenses and other current liabilities	49,778,042	\$ 2,347,167	52,125,209
Lease liabilities - noncurrent	-	15,411,411	15,411,411
Other noncurrent liabilities	451,488	64,930	516,418
 Total effect on liabilities		<u><b>\$ 17,823,508</b></u>	
 Total effect on equity		<u><b>\$ _____</b></u>	

- b. Amendments to the Regulations Governing the Preparation of Financial Reports by Securities Issuers for application starting from 2020 and the IFRSs issued by International Accounting Standards Board (IASB) and endorsed by the FSC with effective date starting 2020

<b>New, Revised or Amended Standards and Interpretations</b>	<b>Effective Date Issued by IASB</b>
Amendments to IFRS 3 "Definition of a Business"	January 1, 2020 (Note 1)
Amendments to IFRS 9, IAS 39 and IFRS 7 "Interest Rate Benchmark Reform"	January 1, 2020 (Note 2)
Amendments to IAS 1 and IAS 8 "Definition of Material"	January 1, 2020 (Note 3)

Note 1: The Company shall apply these amendments to business combinations for which the acquisition date is on or after the beginning of the first annual reporting period beginning on or after January 1, 2020 and to asset acquisitions that occur on or after the beginning of that period.

Note 2: The Company shall apply these amendments retrospectively for annual reporting periods beginning on or after January 1, 2020.

Note 3: The Company shall apply these amendments prospectively for annual reporting periods beginning on or after January 1, 2020.

- c. The IFRSs issued by IASB but not yet endorsed and issued into effect by the FSC

<u>New, Revised or Amended Standards and Interpretations</u>	<u>Effective Date Issued by IASB</u>
Amendments to IFRS 10 and IAS 28 “Sale or Contribution of Assets between an Investor and its Associate or Joint Venture”	To be determined by IASB
Amendments to IAS 1 “Classification of Liabilities as Current or Non-current”	January 1, 2022

As of the date the accompanying parent company only financial statements were authorized for issue, the Company continues in evaluating the impact on its financial position and financial performance as a result of the initial adoption of the aforementioned standards or interpretations. The related impact will be disclosed when the Company completes the evaluation.

#### **4. SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES**

For the convenience of readers, the accompanying parent company only financial statements have been translated into English from the original Chinese version prepared and used in the R.O.C. If there is any conflict between the English version and the original Chinese version or any difference in the interpretation of the two versions, the Chinese-language parent company only financial statements shall prevail.

##### **Statement of Compliance**

The accompanying parent company only financial statements have been prepared in conformity with the Regulations Governing the Preparation of Financial Reports by Securities Issuers (the “Accounting Standards Used in Preparation of the Parent Company Only Financial Statements”).

##### **Basis of Preparation**

The accompanying parent company only financial statements have been prepared on the historical cost basis except for financial instruments that are measured at fair values, as explained in the accounting policies below. Historical cost is generally based on the fair value of the consideration given in exchange for the assets.

When preparing the parent company only financial statements, the Company account for subsidiaries and associates by using the equity method. In order to agree with the amount of net income, other comprehensive income and equity attributable to shareholders of the parent in the consolidated financial statements, the differences of the accounting treatment between the parent company only basis and the consolidated basis are adjusted under the heading of investments accounted for using equity method, share of profits of subsidiaries and associates and share of other comprehensive income of subsidiaries and associates in the parent company only financial statements.

##### **Foreign Currencies**

In preparing the parent company only financial statements, transactions in currencies other than the entity’s functional currency (foreign currencies) are recognized at the rates of exchange prevailing at the dates of the transactions. At the end of each reporting period, monetary items denominated in foreign currencies are retranslated at the rates prevailing at that date. Such exchange differences are recognized in profit or loss in the year in which they arise. Non-monetary items measured at fair value that are denominated in foreign currencies are retranslated at the rates prevailing at the date when the fair value was determined. Exchange differences arising on the retranslation of non-monetary items are included in profit or loss for the year except for exchange differences arising on the retranslation of non-monetary items in respect of which gains and losses are recognized directly in other comprehensive income, in which case, the exchange differences are also recognized directly in other comprehensive income. Non-monetary items that are measured in terms of historical cost in foreign currencies are not retranslated.

For the purposes of presenting parent company only financial statements, the assets and liabilities of the Company's foreign operations are translated into NT\$ using exchange rates prevailing at the end of each reporting period. Income and expense items are translated at the average exchange rates for the period. Exchange differences arising, if any, are recognized in other comprehensive income and accumulated in equity.

### **Classification of Current and Noncurrent Assets and Liabilities**

Current assets are assets held for trading purposes and assets expected to be converted to cash, sold or consumed within one year from the end of the reporting period. Current liabilities are obligations incurred for trading purposes and obligations expected to be settled within one year from the end of the reporting period. Assets and liabilities that are not classified as current are noncurrent assets and liabilities, respectively.

#### **Cash Equivalents**

Cash equivalents, for the purpose of meeting short-term cash commitments, consist of highly liquid time deposits and investments that are readily convertible to known amounts of cash and which are subject to an insignificant risk of changes in value.

#### **Financial Instruments**

Financial assets and liabilities shall be recognized when the Company becomes a party to the contractual provisions of the instruments.

Financial assets and liabilities are initially recognized at fair values. Transaction costs that are directly attributable to the acquisition or issue of financial assets and financial liabilities (other than financial assets and financial liabilities at fair value through profit or loss) are added to or deducted from the fair value of the financial assets or financial liabilities, as appropriate, on initial recognition. Transaction costs directly attributable to the acquisition of financial assets or financial liabilities at fair value through profit or loss are recognized immediately in profit or loss.

#### **Financial Assets**

The classification of financial assets depends on the nature and purpose of the financial assets and is determined at the time of initial recognition. Regular way purchases or sales of financial assets are recognized and derecognized on a trade date or settlement date basis for which financial assets were classified in the same way, respectively. Regular way purchases or sales are purchases or sales of financial assets that require delivery of assets within the time frame established by regulation or convention in the marketplace.

##### a. Category of financial assets and measurement

Financial assets are classified into the following categories: financial assets at FVTPL, investments in debt instruments and equity instruments at FVTOCI, and financial assets at amortized cost.

###### 1) Financial asset at FVTPL

For certain financial assets which include debt instruments that do not meet the criteria of amortized cost or FVTOCI, it is mandatorily required to measure them at FVTPL. Any gain or loss arising from remeasurement is recognized in profit or loss. The net gain or loss recognized in profit or loss incorporates any interest earned on the financial asset.

2) Investments in debt instruments at FVTOCI

Debt instruments with contractual terms specifying that cash flows are solely payments of principal and interest on the principal amount outstanding, together with objective of collecting contractual cash flows and selling the financial assets, are measured at FVTOCI.

Interest income calculated using the effective interest method, foreign exchange gains and losses and impairment gains or losses on investments in debt instruments at FVTOCI are recognized in profit or loss. Other changes in the carrying amount of these debt instruments are recognized in other comprehensive income and will be reclassified to profit or loss when these debt instruments are disposed.

3) Investments in equity instruments at FVTOCI

On initial recognition, the Company may irrevocably designate investments in equity investments that is not held for trading as at FVTOCI.

Investments in equity instruments at FVTOCI are subsequently measured at fair value with gains and losses arising from changes in fair value recognized in other comprehensive income and accumulated in other equity.

Dividends on these investments in equity instruments at FVTOCI are recognized in profit or loss when the Company's right to receive the dividends is established, unless the Company's rights clearly represent a recovery of part of the cost of the investment.

4) Measured at amortized cost

Cash and cash equivalents, debt instrument investments, notes and accounts receivable (including related parties), other receivables and refundable deposits are measured at amortized cost.

Debt instruments with contractual terms specifying that cash flows are solely payments of principal and interest on the principal amount outstanding, together with objective of holding financial assets in order to collect contractual cash flows, are measured at amortized cost.

Subsequent to initial recognition, financial assets measured at amortized cost are measured at amortized cost, which equals to carrying amount determined by the effective interest method less any impairment loss.

b. Impairment of financial assets

At the end of each reporting period, a loss allowance for expected credit loss is recognized for financial assets at amortized cost (including accounts receivable) and for investments in debt instruments that are measured at FVTOCI.

The loss allowance for accounts receivable is measured at an amount equal to lifetime expected credit losses. For financial assets at amortized cost and investments in debt instruments that are measured at FVTOCI, when the credit risk on the financial instrument has not increased significantly since initial recognition, a loss allowance is recognized at an amount equal to expected credit loss resulting from possible default events of a financial instrument within 12 months after the reporting date. If, on the other hand, there has been a significant increase in credit risk since initial recognition, a loss allowance is recognized at an amount equal to expected credit loss resulting from all possible default events over the expected life of a financial instrument.

The Company recognizes an impairment loss in profit or loss for all financial instruments with a corresponding adjustment to their carrying amount through a loss allowance account, except for investments in debt instruments that are measured at FVTOCI, for which the loss allowance is recognized

in other comprehensive income and does not reduce the carrying amount of the financial asset.

c. Derecognition of financial assets

The Company derecognizes a financial asset only when the contractual rights to the cash flows from the financial asset expire, or when it transfers the financial asset and substantially all the risks and rewards of ownership of the financial asset to another entity.

On derecognition of a financial asset at amortized cost in its entirety, the difference between the asset's carrying amount and the sum of the consideration received and receivable is recognized in profit or loss. On derecognition of an investment in a debt instrument at FVTOCI, the difference between the asset's carrying amount and the sum of the consideration received and receivable and the cumulative gain or loss that had been recognized in other comprehensive income is recognized in profit or loss. However, on derecognition of an investment in an equity instrument at FVTOCI, the cumulative gain or loss that had been recognized in other comprehensive income is transferred directly to retained earnings, without recycling through profit or loss.

## **Financial Liabilities and Equity Instruments**

### Classification as debt or equity

Debt and equity instruments issued by the Company are classified as either financial liabilities or as equity in accordance with the substance of the contractual arrangements and the definitions of a financial liability and an equity instrument.

#### Equity instruments

An equity instrument is any contract that evidences a residual interest in the assets of an entity after deducting all of its liabilities. Equity instruments issued by the Company are recognized at the proceeds received, net of direct issue costs.

#### Financial liabilities

Financial liabilities are subsequently measured either at amortized cost using effective interest method or at FVTPL.

Financial liabilities are classified as at fair value through profit or loss when the financial liability is either held for trading or is designated as at fair value through profit or loss.

Financial liabilities at fair value through profit or loss are stated at fair value, with any gains or losses arising on remeasurement recognized in profit or loss.

Financial liabilities other than those held for trading purposes and designated as at FVTPL are subsequently measured at amortized cost at the end of each reporting period.

#### Derecognition of financial liabilities

The Company derecognizes financial liabilities when, and only when, the Company's obligations are discharged, cancelled or they expire. The difference between the carrying amount of the financial liability derecognized and the consideration paid and payable is recognized in profit or loss.

## **Derivative Financial Instruments**

Derivative financial instruments are initially recognized at fair value at the date the derivative contracts are entered into and are subsequently remeasured to their fair value at the end of each reporting period. The resulting gain or loss is recognized in profit or loss immediately unless the derivative financial instrument is

designated and effective as a hedging instrument, in which event the timing of the recognition in profit or loss depends on the nature of the hedge relationship.

## **Hedge Accounting**

### Cash flow hedge

The Company designates certain hedging instruments, such as forward exchange contracts and foreign currency deposits, to partially hedge its foreign exchange rate risks associated with certain highly probable forecast transactions (capital expenditures). The effective portion of changes in the fair value of hedging instruments is recognized in other comprehensive income. When the forecast transactions actually take place, the associated gains or losses that were recognized in other comprehensive income are removed from equity and included in the initial cost of the hedged items. The gains or losses from hedging instruments relating to the ineffective portion are recognized immediately in profit or loss.

The Company prospectively discontinues hedge accounting only when the hedging relationship ceases to meet the qualifying criteria; for instance when the hedging instrument expires or is sold, terminated or exercised.

## **Inventories**

Inventories are stated at the lower of cost or net realizable value. Inventories are recorded at standard cost and adjusted to approximate weighted-average cost at the end of the reporting period. Net realizable value represents the estimated selling price of inventories less all estimated costs of completion and costs necessary to make the sale.

## **Investments Accounted for Using Equity Method**

Investments accounted for using the equity method include investments in subsidiaries and associates.

### Investment in subsidiaries

A subsidiary is an entity that is controlled by the Company.

Under the equity method, an investment in a subsidiary is initially recognized at cost and adjusted thereafter to recognize the Company's share of profit or loss and other comprehensive income of the subsidiary as well as the distribution received. The Company also recognized its share in the changes in the equity of subsidiaries.

Changes in the Company's ownership interests in subsidiaries that do not result in the Company losing control over the subsidiaries are accounted for as equity transactions. Any difference between the carrying amount of the subsidiary and the fair value of the consideration paid or received is recognized directly in equity.

When the Company loses control of a subsidiary, any retained investment of the former subsidiary is measured at the fair value at that date. A gain or loss is recognized in profit or loss and calculated as the difference between (a) the aggregate of the fair value of consideration received and the fair value of any retained interest at the date when control is lost; and (b) the previous carrying amount of the investments in such subsidiary. In addition, the Company shall account for all amounts previously recognized in other comprehensive income in relation to the subsidiary on the same basis as would be required if the subsidiary had directly disposed of the related assets and liabilities.

When the Company transacts with its subsidiaries, profits and losses resulting from the transactions with the subsidiaries are recognized in the Company's parent company only financial statements only to the extent of interests in the subsidiaries that are not owned by the Company.

### Investment in associates

An associate is an entity over which the Company has significant influence and that is neither a subsidiary nor a joint venture. Significant influence is the power to participate in the financial and operating policy decisions of the investee but is not control or joint control over those policies.

The operating results and assets and liabilities of associates are incorporated in these parent company only financial statements using the equity method of accounting. Under the equity method, an investment in an associate is initially recognized in the statement of financial position at cost and adjusted thereafter to recognize the Company's share of profit or loss and other comprehensive income of the associate as well as the distribution received. The Company also recognizes its share in the changes in the equities of associates.

Any excess of the cost of acquisition over the Company's share of the net fair value of the identifiable assets, liabilities and contingent liabilities of an associate recognized at the date of acquisition is recognized as goodwill, which is included within the carrying amount of the investment. Any excess of the Company's share of the net fair value of the identifiable assets, liabilities and contingent liabilities over the cost of acquisition, after reassessment, is recognized immediately in profit or loss.

When necessary, the entire carrying amount of the investment (including goodwill) is tested for impairment as a single asset by comparing its recoverable amount (higher of value in use and fair value less costs to sell) with its carrying amount. Any impairment loss recognized forms part of the carrying amount of the investment. Any reversal of that impairment loss is recognized to the extent that the recoverable amount of the investment subsequently increases.

The Company discontinues the use of the equity method from the date when the Company ceases to have significant influence over an associate. When the Company retains an interest in the former associate, the Company measures the retained interest at fair value at that date. The difference between the carrying amount of the associate at the date the equity method was discontinued, and the fair value of any retained interest and any proceeds from disposing of a part interest in the associate is included in the determination of the gain or loss on disposal of the associate. In addition, the Company shall account for all amounts recognized in other comprehensive income in relation to that associate on the same basis as would be required if the associate had directly disposed of the related assets or liabilities. If the Company's ownership interest in an associate is reduced as a result of disposal, but the investment continues to be an associate, the Company should reclassify to profit or loss only a proportionate amount of the gain or loss previously recognized in other comprehensive income.

When the Company subscribes to additional shares in an associate at a percentage different from its existing ownership percentage, the resulting carrying amount of the investment differs from the amount of the Company's proportionate interest in the net assets of the associate. The Company records such a difference as an adjustment to investments with the corresponding amount charged or credited to capital surplus. If the Company's ownership interest is reduced due to the additional subscription to the shares of associate by other investors, the proportionate amount of the gains or losses previously recognized in other comprehensive income in relation to that associate shall be reclassified to profit or loss on the same basis as would be required if the associate had directly disposed of the related assets or liabilities.

When the Company transacts with an associate, profits and losses resulting from the transactions with the associate are recognized in the Company's parent company only financial statements only to the extent of interests in the associate that are not owned by the Company.

## **Property, Plant and Equipment**

Property, plant and equipment are measured at cost less accumulated depreciation and accumulated impairment. Costs include any incremental costs that are directly attributable to the construction or acquisition of the item of property, plant and equipment.

Property, plant and equipment in the course of construction for production, supply or administrative purposes are carried at cost, less any recognized impairment loss. Such assets are classified to the appropriate categories of property, plant and equipment when completed and ready for intended use. Depreciation of these assets, on the same basis as other identical categories of property, plant and equipment, commences when the assets are available for their intended use.

Depreciation is recognized so as to write off the cost of the assets less their residual values over their useful lives, and it is computed using the straight-line method mainly over the following estimated useful lives: buildings (assets used by the Company and assets subject to operating leases) - 10 to 20 years; machinery and equipment - 5 years; and office equipment - 5 years. The estimated useful lives, residual values and depreciation method are reviewed at the end of each reporting period, with the effect of any changes in estimates accounted for on a prospective basis. Land is not depreciated.

An item of property, plant and equipment is derecognized upon disposal or when no future economic benefits are expected to arise from the continued use of the assets. Any gain or loss arising on the disposal or retirement of an item of property, plant and equipment is determined as the difference between the sales proceeds and the carrying amount of the asset and is recognized in profit or loss.

## **Leases**

### 2019

For a contract that contains a lease component and non-lease component, the Company may elect to account for the lease and non-lease components as a single lease component.

#### The Company as lessor

Rental income from operating lease is recognized on a straight-line basis over the term of the lease.

#### The Company as lessee

Except for short-term leases (leases of machinery and equipment and others) which are recognized as expenses on a straight-line basis, the Company recognizes right-of-use assets and lease liabilities for all leases at the commencement date of the lease.

Right-of-use assets are measured at cost. The cost of right-of-use assets comprises the initial measurement of lease liabilities adjusted for lease payments made at or before the commencement date, plus an estimate of costs needed to restore the underlying assets. Subsequent measurement is calculated as cost less accumulated depreciation and accumulated impairment loss and adjusted for changes in lease liabilities as a result of lease term modifications or other related factors. Right-of-use assets are presented separately in the parent company only balance sheets.

Right-of-use assets are depreciated using the straight-line method from the commencement dates to the earlier of the end of the useful lives of the right-of-use assets or the end of the lease terms. If the lease transfers ownership of the underlying assets to the Company by the end of the lease terms or if the cost of right-of-use assets reflects that the Company will exercise a purchase option, the Company depreciates the right-of-use assets from the commencement dates to the end of the useful lives of the underlying assets.

Lease liabilities are measured at the present value of the lease payments. Lease payments comprise fixed payments, variable lease payments which depend on an index or a rate and the exercise price of a purchase option if the Company is reasonably certain to exercise that option. The lease payments are discounted using the lessee's incremental borrowing rates.

Subsequently, lease liabilities are measured at amortized cost using the effective interest method, with interest expense recognized over the lease terms. When there is a change in a lease term, a change in future lease payments resulting from a change in an index or a rate used to determine those payments, or a change in the assessment of an option to purchase an underlying asset, the Company remeasures the lease liabilities with a corresponding adjustment to the right-of-use assets. Lease liabilities are presented on a separate line in the parent company only balance sheets.

Variable lease payments that do not depend on an index or a rate are recognized as expenses in the periods in which they are incurred.

## 2018

Leases are classified as finance lease whenever the terms of the lease transfer substantially all the risks and rewards of ownership to the lessee. All other leases are classified as operating leases.

### The Company as lessor

Rental income from operating leases is recognized on a straight-line basis over the term of the lease.

### The Company as lessee

Operating lease payments are recognized as an expense on a straight-line basis over the lease term.

## **Intangible Assets**

### Goodwill

Goodwill arising on an acquisition of a business is carried at cost as established at the date of acquisition of the business less accumulated impairment losses, if any.

### Other intangible assets

Other separately acquired intangible assets with finite useful lives are carried at cost less accumulated amortization and accumulated impairment losses. Amortization is recognized using the straight-line method over the following estimated useful lives: Technology license fees - the estimated life of the technology or the term of the technology transfer contract; software and system design costs - 3 years or contract period; patent and others - the economic life or contract period. The estimated useful life and amortization method are reviewed at the end of each reporting period, with the effect of any changes in estimate being accounted for on a prospective basis.

## **Impairment of Tangible Assets, Right-of-use Assets and Intangible Assets**

### Goodwill

Goodwill is not amortized and instead is tested for impairment annually, or more frequently when there is an indication that the cash generating unit may be impaired. For the purpose of impairment testing, goodwill is allocated to each of the Company's cash generating units or groups of cash-generating units that are expected to benefit. If the recoverable amount of a cash generating unit is less than its carrying amount, the difference is allocated first to reduce the carrying amount of any goodwill allocated to such cash-generating unit and then to the other assets of the cash generating unit pro rata based on the carrying amount of each asset in the

cash generating unit. Any impairment loss for goodwill is recognized directly in profit or loss. An impairment loss recognized for goodwill is not reversed in subsequent periods.

#### Tangible assets, right-of-use assets and other intangible assets

At the end of each reporting period, the Company reviews the carrying amounts of its tangible assets (property, plant and equipment), right-of-use assets and other intangible assets to determine whether there is any indication that those assets have suffered an impairment loss. If any such indication exists, the recoverable amount of the asset is estimated in order to determine the extent of the impairment loss. When it is not possible to estimate the recoverable amount of an individual asset, the Company estimates the recoverable amount of the cash-generating unit to which the asset belongs. When a reasonable and consistent basis of allocation can be identified, corporate assets are also allocated to individual cash-generating units, or otherwise they are allocated to the smallest group of cash-generating units for which a reasonable and consistent allocation basis can be identified.

Recoverable amount is the higher of fair value less costs to sell and value in use. In assessing value in use, the estimated future cash flows are discounted to their present value using a pre-tax discount rate that reflects current market assessments of the time value of money and the risks specific to the asset for which the estimates of future cash flows have not been adjusted.

If the recoverable amount of an asset or cash-generating unit is estimated to be less than its carrying amount, the carrying amount of the asset or cash-generating unit is reduced to its recoverable amount. An impairment loss is recognized immediately in profit or loss.

When an impairment loss subsequently reverses, the carrying amount of the asset or a cash-generating unit is increased to the revised estimate of its recoverable amount, but the increased carrying amount does not exceed the carrying amount that would have been determined had no impairment loss been recognized for the asset or cash-generating unit in prior years. A reversal of an impairment loss is recognized immediately in profit or loss.

#### **Guarantee Deposit**

Guarantee deposit mainly consists of cash received under deposit agreements with customers to ensure they have access to the Company's specified capacity. Cash received from customers is recorded as guarantee deposit upon receipt. Guarantee deposits are refunded to customers when terms and conditions set forth in the deposit agreements have been satisfied.

#### **Revenue Recognition**

The Company recognizes revenue when performance obligations are satisfied. The performance obligations are satisfied when customers obtain control of the promised goods which is generally when the goods are delivered to the customers' specified locations.

Revenue from sale of goods is measured at the fair value of the consideration received or receivable. Revenue is reduced for estimated customer returns, rebates and other similar allowances. Estimated sales returns and other allowances is generally made and adjusted based on historical experience and the consideration of varying contractual terms to recognize refund liabilities, which is classified under accrued expenses and other current liabilities.

In principle, payment term granted to customers is due 30 days from the invoice date or 30 days from the end of the month of when the invoice is issued. Due to the short term nature of the receivables from sale of goods with the immaterial discounted effect, the Company measures them at the original invoice amounts without discounting.

## **Employee Benefits**

### Short-term employee benefits

Liabilities recognized in respect of short-term employee benefits are measured at the undiscounted amount of the benefits expected to be paid in exchange for service rendered by employees.

### Retirement benefits

For defined contribution retirement benefit plans, payments to the benefit plan are recognized as an expense when the employees have rendered service entitling them to the contribution. For defined benefit retirement benefit plans, the cost of providing benefit is recognized based on actuarial calculations.

Defined benefit costs (including service cost, net interest and remeasurement) under the defined benefit retirement benefit plans are determined using the Projected Unit Credit Method. Service cost (including current service cost), and net interest on the net defined benefit liability (asset) are recognized as employee benefits expense in the period they occur. Remeasurement, comprising actuarial gains and losses and the return on plan assets (excluding interest), is recognized in other comprehensive income in the period in which they occur. Remeasurement recognized in other comprehensive income is reflected immediately in retained earnings and will not be reclassified to profit or loss.

Net defined benefit liability represents the actual deficit in the Company's defined benefit plan.

## **Taxation**

Income tax expense represents the sum of the tax currently payable and deferred tax.

### Current tax

Income tax on unappropriated earnings is expensed in the year the shareholders approved the appropriation of earnings which is the year subsequent to the year the earnings are generated.

Adjustments of prior years' tax liabilities are added to or deducted from the current year's tax provision.

### Deferred tax

Deferred tax is recognized on temporary differences between the carrying amounts of assets and liabilities in the parent company only financial statements and the corresponding tax bases used in the computation of taxable profit. Deferred tax liabilities are generally recognized for all taxable temporary differences. Deferred tax assets are generally recognized for all deductible temporary differences, net operating loss carryforwards and tax credits for research and development expenses to the extent that it is probable that taxable profits will be available against which those deductible temporary differences can be utilized.

Deferred tax liabilities are recognized for taxable temporary differences associated with investments in subsidiaries and associates, except where the Company is able to control the reversal of the temporary difference and it is probable that the temporary difference will not reverse in the foreseeable future. Deferred tax assets arising from deductible temporary differences associated with such investments are only recognized to the extent that it is probable that there will be sufficient taxable profits against which to utilize the benefits of the temporary differences and they are expected to reverse in the foreseeable future.

The carrying amount of deferred tax assets is reviewed at the end of each reporting period and reduced to the extent that it is no longer probable that sufficient taxable profits will be available to allow all or part of the deferred tax asset to be recovered. The deferred tax assets which originally not recognized is also reviewed at the end of each reporting period and recognized to the extent that it is probable that sufficient taxable profits will be available to allow all or part of the deferred tax asset to be recovered.

Deferred tax liabilities and assets are measured at the tax rates that are expected to apply in the year in which the liability is settled or the asset is realized, based on tax rates (and tax laws) that have been enacted or substantively enacted by the end of the reporting period. The measurement of deferred tax liabilities and assets reflects the tax consequences that would follow from the manner in which the Company expects, at the end of the reporting period, to recover or settle the carrying amount of its assets and liabilities.

#### Current and deferred tax for the year

Current and deferred tax are recognized in profit or loss, except when they relate to items that are recognized in other comprehensive income or directly in equity, in which case, the current and deferred tax are also recognized in other comprehensive income or directly in equity, respectively.

### **5. CRITICAL ACCOUNTING JUDGMENTS AND KEY SOURCES OF ESTIMATION AND UNCERTAINTY**

In the application of the aforementioned Company's accounting policies, the Company is required to make judgments, estimates and assumptions about the carrying amounts of assets and liabilities that are not readily apparent from other sources. The estimates and associated assumptions are based on historical experience and other factors that are considered to be relevant. Actual results may differ from these estimates.

The estimates and underlying assumptions are reviewed on an ongoing basis. Revisions to accounting estimates are recognized in the year in which the estimate is revised if the revision affects only that year, or in the year of the revision and future years if the revision affects both current and future years.

#### **Critical Accounting Judgments**

##### **Revenue Recognition**

The Company recognizes revenue when the conditions described in Note 4 are satisfied.

##### **Commencement of Depreciation Related to Property, Plant and Equipment Classified as Equipment under Installation and Construction in Progress (EUI/CIP)**

As described in Note 4, commencement of depreciation related to EUI/CIP involves determining when the assets are available for their intended use. The criteria the Company uses to determine whether EUI/CIP are available for their intended use involves subjective judgements and assumptions about the conditions necessary for the assets to be capable of operating in the intended manner.

##### **Judgments on Lease Terms**

In determining a lease term, the Company considers all facts and circumstances that create an economic incentive to exercise or not to exercise an option, including any expected changes in facts and circumstances from the commencement date until the exercise date of the option. Main factors considered include contractual terms and conditions covered by the optional periods, and the importance of the underlying asset to the lessee's operations, etc. The lease term is reassessed if a significant change in circumstances that are within the control of the Company occurs.

#### **Key Sources of Estimation and Uncertainty**

##### **Estimation of Sales Returns and Allowances**

Sales returns and other allowance is estimated and recorded based on historical experience and in consideration of different contractual terms. The amount is deducted from revenue in the same period the related revenue is recorded. The Company periodically reviews the reasonableness of the estimates.

### **Valuation of Inventory**

Inventories are stated at the lower of cost or net realizable value, and the Company uses estimate to determine the net realizable value of inventory at the end of each reporting period.

The Company estimates the net realizable value of inventory for normal waste, obsolescence and unmarketable items at the end of reporting period and then writes down the cost of inventories to net realizable value. The net realizable value of the inventory is determined mainly based on assumptions of future demand within a specific time horizon.

### **Impairment of Tangible Assets, Right-of-use Assets and Intangible Assets Other than Goodwill**

In the process of evaluating the potential impairment of tangible assets, right-of-use assets and intangible assets other than goodwill, the Company determines the independent cash flows, useful lives, expected future revenue and expenses related to the specific asset groups with the consideration of the nature of semiconductor industry. Any change in these estimates based on changed economic conditions or business strategies could result in significant impairment charges or reversal in future years.

### **Realization of Deferred Income Tax Assets**

Deferred tax assets are recognized to the extent that it is probable that future taxable profits will be available against which those deferred tax assets can be utilized. Assessment of the realization of the deferred tax assets requires subjective judgment and estimate, including the future revenue growth and profitability, tax holidays, the amount of tax credits can be utilized and feasible tax planning strategies. Any changes in the global economic environment, the industry trends and relevant laws and regulations could result in significant adjustments to the deferred tax assets.

### **Determination of Lessees' Incremental Borrowing Rates**

In determining a lessee's incremental borrowing rate used in discounting lease payments, the Company mainly takes into account the market risk-free rates, the estimated lessee's credit spreads and secured status in a similar economic environment.

## **6. CASH AND CASH EQUIVALENTS**

	<b>December 31, 2019</b>	<b>December 31, 2018</b>
Cash and deposits in banks	\$ 141,450,698	\$ 238,473,857
Repurchase agreements collateralized by corporate bonds	-	1,229,600
Commercial paper	-	499,068
	<u>\$ 141,450,698</u>	<u>\$ 240,202,525</u>

Deposits in banks consisted of highly liquid time deposits that were readily convertible to known amounts of cash and were subject to an insignificant risk of changes in value.

## 7. FINANCIAL ASSETS AND LIABILITIES AT FAIR VALUE THROUGH PROFIT OR LOSS

	December 31, 2019	December 31, 2018
<b><u>Financial assets</u></b>		
Mandatorily measured at FVTPL Forward exchange contracts	<u>\$ 27,481</u>	<u>\$ 54,115</u>
<b><u>Financial liabilities</u></b>		
Held for trading Forward exchange contracts	<u>\$ 982,302</u>	<u>\$ 30,232</u>

The Company entered into forward exchange contracts to manage exposures due to fluctuations of foreign exchange rates. These forward exchange contracts did not meet the criteria for hedge accounting. Therefore, the Company did not apply hedge accounting treatment for these forward exchange contracts.

Outstanding forward exchange contracts consisted of the following:

	<b>Maturity Date</b>	<b>Contract Amount (In Thousands)</b>
<b><u>December 31, 2019</u></b>		
Sell NT\$/Buy EUR	January 2020 to June 2020	NT\$84,690,438/EUR2,509,000
Sell NT\$/Buy JPY	January 2020 to March 2020	NT\$23,737,589/JPY85,600,000
Sell JPY/Buy US\$	January 2020 to February 2020	JPY57,471,581/US\$526,368
<b><u>December 31, 2018</u></b>		
Sell NT\$/Buy EUR	January 2019 to March 2019	NT\$18,545,854/EUR527,000
Sell NT\$/Buy JPY	January 2019 to March 2019	NT\$4,757,858/JPY17,200,000
Sell US\$/Buy JPY	January 2019	US\$162,834/JPY17,976,014
Sell US\$/Buy NT\$	January 2019	US\$110,000/NT\$3,386,459

## 8. HEDGING FINANCIAL INSTRUMENTS

	December 31, 2019	December 31, 2018
<b><u>Financial assets- current</u></b>		
Cash flow hedges Forward exchange contracts	<u>\$ 3,504</u>	<u>\$ 23,497</u>
<b><u>Financial liabilities- current</u></b>		
Cash flow hedges Forward exchange contracts	<u>\$ 1,798</u>	<u>\$ 1,941</u>

The Company entered into forward exchange contracts and foreign currency deposits to partially hedge foreign exchange rate risks associated with certain highly probable forecast transactions (capital expenditures). The hedge ratio is adjusted in response to the changes in the financial market and capped at 100%. The forward exchange contracts have maturities of 12 months or less.

On the basis of economic relationships, the Company expects that the value of forward exchange contracts and foreign currency deposits and the value of hedged transactions will change in opposite directions in response to movements in foreign exchange rates.

The main source of hedge ineffectiveness in these hedging relationships is driven by the effect of the counterparty's own credit risk on the fair value of forward exchange contracts and foreign currency deposits. No other sources of ineffectiveness emerged from these hedging relationships. For the years ended December 31, 2019 and 2018, refer to Note 19(d) for gain or loss arising from changes in the fair value of hedging instruments and the amount transferred to initial carrying amount of hedged items.

The following tables summarize the information relating to the hedges for foreign currency risk.

December 31, 2019

Hedging Instruments	Contract Amount (In Thousands)	Maturity	Balance in Other Equity (Continuing Hedges)
Forward exchange contracts	NT\$1,342,392/EUR40,000	January 2020	\$ (3,820)

December 31, 2018

Hedging Instruments	Contract Amount (In Thousands)	Maturity	Balance in Other Equity (Continuing Hedges)
Forward exchange contracts	NT\$3,917,657/EUR112,000	February 2019 to April 2019	\$ 23,601

The effect for the years ended December 31, 2019 and 2018 is detailed below:

Hedging Instruments/Hedged Items	Increase (Decrease) in Value Used for Calculating Hedge Ineffectiveness	
	Years Ended December 31	
	2019	2018
Hedging Instruments		
Forward exchange contracts	\$ (109,592)	\$ 34,563
Foreign currency deposits	-	6,412
	<u><u>\$ (109,592)</u></u>	<u><u>\$ 40,975</u></u>
Hedged Items		
Forecast transaction (capital expenditures)	<u><u>\$ 109,592</u></u>	<u><u>\$ (40,975)</u></u>

## 9. NOTES AND ACCOUNTS RECEIVABLE, NET

	<b>December 31, 2019</b>	<b>December 31, 2018</b>
At amortized cost		
Notes and accounts receivable	\$ 46,188,113	\$ 33,097,452
Less: Loss allowance	<u>(319,045)</u>	<u>(7,132)</u>
	45,869,068	33,090,320
At FVTOCI	<u>3,255,865</u>	<u>3,595,069</u>
	<u><u>\$ 49,124,933</u></u>	<u><u>\$ 36,685,389</u></u>

The Company signed a contract with the bank to sell certain accounts receivable without recourse and transaction cost required. These accounts receivable are classified as at FVTOCI because they are held within a business model whose objective is achieved by both collecting contractual cash flows and selling financial assets.

In principle, the payment term granted to customers is due 30 days from the invoice date or 30 days from the end of the month when the invoice is issued. Aside from recognizing impairment loss for credit-impaired accounts receivable, the Company recognizes loss allowance based on the expected credit loss ratio of customers by different risk levels with consideration of factors of historical loss ratios and customers' financial conditions, competitiveness and business outlook. For accounts receivable past due over 90 days without collaterals or guarantees, the Company recognizes loss allowance at full amount.

### Aging analysis of notes and accounts receivable

	<b>December 31, 2019</b>	<b>December 31, 2018</b>
Not past due	\$ 43,374,378	\$ 29,258,313
Past due		
Past due within 30 days	6,054,771	6,956,366
Past due 31-60 days	10,864	464,879
Past due 61-120 days	720	7,548
Past due over 121 days	3,245	5,415
Less: Loss allowance	<u>(319,045)</u>	<u>(7,132)</u>
	<u><u>\$ 49,124,933</u></u>	<u><u>\$ 36,685,389</u></u>

All of the Company's accounts receivable classified as at FVTOCI were not past due.

### Movements of the loss allowance for accounts receivable

	<b>Years Ended December 31</b>	
	<b>2019</b>	<b>2018</b>
Balance, beginning of year	\$ 7,132	\$ 224,352
Provision (Reversal)	<u>311,913</u>	<u>(217,220)</u>
Balance, end of year	<u><u>\$ 319,045</u></u>	<u><u>\$ 7,132</u></u>

For the years ended December 31, 2018 and 2019, the changes in loss allowance were mainly due to the variations in the expected credit loss ratios and the balance of accounts receivable of different risk levels.

## 10. INVENTORIES

	<b>December 31, 2019</b>	<b>December 31, 2018</b>
Finished goods	\$ 8,533,179	\$ 10,920,351
Work in process	49,268,466	70,405,998
Raw materials	15,046,116	14,110,534
Supplies and spare parts	<u>3,416,090</u>	<u>2,651,277</u>
	<u><u>\$ 76,263,851</u></u>	<u><u>\$ 98,088,160</u></u>

Reversal of write-down of inventories resulting from the increase in net realizable value and write-down of inventories to net realizable value were included in the cost of revenue, as illustrated below:

	<b>Years Ended December 31</b>	
	<b>2019</b>	<b>2018</b>
Inventory losses (reversal of write-down of inventories)	<u><u>\$ (2,071,888)</u></u>	<u><u>\$ 1,098,915</u></u>

The aforementioned inventory losses (reversal of write-down of inventories) exclude wafer contamination losses and computer virus outbreak losses. Please refer to related losses in Note 34.

## 11. INVESTMENTS ACCOUNTED FOR USING EQUITY METHOD

Investments accounted for using the equity method consisted of the following:

	<b>December 31, 2019</b>	<b>December 31, 2018</b>
Subsidiaries	\$ 539,843,621	\$ 531,717,913
Associates	<u>18,660,268</u>	<u>17,842,971</u>
	<u><u>\$ 558,503,889</u></u>	<u><u>\$ 549,560,884</u></u>

### a. Investments in subsidiaries

Subsidiaries consisted of the following:

Subsidiaries	Principal Activities	Place of Incorporation and Operation	Carrying Amount		% of Ownership and Voting Rights Held by the Company	
			December 31, 2019	December 31, 2018	December 31, 2019	December 31, 2018
TSMC Global Ltd. (TSMC Global)	Investment activities	Tortola, British Virgin Islands	\$ 397,737,270	\$ 393,577,931	100%	100%
TSMC China Company Limited (TSMC China)	Manufacturing, selling, testing and computer-aided design of integrated circuits and other semiconductor devices	Shanghai, China	57,289,154	55,466,911	100%	100%
TSMC Partners, Ltd. (TSMC Partners)	Investing in companies involved in the design, manufacture, and other related business in the semiconductor industry and other investment activities	Tortola, British Virgin Islands	53,388,267	52,339,094	100%	100%
TSMC Nanjing Company Limited (TSMC Nanjing)	Manufacturing, selling, testing and computer-aided design of integrated circuits and other semiconductor devices	Nanjing, China	21,364,939	20,601,413	100%	100%
TSMC North America	Selling and marketing of integrated circuits and other semiconductor devices	San Jose, California, U.S.A.	4,569,825	4,269,393	100%	100%

(Continued)

Subsidiaries	Principal Activities	Place of Incorporation and Operation	Carrying Amount		% of Ownership and Voting Rights Held by the Company	
			December 31, 2019	December 31, 2018	December 31, 2019	December 31, 2018
VisEra Technologies Company Ltd. (VisEra Tech)	Engaged in manufacturing electronic spare parts and in researching, developing, designing, manufacturing, selling, packaging and testing of color filter	Hsinchu, Taiwan	\$ 4,541,741	\$ 4,531,929	87%	87%
TSMC Europe B.V. (TSMC Europe)	Customer service and supporting activities	Amsterdam, the Netherlands	462,479	445,828	100%	100%
VentureTech Alliance Fund III, L.P. (VTAF III)	Investing in new start-up technology companies	Cayman Islands	231,504	194,660	98%	98%
TSMC Japan Limited (TSMC Japan)	Customer service and supporting activities	Yokohama, Japan	142,620	141,136	100%	100%
VentureTech Alliance Fund II, L.P. (VTAF II)	Investing in new start-up technology companies	Cayman Islands	75,095	128,758	98%	98%
TSMC Korea Limited (TSMC Korea)	Customer service and supporting activities	Seoul, Korea	40,727	40,966	100%	100%
TSMC Solar Europe GmbH	Selling of solar related products and providing customer service	Hamburg, Germany	— -	(20,106)	-	100%
			<u>\$ 539,843,621</u>	<u>\$ 531,717,913</u>		

(Concluded)

To lower the hedging cost, in 2018, the Company increased its investment in TSMC Global for the amount of NT\$62,272,080 thousand. This project was approved by the Investment Commission, Ministry of Economic Affairs, R.O.C. (MOEA).

In 2018, the Company increased its investment in TSMC Nanjing for the amount of NT\$2,361,320 thousand. This project was approved by the Investment Commission, MOEA.

TSMC Solar Europe GmbH has completed the liquidation procedures in March 2019.

#### b. Investments in associates

Associates consisted of the following:

Name of Associate	Principal Activities	Place of Incorporation and Operation	Carrying Amount		% of Ownership and Voting Rights Held by the Company	
			December 31, 2019	December 31, 2018	December 31, 2019	December 31, 2018
Vanguard International Semiconductor Corporation (VIS)	Manufacturing, selling, packaging, testing and computer-aided design of integrated circuits and other semiconductor devices and the manufacturing and design service of masks	Hsinchu, Taiwan	\$ 9,027,572	\$ 9,006,126	28%	28%
Systems on Silicon Manufacturing Company Pte Ltd. (SSMC)	Manufacturing and selling of integrated circuits and other semiconductor devices	Singapore	6,502,174	5,772,815	39%	39%
Xintec Inc. (Xintec)	Wafer level chip size packaging and wafer level post passivation interconnection service	Taoyuan, Taiwan	1,846,145	1,764,607	41%	41%
Global Unichip Corporation (GUC)	Researching, developing, manufacturing, testing and marketing of integrated circuits	Hsinchu, Taiwan	1,284,377	1,299,423	35%	35%
			<u>\$ 18,660,268</u>	<u>\$ 17,842,971</u>		

As of December 31, 2019 and 2018, no investments in associates are individually material to the Company. Please refer to the parent company only statements of comprehensive income for recognition of share of both profit (loss) and other comprehensive income (loss) of associates that are not individually material.

The market prices of the investments accounted for using the equity method in publicly traded stocks calculated by the closing price at the end of the reporting period are summarized as follows. The closing price represents the quoted price in active markets, the level 1 fair value measurement.

Name of Associate	December 31, 2019	December 31, 2018
VIS	\$ 36,812,923	\$ 27,621,298
GUC	\$ 11,251,774	\$ 9,617,699
Xintec	\$ 8,958,195	\$ 3,783,585

## 12. PROPERTY, PLANT AND EQUIPMENT

2019

	December 31, 2019
Assets used by the Company	\$ 1,310,882,220
Assets subject to operating leases	18,414
	<u>\$ 1,310,900,634</u>

### a. Assets used by the Company

	Land	Buildings	Machinery and Equipment	Office Equipment	Equipment under Installation and Construction in Progress	Total
<u>Cost</u>						
Balance at January 1, 2019	\$ 3,212,000	\$ 381,150,802	\$ 2,585,629,465	\$ 43,722,686	\$ 171,277,329	\$ 3,184,992,282
Additions	-	20,149,613	173,199,951	6,908,814	355,119,486	555,377,864
Disposals or retirements	-	(158,970)	(21,635,299)	(986,625)	-	(22,780,894)
Transfers from right-of-use assets	-	-	619,779	-	-	619,779
Balance at December 31, 2019	<u>\$ 3,212,000</u>	<u>\$ 401,141,445</u>	<u>\$ 2,737,813,896</u>	<u>\$ 49,644,875</u>	<u>\$ 526,396,815</u>	<u>\$ 3,718,209,031</u>
<u>Accumulated depreciation and impairment</u>						
Balance at January 1, 2019	\$ -	\$ 198,301,715	\$ 1,931,489,635	\$ 29,950,916	\$ -	\$ 2,159,742,266
Additions	-	24,077,824	235,731,567	5,392,188	-	265,201,579
Disposals or retirements	-	(144,402)	(16,206,228)	(985,679)	-	(17,336,309)
Transfers from right-of-use assets	-	-	20,659	-	-	20,659
Reversal of impairment	-	-	(301,384)	-	-	(301,384)
Balance at December 31, 2019	<u>\$ -</u>	<u>\$ 222,235,137</u>	<u>\$ 2,150,734,249</u>	<u>\$ 34,357,425</u>	<u>\$ -</u>	<u>\$ 2,407,326,811</u>
Carrying amounts at December 31, 2019	<u>\$ 3,212,000</u>	<u>\$ 178,906,308</u>	<u>\$ 587,079,647</u>	<u>\$ 15,287,450</u>	<u>\$ 526,396,815</u>	<u>\$ 1,310,882,220</u>

The significant part of the Company's buildings includes main plants, mechanical and electrical power equipment and clean rooms, and the related depreciation is calculated using the estimated useful lives of 20 years, 10 years and 10 years, respectively.

In the first quarter of 2019, the Company recognized a reversal of impairment loss of NT\$301,384 thousand due to redeployment of certain idle machinery and equipment. Such reversal of impairment loss was recognized in other operating income and expenses.

b. Assets subject to operating leases

	<b>Buildings</b>
<u>Cost</u>	
Balance at January 1, 2019	<u>\$ 494,582</u>
Balance at December 31, 2019	<u>\$ 494,582</u>
<u>Accumulated depreciation</u>	
Balance at January 1, 2019	\$ 457,657
Additions	<u>18,511</u>
Balance at December 31, 2019	<u>\$ 476,168</u>
Carrying amounts at December 31, 2019	<u>\$ 18,414</u>

Operating leases relate to leases of buildings with lease terms between 1 to 2 years. The lessees do not have purchase options to acquire the assets at the expiry of the lease periods.

The maturity analysis of operating lease payments receivable for the buildings is as follows:

	<b>December 31, 2019</b>					
<u>Year 1</u>	<u>\$ 1,458</u>					
<u>2018</u>	<u>Land</u>	<u>Buildings</u>	<u>Machinery and Equipment</u>	<u>Office Equipment</u>	<u>Equipment under Installation and Construction in Progress</u>	<u>Total</u>
<u>Cost</u>						
Balance at January 1, 2018	\$ 3,212,000	\$ 357,391,050	\$ 2,369,226,722	\$ 39,403,217	\$ 144,776,878	\$ 2,914,009,867
Additions	-	24,665,225	231,468,189	5,036,411	26,500,451	287,670,276
Disposals or retirements	<u>-</u>	<u>(410,891)</u>	<u>(15,065,446)</u>	<u>(716,942)</u>	<u>-</u>	<u>(16,193,279)</u>
Balance at December 31, 2018	<u>\$ 3,212,000</u>	<u>\$ 381,645,384</u>	<u>\$ 2,585,629,465</u>	<u>\$ 43,722,686</u>	<u>\$ 171,277,329</u>	<u>\$ 3,185,486,864</u>
<u>Accumulated depreciation and impairment</u>						
Balance at January 1, 2018	\$ -	\$ 176,623,784	\$ 1,695,482,201	\$ 25,547,912	\$ -	\$ 1,897,653,897
Additions	-	22,534,543	246,686,584	5,119,413	-	274,340,540
Disposals or retirements	<u>-</u>	<u>(398,955)</u>	<u>(11,102,618)</u>	<u>(716,409)</u>	<u>-</u>	<u>(12,217,982)</u>
Impairment	<u>-</u>	<u>-</u>	<u>423,468</u>	<u>-</u>	<u>-</u>	<u>423,468</u>
Balance at December 31, 2018	<u>\$ -</u>	<u>\$ 198,759,372</u>	<u>\$ 1,931,489,635</u>	<u>\$ 29,950,916</u>	<u>\$ -</u>	<u>\$ 2,160,199,923</u>
Carrying amounts at December 31, 2018	<u>\$ 3,212,000</u>	<u>\$ 182,886,012</u>	<u>\$ 654,139,830</u>	<u>\$ 13,771,770</u>	<u>\$ 171,277,329</u>	<u>\$ 1,025,286,941</u>

The significant part of the Company's buildings includes main plants, mechanical and electrical power equipment and clean rooms, and the related depreciation is calculated using the estimated useful lives of 20 years, 10 years and 10 years, respectively.

For the year ended December 31, 2018, the Company recognized an impairment loss of NT\$423,468 thousand for certain machinery and equipment that was assessed to have no future use, and the recoverable amount of certain machinery and equipment was nil. Such impairment loss was recognized in other operating income and expenses.

### 13. LEASE ARRANGEMENTS

2019

a. Right-of-use assets

	<b>December 31, 2019</b>
<u>Carrying amounts</u>	
Land	\$ 13,830,199
Buildings	402,836
Machinery and equipment	775,809
Office equipment	<u>21,176</u>
	<u>\$ 15,030,020</u>
	<b>Year Ended December 31, 2019</b>
Additions to right-of-use assets	<u>\$ 639,879</u>
	<b>Year Ended December 31, 2019</b>
Depreciation of right-of-use assets	
Land	\$ 944,052
Buildings	105,873
Machinery and equipment	1,184,374
Office equipment	<u>10,154</u>
	<u>\$ 2,244,453</u>
Income from subleasing right-of-use assets (classified under other operating income and expenses, net)	<u>\$ 44,796</u>
b. Lease liabilities	
	<b>December 31, 2019</b>
<u>Carrying amounts</u>	
Current portion (classified under accrued expenses and other current liabilities)	\$ 1,843,556
Noncurrent portion	<u>13,300,263</u>
	<u>\$ 15,143,819</u>

Ranges of discount rates for lease liabilities are as follows:

	<b>December 31, 2019</b>
Land	0.67%-0.94%
Buildings	0.67%-0.71%
Machinery and equipment	3.24%
Office equipment	0.64%-0.71%

c. Material terms of right-of-use assets

The Company leases land and buildings mainly for the use of plants and offices with lease terms of 2 to 22 years. The lease contracts for land located in the R.O.C. specify that lease payments will be adjusted every 2 years on the basis of changes in announced land value prices. The Company does not have purchase options to acquire the leasehold land and buildings at the end of the lease terms.

The Company leases machinery and equipment for use in operation with lease terms of 2 years. The Company has purchase options to acquire leasehold machinery and equipment at the end of the lease terms.

d. Subleases of right-of-use assets

The Company subleases its right-of-use assets for buildings under operating leases with lease terms of 1 year.

The maturity analysis of lease payments receivable under operating subleases is as follows:

	<b>December 31, 2019</b>
Year 1	<u>\$ 50,862</u>
e. Other lease information	
	<b>Year Ended December 31, 2019</b>
Expenses relating to short-term leases	<u>\$ 4,991,637</u>
Expenses relating to variable lease payments not included in the measurement of lease liabilities	<u>\$ 158,375</u>
	<b>Year Ended December 31, 2019</b>
Total cash outflow for leases	<u>\$ 7,324,585</u>

2018

The Company's major operating leases are arrangements on several parcels of land and machinery and equipment.

The Company expensed the lease payments as follows:

	<b>Year Ended December 31, 2018</b>
Minimum lease payments	<u>\$ 3,773,364</u>

Future minimum lease payments under non-cancellable operating leases are as follows:

	<b>December 31, 2018</b>
Not later than 1 year	\$ 5,510,729
Later than 1 year and not later than 5 years	4,957,770
Later than 5 years	<u>8,253,382</u>
	<u><u>\$ 18,721,881</u></u>

#### 14. INTANGIBLE ASSETS

	Goodwill	Technology License Fees	Software and System Design Costs	Patent and Others	Total
<u>Cost</u>					
Balance at January 1, 2019	\$ 1,567,756	\$ 10,921,844	\$ 29,140,011	\$ 7,607,537	\$ 49,237,148
Additions	-	4,879,562	3,639,706	663,509	9,182,777
Disposals or retirements	<u>-</u>	<u>-</u>	<u>(260,904)</u>	<u>-</u>	<u>(260,904)</u>
Balance at December 31, 2019	<u><u>\$ 1,567,756</u></u>	<u><u>\$ 15,801,406</u></u>	<u><u>\$ 32,518,813</u></u>	<u><u>\$ 8,271,046</u></u>	<u><u>\$ 58,159,021</u></u>
<u>Accumulated amortization and impairment</u>					
Balance at January 1, 2019	\$ -	\$ 8,703,391	\$ 22,863,319	\$ 5,240,508	\$ 36,807,218
Additions	-	1,066,834	3,610,902	661,150	5,338,886
Disposals or retirements	<u>-</u>	<u>-</u>	<u>(258,527)</u>	<u>-</u>	<u>(258,527)</u>
Balance at December 31, 2019	<u><u>\$ -</u></u>	<u><u>\$ 9,770,225</u></u>	<u><u>\$ 26,215,694</u></u>	<u><u>\$ 5,901,658</u></u>	<u><u>\$ 41,887,577</u></u>
Carrying amounts at December 31, 2019	<u><u>\$ 1,567,756</u></u>	<u><u>\$ 6,031,181</u></u>	<u><u>\$ 6,303,119</u></u>	<u><u>\$ 2,369,388</u></u>	<u><u>\$ 16,271,444</u></u>
<u>Cost</u>					
Balance at January 1, 2018	\$ 1,567,756	\$ 10,388,175	\$ 24,963,709	\$ 5,590,392	\$ 42,510,032
Additions	-	533,669	4,361,894	2,017,145	6,912,708
Disposals or retirements	<u>-</u>	<u>-</u>	<u>(185,592)</u>	<u>-</u>	<u>(185,592)</u>
Balance at December 31, 2018	<u><u>\$ 1,567,756</u></u>	<u><u>\$ 10,921,844</u></u>	<u><u>\$ 29,140,011</u></u>	<u><u>\$ 7,607,537</u></u>	<u><u>\$ 49,237,148</u></u>
<u>Accumulated amortization and impairment</u>					
Balance at January 1, 2018	\$ -	\$ 7,639,775	\$ 20,282,457	\$ 4,717,673	\$ 32,639,905
Additions	-	1,063,616	2,766,396	522,835	4,352,847
Disposals or retirements	<u>-</u>	<u>-</u>	<u>(185,534)</u>	<u>-</u>	<u>(185,534)</u>
Balance at December 31, 2018	<u><u>\$ -</u></u>	<u><u>\$ 8,703,391</u></u>	<u><u>\$ 22,863,319</u></u>	<u><u>\$ 5,240,508</u></u>	<u><u>\$ 36,807,218</u></u>
Carrying amounts at December 31, 2018	<u><u>\$ 1,567,756</u></u>	<u><u>\$ 2,218,453</u></u>	<u><u>\$ 6,276,692</u></u>	<u><u>\$ 2,367,029</u></u>	<u><u>\$ 12,429,930</u></u>

The Company's goodwill has been tested for impairment at the end of the annual reporting period and the recoverable amount is determined based on the value in use. The value in use was calculated based on the cash flow forecast from the financial budgets covering the future five-year period, and the Company used annual discount rates of 8.0% and 9.0% in its test of impairment as of December 31, 2019 and 2018, respectively, to reflect the relevant specific risk in the cash-generating unit.

For the years ended December 31, 2019 and 2018, the Company did not recognize any impairment loss on goodwill.

## 15. SHORT-TERM LOANS

	December 31, 2019	December 31, 2018
Unsecured loans	\$ 118,522,290	\$ 88,754,640
Related parties unsecured loans	<u>29,988,000</u>	<u>3,227,700</u>
	<u>\$ 148,510,290</u>	<u>\$ 91,982,340</u>
Original loan content		
US\$ (in thousands)	\$ 3,370,000	\$ 2,715,000
EUR (in thousands)	1,410,000	242,000
Annual interest rate	0%-2.22%	0.01%-3.22%
Maturity date	Due by July 2020	Due by April 2019

The borrowing rates from loans between the Company and related parties should be determined by mutual consent as the loan are repayable on related parties' demand.

## 16. BONDS PAYABLE

	December 31, 2019	December 31, 2018
Domestic unsecured bonds	\$ 56,900,000	\$ 91,800,000
Less: Current portion	<u>(31,800,000)</u>	<u>(34,900,000)</u>
	<u>\$ 25,100,000</u>	<u>\$ 56,900,000</u>

The major terms of domestic unsecured bonds are as follows:

Issuance	Tranche	Issuance Period	Total Amount	Coupon Rate	Repayment and Interest Payment
100-1	B	September 2011 to September 2018	\$ 7,500,000	1.63%	Bullet repayment; interest payable annually
100-2	B	January 2012 to January 2019	7,000,000	1.46%	The same as above
101-1	B	August 2012 to August 2019	9,000,000	1.40%	The same as above
101-2	B	September 2012 to September 2019	9,000,000	1.39%	The same as above

(Continued)

<b>Issuance</b>	<b>Tranche</b>	<b>Issuance Period</b>	<b>Total Amount</b>	<b>Coupon Rate</b>	<b>Repayment and Interest Payment</b>
101-3	-	October 2012 to October 2022	\$ 4,400,000	1.53%	Bullet repayment; interest payable annually
101-4	A	January 2013 to January 2018	10,600,000	1.23%	The same as above
	B	January 2013 to January 2020	10,000,000	1.35%	The same as above
	C	January 2013 to January 2023	3,000,000	1.49%	The same as above
102-1	A	February 2013 to February 2018	6,200,000	1.23%	The same as above
	B	February 2013 to February 2020	11,600,000	1.38%	The same as above
	C	February 2013 to February 2023	3,600,000	1.50%	The same as above
102-2	A	July 2013 to July 2020	10,200,000	1.50%	The same as above
	B	July 2013 to July 2023	3,500,000	1.70%	The same as above
102-3	B	August 2013 to August 2019	8,500,000	1.52%	The same as above
102-4	C	September 2013 to March 2019	1,400,000	1.60%	Bullet repayment; interest payable annually (interest for the six months prior to maturity will accrue on the basis of actual days and be repayable at maturity)
	D	September 2013 to March 2021	2,600,000	1.85%	The same as above
	E	September 2013 to March 2023	5,400,000	2.05%	The same as above
	F	September 2013 to September 2023	2,600,000	2.10%	Bullet repayment; interest payable annually
(Concluded)					

## 17. RETIREMENT BENEFIT PLANS

### a. Defined contribution plans

The plan under the R.O.C. Labor Pension Act (the “Act”) is deemed a defined contribution plan. Pursuant to the Act, the Company has made monthly contributions equal to 6% of each employee’s monthly salary to employees’ pension accounts. Accordingly, the Company recognized expenses of NT\$2,063,508 thousand and NT\$2,028,928 thousand for the years ended December 31, 2019 and 2018, respectively.

b. Defined benefit plans

The Company has defined benefit plans under the R.O.C. Labor Standards Law that provide benefits based on an employee's length of service and average monthly salary for the six-month period prior to retirement. The Company contributes an amount equal to 2% of salaries paid each month to their respective pension funds (the Funds), which are administered by the Labor Pension Fund Supervisory Committee (the Committee) and deposited in the Committee's name in the Bank of Taiwan. Before the end of each year, the Company assesses the balance in the Funds. If the amount of the balance in the Funds is inadequate to pay retirement benefits for employees who conform to retirement requirements in the next year, the Company is required to fund the difference in one appropriation that should be made before the end of March of the next year. The Funds are operated and managed by the government's designated authorities; as such, the Company does not have any right to intervene in the investments of the Funds.

Amounts recognized in respect of these defined benefit plans were as follows:

	<b>Years Ended December 31</b>	
	<b>2019</b>	<b>2018</b>
Current service cost	\$ 135,645	\$ 137,758
Net interest expense	<u>123,951</u>	<u>144,108</u>
Components of defined benefit costs recognized in profit or loss	<u>259,596</u>	<u>281,866</u>
Remeasurement on the net defined benefit liability:		
Return on plan assets (excluding amounts included in net interest expense)	(124,344)	(71,288)
Actuarial loss (gain) arising from experience adjustments	(438,009)	334,630
Actuarial gain arising from changes in demographic assumptions	(233,239)	-
Actuarial loss arising from changes in financial assumptions	<u>541,697</u>	<u>597,820</u>
Components of defined benefit costs recognized in other comprehensive income	<u>(253,895)</u>	<u>861,162</u>
Total	<u>\$ 5,701</u>	<u>\$ 1,143,028</u>

The pension costs of the aforementioned defined benefit plans were recognized in profit or loss by the following categories:

	<b>Years Ended December 31</b>	
	<b>2019</b>	<b>2018</b>
Cost of revenue	\$ 157,845	\$ 177,772
Research and development expenses	72,686	79,143
General and administrative expenses	25,063	20,591
Marketing expenses	<u>4,002</u>	<u>4,360</u>
	<u>\$ 259,596</u>	<u>\$ 281,866</u>

The amounts arising from the defined benefit obligation of the Company were as follows:

	<b>December 31, 2019</b>	<b>December 31, 2018</b>
Present value of defined benefit obligation	\$ 13,484,090	\$ 13,662,684
Fair value of plan assets	<u>(4,301,594)</u>	<u>(4,011,279)</u>
Net defined benefit liability	<u>\$ 9,182,496</u>	<u>\$ 9,651,405</u>

Movements in the present value of the defined benefit obligation were as follows:

	<b>Years Ended December 31</b>	
	<b>2019</b>	<b>2018</b>
Balance, beginning of year	\$ 13,662,684	\$ 12,774,593
Current service cost	135,645	137,758
Interest expense	175,401	207,804
Remeasurement:		
Actuarial loss (gain) arising from experience adjustments	(438,009)	334,630
Actuarial gain arising from changes in demographic assumptions	(233,239)	-
Actuarial loss arising from changes in financial assumptions	541,697	597,820
Benefits paid from plan assets	(344,131)	(274,326)
Benefits paid directly by the Company	<u>(15,958)</u>	<u>(115,595)</u>
Balance, end of year	<u>\$ 13,484,090</u>	<u>\$ 13,662,684</u>

Movements in the fair value of the plan assets were as follows:

	<b>Years Ended December 31</b>	
	<b>2019</b>	<b>2018</b>
Balance, beginning of year	\$ 4,011,279	\$ 3,923,889
Interest income	51,450	63,696
Remeasurement:		
Return on plan assets (excluding amounts included in net interest expense)	124,344	71,288
Contributions from employer	458,652	226,732
Benefits paid from plan assets	<u>(344,131)</u>	<u>(274,326)</u>
Balance, end of year	<u>\$ 4,301,594</u>	<u>\$ 4,011,279</u>

The fair value of the plan assets by major categories at the end of reporting period was as follows:

	<b>December 31, 2019</b>	<b>December 31, 2018</b>
Cash	\$ 713,204	\$ 756,126
Equity instruments	2,313,828	2,148,040
Debt instruments	<u>1,274,562</u>	<u>1,107,113</u>
	<u>\$ 4,301,594</u>	<u>\$ 4,011,279</u>

The actuarial valuations of the present value of the defined benefit obligation were carried out by qualified actuaries. The principal assumptions of the actuarial valuation were as follows:

	<b>Measurement Date</b>	
	<b>December 31, 2019</b>	<b>December 31, 2018</b>
Discount rate	0.90%	1.30%
Future salary increase rate	3.00%	3.00%

Through the defined benefit plans under the R.O.C. Labor Standards Law, the Company is exposed to the following risks:

- 1) Investment risk: The pension funds are invested in equity and debt securities, bank deposits, etc. The investment is conducted at the discretion of the government's designated authorities or under the mandated management. However, under the R.O.C. Labor Standards Law, the rate of return on assets shall not be less than the average interest rate on a two-year time deposit published by the local banks and the government is responsible for any shortfall in the event that the rate of return is less than the required rate of return.
- 2) Interest risk: A decrease in the government bond interest rate will increase the present value of the defined benefit obligation; however, this will be partially offset by an increase in the return on the debt investments of the plan assets.

Assuming a hypothetical decrease in interest rate at the end of the reporting period contributed to a decrease of 0.5% in the discount rate and all other assumptions were held constant, the present value of the defined benefit obligation would increase by NT\$724,963 thousand and NT\$921,750 thousand as of December 31, 2019 and 2018, respectively.

- 3) Salary risk: The present value of the defined benefit obligation is calculated by reference to the future salaries of plan participants. As such, an increase in the salary of the plan participants will increase the present value of the defined benefit obligation.

Assuming the expected salary rate increases by 0.5% at the end of the reporting period and all other assumptions were held constant, the present value of the defined benefit obligation would increase by NT\$706,502 thousand and NT\$901,629 thousand as of December 31, 2019 and 2018, respectively.

The sensitivity analysis presented above may not be representative of the actual change in the defined benefit obligation as it is unlikely that the change in assumptions would occur in isolation of one another as some of the assumptions may be correlated.

Furthermore, in presenting the above sensitivity analysis, the present value of the defined benefit obligation has been calculated using the projected unit credit method at the end of the reporting period, which is the same as that applied in calculating the defined benefit obligation liability.

The Company expects to make contributions of NT\$230,864 thousand to the defined benefit plans in the next year starting from December 31, 2019. The weighted average duration of the defined benefit obligation is 10 years.

## 18. GUARANTEE DEPOSITS

	December 31, 2019	December 31, 2018
Capacity guarantee	\$ 1,499,400	\$ 9,289,628
Others	<u>191,352</u>	<u>205,020</u>
	<u><u>\$ 1,690,752</u></u>	<u><u>\$ 9,494,648</u></u>
Current portion (classified under accrued expenses and other current liabilities)	\$ 1,520,306	\$ 6,148,000
Noncurrent portion	<u>170,446</u>	<u>3,346,648</u>
	<u><u>\$ 1,690,752</u></u>	<u><u>\$ 9,494,648</u></u>

Some of guarantee deposits were refunded to customers by offsetting related accounts receivable.

## 19. EQUITY

### a. Capital stock

	December 31, 2019	December 31, 2018
Authorized shares (in thousands)	<u>28,050,000</u>	<u>28,050,000</u>
Authorized capital	<u>\$ 280,500,000</u>	<u>\$ 280,500,000</u>
Issued and paid shares (in thousands)	<u>25,930,380</u>	<u>25,930,380</u>
Issued capital	<u>\$ 259,303,805</u>	<u>\$ 259,303,805</u>

A holder of issued common shares with par value of NT\$10 per share is entitled to vote and to receive dividends.

The authorized shares include 500,000 thousand shares allocated for the exercise of employee stock options.

As of December 31, 2019, 1,065,122 thousand ADSs of the Company were traded on the NYSE. The number of common shares represented by the ADSs was 5,325,610 thousand shares (one ADS represents five common shares).

### b. Capital surplus

	December 31, 2019	December 31, 2018
Additional paid-in capital	\$ 24,184,939	\$ 24,184,939
From merger	22,804,510	22,804,510
From convertible bonds	8,892,847	8,892,847
From share of changes in equities of subsidiaries	121,843	121,473
From share of changes in equities of associates	302,234	282,820
Donations	<u>33,336</u>	<u>29,343</u>
	<u><u>\$ 56,339,709</u></u>	<u><u>\$ 56,315,932</u></u>

Under the relevant laws, the capital surplus generated from donations and the excess of the issuance price over the par value of capital stock (including the stock issued for new capital, mergers and convertible bonds) may be used to offset a deficit; in addition, when the Company has no deficit, such capital surplus may be distributed as cash dividends or stock dividends up to a certain percentage of the Company's paid-in capital. The capital surplus from share of changes in equities of subsidiaries and associates and dividend of a claim extinguished by a prescription may be used to offset a deficit; however, when generated from issuance of restricted shares for employees, such capital surplus may not be used for any purpose.

### c. Retained earnings and dividend policy

The amendments to the Company's Articles of Incorporation had been approved by the Company's shareholders in its meeting held on June 5, 2019, which stipulate that earnings distribution may be made on a quarterly basis after the close of each quarter. Distribution of earnings by way of cash dividends should be approved by the Company's Board of Directors and reported to the Company's shareholders in its meeting.

The Company's amended Articles of Incorporation provide that, when allocating earnings, the Company shall first estimate and reserve the taxes to be paid, offset its losses, set aside a legal capital reserve at 10% of the remaining earnings (until the accumulated legal capital reserve equals the Company's paid-in

capital), then set aside a special capital reserve in accordance with relevant laws or regulations or as requested by the authorities in charge. Any balance left over shall be allocated according to relevant laws and the Company's Articles of Incorporation.

The Company's Articles of Incorporation also provide that profits of the Company may be distributed by way of cash dividend and/or stock dividend. However, distribution of earnings shall be made preferably by way of cash dividend. Distribution of earnings may also be made by way of stock dividend, provided that the ratio for stock dividend shall not exceed 50% of the total distribution.

The reserve may be used to offset a deficit, or be distributed as dividends in cash or stocks for the portion in excess of 25% of the paid-in capital if the Company incurs no loss.

Pursuant to existing regulations, the Company is required to set aside additional special capital reserve equivalent to the net debit balance of the other components of stockholders' equity, such as the accumulated balance of foreign currency translation reserve, unrealized valuation gain or loss from fair value through other comprehensive income financial assets, unrealized valuation gain or loss from available-for-sale financial assets, gain or loss from changes in fair value of hedging instruments in cash flow hedges, etc. For the subsequent decrease in the deduction amount to stockholders' equity, any special reserve appropriated may be reversed to the extent that the net debit balance reverses.

The appropriations of 2018 and 2017 earnings have been approved by the Company's shareholders in its meetings held on June 5, 2019 and June 5, 2018, respectively. The appropriations and cash dividends per share were as follows:

	Cash Dividends Per Share (NT\$)			
	Appropriation of Earnings			
	For Fiscal Year 2018	For Fiscal Year 2017	For Fiscal Year 2018	For Fiscal Year 2017
Legal capital reserve	\$ 35,113,088	\$ 34,311,148		
Special capital reserve	\$ (11,459,458)	\$ 26,907,527		
Cash dividends to shareholders	\$207,443,044	\$207,443,044	\$8.0	\$8.0

The appropriations of 2019 earnings for each quarter have been approved by the Company's Board of Directors in its meeting. The appropriations and cash dividends per share were as follows:

Resolution date of TSMC's Board of Directors in its meeting	Fourth Quarter of 2019	Third Quarter of 2019	Second Quarter of 2019	First Quarter of 2019
	February 11, 2020	November 12, 2019	August 13, 2019	June 5, 2019
Special capital reserve	\$ 16,893,073	\$ 3,289,166	\$ (3,338,190)	\$ (4,723,939)
Cash dividends to shareholders	\$ 64,825,951	\$ 64,825,951	\$ 64,825,951	\$ 51,860,761
Cash dividends per share(NT\$)	\$ 2.5	\$ 2.5	\$ 2.5	\$ 2.0

d. Others

Changes in others were as follows:

	Year Ended December 31, 2019				
	Foreign Currency Translation Reserve	Unrealized Gain (Loss) on Financial Assets at FVTOCI	Gain (Loss) on Hedging Instruments	Unearned Stock-Based Employee Compensation	Total
Balance, beginning of year	\$ (12,042,347)	\$ (3,429,324)	\$ 23,601	\$ (1,843)	\$ (15,449,913)
Exchange differences arising on translation of foreign operations	(14,698,117)	-	-	-	(14,698,117)
Unrealized gain (loss) on financial assets at FVTOCI					
Equity instruments	-	121,740	-	-	121,740
Cumulative unrealized gain (loss) of equity instruments transferred to retained earnings due to disposal	-	(162,118)	-	-	(162,118)
Gain (loss) arising on changes in the fair value of hedging instruments	-	-	(109,592)	-	(109,592)
Transferred to initial carrying amount of hedged items	-	-	82,276	-	82,276
Share of other comprehensive income (loss) of subsidiaries and associates	(130,936)	2,767,267	(105)	-	2,636,226
Share of unearned stock-based employee compensation of subsidiaries and associates	-	-	-	1,653	1,653
Income tax effect	-	9,476	-	-	9,476
Balance, end of year	<u>\$ (26,871,400)</u>	<u>\$ (692,959)</u>	<u>\$ (3,820)</u>	<u>\$ (190)</u>	<u>\$ (27,568,369)</u>

	Year Ended December 31, 2018				
	Foreign Currency Translation Reserve	Unrealized Gain (Loss) on Financial Assets at FVTOCI	Gain (Loss) on Hedging Instruments	Unearned Stock-Based Employee Compensation	Total
Balance, beginning of year	\$ (26,697,680)	\$ (524,915)	\$ 4,226	\$ (10,290)	\$ (27,228,659)
Exchange differences arising on translation of foreign operations	14,578,483	-	-	-	14,578,483
Unrealized gain (loss) on financial assets at FVTOCI					
Equity instruments	-	(1,189,957)	-	-	(1,189,957)
Cumulative unrealized gain (loss) of equity instruments transferred to retained earnings due to disposal	-	1,193,056	-	-	1,193,056
Gain (loss) arising on changes in the fair value of hedging instruments	-	-	40,975	-	40,975
Transferred to initial carrying amount of hedged items	-	-	(22,162)	-	(22,162)
Share of other comprehensive income (loss) of subsidiaries and associates	76,850	(2,999,336)	-	-	(2,922,486)
Share of unearned stock-based employee compensation of subsidiaries and associates	-	-	-	8,447	8,447
Income tax effect	-	91,828	562	-	92,390
Balance, end of year	<u>\$ (12,042,347)</u>	<u>\$ (3,429,324)</u>	<u>\$ 23,601</u>	<u>\$ (1,843)</u>	<u>\$ (15,449,913)</u>

The aforementioned other equity includes the changes in other equities of the Company and the Company's share of its subsidiaries and associates.

## 20. NET REVENUE

- a. Disaggregation of revenue from contracts with customers

Product	<b>Years Ended December 31</b>	
	<b>2019</b>	<b>2018</b>
Wafer	\$ 921,095,318	\$ 906,992,422
Others	<u>138,551,475</u>	<u>116,933,291</u>

Geography	<b>Years Ended December 31</b>	
	<b>2019</b>	<b>2018</b>
Taiwan	\$ 84,255,256	\$ 78,260,773
United States	628,365,912	626,493,249
China	208,101,401	175,794,228
Europe, the Middle East and Africa	67,568,157	71,068,438
Japan	57,468,605	58,125,879
Others	<u>13,887,462</u>	<u>14,183,146</u>

\$1,059,646,793    \$1,023,925,713

The Company categorized the net revenue mainly based on the countries where the customers are headquartered.

Platform	<b>Years Ended December 31</b>	
	<b>2019</b>	<b>2018</b>
Smartphone	\$ 518,553,492	\$ 462,957,802
High Performance Computing	312,770,702	339,165,302
Internet of Things	85,508,427	64,622,380
Automotive	47,451,547	51,477,572
Digital Consumer Electronics	53,214,200	58,168,903
Others	<u>42,148,425</u>	<u>47,533,754</u>

\$1,059,646,793    \$1,023,925,713

Resolution	<b>Years Ended December 31</b>	
	<b>2019</b>	<b>2018</b>
7-nanometer	\$ 245,690,772	\$ 81,146,571
10-nanometer	22,860,307	96,600,008
16-nanometer	191,214,471	186,415,724
20-nanometer	9,357,161	23,412,787
28-nanometer	147,286,987	177,484,309
40/45-nanometer	92,227,266	101,481,881
65-nanometer	68,263,047	75,734,952
90-nanometer	25,296,617	36,543,823
0.11/0.13 micron	22,639,549	20,638,247
0.15/0.18 micron	76,565,220	80,886,264
0.25 micron and above	<u>19,693,921</u>	<u>26,647,856</u>

Wafer revenue                          \$ 921,095,318    \$ 906,992,422

Starting the first quarter of 2019, the Company reported its net revenue breakdown by platform, instead of by application. The Company believes this change better represents the Company's results.

b. Contract balances

	<b>December 31, 2019</b>	<b>December 31, 2018</b>	<b>January 1, 2018</b>
Contract liabilities (classified under accrued expenses and other current liabilities)	<u>\$ 4,095,915</u>	<u>\$ 2,740,649</u>	<u>\$ 31,078,331</u>

The changes in the contract liability balances primarily result from the timing difference between the satisfaction of performance obligation and the customer's payment.

The Company recognized revenue from the beginning balance of contract liability, which amounted to NT\$2,192,221 thousand and NT\$30,742,181 thousand for the years ended December 31, 2019 and 2018, respectively.

c. Refund liabilities

Estimated sales returns and other allowances is made and adjusted based on historical experience and the consideration of varying contractual terms, which amounted to NT\$33,893,735 thousand and NT\$53,382,673 thousand for the years ended December 31, 2019 and 2018, respectively. As of December 31, 2019 and 2018, the aforementioned refund liabilities amounted to NT\$17,673,937 thousand and NT\$21,199,032 thousand (classified under accrued expenses and other current liabilities), respectively.

## 21. OTHER OPERATING INCOME AND EXPENSES, NET

	<b>Years Ended December 31</b>	
	<b>2019</b>	<b>2018</b>
Loss on disposal or retirement of property, plant and equipment, net	\$ (582,289)	\$ (557,598)
Reversal of impairment loss (impairment loss) on property, plant and equipment	301,384	(423,468)
Others	<u>129,675</u>	<u>(687,168)</u>
	<u><u>\$ (151,230)</u></u>	<u><u>\$ (1,668,234)</u></u>

## 22. OTHER INCOME

	<b>Years Ended December 31</b>	
	<b>2019</b>	<b>2018</b>
Interest income		
Bank deposits	\$ 1,998,705	\$ 1,845,471
Financial assets at amortized cost	<u>4,172</u>	<u>1,731</u>
	<u>2,002,877</u>	<u>1,847,202</u>
Dividend income	<u>177,374</u>	<u>157,905</u>
	<u><u>\$ 2,180,251</u></u>	<u><u>\$ 2,005,107</u></u>

### 23. FINANCE COSTS

	<b>Years Ended December 31</b>	
	<b>2019</b>	<b>2018</b>
Interest expense		
Bank loans	\$ 1,869,335	\$ 1,417,287
Corporate bonds	1,139,935	1,485,486
Lease liabilities	181,390	-
Related parties	454	681
Others	<u>495</u>	<u>-</u>
	<u><u>495</u></u>	<u><u>-</u></u>
	<u><u>\$ 3,191,609</u></u>	<u><u>\$ 2,903,454</u></u>

### 24. OTHER GAINS AND LOSSES, NET

	<b>Years Ended December 31</b>	
	<b>2019</b>	<b>2018</b>
Loss on financial instruments at FVTPL, net		
Mandatorily measured at FVTPL	\$ (1,361,538)	\$ (1,498,856)
Gain on disposal of investments accounted for using equity method, net	15,200	-
Other gains (losses), net	<u>277,765</u>	<u>130,530</u>
	<u><u>\$ (1,068,573)</u></u>	<u><u>\$ (1,368,326)</u></u>

### 25. INCOME TAX

#### a. Income tax expense recognized in profit or loss

Income tax expense consisted of the following:

	<b>Years Ended December 31</b>	
	<b>2019</b>	<b>2018</b>
Current income tax expense		
Current tax expense recognized in the current year	\$ 44,184,422	\$ 50,511,247
Income tax adjustments on prior years	224,691	(963,356)
Other income tax adjustments	<u>135,056</u>	<u>149,771</u>
	<u><u>44,544,169</u></u>	<u><u>49,697,662</u></u>
Deferred income tax benefit		
Effect of tax rate changes	-	(1,466,706)
The origination and reversal of temporary differences	<u>(1,062,618)</u>	<u>(3,163,687)</u>
	<u><u>(1,062,618)</u></u>	<u><u>(4,630,393)</u></u>
Income tax expense recognized in profit or loss	<u><u>\$ 43,481,551</u></u>	<u><u>\$ 45,067,269</u></u>

A reconciliation of income before income tax and income tax expense recognized in profit or loss was as follows:

	<b>Years Ended December 31</b>	
	<b>2019</b>	<b>2018</b>
Income before tax	<u>\$ 388,745,219</u>	<u>\$ 396,198,153</u>
Income tax expense at the statutory rate	\$ 77,749,044	\$ 79,239,631
Tax effect of adjusting items:		
Nondeductible (deductible) items in determining taxable income	(4,124,417)	2,636,232
Tax-exempt income	(39,808,121)	(54,234,074)
Additional income tax under the Alternative Minimum Tax Act	10,367,916	21,455,854
Additional income tax on unappropriated earnings	5,903,794	7,420,479
Effect of tax rate changes on deferred income tax	-	(1,466,706)
The origination and reversal of temporary differences	(1,062,618)	(3,163,687)
Income tax credits	<u>(5,903,794)</u>	<u>(6,006,875)</u>
	43,121,804	45,880,854
Income tax adjustments on prior years	224,691	(963,356)
Other income tax adjustments	<u>135,056</u>	<u>149,771</u>
Income tax expense recognized in profit or loss	<u>\$ 43,481,551</u>	<u>\$ 45,067,269</u>

Under the amendment to the R.O.C Statute of Industrial Innovation in 2019, the amounts of unappropriated earnings in 2018 and thereafter used for building or purchasing specific assets or technologies can qualify for deduction when computing the income tax on unappropriated earnings.

In 2018, the Income Tax Law in the R.O.C. was amended and, starting from 2018, the corporate income tax rate was adjusted from 17% to 20%. In addition, the tax rate for 2018 unappropriated earnings was reduced from 10% to 5%.

b. Income tax expense recognized in other comprehensive income

	<b>Years Ended December 31</b>	
	<b>2019</b>	<b>2018</b>
Deferred income tax benefit (expense)		
Related to remeasurement of defined benefit obligation	\$ (30,468)	\$ 103,339
Related to unrealized gain/loss on investments in equity instruments at FVTOCI	9,476	91,828
Related to gain/loss on cash flow hedges	<u>-</u>	<u>562</u>
	<u>\$ (20,992)</u>	<u>\$ 195,729</u>

c. Deferred income tax balance

The analysis of deferred income tax assets and liabilities was as follows:

	<b>December 31, 2019</b>	<b>December 31, 2018</b>	
Deferred income tax assets			
Temporary differences			
Depreciation	\$ 12,927,764	\$ 11,177,890	
Refund liability	2,120,873	2,543,884	
Net defined benefit liability	1,016,248	1,084,874	
Unrealized loss on inventories	437,327	723,835	
Investments in equity instruments at FVTOCI	65,667	56,191	
Others	<u>160,743</u>	<u>-</u>	
	<u><u>\$ 16,728,622</u></u>	<u><u>\$ 15,586,674</u></u>	
Deferred income tax liabilities			
Temporary differences			
Unrealized exchange gains	\$ (333,606)	\$ (61,677)	
Others	<u>-</u>	<u>(171,607)</u>	
	<u><u>\$ (333,606)</u></u>	<u><u>\$ (233,284)</u></u>	
	<b>Year Ended December 31, 2019</b>		
	<b>Recognized in</b>		
	<b>Balance, Beginning of Year</b>	<b>Other Comprehensive Income</b>	<b>Balance, End of Year</b>
Deferred income tax assets			
Temporary differences			
Depreciation	\$ 11,177,890	\$ 1,749,874	\$ -
Refund liability	2,543,884	(423,011)	2,120,873
Net defined benefit liability	1,084,874	(38,158)	(30,468)
Unrealized loss on inventories	723,835	(286,508)	437,327
Investments in equity instruments at FVTOCI	56,191	-	65,667
Others	<u>-</u>	<u>9,476</u>	<u>160,743</u>
	<u><u>\$ 15,586,674</u></u>	<u><u>\$ 1,162,940</u></u>	<u><u>\$ (20,992)</u></u>
	<u><u>\$ 16,728,622</u></u>		
Deferred income tax liabilities			
Temporary differences			
Unrealized exchange gains	\$ (61,677)	\$ (271,929)	\$ -
Others	<u>(171,607)</u>	<u>171,607</u>	<u>-</u>
	<u><u>\$ (233,284)</u></u>	<u><u>\$ (100,322)</u></u>	<u><u>\$ (333,606)</u></u>

	Year Ended December 31, 2018			
	Recognized in			
Balance, Beginning of Year	Profit or Loss	Other Comprehensive Income	Balance, End of Year	
Deferred income tax assets				
Temporary differences				
Depreciation	\$ 7,668,535	\$ 3,509,355	\$ -	\$ 11,177,890
Refund liability	1,580,979	962,905	-	2,543,884
Net defined benefit liability	975,324	6,211	103,339	1,084,874
Unrealized loss on inventories	604,635	119,200	-	723,835
Investments in equity instruments at FVTOCI				
	<u>-</u>	<u>-</u>	<u>56,191</u>	<u>56,191</u>
	<u><u>\$ 10,829,473</u></u>	<u><u>\$ 4,597,671</u></u>	<u><u>\$ 159,530</u></u>	<u><u>\$ 15,586,674</u></u>
Deferred income tax liabilities				
Temporary differences				
Unrealized exchange gains	\$ (169,480)	\$ 107,803	\$ -	\$ (61,677)
Investments in equity instruments at FVTOCI	(95,421)	-	95,421	-
Others	<u>(37,304)</u>	<u>(75,081)</u>	<u>(59,222)</u>	<u>(171,607)</u>
	<u><u>\$ (302,205)</u></u>	<u><u>\$ 32,722</u></u>	<u><u>\$ 36,199</u></u>	<u><u>\$ (233,284)</u></u>

- d. The deductible temporary differences for which no deferred income tax assets have been recognized

As of December 31, 2019 and 2018, the aggregate deductible temporary differences for which no deferred income tax assets have been recognized amounted to NT\$33,445,504 thousand and NT\$20,060,918 thousand, respectively.

- e. Unused tax-exemption information

As of December 31, 2019, the profits generated from the following projects of the Company are exempt from income tax for a five-year period:

#### Tax-exemption Period

Construction and expansion of 2009	2018 to 2022
------------------------------------	--------------

- f. The information of unrecognized deferred income tax liabilities associated with investments

As of December 31, 2019 and 2018, the aggregate taxable temporary differences associated with investments in subsidiaries not recognized as deferred income tax liabilities amounted to NT\$131,085,673 thousand and NT\$112,893,001 thousand, respectively.

- g. Income tax examination

The tax authorities have examined income tax returns of the Company through 2017. All investment tax credit adjustments assessed by the tax authorities have been recognized accordingly.

## 26. EARNINGS PER SHARE

	<b>Years Ended December 31</b>	
	<b>2019</b>	<b>2018</b>
Basic EPS	\$ 13.32	\$ 13.54
Diluted EPS	<u>\$ 13.32</u>	<u>\$ 13.54</u>

EPS is computed as follows:

	<b>Amounts (Numerator)</b>	<b>Number of Shares (Denominator) (In Thousands)</b>	<b>EPS (NT\$)</b>
<b><u>Year Ended December 31, 2019</u></b>			
Basic/Diluted EPS			
Net income available to common shareholders	<u>\$ 345,263,668</u>	<u>25,930,380</u>	<u>\$13.32</u>
<b><u>Year Ended December 31, 2018</u></b>			
Basic/Diluted EPS			
Net income available to common shareholders	<u>\$ 351,130,884</u>	<u>25,930,380</u>	<u>\$13.54</u>

## 27. ADDITIONAL INFORMATION OF EXPENSES BY NATURE

	<b>Years Ended December 31</b>	
	<b>2019</b>	<b>2018</b>
a. Depreciation of property, plant and equipment and right-of-use assets		
Recognized in cost of revenue	\$ 243,160,463	\$ 251,292,565
Recognized in operating expenses	24,285,569	23,020,118
Recognized in other operating income and expenses	<u>18,511</u>	<u>27,857</u>
	<u>\$267,464,543</u>	<u>\$274,340,540</u>
b. Amortization of intangible assets		
Recognized in cost of revenue	\$ 2,971,336	\$ 2,018,702
Recognized in operating expenses	<u>2,367,550</u>	<u>2,334,145</u>
	<u>\$ 5,338,886</u>	<u>\$ 4,352,847</u>
c. Research and development costs expensed as incurred	<u>\$ 90,482,815</u>	<u>\$ 84,944,461</u>

	<b>Years Ended December 31</b>	
	<b>2019</b>	<b>2018</b>
d. Employee benefits expenses		
Post-employment benefits		
Defined contribution plans	\$ 2,063,508	\$ 2,028,928
Defined benefit plans	<u>259,596</u>	<u>281,866</u>
	2,323,104	2,310,794
Other employee benefits	<u>94,236,265</u>	<u>93,694,021</u>
	<u><u>\$ 96,559,369</u></u>	<u><u>\$ 96,004,815</u></u>
Employee benefits expense summarized by function		
Recognized in cost of revenue	\$ 58,502,618	\$ 57,733,597
Recognized in operating expenses	<u>38,056,751</u>	<u>38,271,218</u>
	<u><u>\$ 96,559,369</u></u>	<u><u>\$ 96,004,815</u></u>

According to the Company's Articles of Incorporation, the Company shall allocate compensation to directors and profit sharing bonus to employees of the Company not more than 0.3% and not less than 1% of annual profits during the period, respectively.

The Company accrued profit sharing bonus to employees based on a percentage of net income before income tax, profit sharing bonus to employees and compensation to directors during the period, which amounted to NT\$23,165,745 thousand and NT\$23,570,040 thousand for the years ended December 31, 2019 and 2018, respectively; compensation to directors was expensed based on estimated amount payable. If there is a change in the proposed amounts after the annual parent company only financial statements are authorized for issue, the differences are recorded as a change in accounting estimate.

The Company's profit sharing bonus to employees and compensation to directors in the amounts of NT\$23,165,745 thousand and NT\$360,404, thousand in cash for 2019, respectively, profit sharing bonus to employees and compensation to directors in the amounts of NT\$23,570,040 thousand and NT\$349,272 thousand in cash for 2018, respectively, and profit sharing bonus to employees and compensation to directors in the amounts of NT\$23,019,082 thousand and NT\$368,919 thousand in cash for 2017, respectively, had been approved by the Board of Directors of the Company held on February 11, 2020, February 19, 2019 and February 13, 2018, respectively. There is no significant difference between the aforementioned approved amounts and the amounts charged against earnings of 2019, 2018 and 2017, respectively.

The information about the appropriations of the Company's profit sharing bonus to employees and compensation to directors is available at the Market Observation Post System website.

## 28. CASH FLOW INFORMATION

### a. Non-cash transactions

	<b>Years Ended December 31</b>	
	<b>2019</b>	<b>2018</b>
Additions of property, plant and equipment	\$ 555,377,864	\$ 287,670,276
Exchange of assets	(3,287,138)	-
Changes in payables to contractors and equipment suppliers	(101,720,581)	10,406,719
Transferred to initial carrying amount of hedged items	<u>(82,276)</u>	<u>22,162</u>
Payments for acquisition of property, plant and equipment	<u>\$ 450,287,869</u>	<u>\$ 298,099,157</u>
	<b>Years Ended December 31</b>	
	<b>2019</b>	<b>2018</b>
Disposal of property, plant and equipment	\$ 1,286,373	\$ 3,039,237
Changes in other receivables from related parties	(175,900)	1,692,416
Changes in other financial assets	<u>7,865</u>	<u>(24,535)</u>
Proceeds from disposal of property, plant and equipment	<u>\$ 1,118,338</u>	<u>\$ 4,707,118</u>

### b. Reconciliation of liabilities arising from financing activities

	Balance as of January 1, 2019	Financing Cash Flow	<b>Non-cash changes</b>			Balance as of December 31, 2019
			Foreign Exchange Movement	Leases Modifications	Other Changes (Note)	
Short-term loans	\$ 91,982,340	\$ 59,615,602	\$ (3,087,652)	\$ -	\$ -	\$ 148,510,290
Guarantee deposits	9,494,648	19,002	1,674	-	(7,824,572)	1,690,752
Lease liabilities	17,758,578	(2,811,698)	(17,489)	33,038	181,390	15,143,819
Bonds payable	<u>91,800,000</u>	<u>(34,900,000)</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>56,900,000</u>
Total	<u><u>\$ 211,035,566</u></u>	<u><u>\$ 21,922,906</u></u>	<u><u>\$ (3,103,467)</u></u>	<u><u>\$ 33,038</u></u>	<u><u>\$ (7,643,182)</u></u>	<u><u>\$ 222,244,861</u></u>
	Balance as of January 1, 2018	Financing Cash Flow	<b>Non-cash changes</b>			Balance as of December 31, 2018
			Foreign Exchange Movement	Other Changes (Note)		
Short-term loans	\$ 63,766,850	\$ 27,154,770	\$ 1,060,720	\$ -	\$ 91,982,340	
Guarantee deposits	13,629,122	1,504,809	396,617	(6,035,900)	9,494,648	
Bonds payable	<u>116,100,000</u>	<u>(24,300,000)</u>	<u>-</u>	<u>-</u>	<u>91,800,000</u>	
Total	<u><u>\$ 193,495,972</u></u>	<u><u>\$ 4,359,579</u></u>	<u><u>\$ 1,457,337</u></u>	<u><u>\$ (6,035,900)</u></u>	<u><u>\$ 193,276,988</u></u>	

Note: Other changes include guarantee deposits refunded to customers by offsetting related accounts receivable and financial cost of lease liabilities.

## 29. CAPITAL MANAGEMENT

The Company requires significant amounts of capital to build and expand its production facilities and acquire additional equipment. In consideration of the industry dynamics, the Company manages its capital in a manner to ensure that it has sufficient and necessary financial resources to fund its working capital needs, capital asset purchases, research and development activities, dividend payments, debt service requirements and other business requirements associated with its existing operations over the next 12 months.

## 30. FINANCIAL INSTRUMENTS

### a. Categories of financial instruments

	December 31, 2019	December 31, 2018
Financial assets		
FVTPL (Note 1)	\$ 27,481	\$ 54,115
FVTOCI (Note 2)	4,132,975	5,126,829
Hedging financial assets	3,504	23,497
Amortized cost (Note 3)	<u>272,886,863</u>	<u>365,119,060</u>
	<u>\$ 277,050,823</u>	<u>\$ 370,323,501</u>
Financial liabilities		
FVTPL (Note 4)	\$ 982,302	\$ 30,232
Hedging financial liabilities	1,798	1,941
Amortized cost (Note 5)	<u>553,905,061</u>	<u>310,265,696</u>
	<u>\$ 554,889,161</u>	<u>\$ 310,297,869</u>

Note 1: Financial assets mandatorily measured at FVTPL.

Note 2: Including notes and accounts receivable (net) and equity investments.

Note 3: Including cash and cash equivalents, financial assets at amortized cost, notes and accounts receivable (including related parties), other receivables and refundable deposits.

Note 4: Held for trading.

Note 5: Including short-term loans, accounts payable (including related parties), payables to contractors and equipment suppliers, cash dividends payable, accrued expenses and other current liabilities, bonds payable and guarantee deposits.

### b. Financial risk management objectives

The Company seeks to ensure that sufficient cost-efficient funding is readily available when needed. The Company manages its exposure to foreign currency risk, interest rate risk, equity price risk, credit risk and liquidity risk with the objective to reduce the potentially adverse effects the market uncertainties may have on its financial performance.

The plans for material treasury activities are reviewed by Audit Committees and/or Board of Directors in accordance with procedures required by relevant regulations or internal controls. During the implementation of such plans, the corporate treasury function must comply with certain treasury procedures that provide guiding principles for overall financial risk management and segregation of duties.

### c. Market risk

The Company is exposed to the financial market risks, primarily changes in foreign currency exchange rates, interest rates and equity investment prices. A portion of these risks is hedged.

### Foreign currency risk

The majority of the Company's revenue is denominated in U.S. dollar and over one-half of its capital expenditures are denominated in currencies other than NT dollar, primarily in U.S. dollar, Japanese yen and Euro. As a result, any significant fluctuations to its disadvantage in exchange rate of NT dollar against such currencies, in particular a weakening of U.S. dollar against NT dollar, would have an adverse impact on the revenue and operating profit as expressed in NT dollar. The Company uses foreign currency derivative contracts, such as currency forwards or currency swaps, to protect against currency exchange rate risks associated with non-NT dollar-denominated assets and liabilities and certain forecasted transactions. The Company utilizes U.S. dollar denominated debt to partially offset currency risk arising from U.S. dollar denominated receivables for balance sheet hedges. These hedges reduce, but do not entirely eliminate, the financial impact on the Company caused by the effect of foreign currency exchange rate movements on the assets and liabilities.

Based on a sensitivity analysis performed on the Company's total monetary assets and liabilities for the years ended December 31, 2019 and 2018, a hypothetical adverse foreign currency exchange rate change of 10% would have decreased its net income by NT\$2,112,450 thousand and NT\$489,326 thousand, respectively, and decreased its other comprehensive income by NT\$107,690 thousand and NT\$315,571 thousand, respectively, after taking into account hedges and offsetting positions.

### Interest rate risk

The Company is exposed to interest rate risks primarily related to its bank deposits and bank loans. Changes in interest rates affect the interest earned on the Company's bank deposits, as well as the interest paid on its bank loans. Because all of the Company's bonds issued are fixed-rate and measured at amortized cost, changes in interest rates would not affect the cash flows and the fair value.

### Other price risk

The Company is exposed to equity price risk arising from financial assets at FVTOCI.

Assuming a hypothetical decrease of 10% in prices of the equity investments at the end of the reporting period for the years ended December 31, 2019 and 2018, the other comprehensive income would have decreased by NT\$77,156 thousand and NT\$130,193 thousand, respectively.

## d. Credit risk management

Credit risk refers to the risk that a counterparty will default on its contractual obligations resulting in financial losses to the Company. The Company is exposed to credit risks from operating activities, primarily trade receivables, and from investing activities, primarily deposits, fixed-income investments and other financial instruments with banks. Credit risk is managed separately for business related and financial related exposures. As of the end of the reporting period, the Company's maximum credit risk exposure is equal to the carrying amount of financial assets.

### Business related credit risk

The Company's trade receivables are from its customers worldwide. The majority of the Company's outstanding trade receivables are not covered by collaterals or guarantees. While the Company has procedures to monitor and manage credit risk exposure on trade receivables, there is no assurance such procedures will effectively eliminate losses resulting from its credit risk. This risk is heightened during periods when economic conditions worsen.

As of December 31, 2019 and 2018, the Company's ten largest customers accounted for 83% and 76% of accounts receivable, respectively. The Company considers the concentration of credit risk for the remaining accounts receivable not material.

### Financial credit risk

The Company mitigates its financial credit risk by selecting counterparties with investment-grade credit ratings and by limiting the exposure to any individual counterparty. The Company regularly monitors and reviews the limit applied to counterparties and adjusts the limit according to market conditions and the credit standing of the counterparties.

The risk management of expected credit loss for financial assets at amortized cost is as follows:

The Company only invests in debt instruments that are rated as investment grade or higher. The credit rating information is supplied by external rating agencies. The Company assesses whether there has been a significant increase in credit risk since initial recognition by reviewing changes in external credit ratings, financial market conditions and material information of the bond issuers.

The Company assesses the 12-month expected credit loss and lifetime expected credit loss based on the probability of default and loss given default provided by external credit rating agencies. The current credit risk assessment policies are as follows:

Category	Description	Basis for Recognizing Expected Credit Loss	Expected Credit Loss Ratio
Performing	Credit rating on trade date and valuation date: (1) Within investment grade (2) Between BB+ and BB-	12 months expected credit loss	0%
Doubtful	Credit rating on trade date and valuation date: (1) From investment grade to non-investment grade (2) From BB+~BB- to B+~CCC-	Lifetime expected credit loss-not credit impaired	-
In default	Credit rating CC or below	Lifetime expected credit loss-credit impaired	-
Write-off	There is evidence indicating that the debtor is in severe financial difficulty and the Company has no realistic prospect of recovery	Amount is written off	-

For the years ended December 31, 2019 and 2018, no expected credit loss was recognized.

#### e. Liquidity risk management

The objective of liquidity risk management is to ensure the Company has sufficient liquidity to fund its business operations over the next 12 months. The Company manages its liquidity risk by maintaining adequate cash and cash equivalent.

The table below summarizes the maturity profile of the Company's financial liabilities based on contractual undiscounted payments, including principal and interest.

	<b>Less Than 1 Year</b>	<b>1-3 Years</b>	<b>3-5 Years</b>	<b>More Than 5 Years</b>	<b>Total</b>
<b><u>December 31, 2019</u></b>					
<b><u>Non-derivative financial liabilities</u></b>					
Short-term loans	\$ 148,550,641	\$ -	\$ -	\$ -	\$ 148,550,641
Accounts payable (including related parties)	41,745,770	-	-	-	41,745,770
Payables to contractors and equipment suppliers	139,754,491	-	-	-	139,754,491
Accrued expenses and other current liabilities	35,651,856	-	-	-	35,651,856
Bonds payable	32,338,853	7,777,715	18,203,601	-	58,320,169
Lease liabilities (including those classified under accrued expenses and other current liabilities)	1,976,891	2,170,171	2,063,855	9,981,523	16,192,440
Guarantee deposits (including those classified under accrued expenses and other current liabilities)	<u>1,520,306</u>	<u>114,945</u>	<u>55,501</u>	<u>-</u>	<u>1,690,752</u>
	<u>401,538,808</u>	<u>10,062,831</u>	<u>20,322,957</u>	<u>9,981,523</u>	<u>441,906,119</u>
<b><u>Derivative financial instruments</u></b>					
Forward exchange contracts					
Outflows	125,580,851	-	-	-	125,580,851
Inflows	(125,114,784)	-	-	-	(125,114,784)
	<u>466,067</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>466,067</u>
	<u>\$ 402,004,875</u>	<u>\$ 10,062,831</u>	<u>\$ 20,322,957</u>	<u>\$ 9,981,523</u>	<u>\$ 442,372,186</u>

Additional information about the maturity analysis for lease liabilities:

	<b>Less than 5 Years</b>	<b>5-10 Years</b>	<b>10-15 Years</b>	<b>15-20 Years</b>	<b>More Than 20 Years</b>
Lease liabilities	<u>\$ 6,210,917</u>	<u>\$ 4,679,991</u>	<u>\$ 3,626,190</u>	<u>\$ 1,600,962</u>	<u>\$ 74,380</u>
<b><u>December 31, 2018</u></b>					
<b><u>Non-derivative financial liabilities</u></b>					
Short-term loans	\$ 92,039,118	\$ -	\$ -	\$ -	\$ 92,039,118
Accounts payable (including related parties)	35,019,044	-	-	-	35,019,044
Payables to contractors and equipment suppliers	41,279,910	-	-	-	41,279,910
Accrued expenses and other current liabilities	40,888,712	-	-	-	40,888,712
Bonds payable	36,039,935	35,340,742	22,979,426	-	94,360,103
Guarantee deposits (including those classified under accrued expenses and other current liabilities)	<u>6,148,000</u>	<u>2,884,933</u>	<u>461,715</u>	<u>-</u>	<u>9,494,648</u>
	<u>251,414,719</u>	<u>38,225,675</u>	<u>23,441,141</u>	<u>-</u>	<u>313,081,535</u>
<b><u>Derivative financial instruments</u></b>					
Forward exchange contracts					
Outflows	35,608,273	-	-	-	35,608,273
Inflows	(35,681,524)	-	-	-	(35,681,524)
	<u>(73,251)</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>(73,251)</u>
	<u>\$ 251,341,468</u>	<u>\$ 38,225,675</u>	<u>\$ 23,441,141</u>	<u>\$ -</u>	<u>\$ 313,008,284</u>

f. Fair value of financial instruments

1) Fair value measurements recognized in the parent company only balance sheets

Fair value measurements are grouped into Levels 1 to 3 based on the degree to which the fair value is observable:

- Level 1 fair value measurements are those derived from quoted prices (unadjusted) in active markets for identical assets or liabilities;
- Level 2 fair value measurements are those derived from inputs other than quoted prices included within Level 1 that are observable for the asset or liability, either directly (i.e. as prices) or indirectly (i.e. derived from prices); and
- Level 3 fair value measurements are those derived from valuation techniques that include inputs for the asset or liability that are not based on observable market data (unobservable inputs).

2) Fair value of financial instruments that are measured at fair value on a recurring basis

Fair value hierarchy

The following table presents the Company's financial assets and liabilities measured at fair value on a recurring basis:

	December 31, 2019		
	Level 1	Level 2	Level 3
			Total
<u>Financial assets at FVTPL</u>			
Mandatorily measured at FVTPL Forward exchange contracts	\$ _____ -	\$ 27,481	\$ _____ -
<u>Financial assets at FVTOCI</u>			
Investments in equity instruments Non-publicly traded equity investments	\$ _____ -	\$ _____ -	\$ 877,110
Notes and accounts receivable, net	\$ _____ -	\$ 3,255,865	\$ _____ -
	\$ _____ -	\$ 3,255,865	\$ 877,110
			\$ 4,132,975
<u>Hedging financial assets</u>			
Cash flow hedges Forward exchange contracts	\$ _____ -	\$ 3,504	\$ _____ -
<u>Financial liabilities at FVTPL</u>			
Held for trading Forward exchange contracts	\$ _____ -	\$ 982,302	\$ _____ -
<u>Hedging financial liabilities</u>			
Cash flow hedges Forward exchange contracts	\$ _____ -	\$ 1,798	\$ _____ -
			\$ 1,798

	December 31, 2018		
	Level 1	Level 2	Level 3
			Total
<u>Financial assets at FVTPL</u>			
Mandatorily measured at FVTPL			
Forward exchange contracts	\$ _____ -	\$ 54,115	\$ _____ -
<u>Financial assets at FVTOCI</u>			
Investments in equity instruments			
Non-publicly traded equity investments	\$ _____ -	\$ _____ -	\$ 963,610
Publicly traded stocks	568,150	-	-
Notes and accounts receivable, net	_____ -	3,595,069	_____ -
	\$ 568,150	\$ 3,595,069	\$ 963,610
			\$ 5,126,829
<u>Hedging financial assets</u>			
Cash flow hedges			
Forward exchange contracts	\$ _____ -	\$ 23,497	\$ _____ -
<u>Financial liabilities at FVTPL</u>			
Held for trading			
Forward exchange contracts	\$ _____ -	\$ 30,232	\$ _____ -
<u>Hedging financial liabilities</u>			
Cash flow hedges			
Forward exchange contracts	\$ _____ -	\$ 1,941	\$ _____ -
<u>Reconciliation of Level 3 fair value measurements of financial assets</u>			
The financial assets measured at Level 3 fair value were equity investments classified as financial assets at FVTOCI. Reconciliations for the years ended December 31, 2019 and 2018 were as follows:			
	Years Ended December 31		
	2019	2018	
Balance, beginning of year	\$ 963,610	\$ 983,590	
Recognized in other comprehensive income	(85,393)	(16,524)	
Disposals and proceeds from return of capital of investments	_____ (1,107)	_____ (3,456)	
Balance, end of year	\$ 877,110	\$ 963,610	

#### Valuation techniques and assumptions used in Level 2 fair value measurement

The fair values of financial assets and financial liabilities are determined as follows:

- Forward exchange contracts are measured using forward exchange rates and the discounted curves that are derived from quoted market prices.
- The fair value of accounts receivables classified as at FVTOCI are determined by the present value of future cash flows based on the discount rate that reflects the credit risk of counterparties.

### Valuation techniques and assumptions used in Level 3 fair value measurement

The fair values of non-publicly traded equity investments are mainly determined by using the asset approach and market approach.

The asset approach takes into account the net asset value measured at the fair value by independent parties.

The market approach takes into account the recent financing activities of investees, the market transaction prices of the similar companies and market conditions.

### 3) Fair value of financial instruments that are not measured at fair value

Except as detailed in the following table, the Company considers that the carrying amounts of financial instruments in the parent company only financial statements that are not measured at fair value approximate their fair values.

#### Fair value hierarchy

The table below sets out the fair value hierarchy for the Company's assets and liabilities which are not required to measure at fair value:

	<b>December 31, 2019</b>	
	<b>Carrying Amount</b>	<b>Level 2 Fair Value</b>
<b>Financial liabilities</b>		
Financial liabilities at amortized costs		
Bonds payable	\$ 56,900,000	\$ 57,739,115
<b>December 31, 2018</b>		
	<b>Carrying Amount</b>	<b>Level 2 Fair Value</b>
<b>Financial assets</b>		
Financial assets at amortized costs		
Commercial paper	\$ 2,294,098	\$ 2,296,188
<b>Financial liabilities</b>		
Financial liabilities at amortized costs		
Bonds payable	\$ 91,800,000	\$ 93,171,255

### Valuation techniques and assumptions used in Level 2 fair value measurement

The fair value of commercial paper is determined by the present value of future cash flows based on the discounted curves that are derived from the quoted market prices.

The fair value of the Company's bonds payable is determined by quoted market prices provided by third party pricing services.

### 31. RELATED PARTY TRANSACTIONS

The significant transactions between the Company and its related parties, other than those disclosed in other notes, are summarized as follows:

- a. Related party name and categories

<b>Related Party Name</b>	<b>Related Party Categories</b>
TSMC Global	Subsidiaries
TSMC China	Subsidiaries
TSMC Nanjing	Subsidiaries
VisEra Tech	Subsidiaries
TSMC North America	Subsidiaries
TSMC Europe	Subsidiaries
TSMC Japan	Subsidiaries
TSMC Korea	Subsidiaries
TSMC Solar Europe GmbH	Subsidiaries
TSMC Design Technology Canada Inc. (TSMC Canada)	Indirect Subsidiaries
TSMC Technology, Inc. (TSMC Technology)	Indirect Subsidiaries
WaferTech, LLC (WaferTech)	Indirect Subsidiaries
GUC	Associates
VIS	Associates
SSMC	Associates
Xintec	Associates
TSMC Education and Culture Foundation	Other related parties
TSMC Charity Foundation	Other related parties

- b. Net revenue

Item	Related Party Name/Categories	<b>Years Ended December 31</b>	
		<b>2019</b>	<b>2018</b>
Net revenue from sale of goods	TSMC North America	\$ 636,441,507	\$ 650,432,820
	Associates	4,052,853	6,762,827
	Other subsidiaries	149,560	150,407
	Other related parties	-	330
		<u>\$ 640,643,920</u>	<u>\$ 657,346,384</u>
Net revenue from royalties	Associates	\$ 183,583	\$ 362,259
	Subsidiaries	64,710	568
		<u>\$ 248,293</u>	<u>\$ 362,827</u>

c. Purchases

	<b>Years Ended December 31</b>	
	<b>2019</b>	<b>2018</b>
<b><u>Related Party Categories</u></b>		
Subsidiaries	\$ 40,419,311	\$ 34,136,678
Associates	<u>6,301,417</u>	<u>8,809,394</u>
	<u>\$ 46,720,728</u>	<u>\$ 42,946,072</u>

d. Receivables from related parties

	<b>December 31, 2019</b>	<b>December 31, 2018</b>
<b><u>Item</u></b>	<b><u>Related Party Name/Categories</u></b>	
Receivables from related parties		
TSMC North America	\$ 81,732,281	\$ 86,057,097
Associates	458,292	375,184
Other subsidiaries	<u>3,928</u>	<u>20,303</u>
	<u>\$ 82,194,501</u>	<u>\$ 86,452,584</u>
Other receivables from related parties		
TSMC North America	\$ 802,726	\$ 1,035,465
TSMC Nanjing	101,559	89,334
Associates	50,450	64,203
Other subsidiaries	<u>13,388</u>	<u>45,660</u>
	<u>\$ 968,123</u>	<u>\$ 1,234,662</u>

e. Payables to related parties

	<b>December 31, 2019</b>	<b>December 31, 2018</b>
<b><u>Item</u></b>	<b><u>Related Party Name/Categories</u></b>	
Payables to related parties		
TSMC China	\$ 1,538,971	\$ 1,299,072
TSMC Nanjing	1,266,002	414,401
WaferTech	1,097,625	1,092,785
Xintec	736,747	649,812
SSMC	487,944	362,564
VIS	153,977	357,080
Other subsidiaries	379,250	363,995
Other associates	41,119	7,043
Other related parties	<u>15,000</u>	<u>-</u>
	<u>\$ 5,716,635</u>	<u>\$ 4,546,752</u>

f. Accrued expenses and other current liabilities

Item	Related Party Name/Categories	December 31, 2019	December 31, 2018
Accrued expenses and other current liabilities	TSMC Nanjing Other subsidiaries	\$ - <u>2,722</u>	\$ 199,638 <u>681</u>
		<u>\$ 2,722</u>	<u>\$ 200,319</u>

g. Disposal of property, plant and equipment

Related Party Name/Categories	Proceeds	
	Years Ended December 31	2019
	2018	2018
TSMC Nanjing Other subsidiaries	\$ 1,096,516 <u>44,095</u>	\$ 2,839,622 <u>25,380</u>
	<u>\$ 1,140,611</u>	<u>\$ 2,865,002</u>
Related Party Name/Categories	Gains	
	Years Ended December 31	2019
	2018	2018
TSMC Nanjing Other subsidiaries	\$ 332,955 <u>67,151</u>	\$ 386,239 <u>64,964</u>
	<u>\$ 400,106</u>	<u>\$ 451,203</u>
Related Party Name/Categories	Deferred Gains (Losses) from Disposal of Property, Plant and Equipment	
	December 31,	December 31,
	2019	2018
TSMC Nanjing Other subsidiaries	\$ (30,731) <u>129,915</u>	\$ 234,810 <u>152,970</u>
	<u>\$ 99,184</u>	<u>\$ 387,780</u>

h. Others

<u>Item</u>	<u>Related Party Name/Categories</u>	<b>Years Ended December 31</b>	
		<b>2019</b>	<b>2018</b>
Manufacturing expenses	Associates Subsidiaries	\$ 2,816,089 <u>35,825</u>	\$ 2,876,216 <u>35,603</u>
		<u>\$ 2,851,914</u>	<u>\$ 2,911,819</u>
Research and development expenses	Subsidiaries Associates	\$ 2,821,204 <u>163,425</u>	\$ 2,407,068 <u>83,145</u>
		<u>\$ 2,984,629</u>	<u>\$ 2,490,213</u>
Marketing expenses - commission	TSMC Europe Other subsidiaries	\$ 439,147 <u>419,920</u>	\$ 463,093 <u>402,973</u>
		<u>\$ 859,067</u>	<u>\$ 866,066</u>
General and administrative expenses	Other related parties Subsidiaries	\$ 120,000 <u>3,423</u>	\$ 120,756 <u>3,426</u>
		<u>\$ 123,423</u>	<u>\$ 124,182</u>

The sales prices and payment terms to related parties were not significantly different from those of sales to third parties. For other related party transactions, price and terms were determined in accordance with mutual agreements.

The Company leased factory and office from associates. The lease terms and prices were both determined in accordance with mutual agreements. The rental expenses were paid to associates monthly; the related expenses were both classified under manufacturing expenses.

The Company deferred the disposal gain or loss derived from sales of property, plant and equipment to related parties using equity method, and then recognized such gain or loss over the depreciable lives of the disposed assets.

i. Compensation of key management personnel

The compensation to directors and other key management personnel for the years ended December 31, 2019 and 2018 were as follows:

	<b>Years Ended December 31</b>	
	<b>2019</b>	<b>2018</b>
Short-term employee benefits	\$ 1,822,806	\$ 1,906,266
Post-employment benefits	<u>2,330</u>	<u>3,041</u>
	<u>\$ 1,825,136</u>	<u>\$ 1,909,307</u>

The compensation to directors and other key management personnel were determined by the Compensation Committee of the Company in accordance with the individual performance and the market trends.

## **32. SIGNIFICANT CONTINGENT LIABILITIES AND UNRECOGNIZED COMMITMENTS**

Significant contingent liabilities and unrecognized commitments of the Company as of the end of the reporting period, excluding those disclosed in other notes, were as follows:

- a. Under a technical cooperation agreement with Industrial Technology Research Institute, the R.O.C. Government or its designee approved by the Company can use up to 35% of the Company's capacity provided the Company's outstanding commitments to its customers are not prejudiced. The term of this agreement is for five years beginning from January 1, 1987 and is automatically renewed for successive periods of five years unless otherwise terminated by either party with one year prior notice. As of December 31, 2019, the R.O.C. Government did not invoke such right.
- b. Under a Shareholders Agreement entered into with Philips and EDB Investments Pte Ltd. on March 30, 1999, the parties formed a joint venture company, SSMC, which is an integrated circuit foundry in Singapore. The Company's equity interest in SSMC was 32%. Nevertheless, in September 2006, Philips spun-off its semiconductor subsidiary which was renamed as NXP B.V. Further, the Company and NXP B.V. purchased all the SSMC shares owned by EDB Investments Pte Ltd. pro rata according to the Shareholders Agreement on November 15, 2006. After the purchase, the Company and NXP B.V. currently own approximately 39% and 61% of the SSMC shares, respectively. The Company and NXP B.V. are required, in the aggregate, to purchase at least 70% of SSMC's capacity, but the Company alone is not required to purchase more than 28% of the capacity. If any party defaults on the commitment and the capacity utilization of SSMC falls below a specific percentage of its capacity, the defaulting party is required to compensate SSMC for all related unavoidable costs. There was no default from the aforementioned commitment as of December 31, 2019.
- c. In February 2019, Innovative Foundry Technologies LLC ("IFT") filed a complaint in the U.S. District Court for the District of Delaware alleging that the Company and TSMC Technology Inc. infringe five U.S. patents. IFT also filed a complaint in the U.S. International Trade Commission (the "ITC") alleging that the Company, TSMC North America, TSMC Technology Inc., and other companies infringe the same patents. The ITC instituted an investigation in March 2019. Both parties agreed to end the dispute and the ITC terminated the investigation in October 2019. The pending litigation in the U.S. District Court for the District of Delaware was dismissed at the same time.
- d. On September 28, 2017, the Company was contacted by the European Commission (the "Commission"), which has asked us for information and documents concerning alleged anti-competitive practices in relation to semiconductor sales. We are cooperating with the Commission to provide the requested information and documents. In light of the fact that this proceeding is still in its preliminary stage, it is premature to predict how the case will proceed, the outcome of the proceeding or its impact.
- e. The Company entered into long-term purchase agreements of material with multiple suppliers. The relative minimum purchase quantity and price are specified in the agreements.
- f. The Company entered into a long-term purchase agreement of equipment. The relative purchase quantity and price are specified in the agreement.
- g. The Company entered into long-term energy purchase agreements with multiple suppliers. The relative purchase period, quantity and price are specified in the agreements.
- h. As of December 31, 2019, the Company provided endorsement guarantees of NT\$2,495,400 thousand to its subsidiary, TSMC North America, in respect of providing endorsement guarantees for office leasing contract.

### **33. EXCHANGE RATE INFORMATION OF FOREIGN-CURRENCY FINANCIAL ASSETS AND LIABILITIES**

The following information was summarized according to the foreign currencies other than the functional currency of the Company. The exchange rates disclosed were used to translate the foreign currencies into the functional currency. The significant financial assets and liabilities denominated in foreign currencies were as follows:

	<b>Foreign Currencies (In Thousands)</b>	<b>Exchange Rate (Note)</b>	<b>Carrying Amount (In Thousands)</b>
<u>December 31, 2019</u>			
<u>Financial assets</u>			
Monetary items			
USD	\$ 4,515,031	29.988	\$ 135,396,753
EUR	2,867	33.653	96,495
JPY	71,980,350	0.2751	19,801,794
<u>Financial liabilities</u>			
Monetary items			
USD	5,874,701	29.988	176,170,537
EUR	2,550,377	33.653	85,827,831
JPY	100,338,589	0.2751	27,603,146
<u>December 31, 2018</u>			
<u>Financial assets</u>			
Monetary items			
USD	4,527,578	30.740	139,177,748
EUR	2,171	35.22	76,462
JPY	235,512	0.2783	65,543
Non-monetary items			
HKD	144,567	3.93	568,150
<u>Financial liabilities</u>			
Monetary items			
USD	4,147,398	30.740	127,491,021
EUR	471,127	35.22	16,593,099
JPY	33,416,236	0.2783	9,299,738

Note: Exchange rate represents the number of N.T. dollars for which one foreign currency could be exchanged.

Please refer to the parent company only statements of comprehensive income for the total of realized and unrealized foreign exchange gain and loss for the years ended December 31, 2019 and 2018, respectively. Since there were varieties of foreign currency transactions of the Company, the Company was unable to disclose foreign exchange gain (loss) towards each foreign currency with significant impact.

#### **34. SIGNIFICANT OPERATION LOSSES**

On January 19, 2019, the Company discovered a wafer contamination issue in a fab in Taiwan caused by a batch of unqualified photoresist materials. After investigation, the Company immediately stopped using the unqualified materials. An estimated loss of NT\$3,400,000 thousand related to this event was recognized in cost of revenue for the three months ended March 31, 2019.

The Company experienced a computer virus outbreak on August 3, 2018, which affected a number of computer systems and fab tools, and consequently impacted wafer production in Taiwan. All the impacted tools have been recovered by August 6, 2018. The Company recognized a loss of NT\$2,596,046 thousand related to this incident for the three months ended September 30, 2018, which was included in cost of revenue.

#### **35. ADDITIONAL DISCLOSURES**

Following are the additional disclosures required by the Securities and Futures Bureau for the Company:

- a. Financings provided: Please see Table 1 attached;
- b. Endorsement/guarantee provided: Please see Table 2 attached;
- c. Marketable securities held (excluding investments in subsidiaries and associates): Please see Table 3 attached;
- d. Marketable securities acquired and disposed of at costs or prices of at least NT\$300 million or 20% of the paid-in capital: Please see Table 4 attached;
- e. Acquisition of individual real estate properties at costs of at least NT\$300 million or 20% of the paid-in capital: Please see Table 5 attached;
- f. Disposal of individual real estate properties at prices of at least NT\$300 million or 20% of the paid-in capital: None;
- g. Total purchases from or sales to related parties of at least NT\$100 million or 20% of the paid-in capital: Please see Table 6 attached;
- h. Receivables from related parties amounting to at least NT\$100 million or 20% of the paid-in capital: Please see Table 7 attached;
- i. Information about the derivative financial instruments transaction: Please see Notes 7 and 8;
- j. Names, locations, and related information of investees over which the Company exercises significant influence (excluding information on investment in mainland China): Please see Table 8 attached;
- k. Information on investment in mainland China
  - 1) The name of the investee in mainland China, the main businesses and products, its issued capital, method of investment, information on inflow or outflow of capital, percentage of ownership, income (losses) of the investee, share of profits/losses of investee, ending balance, amount received as dividends from the investee, and the limitation on investee: Please see Table 9 attached.

- 2) Significant direct or indirect transactions with the investee, its prices and terms of payment, unrealized gain or loss, and other related information which is helpful to understand the impact of investment in mainland China on financial reports: Please see Note 31.

## **36. OPERATING SEGMENTS INFORMATION**

The Company has provided the operating segments disclosure in the consolidated financial statements.

TABLE 1

**Taiwan Semiconductor Manufacturing Company Limited and Investees**  
**FINANCINGS PROVIDED**  
**FOR THE YEAR ENDED DECEMBER 31, 2019**  
**(Amounts in Thousands of New Taiwan Dollars, Unless Specified Otherwise)**

No.	Financing Company	Counter-party	Financial Statement Account	Related Party	Maximum Balance for the Period (Foreign Currencies in Thousands) (Note 3)	Ending Balance (Foreign Currencies in Thousands) (Note 3)	Amount Actually Drawn (Foreign Currencies in Thousands)	Nature for Financing (Note 4)	Transaction Amounts	Reason for Financing (Note 4)	Allowance for Bad Debt	Collateral Item	Value	Financing Limits for Each Borrowing Company (Notes 1 and 2)	Financing Company's total Financing Amount Limits (Notes 1 and 2)
1	TSMC China	TSMC Nanjing	Other receivables from related parties	Yes	\$ 44,497,852 (RMB 7,000,000& US\$ 479,000)	\$ 38,903,568 (RMB 6,000,000& US\$ 436,000)	\$ 24,102,968 (RMB 5,000,000& US\$ 86,000)	1.50~1.96% The need for long-term financing	\$ -	Operating capital	\$ -	-	\$ 57,358,467	\$ 57,358,467	
2	TSMC Global	TSMC	Other receivables from related parties	Yes	\$ 44,982,000 (US\$ 1,500,000)	\$ 29,988,000 (US\$ 1,000,000)	\$ 0.00% (US\$ 1,000,000)	0.00% The need for short-term financing	\$ -	Operating capital	\$ -	-	\$ 397,737,270	\$ 397,737,270	

Note 1: The total amount available for lending purpose shall not exceed the net worth of TSMC China. The total amount for lending to a company for funding for a short-term period shall not exceed ten percent (10%) of the net worth of TSMC China. In addition, the total amount lendable to any one borrower shall be no more than thirty percent (30%) of the borrower's net worth. The above restriction does not apply to the subsidiaries whose voting shares are 100% owned, directly or indirectly, by TSMC. However, the total amount lendable to any such subsidiary of TSMC shall not exceed forty percent (40%) of the net worth of TSMC China. When there is a lending for funding needs by TSMC China to TSMC, or to the subsidiaries whose voting shares are 100% owned, directly or indirectly, by TSMC, which are not located in Taiwan, the lending will not be subject to the restriction set forth in the above paragraph. Notwithstanding the foregoing, the aggregate amount available for lending to such borrowers and the total amount lendable to each of such borrowers still shall not exceed the net worth of TSMC China.

Note 2: The total amount available for lending purpose shall not exceed the net worth of TSMC Global. The total amount for lending to a company for funding for a short-term period shall not exceed ten percent (10%) of the net worth of TSMC Global. In addition, the total amount lendable to any one borrower shall be no more than thirty percent (30%) of the borrower's net worth. While TSMC, or its foreign subsidiaries in which TSMC directly or indirectly holds 100% of the voting shares will not be subject to this restriction, their total borrowing amount still shall not exceed the net worth of TSMC Global. Notwithstanding the foregoing, the aggregate amount for lending to Taiwan companies other than TSMC shall not exceed forty percent (40%) of the net worth of TSMC Global.

Note 3: The maximum balance for the period and ending balance represent the amounts approved by the Board of Directors.

Note 4: The restriction of the term of each loan for funding not exceeding one year shall not apply to inter-company loans for funding between offshore subsidiaries in which the Company holds, directly or indirectly, 100% of the voting shares.

TABLE 2

Taiwan Semiconductor Manufacturing Company Limited and Investees

ENDORSEMENTS/GUARANTEES PROVIDED  
FOR THE YEAR ENDED DECEMBER 31, 2019  
(Amounts in Thousands of New Taiwan Dollars, Unless Specified Otherwise)

No.	Endorsement/ Guarantee Provider	Guaranteed Party	Limits on Endorsement/ Guarantee Amount Provided to Each Guaranteed Party (Notes 1 and 2)	Maximum Balance for the Period (US\$ in Thousands) (Note 3)	Ending Balance (US\$ in Thousands) (Note 3)	Amount Actually Drawn (US\$ in Thousands)	Amount of Endorsement/ Guarantee Colateralized by Properties	Maximum Endorsement/ Guarantee Amount Allowable (Note 2)	Ratio of Accumulated Endorsement/ Guarantee to Net Equity per Latest Financial Statements	Guarantee Provided by Parent Company	Guarantee Provided by A Subsidiary	Guarantee Provided to Subsidiaries in Mainland China
0	TSMC	TSMC North America	Subsidiary	\$ 405,352,531 (US\$ 83,213)	\$ 2,495,400 (US\$ 83,213)	\$ 2,495,400 (US\$ 83,213)	\$ 2,495,400 (US\$ 83,213)	\$ 405,352,531	0.15%	Yes	No	No

Note 1: The total amount of the guarantee provided by TSMC to any individual entity shall not exceed ten percent (10%) of TSMC's net worth, or the net worth of such entity. However, subsidiaries whose voting shares are 100% owned, directly or indirectly, by TSMC are not subject to the above restrictions after the approval of the Board of Directors.

Note 2: The total amount of guarantee shall not exceed twenty-five percent (25%) of TSMC's net worth.

Note 3: The maximum balance for the period and ending balance represent the amounts approved by the Board of Directors.

**Taiwan Semiconductor Manufacturing Company Limited and Investees**  
**MARKETABLE SECURITIES HELD**  
**DECEMBER 31, 2019**  
 (Amounts in Thousands of New Taiwan Dollars, Unless Specified Otherwise)

**TABLE 3**

Held Company Name	Marketable Securities Type and Name	Relationship with the Company	Financial Statement Account	Shares/Units (In Thousands)	Carrying Value (Foreign Currencies in Thousands)	Percentage of Ownership (%)	Fair Value (Foreign Currencies in thousands)		Note
							December 31, 2019	December 31, 2019	
TSMC	Non-publicly traded equity investments United Industrial Gases Co., Ltd.	-	Financial assets at fair value through other comprehensive income	21,230	\$ 468,428	10	\$ 468,428	\$ 318,276	318,276
	Shin-Etsu Handotai Taiwan Co., Ltd.	-	"	10,500	81,529	7	81,529	5,157	5,157
	Global Investment Holding Inc.	-	"	11,124	5,157	2	5,157	2,621	2,621
	W.K. Technology Fund IV	-	"	806	2,621	1	2,621	1,100	1,100
	Crinson Asia Capital	-	"	-	1,100	12	-	-	-
	Horizon Ventures Fund	-	"	-	-	-	-	-	-
TSMC Partners	Convertible bonds Inpria Corporation	-	Financial assets at fair value through Profit or Loss	-	US\$ 4,127	-	US\$ 4,127	-	-
	Non-publicly traded equity investments Shanghai Walden Venture Capital Enterprise	-	Financial assets at fair value through other comprehensive income	-	US\$ 10,380	6	US\$ 10,380	-	-
	China Walden Venture Investments II, L.P.	-	"	-	US\$ 9,474	9	US\$ 9,474	-	-
	China Walden Venture Investments III, L.P.	-	"	-	US\$ 3,298	4	US\$ 3,298	-	-
	Tela Innovations	-	"	10,440	-	25	-	-	-
	Meube Inc.	-	"	6,333	-	12	-	-	-
TSMC Global	Corporate bond Bank of America Corp	-	Financial assets at fair value through other comprehensive income	-	US\$ 46,671	N/A	US\$ 46,671	-	-
	Goldman Sachs Group Inc/The	-	"	-	US\$ 39,686	N/A	US\$ 39,686	-	-
	Morgan Stanley	-	"	-	US\$ 39,419	N/A	US\$ 39,419	-	-
	Citigroup Inc	-	"	-	US\$ 38,637	N/A	US\$ 38,637	-	-
	AbbVie Inc	-	"	-	US\$ 31,425	N/A	US\$ 31,425	-	-
	JPMorgan Chase & Co	-	"	-	US\$ 30,678	N/A	US\$ 30,678	-	-
	AT&T Inc	-	"	-	US\$ 26,140	N/A	US\$ 26,140	-	-
	CVS Health Corp	-	"	-	US\$ 22,242	N/A	US\$ 22,242	-	-
	Bristol-Myers Squibb Co	-	"	-	US\$ 21,666	N/A	US\$ 21,666	-	-
	Mitsubishi UFJ Financial Group Inc	-	"	-	US\$ 21,332	N/A	US\$ 21,332	-	-
	Wells Fargo & Co	-	"	-	US\$ 21,303	N/A	US\$ 21,303	-	-
	HSBC Holdings PLC	-	"	-	US\$ 20,102	N/A	US\$ 20,102	-	-
	Apple Inc	-	"	-	US\$ 19,886	N/A	US\$ 19,886	-	-
	Sumitomo Mitsui Financial Group Inc	-	"	-	US\$ 19,176	N/A	US\$ 19,176	-	-
	Toronto-Dominion Bank/The	-	"	-	US\$ 18,018	N/A	US\$ 18,018	-	-
	Credit Agricole SA/London	-	"	-	US\$ 14,904	N/A	US\$ 14,904	-	-
	Verizon Communications Inc	-	"	-	US\$ 14,058	N/A	US\$ 14,058	-	-
	BNP Paribas SA	-	"	-	US\$ 13,092	N/A	US\$ 13,092	-	-
	UBS Group Funding Switzerland AG	-	"	-	US\$ 12,932	N/A	US\$ 12,932	-	-
	Banco Santander SA	-	"	-	US\$ 12,837	N/A	US\$ 12,837	-	-
	United Technologies Corp	-	"	-	US\$ 12,108	N/A	US\$ 12,108	-	-
	ERAC USA Finance LLC	-	"	-	US\$ 11,904	N/A	US\$ 11,904	-	-
	Banque Federative du Credit Mutual SA	-	"	-	US\$ 11,752	N/A	US\$ 11,752	-	-

(Continued)

Held Company Name	Marketable Securities Type and Name	Relationship with the Company	Financial Statement Account	Shares/Units (In Thousands)	Carrying Value (Foreign Currencies in Thousands)	December 31, 2019 Percentage of Ownership (%)	Fair Value (Foreign Currencies in Thousands)	Note
TSMC Global	American International Group Inc	-	-	-	US\$ 11,423	N/A	US\$ 11,423	
	Equifax Inc	-	Financial assets at fair value through other comprehensive income "	-	US\$ 11,001	N/A	US\$ 11,001	
	Ryder System Inc	"		-	US\$ 10,892	N/A	US\$ 10,892	
	BPCE SA	"		-	US\$ 10,887	N/A	US\$ 10,887	
	BAT Capital Corp	"		-	US\$ 10,843	N/A	US\$ 10,843	
	Reliance Standard Life Global Funding II	"		-	US\$ 10,682	N/A	US\$ 10,682	
	DTE Energy Co	"		-	US\$ 10,681	N/A	US\$ 10,681	
	Hewlett Packard Enterprise Co	"		-	US\$ 10,661	N/A	US\$ 10,661	
	Penske Truck Leasing Co Lp / PTL Finance Corp	"		-	US\$ 10,612	N/A	US\$ 10,612	
	International Business Machines Corp	"		-	US\$ 10,414	N/A	US\$ 10,414	
	Macquarie Group Ltd.	"		-	US\$ 10,344	N/A	US\$ 10,344	
	Mizuho Financial Group Inc	"		-	US\$ 10,307	N/A	US\$ 10,307	
	Skandnaviska Enskilda Banken AB	"		-	US\$ 9,827	N/A	US\$ 9,827	
	Nordea Bank Abp	"		-	US\$ 9,458	N/A	US\$ 9,458	
	NextEra Energy Capital Holdings Inc	"		-	US\$ 9,420	N/A	US\$ 9,420	
	SMBC Aviation Capital Finance DAC	"		-	US\$ 9,414	N/A	US\$ 9,414	
	Fiserv Inc	"		-	US\$ 9,174	N/A	US\$ 9,174	
	Lloyds Banking Group PLC	"		-	US\$ 9,106	N/A	US\$ 9,106	
	Cox Communications Inc	"		-	US\$ 9,062	N/A	US\$ 9,062	
	Western Union Co/ The	"		-	US\$ 8,991	N/A	US\$ 8,991	
	Tyson Foods Inc	"		-	US\$ 8,944	N/A	US\$ 8,944	
	PNC Bank NA	"		-	US\$ 8,913	N/A	US\$ 8,913	
	Suncorp-Metway Ltd	"		-	US\$ 8,869	N/A	US\$ 8,869	
	Bank of Montreal	"		-	US\$ 8,551	N/A	US\$ 8,551	
	Comcast Corp	"		-	US\$ 8,514	N/A	US\$ 8,514	
	Capital One NA	"		-	US\$ 8,484	N/A	US\$ 8,484	
	Midwest Connector Capital Co LLC	"		-	US\$ 8,412	N/A	US\$ 8,412	
	Santander UK PLC	"		-	US\$ 8,272	N/A	US\$ 8,272	
	Scenite Group Trust I / Scenite Group Trust 2	"		-	US\$ 8,248	N/A	US\$ 8,248	
	Metropolitan Life Global Funding I	"		-	US\$ 8,222	N/A	US\$ 8,222	
	Credit Suisse AG/New York NY	"		-	US\$ 8,031	N/A	US\$ 8,031	
	Athena Global Funding	"		-	US\$ 7,999	N/A	US\$ 7,999	
	Societe Generale SA	"		-	US\$ 7,825	N/A	US\$ 7,825	
	NatWest Markets PLC	"		-	US\$ 7,816	N/A	US\$ 7,816	
	Altria Group Inc	"		-	US\$ 7,805	N/A	US\$ 7,805	
	Dominion Energy Gas Holdings LLC	"		-	US\$ 7,681	N/A	US\$ 7,681	
	Air Lease Corp	"		-	US\$ 7,675	N/A	US\$ 7,675	
	Tencent Holdings Ltd	"		-	US\$ 7,612	N/A	US\$ 7,612	
	Microsoft Corp	"		-	US\$ 7,455	N/A	US\$ 7,455	
	BG Energy Capital PLC	"		-	US\$ 7,346	N/A	US\$ 7,346	
	Prudential Funding LLC	"		-	US\$ 7,333	N/A	US\$ 7,333	
	Fox Corp	"		-	US\$ 7,331	N/A	US\$ 7,331	
	BP Capital Markets America Inc	"		-	US\$ 7,280	N/A	US\$ 7,280	
	ANZ/NZ New Zealand Int'l Ltd/London	"		-	US\$ 7,259	N/A	US\$ 7,259	
	Jackson National Life Global Funding	"		-	US\$ 7,203	N/A	US\$ 7,203	
	Huntington Bancshares Inc/OH	"		-	US\$ 7,160	N/A	US\$ 7,160	
	Shire Acquisitions Investments Ireland DAC	"		-	US\$ 6,972	N/A	US\$ 6,972	
	Wells Fargo Bank NA	"		-	US\$ 6,958	N/A	US\$ 6,958	
	New York Life Global Funding	"		-	US\$ 6,947	N/A	US\$ 6,947	
	ING Group NV	"		-	US\$ 6,874	N/A	US\$ 6,874	
	Kinder Morgan Energy Partners LP	"		-	US\$ 6,842	N/A	US\$ 6,842	
	SunTrust Bank/Atlanta GA	"		-	US\$ 6,680	N/A	US\$ 6,680	

(Continued)

Held Company Name	Marketable Securities Type and Name	Relationship with the Company	Financial Statement Account	December 31, 2019		Fair Value (Foreign Currencies in Thousands)	Percentage of Ownership (%)	Note
				Shares/Units (In Thousands)	Carrying Value (Foreign Currencies in Thousands)			
TSMC Global	Daimler Finance North America LLC	-	Financial assets at fair value through other comprehensive income	-	USS 6,536	N/A	USS 6,536	
	Regions Financial Corp	-	"	-	USS 6,384	N/A	USS 6,384	
	Credit Suisse Group Funding Guernsey Ltd	"	"	-	USS 6,344	N/A	USS 6,344	
	General Dynamics Corp	"	"	-	USS 6,297	N/A	USS 6,297	
	Anheuser-Busch InBev Worldwide Inc	"	"	-	USS 6,276	N/A	USS 6,276	
	DNB Bank ASA	"	"	-	USS 6,252	N/A	USS 6,252	
	American Express Co	"	"	-	USS 6,239	N/A	USS 6,239	
	AIG Global Funding	"	"	-	USS 6,199	N/A	USS 6,199	
	Panasonic Corp	"	"	-	USS 6,104	N/A	USS 6,104	
	Canadian Imperial Bank of Commerce	"	"	-	USS 6,036	N/A	USS 6,036	
	Bank of Nova Scotia/The	"	"	-	USS 6,029	N/A	USS 6,029	
	WPP Finance 2010	"	"	-	USS 6,025	N/A	USS 6,025	
	Fortive Corp	"	"	-	USS 6,010	N/A	USS 6,010	
	Royal Bank of Canada	"	"	-	USS 5,983	N/A	USS 5,983	
	Macquarie Bank Ltd	"	"	-	USS 5,969	N/A	USS 5,969	
	Analog Devices Inc	"	"	-	USS 5,958	N/A	USS 5,958	
	Barclays Bank PLC	"	"	-	USS 5,927	N/A	USS 5,927	
	Alabama Power Co	"	"	-	USS 5,848	N/A	USS 5,848	
	Capital One Financial Corp	"	"	-	USS 5,717	N/A	USS 5,717	
	Roper Technologies Inc	"	"	-	USS 5,678	N/A	USS 5,678	
	Iniesa Sampaolo SpA	"	"	-	USS 5,645	N/A	USS 5,645	
	Bayer US Finance II LLC	"	"	-	USS 5,623	N/A	USS 5,623	
	Cigna Corp	"	"	-	USS 5,618	N/A	USS 5,618	
	Sompo International Holdings Ltd	"	"	-	USS 5,595	N/A	USS 5,595	
	Anheuser-Busch InBev Finance Inc	"	"	-	USS 5,510	N/A	USS 5,510	
	Shell International Finance BV	"	"	-	USS 5,475	N/A	USS 5,475	
	Alatama Power Co	"	"	-	USS 5,275	N/A	USS 5,275	
	Takeda Pharmaceutical Co Ltd	"	"	-	USS 5,245	N/A	USS 5,245	
	Laboratory Corp of America Holdings	"	"	-	USS 5,230	N/A	USS 5,230	
	Lloyds Bank PLC	"	"	-	USS 5,202	N/A	USS 5,202	
	CNA Financial Corp	"	"	-	USS 5,173	N/A	USS 5,173	
	Cooperative Rabobank UA	"	"	-	USS 5,124	N/A	USS 5,124	
	BMW US Capital LLC	"	"	-	USS 5,112	N/A	USS 5,112	
	Saudi Arabian Oil Co	"	"	-	USS 5,096	N/A	USS 5,096	
	BRXET Corp	"	"	-	USS 5,041	N/A	USS 5,041	
	Thermo Fisher Scientific Inc	"	"	-	USS 5,029	N/A	USS 5,029	
	Five Corners Funding Trust	"	"	-	USS 4,888	N/A	USS 4,888	
	Ene Finance International NV	"	"	-	USS 4,888	N/A	USS 4,888	
	Vodafone Group PLC	"	"	-	USS 4,807	N/A	USS 4,807	
	Credit Suisse Group AG	"	"	-	USS 4,737	N/A	USS 4,737	
	Standard Chartered PLC	"	"	-	USS 4,717	N/A	USS 4,717	
	Principia Life Global Funding II	"	"	-	USS 4,693	N/A	USS 4,693	
	American Express Credit Corp	"	"	-	USS 4,676	N/A	USS 4,676	
	NiSource Inc	"	"	-	USS 4,583	N/A	USS 4,583	
	ABN AMRO Bank NV	"	"	-	USS 4,574	N/A	USS 4,574	
	Svenska Handelsbanken AB	"	"	-	USS 4,529	N/A	USS 4,529	
	Sempra Energy	"	"	-	USS 4,476	N/A	USS 4,476	
	Kraft Dr Pepper Inc	"	"	-	USS 4,463	N/A	USS 4,463	
	Eversource Energy	"	"	-	USS 4,456	N/A	USS 4,456	
	Welltower Inc	"	"	-	USS 4,444	N/A	USS 4,444	
	Fifth Third Bancorp	"	"	-	USS 4,398	N/A	USS 4,398	
	Trust Bank	"	"	-	USS 4,353	N/A	USS 4,353	

(Continued)

Held Company Name	Marketable Securities Type and Name	Relationship with the Company	Financial Statement Account	Shares/Units (In Thousands)	Carrying Value (Foreign Currencies in Thousands)	December 31, 2019 Percentage of Ownership (%)	Fair Value (Foreign Currencies in Thousands)	Note
TSMC Global	Westpac Banking Corp	-	-	-	US\$ 4,350	N/A	US\$ 4,350	
	Marriott International Inc/MD	-	Financial assets at fair value through other comprehensive income "	-	US\$ 4,334	N/A	US\$ 4,334	
	Duke Energy Corp	"		-	US\$ 4,262	N/A	US\$ 4,262	
	Verisk Analytics Inc	"		-	US\$ 4,200	N/A	US\$ 4,200	
	Husky Energy Inc	"		-	US\$ 4,182	N/A	US\$ 4,182	
	Exxon Corp	"		-	US\$ 4,087	N/A	US\$ 4,087	
	CenterPoint Energy Inc	"		-	US\$ 4,052	N/A	US\$ 4,052	
	Intercontinental Exchange Inc	"		-	US\$ 4,043	N/A	US\$ 4,043	
	Alimentation Couche-Tard Inc	"		-	US\$ 4,003	N/A	US\$ 4,003	
	HCP Inc	"		-	US\$ 3,989	N/A	US\$ 3,989	
	European Bank for Reconstruction & Development	"		-	US\$ 3,973	N/A	US\$ 3,973	
	GE Capital International Funding Co Unlimited Co	"		-	US\$ 3,953	N/A	US\$ 3,953	
	Citizens Bank NA/Providence RI	"		-	US\$ 3,912	N/A	US\$ 3,912	
	BOC Aviation Ltd	"		-	US\$ 3,901	N/A	US\$ 3,901	
	Volkswagen Group of America Finance LLC	"		-	US\$ 3,896	N/A	US\$ 3,896	
	Nationwide Building Society	"		-	US\$ 3,836	N/A	US\$ 3,836	
	MPLX LP	"		-	US\$ 3,795	N/A	US\$ 3,795	
	Monongahela Power Co	"		-	US\$ 3,717	N/A	US\$ 3,717	
	Asian Development Bank	"		-	US\$ 3,628	N/A	US\$ 3,628	
	Charles Schwab Corp/The	"		-	US\$ 3,524	N/A	US\$ 3,524	
	Dominion Energy Inc	"		-	US\$ 3,488	N/A	US\$ 3,488	
	Commonwealth Bank of Australia	"		-	US\$ 3,421	N/A	US\$ 3,421	
	KeyBank NA/Cleveland OH	"		-	US\$ 3,324	N/A	US\$ 3,324	
	WECA Energy Group Inc	"		-	US\$ 3,293	N/A	US\$ 3,293	
	General Electric Co	"		-	US\$ 3,250	N/A	US\$ 3,250	
	Walt Disney Co/The	"		-	US\$ 3,246	N/A	US\$ 3,246	
	ONE Gas Inc	"		-	US\$ 3,224	N/A	US\$ 3,224	
	Boeing Co/The	"		-	US\$ 3,214	N/A	US\$ 3,214	
	Nutrien Ltd	"		-	US\$ 3,188	N/A	US\$ 3,188	
	Hyundai Capital America	"		-	US\$ 3,187	N/A	US\$ 3,187	
	Inter-American Development Bank	"		-	US\$ 3,168	N/A	US\$ 3,168	
	AutoZone Inc	"		-	US\$ 3,167	N/A	US\$ 3,167	
	People's United Financial Inc	"		-	US\$ 3,117	N/A	US\$ 3,117	
	Textron Inc	"		-	US\$ 3,072	N/A	US\$ 3,072	
	McKesson Corp	"		-	US\$ 3,071	N/A	US\$ 3,071	
	Zions Bancorp NA	"		-	US\$ 3,070	N/A	US\$ 3,070	
	Amaren Corp	"		-	US\$ 3,049	N/A	US\$ 3,049	
	Rockwell Collins Inc	"		-	US\$ 3,040	N/A	US\$ 3,040	
	Oncor Electric Delivery Co LLC	"		-	US\$ 3,038	N/A	US\$ 3,038	
	DuPont de Nemours Inc	"		-	US\$ 3,037	N/A	US\$ 3,037	
	Xcel Energy Inc	"		-	US\$ 3,015	N/A	US\$ 3,015	
	Duke Energy Florida LLC	"		-	US\$ 3,002	N/A	US\$ 3,002	
	Cooperative Rabobank UA/NY	"		-	US\$ 2,980	N/A	US\$ 2,980	
	Canadian Natural Resources Ltd	"		-	US\$ 2,921	N/A	US\$ 2,921	
	Reynolds American Inc	"		-	US\$ 2,921	N/A	US\$ 2,921	
	Danske Bank A/S	"		-	US\$ 2,903	N/A	US\$ 2,903	
	MUFG Union Bank NA	"		-	US\$ 2,893	N/A	US\$ 2,893	
	RELEX Capital Inc	"		-	US\$ 2,875	N/A	US\$ 2,875	
	Barrick Gold Corp	"		-	US\$ 2,862	N/A	US\$ 2,862	
	Royal Bank of Scotland Group PLC	"		-	US\$ 2,848	N/A	US\$ 2,848	
	Compass Bank	"		-	US\$ 2,794	N/A	US\$ 2,794	
	Ventas Realty LP	"		-	US\$ 2,771	N/A	US\$ 2,771	

(Continued)

Held Company Name	Marketable Securities Type and Name	Relationship with the Company		Financial Statement Account		Carrying Value (Foreign Currencies in Thousands)	Percentage of Ownership (%)	Fair Value (Foreign Currencies in Thousands)	Note
		Shares/Units (In Thousands)	December 31, 2019	Shares/Units (In Thousands)	December 31, 2019				
TSMC Global	Dow Chemical Co/The	-	-	Financial assets at fair value through other comprehensive income	-	USS 2,740	N/A	USS 2,740	
Public Service Enterprise Group Inc	"	"	"	"	"	USS 2,728	N/A	USS 2,728	
Nuveen Finance LLC	"	"	"	"	"	USS 2,717	N/A	USS 2,717	
John Deere Capital Corp	"	"	"	"	"	USS 2,698	N/A	USS 2,698	
Quest Diagnostics Inc	"	"	"	"	"	USS 2,695	N/A	USS 2,695	
Huntington National Bank/The	"	"	"	"	"	USS 2,668	N/A	USS 2,668	
Newcrest Finance Pty Ltd	"	"	"	"	"	USS 2,668	N/A	USS 2,668	
Enterprise Products Operating LLC	"	"	"	"	"	USS 2,622	N/A	USS 2,622	
Deutsche Telekom International Finance BV	"	"	"	"	"	USS 2,615	N/A	USS 2,615	
Exelon Generation Co LLC	"	"	"	"	"	USS 2,601	N/A	USS 2,601	
AvalonBay Communities Inc	"	"	"	"	"	USS 2,564	N/A	USS 2,564	
GlaxoSmithKline Capital PLC	"	"	"	"	"	USS 2,555	N/A	USS 2,555	
Seven & i Holdings Co Ltd	"	"	"	"	"	USS 2,550	N/A	USS 2,550	
UBS Group AG	"	"	"	"	"	USS 2,540	N/A	USS 2,540	
Barclays PLC	"	"	"	"	"	USS 2,527	N/A	USS 2,527	
Entergy Corp	"	"	"	"	"	USS 2,527	N/A	USS 2,527	
Delta Air Lines 2007-1 Class A Pass Through Trust	"	"	"	"	"	USS 2,524	N/A	USS 2,524	
3M Co	"	"	"	"	"	USS 2,507	N/A	USS 2,507	
Simon Property Group LP	"	"	"	"	"	USS 2,494	N/A	USS 2,494	
Ventas Realty LP / Ventas Capital Corp	"	"	"	"	"	USS 2,450	N/A	USS 2,450	
Northrop Grumman Corp	"	"	"	"	"	USS 2,435	N/A	USS 2,435	
Berkshire Hathaway Energy Co	"	"	"	"	"	USS 2,424	N/A	USS 2,424	
Baidu Inc	"	"	"	"	"	USS 2,374	N/A	USS 2,374	
Berkshire Hathaway Inc	"	"	"	"	"	USS 2,373	N/A	USS 2,373	
Anthem Inc	"	"	"	"	"	USS 2,352	N/A	USS 2,352	
Eastman Chemical Co	"	"	"	"	"	USS 2,307	N/A	USS 2,307	
NBCUniversal Media LLC	"	"	"	"	"	USS 2,269	N/A	USS 2,269	
Cintas Corp No 2	"	"	"	"	"	USS 2,244	N/A	USS 2,244	
Marathon Petroleum Corp	"	"	"	"	"	USS 2,242	N/A	USS 2,242	
Aetna Inc	"	"	"	"	"	USS 2,235	N/A	USS 2,235	
Unum Group	"	"	"	"	"	USS 2,219	N/A	USS 2,219	
National Bank of Canada	"	"	"	"	"	USS 2,209	N/A	USS 2,209	
PSEG Power LLC	"	"	"	"	"	USS 2,193	N/A	USS 2,193	
Southern California Edison Co	"	"	"	"	"	USS 2,175	N/A	USS 2,175	
QUALCOMM Inc	"	"	"	"	"	USS 2,164	N/A	USS 2,164	
US Bank NA/Cincinnati OH	"	"	"	"	"	USS 2,163	N/A	USS 2,163	
Lincoln National Corp	"	"	"	"	"	USS 2,162	N/A	USS 2,162	
American Airlines 2013-2 Class A Pass Through Trust	"	"	"	"	"	USS 2,159	N/A	USS 2,159	
Suncor Energy Inc	"	"	"	"	"	USS 2,122	N/A	USS 2,122	
ASB Bank Ltd	"	"	"	"	"	USS 2,120	N/A	USS 2,120	
Ingersoll-Rand Luxembourg Finance SA	"	"	"	"	"	USS 2,099	N/A	USS 2,099	
Pricoa Global Fund I	"	"	"	"	"	USS 2,015	N/A	USS 2,015	
Oracle Corp	"	"	"	"	"	USS 2,004	N/A	USS 2,004	
CK Hutchison International 16 Ltd	"	"	"	"	"	USS 1,984	N/A	USS 1,984	
Avangrid Inc	"	"	"	"	"	USS 1,960	N/A	USS 1,960	
Bank of New York Mellon Corp/The	"	"	"	"	"	USS 1,956	N/A	USS 1,956	
Kinder Morgan Inc/DE	"	"	"	"	"	USS 1,949	N/A	USS 1,949	

(Continued)

Held Company Name	Marketable Securities Type and Name	Relationship with the Company	Financial Statement Account	December 31, 2019		Fair Value (Foreign Currencies in Thousands)	Percentage of Ownership (%)	Note
				Shares/Units (In Thousands)	Carrying Value (Foreign Currencies in Thousands)			
TSMC Global	CenterPoint Energy Resources Corp	-	-	-	US\$ 1,918	N/A	US\$ 1,918	
	Australia & New Zealand Banking Group Ltd/New York NY	-	Financial assets at fair value through other comprehensive income "	-	US\$ 1,906	N/A	US\$ 1,906	
Kroger Co/The	"	"	"	-	US\$ 1,904	N/A	US\$ 1,904	
BP Capital Markets PLC	"	"	"	-	US\$ 1,900	N/A	US\$ 1,900	
Sydney Airport Finance Co Pty Ltd	"	"	"	-	US\$ 1,886	N/A	US\$ 1,886	
Bank of New Zealand	"	"	"	-	US\$ 1,866	N/A	US\$ 1,866	
Discover Bank	"	"	"	-	US\$ 1,831	N/A	US\$ 1,831	
WestRock RKT LLC	"	"	"	-	US\$ 1,791	N/A	US\$ 1,791	
Philip Morris International Inc	"	"	"	-	US\$ 1,772	N/A	US\$ 1,772	
McCormick & Co Inc/MD	"	"	"	-	US\$ 1,760	N/A	US\$ 1,760	
Equinor ASA	"	"	"	-	US\$ 1,751	N/A	US\$ 1,751	
General Mills Inc	"	"	"	-	US\$ 1,744	N/A	US\$ 1,744	
Public Service Co of Oklahoma	"	"	"	-	US\$ 1,741	N/A	US\$ 1,741	
PPL Capital Funding Inc	"	"	"	-	US\$ 1,722	N/A	US\$ 1,722	
Walgreens Boots Alliance Inc	"	"	"	-	US\$ 1,711	N/A	US\$ 1,711	
Wisconsin Public Service Corp	"	"	"	-	US\$ 1,670	N/A	US\$ 1,670	
ITC Holdings Corp	"	"	"	-	US\$ 1,661	N/A	US\$ 1,661	
Spectra Energy Partners LP	"	"	"	-	US\$ 1,657	N/A	US\$ 1,657	
Toyota Industries Corp	"	"	"	-	US\$ 1,650	N/A	US\$ 1,650	
Mondelez International Holdings Netherlands BV	"	"	"	-	US\$ 1,643	N/A	US\$ 1,643	
Southern Co/The	"	"	"	-	US\$ 1,630	N/A	US\$ 1,630	
Walgreens Boots Alliance Inc	"	"	"	-	US\$ 1,604	N/A	US\$ 1,604	
Brockfield Finance Inc	"	"	"	-	US\$ 1,601	N/A	US\$ 1,601	
UnitedHealth Group Inc	"	"	"	-	US\$ 1,593	N/A	US\$ 1,593	
LyondellBasell Industries NV	"	"	"	-	US\$ 1,572	N/A	US\$ 1,572	
Xylem Inc/NY	"	"	"	-	US\$ 1,572	N/A	US\$ 1,572	
Suntory Holdings Ltd	"	"	"	-	US\$ 1,559	N/A	US\$ 1,559	
Nestle Holdings Inc	"	"	"	-	US\$ 1,538	N/A	US\$ 1,538	
CK Hutchison International 19 Ltd	"	"	"	-	US\$ 1,525	N/A	US\$ 1,525	
NTT Finance Corp	"	"	"	-	US\$ 1,523	N/A	US\$ 1,523	
Trust F/1401	"	"	"	-	US\$ 1,517	N/A	US\$ 1,517	
Activision Blizzard Inc	"	"	"	-	US\$ 1,516	N/A	US\$ 1,516	
Public Service Electric & Gas Co	"	"	"	-	US\$ 1,504	N/A	US\$ 1,504	
KEI Hana Bank	"	"	"	-	US\$ 1,502	N/A	US\$ 1,502	
Guardian Life Global Funding	"	"	"	-	US\$ 1,501	N/A	US\$ 1,501	
Sinopec Group Overseas Development 2015 Ltd	"	"	"	-	US\$ 1,500	N/A	US\$ 1,500	
Georgia Power Co	"	"	"	-	US\$ 1,496	N/A	US\$ 1,496	
Mastercard Inc	"	"	"	-	US\$ 1,496	N/A	US\$ 1,496	
Realty Income Corp	"	"	"	-	US\$ 1,488	N/A	US\$ 1,488	
AIA Group Ltd	"	"	"	-	US\$ 1,481	N/A	US\$ 1,481	
Protective Life Global Funding	"	"	"	-	US\$ 1,461	N/A	US\$ 1,461	
Prudential Financial Inc	"	"	"	-	US\$ 1,458	N/A	US\$ 1,458	
HSBC Bank PLC	"	"	"	-	US\$ 1,438	N/A	US\$ 1,438	
Westlake Chemical Corp	"	"	"	-	US\$ 1,432	N/A	US\$ 1,432	
Texas Eastern Transmission LP	"	"	"	-	US\$ 1,415	N/A	US\$ 1,415	
Daiwa Securities Group Inc	"	"	"	-	US\$ 1,412	N/A	US\$ 1,412	
Citizens Financial Group Inc	"	"	"	-	US\$ 1,410	N/A	US\$ 1,410	
CNOOC Curtis Funding No 1 Pty Ltd	"	"	"	-	US\$ 1,390	N/A	US\$ 1,390	
Baker Hughes a GE Co LLC / Baker Hughes Co-Obligor Inc	"	"	"	-	US\$ 1,387	N/A	US\$ 1,387	
Permud Ricard SA	"	"	"	-	US\$ 1,357	N/A	US\$ 1,357	
Enterprise Financial Inc	"	"	"	-	US\$ 1,355	N/A	US\$ 1,355	
Essex Portfolio LP	"	"	"	-	US\$ 1,343	N/A	US\$ 1,343	
Ontario Teachers' Cadillac Fairview Properties Trust	"	"	"	-	US\$ 1,326	N/A	US\$ 1,326	

(Continued)

Held Company Name	Marketable Securities Type and Name	Relationship with the Company	Financial Statement Account	December 31, 2019		Fair Value (Foreign Currencies in Thousands)	Note
				Shares/Units (In Thousands)	Carrying Value (Foreign Currencies in Thousands)		
TSMC Global	Energy Arkansas LLC	-	-	-	US\$ 1,315	N/A	US\$ 1,315
	JPMorgan Chase Bank NA	-	Financial assets at fair value through other comprehensive income "	-	US\$ 1,304	N/A	US\$ 1,304
	Interpublic Group of Cos Inc/The American Electric Power Co Inc	"		-	US\$ 1,289	N/A	US\$ 1,289
	Santander UK Group Holdings PLC	"		-	US\$ 1,274	N/A	US\$ 1,274
	State Street Corp	"		-	US\$ 1,228	N/A	US\$ 1,228
	Cardinal Health Inc	"		-	US\$ 1,201	N/A	US\$ 1,201
	Aviation Capital Group LLC	"		-	US\$ 1,201	N/A	US\$ 1,201
	Sprint Spectrum Co LLC / Sprint Spectrum Co III LLC	"		-	US\$ 1,193	N/A	US\$ 1,193
	UDR Inc	"		-	US\$ 1,192	N/A	US\$ 1,192
	Regions Bank/Birmingham AL	"		-	US\$ 1,178	N/A	US\$ 1,178
	Magellan Midstream Partners LP	"		-	US\$ 1,162	N/A	US\$ 1,162
	Johnson Controls International plc	"		-	US\$ 1,149	N/A	US\$ 1,149
	Cleveland Electric Illuminating Co/The Trans-Canada PipeLines Ltd	"		-	US\$ 1,144	N/A	US\$ 1,144
	API Pipelines Ltd	"		-	US\$ 1,140	N/A	US\$ 1,140
	National Australia Bank Ltd/New York	"		-	US\$ 1,139	N/A	US\$ 1,139
	Manulife Financial Corp	"		-	US\$ 1,135	N/A	US\$ 1,135
	WP Carey Inc	"		-	US\$ 1,122	N/A	US\$ 1,122
	CMS Energy Corp	"		-	US\$ 1,068	N/A	US\$ 1,068
	Alexandria Real Estate Equities Inc	"		-	US\$ 1,053	N/A	US\$ 1,053
	Union Pacific Corp	"		-	US\$ 1,051	N/A	US\$ 1,051
	Baltimore Gas & Electric Co	"		-	US\$ 1,042	N/A	US\$ 1,042
	Cigna Holding Co	"		-	US\$ 1,037	N/A	US\$ 1,037
	DH Europe Finance II Sarl	"		-	US\$ 1,033	N/A	US\$ 1,033
	Weverhaeuser Co	"		-	US\$ 1,026	N/A	US\$ 1,026
	Entergy Mississippi LLC	"		-	US\$ 1,026	N/A	US\$ 1,026
	Toyota Motor Credit Corp	"		-	US\$ 1,024	N/A	US\$ 1,024
	Continental Airlines 2012-1 Class A Pass Through Trust	"		-	US\$ 1,020	N/A	US\$ 1,020
	Loews Corp	"		-	US\$ 1,020	N/A	US\$ 1,020
	Amazon.com Inc	"		-	US\$ 1,019	N/A	US\$ 1,019
	Toyota Motor Finance Netherlands BV	"		-	US\$ 1,018	N/A	US\$ 1,018
	Corp. Nacional del Cobre de Chile	"		-	US\$ 1,011	N/A	US\$ 1,011
	Republic Services Inc	"		-	US\$ 1,011	N/A	US\$ 1,011
	Commonwealth Edison Co	"		-	US\$ 1,009	N/A	US\$ 1,009
	Kimco Realty Corp	"		-	US\$ 1,007	N/A	US\$ 1,007
	African Development Bank	"		-	US\$ 1,007	N/A	US\$ 1,007
	UBS AG/Stamford CT	"		-	US\$ 1,003	N/A	US\$ 1,003
	Gilead Sciences Inc	"		-	US\$ 1,001	N/A	US\$ 1,001
	MetLife Inc	"		-	US\$ 998	N/A	US\$ 998
	BBVA USA	"		-	US\$ 996	N/A	US\$ 996
	British Airways 2013-1 Class A Pass Through Trust	"		-	US\$ 992	N/A	US\$ 992
	Lockheed Martin Corp	"		-	US\$ 988	N/A	US\$ 988
	MasseyFerguson Cos Inc	"		-	US\$ 979	N/A	US\$ 979
	Georgia-Pacific LLC	"		-	US\$ 925	N/A	US\$ 925
	Mitsubishi UFJ Lease & Finance Co Ltd	"		-	US\$ 906	N/A	US\$ 906
	CA Inc	"		-	US\$ 905	N/A	US\$ 905
	CBSS Corp	"		-	US\$ 903	N/A	US\$ 903
	Coca-Cola Femsa SAB de CV	"		-	US\$ 900	N/A	US\$ 900
	CNOOC Finance 2011 Ltd	"		-	US\$ 887	N/A	US\$ 887
	Viterra Inc	"		-	US\$ 878	N/A	US\$ 878
				-	US\$ 866	N/A	US\$ 866
				-	US\$ 843	N/A	US\$ 843

(Continued)

Held Company Name	Marketable Securities Type and Name	Relationship with the Company	Financial Statement Account	Shares/Units (In Thousands)	Carrying Value (Foreign Currencies in Thousands)	December 31, 2019 Percentage of Ownership (%)	Fair Value (Foreign Currencies in Thousands)	Note
TSMC Global	ONEOK Partners LP	-	-	-	USS 824	N/A	USS 824	
	Sinopec Capital 2013 Ltd	-	Financial assets at fair value through other comprehensive income "	-	USS 814	N/A	USS 814	
	Nationwide Financial Services Inc	"		-	USS 779	N/A	USS 779	
	AXIS Specialty Finance LLC	"		-	USS 762	N/A	USS 762	
	PayPal Holdings Inc	"		-	USS 755	N/A	USS 755	
	Pinnacle West Capital Corp	"		-	USS 751	N/A	USS 751	
	Warner Media LLC	"		-	USS 742	N/A	USS 742	
	BNZ International Funding Ltd/London	"		-	USS 724	N/A	USS 724	
	BAE Systems Holdings Inc	"		-	USS 705	N/A	USS 705	
	Phillips 66	"		-	USS 705	N/A	USS 705	
	Southern California Gas Co	"		-	USS 704	N/A	USS 704	
	Aon Corp	"		-	USS 665	N/A	USS 665	
	Digital Realty Trust LP	"		-	USS 657	N/A	USS 657	
	Ohio Power Co	"		-	USS 636	N/A	USS 636	
	Fifth Third Bank/Cincinnati OH	"		-	USS 635	N/A	USS 635	
	OneBeacon US Holdings Inc	"		-	USS 627	N/A	USS 627	
	Norfolk Southern Railway Co	"		-	USS 621	N/A	USS 621	
	RBC USA Holdco Corp	"		-	USS 614	N/A	USS 614	
	Apiv Corp	"		-	USS 609	N/A	USS 609	
	Toledo Edison Co/The	"		-	USS 609	N/A	USS 609	
	Pioneer Natural Resources Co	"		-	USS 608	N/A	USS 608	
	American Water Capital Corp	"		-	USS 603	N/A	USS 603	
	Nissan Motor Acceptance Corp	"		-	USS 600	N/A	USS 600	
	Energy Inc	"		-	USS 593	N/A	USS 593	
	ViacomCBS Inc	"		-	USS 588	N/A	USS 588	
	Duke Energy Progress LLC	"		-	USS 575	N/A	USS 575	
	Swedbank AB	"		-	USS 575	N/A	USS 575	
	Continental Airlines 2007-1 Class A Pass Through Trust	"		-	USS 572	N/A	USS 572	
	ABC Inc.	"		-	USS 550	N/A	USS 550	
	Juniper Networks Inc	"		-	USS 541	N/A	USS 541	
	Amgen Inc	"		-	USS 541	N/A	USS 541	
	Ingersoll-Rand Global Holding Co Ltd	"		-	USS 530	N/A	USS 530	
	Aflac Inc	"		-	USS 525	N/A	USS 525	
	Regency Centers Corp	"		-	USS 521	N/A	USS 521	
	salesforce.com Inc	"		-	USS 519	N/A	USS 519	
	TTX Co	"		-	USS 511	N/A	USS 511	
	Nomura Holdings Inc	"		-	USS 504	N/A	USS 504	
	Hanwha Energy USA Holdings Corp	"		-	USS 502	N/A	USS 502	
	PNC Financial Services Group Inc/The	"		-	USS 502	N/A	USS 502	
	Caterpillar Financial Services Corp	"		-	USS 502	N/A	USS 502	
	Danone SA	"		-	USS 452	N/A	USS 452	
	National Oilwell Varco Inc	"		-	USS 425	N/A	USS 425	
	Duke Energy Carolinas LLC	"		-	USS 417	N/A	USS 417	
	BAT International Finance PLC	"		-	USS 413	N/A	USS 413	
	United Overseas Bank Ltd	"		-	USS 408	N/A	USS 408	
	Narragansett Electric Co/The	"		-	USS 406	N/A	USS 406	
	Duke Realty LP	"		-	USS 405	N/A	USS 405	
	Liberty Property LP	"		-				
	Boston Properties LP	"		-				
	Newmont Goldcorp Corp	"		-				
	Eaton Electric Holdings LLC	"		-				
	Comerica Bank	"		-				

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Held Company Name	Marketable Securities Type and Name	Relationship with the Company	Financial Statement Account	December 31, 2019		Fair Value (Foreign Currencies in Thousands)	Note
				Shares/Units (In Thousands)	Carrying Value (Foreign Currencies in Thousands)		
TSMC Global	Southern Power Co	-	Financial assets at fair value through other comprehensive income "	-	USS 404	N/A	404
	Canadian Pacific Railway Co	-		-	USS 400	N/A	400
	Fidelity National Information Services Inc	-		-	USS 399	N/A	399
	AXA Equitable Holdings Inc	-		-	USS 393	N/A	393
	Metropolitan Edison Co	-		-	USS 388	N/A	388
	Stancorp Financial Group Inc	-		-	USS 386	N/A	386
	Principia Financial Group Inc	-		-	USS 359	N/A	359
	Continental Airlines 2000-1 Class A-1 Pass Through Trust	-		-	USS 312	N/A	312
	Chubb INA Holdings Inc	-		-	USS 308	N/A	308
	America Movil SAB de CV	-		-	USS 307	N/A	307
	Alibaba Group Holding Ltd	-		-	USS 306	N/A	306
	CommonSpirit Health	-		-	USS 303	N/A	303
	Schlumberger Finance Canada Ltd	-		-	USS 300	N/A	300
	Manufacturers & Traders Trust Co	-		-	USS 300	N/A	300
	Eli Lilly & Co	-		-	USS 299	N/A	299
	Home Depot Inc/The	-		-	USS 284	N/A	284
	Southern Natural Gas Co LLC / Southern Natural Issuing Corp	-		-	USS 282	N/A	282
	Archer-Daniels-Midland Co	-		-	USS 258	N/A	258
	Bank of America NA	-		-	USS 257	N/A	257
	Grupo Bimbo SAB de CV	-		-	USS 252	N/A	252
	Aon PLC	-		-	USS 248	N/A	248
	Telstra Corp Ltd	-		-	USS 209	N/A	209
	US Airways 2013-1 Class A Pass Through Trust	-		-	USS 209	N/A	209
	Halliburton Co	-		-	USS 208	N/A	208
	Waste Management Inc	-		-	USS 207	N/A	207
	QNB Finance Ltd	-		-	USS 207	N/A	207
	WestRock MWV LLC	-		-	USS 201	N/A	201
	Glencore Funding LLC	-		-	USS 200	N/A	200
	Nucor Corp	-		-	USS 185	N/A	185
	American Airlines 2011-1 Class A Pass Through Trust	-		-	USS 111	N/A	111
	Wells Fargo & Co	-		-	USS 161,794	N/A	161,794
	JPMorgan Chase & Co.	-		-	USS 84,967	N/A	85,578
	Industrial and Commercial Bank of China	-		-	USS 9,996	N/A	10,022
	Government bond	-	Financial assets at fair value through other comprehensive income "	-	USS 419,942	N/A	419,942
	United States Treasury Note/Bond	-		-	USS 3,501	N/A	3,501
	Abu Dhabi Government International Bond	-		-	USS 2,830	N/A	2,830
	United States Treasury Inflation Indexed Bonds	-		-	USS 1,372	N/A	1,372
	Qatar Government International Bond	-		-			
	Agency bonds/Agency mortgage-backed securities	-	Financial assets at fair value through Profit or Loss Financial assets at fair value through other comprehensive income "	-	USS 1,365	N/A	1,365
	Freddie Mac Multifamily Structured Pass Through Certificates	-		-	USS 761,352	N/A	761,352
	Fannie Mae Pool	-		-	USS 176,379	N/A	176,379
	Fannie Mae REMICs	-		-	USS 164,994	N/A	164,994
	Freddie Mac Gold Pool	-		-	USS 164,081	N/A	164,081
	Ginnie Mae II Pool	-		-	USS 152,833	N/A	152,833
	Freddie Mac Pool	-		-	USS 129,835	N/A	129,835
	Fannie Mae or Freddie Mac	-		-	USS 56,856	N/A	54,891
	Government National Mortgage Association	-		-	USS 33,108	N/A	33,108

(Continued)

Held Company Name	Marketable Securities Type and Name	Relationship with the Company	Financial Statement Account	Shares/Units (In Thousands)	Carrying Value (Foreign Currencies in Thousands)	December 31, 2019 Percentage of Ownership (%)	Fair Value (Foreign Currencies in Thousands)	Note
TSMC Global	Fannie Mae-Aces	-	Financial assets at fair value through other comprehensive income	-	USS 21,409	N/A	USS 21,409	
	Fredie Mac Strips	-	"	-	USS 3,041	N/A	USS 3,041	
	Federal Home Loan Bank Discount Notes	-	"	-	USS 2,996	N/A	USS 2,996	
	Freddie Mac Multifamily Structured Pass Through Certificates	-	"	-	USS 2,160	N/A	USS 2,160	
	Korea Hydro & Nuclear Power Co Ltd	-	"	-	USS 1,970	N/A	USS 1,970	
	Federal Farm Credit Banks Funding Corp	-	"	-	USS 1,099	N/A	USS 1,099	
	Denver City & County Housing Authority	-	"	-	USS 996	N/A	USS 996	
	Ginnie Mae IP pool	-	"	-	USS 970	N/A	USS 970	
	FHL-MC-GNMA	-	"	-	USS 860	N/A	USS 860	
	Oregon Health & Science University	-	"	-	USS 789	N/A	USS 789	
	NCUA Guaranteed Notes Trust 2010-R2	-	"	-	USS 668	N/A	USS 668	
	FRESB 2019-SB61 Mortgage Trust	-	"	-	USS 667	N/A	USS 667	
	Fredie Mac Non Gold Pool	-	"	-	USS 499	N/A	USS 499	
	FRESB 2019-SB60 Mortgage Trust	-	"	-	USS 415	N/A	USS 415	
	NCUA Guaranteed Notes Trust 2010-R1	-	"	-	USS 222	N/A	USS 222	
	Fannie Mae Benchmark REMIC	-	"	-	USS 116	N/A	USS 116	
	Asset-backed securities <sup>25</sup>	-	Financial assets at fair value through other comprehensive income	-	USS 9,925	N/A	USS 9,925	
	Hyundai Auto Receivables Trust 2017-A	-	"	-	USS 7,321	N/A	USS 7,321	
	Citibank Credit Card Issuance Trust	-	"	-	USS 7,036	N/A	USS 7,036	
	Citigroup Commercial Mortgage Trust 2014-GC21	-	"	-	USS 6,845	N/A	USS 6,845	
	CGDBBB Commercial Mortgage Trust 2017-BIOC	-	"	-	USS 6,248	N/A	USS 6,248	
	Benchmark 2019-B11 Mortgage Trust	-	"	-	USS 6,084	N/A	USS 6,084	
	Ford Credit Auto Owner Trust 2017-A	-	"	-	USS 6,075	N/A	USS 6,075	
	Wells Fargo Commercial Mortgage Trust 2016-C35	-	"	-	USS 6,070	N/A	USS 6,070	
	UBS-Barclays Commercial Mortgage Trust 2012-C2	-	"	-	USS 6,041	N/A	USS 6,041	
	Morgan Stanley Bank of America Merrill Lynch Trust 2016-C29	-	"	-	USS 6,022	N/A	USS 6,022	
	Ford Credit Auto Owner Trust 2016-REV1	-	"	-	USS 5,924	N/A	USS 5,924	
	CD 2019-CD8 Mortgage Trust	-	"	-	USS 5,678	N/A	USS 5,678	
	Wells Fargo Commercial Mortgage Trust 2019-C53	-	"	-	USS 5,648	N/A	USS 5,648	
	WFRRBS Commercial Mortgage Trust 2013-C13	-	"	-	USS 5,472	N/A	USS 5,472	
	BBCMS 2018-TALL Mortgage Trust	-	"	-	USS 5,238	N/A	USS 5,238	
	COMM 2015-CCRE24 Mortgage Trust	-	"	-	USS 5,079	N/A	USS 5,079	
	Hyundai Auto Lease Securitization 2018-A	-	"	-	USS 5,030	N/A	USS 5,030	
	Morgan Stanley Bank of America Merrill Lynch Trust 2016-C30	-	"	-	USS 5,012	N/A	USS 5,012	
	Morgan Stanley Bank of America Merrill Lynch Trust 2013-C10	-	"	-	USS 4,922	N/A	USS 4,922	
	Ford Credit Auto Owner Trust 2015-REV1	-	"	-	USS 4,705	N/A	USS 4,705	
	MRCD 2019-MARK Mortgage Trust	-	"	-	USS 4,518	N/A	USS 4,518	
	BANK 2019-BNCK22	-	"	-	USS 4,502	N/A	USS 4,502	
	Hyundai Auto Receivables Trust 2016-B	-	"	-	USS 4,263	N/A	USS 4,263	
	Morgan Stanley Bank of America Merrill Lynch Trust 2013-C7	-	"	-	USS 4,241	N/A	USS 4,241	
	Mercedes-Benz Auto Lease Trust 2019-B	-	"	-	USS 4,180	N/A	USS 4,180	
	JPMBB Commercial Mortgage Securities Trust 2015-C28	-	"	-	USS 4,178	N/A	USS 4,178	
	Hyundai Auto Receivables Trust 2016-A	-	"	-	USS 4,164	N/A	USS 4,164	
	GM Financial Consumer Automobile Receivables Trust 2018-1	-	"	-	USS 4,163	N/A	USS 4,163	
	UBS Commercial Mortgage Trust 2018-C10	-	"	-	USS 4,151	N/A	USS 4,151	
	JPMCC Commercial Mortgage Securities Trust 2017-JP7	-	"	-	USS 4,107	N/A	USS 4,107	
	BANK 2017-BNKS6	-	"	-	USS 4,104	N/A	USS 4,104	
	BANK 2019-BNKL7	-	"	-	USS 4,099	N/A	USS 4,099	
	BX Commercial Mortgage Trust 2018-IND	-	"	-	USS 3,992	N/A	USS 3,992	
	American Express Credit Account Master Trust	-	"	-	USS 3,804	N/A	USS 3,804	

(Continued)

Held Company Name	Marketable Securities Type and Name	Relationship with the Company	Financial Statement Account	Shares/Units (In Thousands)	Carrying Value (Foreign Currencies in Thousands)	Percentage of Ownership (%)	December 31, 2019		Note
							Fair Value (Foreign Currencies in Thousands)		
TSMC Global	Enterprise Fleet Financing 2019-2 LLC	-	Financial assets at fair value through other comprehensive income	-	USS 3,763	N/A	USS 3,763		
	Barclays Commercial Mortgage Trust 2019-C5	-	"	-	USS 3,720	N/A	USS 3,720		
	Citigroup Commercial Mortgage Trust 2019-C7	-	"	-	USS 3,685	N/A	USS 3,685		
	BANK 2019-BNFC23	-	"	-	USS 3,640	N/A	USS 3,640		
	JP Morgan Chase Commercial Mortgage Securities Trust 2012-LC9	-	"	-	USS 3,381	N/A	USS 3,381		
	UBS-Barclays Commercial Mortgage Trust 2013-C6	-	"	-	USS 3,327	N/A	USS 3,327		
	GS Mortgage Securities Trust 2012-GC6	-	"	-	USS 3,194	N/A	USS 3,194		
	Ford Credit Auto Lease Trust 2019-B	-	"	-	USS 3,122	N/A	USS 3,122		
	Toyota Auto Receivables 2017-A Owner Trust	-	"	-	USS 3,108	N/A	USS 3,108		
	Nissan Auto Lease Trust 2017-B	-	"	-	USS 3,072	N/A	USS 3,072		
	UBS-Barclays Commercial Mortgage Trust 2012-C3	-	"	-	USS 3,061	N/A	USS 3,061		
	Toyota Auto Receivables 2018-D Owner Trust	-	"	-	USS 3,059	N/A	USS 3,059		
	J.P. Morgan Chase Commercial Mortgage Securities Trust 2016-WIKI	-	"	-	USS 3,020	N/A	USS 3,020		
	Wells Fargo Commercial Mortgage Trust 2017-C40	-	"	-	USS 3,017	N/A	USS 3,017		
	Citigroup Commercial Mortgage Trust 2016-P5	-	"	-	USS 3,008	N/A	USS 3,008		
	GS Mortgage Securities Corp Trust 2018-RIVR	-	"	-	USS 3,003	N/A	USS 3,003		
	GM Financial Consumer Automobile Receivables Trust 2017-2	-	"	-	USS 2,995	N/A	USS 2,995		
	Morgan Stanley Capital I Trust 2017-HI	-	"	-	USS 2,966	N/A	USS 2,966		
	Hyundai Auto Receivables Trust 2018-A	-	"	-	USS 2,915	N/A	USS 2,915		
	Nissan Auto Lease Trust 2019-B	-	"	-	USS 2,885	N/A	USS 2,885		
	Citigroup Commercial Mortgage Trust 2016-C3	-	"	-	USS 2,760	N/A	USS 2,760		
	GS Mortgage Securities Trust 2013-GCJ12	-	"	-	USS 2,660	N/A	USS 2,660		
	GS Mortgage Securities Trust 2011-GC3	-	"	-	USS 2,626	N/A	USS 2,626		
	BANK 2019-BNFC24	-	"	-	USS 2,606	N/A	USS 2,606		
	Morgan Stanley Banks of America Merrill Lynch Trust 2012-C6	-	"	-	USS 2,536	N/A	USS 2,536		
	ARI Fleet Lease Trust 2019-A	-	"	-	USS 2,408	N/A	USS 2,408		
	Nissan Auto Lease Trust 2019-A	-	"	-	USS 2,350	N/A	USS 2,350		
	UBS Commercial Mortgage Trust 2018-C11	-	"	-	USS 2,179	N/A	USS 2,179		
	Morgan Stanley Capital II Trust 2018-H3	-	"	-	USS 2,134	N/A	USS 2,134		
	BENCHMARK 2018-B4	-	"	-	USS 2,125	N/A	USS 2,125		
	COMM 2013-CCRE12 Mortgage Trust	-	"	-	USS 2,112	N/A	USS 2,112		
	Ford Credit Auto Owner Trust 2019-A	-	"	-	USS 2,088	N/A	USS 2,088		
	Citigroup Commercial Mortgage Trust 2017-P8	-	"	-	USS 2,059	N/A	USS 2,059		
	JPMBDB Commercial Mortgage Securities Trust 2017-C7	-	"	-	USS 2,044	N/A	USS 2,044		
	WFBS Commercial Mortgage Trust 2013-C17	-	"	-	USS 2,044	N/A	USS 2,044		
	JPMBB Commercial Mortgage Securities Trust 2014-C19	-	"	-	USS 2,032	N/A	USS 2,032		
	Morgan Stanley Bank of America Merrill Lynch Trust 2016-C31	-	"	-	USS 2,027	N/A	USS 2,027		
	GM Financial Consumer Automobile 2017-I	-	"	-	USS 2,001	N/A	USS 2,001		
	COMM 2014-CCRE17 Mortgage Trust	-	"	-	USS 2,000	N/A	USS 2,000		
	GS Mortgage Securities Trust 2014-GC22	-	"	-	USS 1,961	N/A	USS 1,961		
	Mercedes-Benz Auto Lease Trust 2018-B	-	"	-	USS 1,961	N/A	USS 1,961		
	GS Mortgage Securities Trust 2015-GC34	-	"	-	USS 1,905	N/A	USS 1,905		
	Chesapeake Funding I LLC	-	"	-	USS 1,903	N/A	USS 1,903		
	Morgan Stanley Bank of America Merrill Lynch Trust 2013-C8	-	"	-	USS 1,831	N/A	USS 1,831		
	Citigroup Commercial Mortgage Trust 2015-GC35	-	"	-	USS 1,791	N/A	USS 1,791		
	Morgan Stanley Capital II Trust 2019-H6	-	"	-	USS 1,772	N/A	USS 1,772		
	GM Financial Automobile Leasing Trust 2019-1	-	"	-	USS 1,647	N/A	USS 1,647		
	JPMBB Commercial Mortgage Securities Trust 2013-C12	-	"	-	USS 1,544	N/A	USS 1,544		
	Wells Fargo Commercial Mortgage Trust 2015-JC20	-	"	-	USS 1,498	N/A	USS 1,498		
	Morgan Stanley Bank of America Merrill Lynch Trust 2015-C24	-	"	-	USS 1,492	N/A	USS 1,492		
	Citigroup Commercial Mortgage Trust 2015-GC27	-	"	-	USS 1,458	N/A	USS 1,458		

(Continued)

Held Company Name	Marketable Securities Type and Name	Relationship with the Company	Financial Statement Account		Carrying Value (Foreign Currencies in Thousands)	Percentage of Ownership (%)	Fair Value (Foreign Currencies in Thousands)	Note
			Shares/Units (In Thousands)	December 31, 2019				
TSMC Global	WFRBS Commercial Mortgage Trust 2013-C14	-	-	Financial assets at fair value through other comprehensive income	-	-	USS 1,454	N/A
	GS Mortgage Securities Trust 2014-GC24	-	"	USS 1,452	N/A	USS 1,452	USS 1,452	
	Morgan Stanley Bank of America Merrill Lynch Trust 2013-C12	-	"	USS 1,438	N/A	USS 1,438	USS 1,438	
	Honda Auto Receivables 2017-3 Owner Trust	-	"	USS 1,425	N/A	USS 1,425	USS 1,425	
	Wells Fargo Commercial Mortgage Trust 2016-C36	-	"	USS 1,403	N/A	USS 1,403	USS 1,403	
	Benchmark 2019-B14 Mortgage Trust	-	"	USS 1,381	N/A	USS 1,381	USS 1,381	
	Hertz Fleet Lease Funding, L.P.	-	"	USS 1,372	N/A	USS 1,372	USS 1,372	
	Hyundai Auto Receivables Trust 2019-B	-	"	USS 1,286	N/A	USS 1,286	USS 1,286	
	Wells Fargo Commercial Mortgage Trust 2012-LC5	-	"	USS 1,268	N/A	USS 1,268	USS 1,268	
	COMM 2013-LC6 Mortgage Trust	-	"	USS 1,238	N/A	USS 1,238	USS 1,238	
	GS Mortgage Securities Trust 2019-GSA1	-	"	USS 1,233	N/A	USS 1,233	USS 1,233	
	GS Mortgage Securities Corp II	-	"	USS 1,226	N/A	USS 1,226	USS 1,226	
	GM Financial Automobile Leasing Trust 2019-4	-	"	USS 1,194	N/A	USS 1,194	USS 1,194	
	JPMDB Commercial Mortgage Securities Trust 2016-C2	-	"	USS 1,192	N/A	USS 1,192	USS 1,192	
	Benchmark 2019-B9 Mortgage Trust	-	"	USS 1,160	N/A	USS 1,160	USS 1,160	
	Morgan Stanley Capital II Trust 2016-UB11	-	"	USS 1,105	N/A	USS 1,105	USS 1,105	
	JPMCC Commercial Mortgage Securities Trust 2017-JP5	-	"	USS 1,073	N/A	USS 1,073	USS 1,073	
	Morgan Stanley Bank of America Merrill Lynch Trust 2013-C13	-	"	USS 1,048	N/A	USS 1,048	USS 1,048	
	UBS-Barclays Commercial Mortgage Trust 2013-CS	-	"	USS 1,032	N/A	USS 1,032	USS 1,032	
	COMM 2015-PCL Mortgage Trust	-	"	USS 1,032	N/A	USS 1,032	USS 1,032	
	WTRBS Commercial Mortgage Trust 2011-C4	-	"	USS 1,027	N/A	USS 1,027	USS 1,027	
	Ford Credit Auto Lease Trust 2019-A	-	"	USS 1,013	N/A	USS 1,013	USS 1,013	
	BMW Vehicle Lease Trust 2019-1	-	"	USS 1,012	N/A	USS 1,012	USS 1,012	
	Ford Credit Auto Owner Trust 2017-REV1	-	"	USS 1,012	N/A	USS 1,012	USS 1,012	
	Benchmark 2019-B15 Mortgage Trust	-	"	USS 998	N/A	USS 998	USS 998	
	BBCM'S MORTGAGE TRUST 2017-CL	-	"	USS 998	N/A	USS 998	USS 998	
	Citigroup Commercial Mortgage Trust 2013-GC11	-	"	USS 959	N/A	USS 959	USS 959	
	Citigroup Commercial Mortgage Trust 2014-GC23	-	"	USS 951	N/A	USS 951	USS 951	
	COMM 2012-C-CREF5 Mortgage Trust	-	"	USS 918	N/A	USS 918	USS 918	
	Cantor Commercial Real Estate Lending 2019-CFI	-	"	USS 916	N/A	USS 916	USS 916	
	280 Park Avenue 2017-280P Mortgage Trust	-	"	USS 830	N/A	USS 830	USS 830	
	GM Financial Automobile Leasing Trust 2019-2	-	"	USS 823	N/A	USS 823	USS 823	
	Ford Credit Auto Lease Trust	-	"	USS 798	N/A	USS 798	USS 798	
	GM Financial Automobile Leasing Trust 2018-1	-	"	USS 759	N/A	USS 759	USS 759	
	Morgan Stanley Bank of America Merrill Lynch Trust 2015-C20	-	"	USS 759	N/A	USS 759	USS 759	
	GM Financial Consumer Automobile Receivables Trust 2018-2	-	"	USS 756	N/A	USS 756	USS 756	
	Toyota Auto Receivables 2016-B Owner Trust	-	"	USS 741	N/A	USS 741	USS 741	
	COMM 2015-C-CREF22 Mortgage Trust	-	"	USS 720	N/A	USS 720	USS 720	
	Wells Fargo Commercial Mortgage Trust 2015-NXSS3	-	"	USS 703	N/A	USS 703	USS 703	
	Wells Fargo Commercial Mortgage Trust 2015-C28	-	"	USS 702	N/A	USS 702	USS 702	
	COMM 2013-C-CREF8 Mortgage Trust	-	"	USS 701	N/A	USS 701	USS 701	
	CFCRE Commercial Mortgage Trust 2011-C1	-	"	USS 696	N/A	USS 696	USS 696	
	GM Financial Automobile Leasing Trust 2019-3	-	"	USS 650	N/A	USS 650	USS 650	
	Mercedes-Benz Auto Lease Trust 2019-A	-	"	USS 620	N/A	USS 620	USS 620	
	JP Morgan Chase Commercial Mortgage Securities Trust 2012-WLDN	-	"	USS 603	N/A	USS 603	USS 603	
	JPMDB Commercial Mortgage Securities Trust 2019-C-OR6	-	"	USS 597	N/A	USS 597	USS 597	
	Citigroup Commercial Mortgage Trust 2014-GC19	-	"	USS 576	N/A	USS 576	USS 576	
	DBUBS 2011-LC2 Mortgage Trust	-	"	USS 510	N/A	USS 510	USS 510	
	CD 2016-CD2 Mortgage Trust	-	"	USS 506	N/A	USS 506	USS 506	
	Nissan Auto Receivables 2019-C-Owner Trust	-	"	USS 485	N/A	USS 485	USS 485	
	Mercedes-Benz Auto Lease Trust 2018-A	-	"	USS 482	N/A	USS 482	USS 482	
	GS Mortgage Securities Trust 2014-GC26	-	"	USS 465	N/A	USS 465	USS 465	

(Continued)

(Continued)

Held Company Name	Marketable Securities Type and Name	Relationship with the Company	Financial Statement Account	December 31, 2019			Fair Value (Foreign Currencies in Thousands)	Note
				Shares/Units (In Thousands)	Carrying Value (Foreign Currencies in Thousands)	Percentage of Ownership (%)		
TSMC Global								
	GM Financial Consumer Automobile Receivables Trust 2019-3	-	Financial assets at fair value through other comprehensive income	"	USS 443	N/A	USS 443	
	Hyundai Auto Lease Securitization Trust 2017-C	-		"	USS 410	N/A	USS 410	
	WFRBS Commercial Mortgage Trust 2014-C25	-		"	USS 408	N/A	USS 408	
	Ford Credit Auto Lease Trust 2017-B	-		"	USS 380	N/A	USS 380	
	Hyundai Auto Receivables Trust 2015-C	-		"	USS 365	N/A	USS 365	
	GM Financial Automobile Leasing Trust 2018-2	-		"	USS 351	N/A	USS 351	
	Morgan Stanley Bank of America Merrill Lynch Trust 2012-C5	-		"	USS 350	N/A	USS 350	
	COMM 2015-CCRE26 Mortgage Trust	-		"	USS 349	N/A	USS 349	
	GM Financial Automobile Leasing Trust 2018-3	-		"	USS 339	N/A	USS 339	
	JPMBB Commercial Mortgage Securities Trust 2015-C31	-		"	USS 325	N/A	USS 325	
	Ford Credit Auto Owner Trust 2017-B	-		"	USS 301	N/A	USS 301	
	Toyota Auto Receivables 2018-B Owner Trust	-		"	USS 283	N/A	USS 283	
	BMW Vehicle Lease Trust 2017-2	-		"	USS 189	N/A	USS 189	
	COMM 2015-DC1 Mortgage Trust	-		"	USS 180	N/A	USS 180	
	Wells Fargo Commercial Mortgage Trust 2015-NXS1	-		"	USS 103	N/A	USS 103	
	Wells Fargo Commercial Mortgage Trust 2015-SGI	-		"	USS 100	N/A	USS 100	
	COMM 2014-CCRE15 Mortgage Trust	-		"	USS 46	N/A	USS 46	
	Nissan Auto Receivables 2016-B Owner Trust	-		"	USS 36	N/A	USS 36	
	WFRBS Commercial Mortgage Trust 2011-C5	-		"	USS 31	N/A	USS 31	
	GS Mortgage Securities Trust 2010-C2	-		"	USS 21	N/A	USS 21	
	Morgan Stanley Bank of America Merrill Lynch Trust 2014-C18	-		"	USS 20	N/A	USS 20	
	GS Mortgage Securities Trust 2010-C1	-		"	USS 9	N/A	USS 9	
	Non-publicly traded equity investments	-	Financial assets at fair value through other comprehensive income	"	USS 78,403	4	USS 78,403	
	Primavera Capital Fund II, L.P.	-						
			Financial assets at fair value through other comprehensive income	"	USS 1,019	4	USS 1,019	
	Semetric	-		"	USS 1,307	4	USS 1,307	
	Aether Systems, Inc.	-		"	USS 362	20	USS 362	
	SV Technologies, Inc.	-		"	USS 4	2	-	
	Non-publicly traded equity investments	-	Financial assets at fair value through other comprehensive income	"	USS 1,952	14	USS 800	
	LiquidLeds Lighting Corp.	-		"	USS 4,147	14	USS 174	
	Neocoinx, Inc.	-		"	USS 230	14	USS 1,560	
	Non-publicly traded equity investments	-	Financial assets at fair value through other comprehensive income	"	USS 221	14	USS 1,501	
	Innovium, Inc.	-		"	USS 237	14	USS 775	
	CNEX Labs, Inc.	-		"	USS 127	14	USS 250	
	Astera Labs, Inc.	-		"				
	VTAF II							
			Growth Fund					

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(Concluded)

TABLE 4

**Taiwan Semiconductor Manufacturing Company Limited and Investees**

MARKETABLE SECURITIES ACQUIRED AND DISPOSED OF AT COSTS OR PRICES OF AT LEAST NT\$300 MILLION OR 20% OF THE PAID-IN CAPITAL  
 FOR THE YEAR ENDED DECEMBER 31, 2019  
 (Amounts in Thousands of New Taiwan Dollars, Unless Specified Otherwise)

Company Name	Marketable Securities Type and Name	Financial Statement Account	Counter-party	Nature of Relationship	Beginning Balance		Acquisition		Disposal		Ending Balance (Note)	
					Shares/Units (In Thousands)	Amount	Shares/Units (In Thousands)	Amount	Shares/Units (In Thousands)	Amount	Shares/Units (In Thousands)	Amount
TSMC	Commercial paper Taiwan Power Company	Financial assets at amortized cost	-	-	180	\$ 1,795,261	-	\$ -	180	\$ 1,800,000	\$ -	\$ -
	CPC Corporation, Taiwan	"	-	-	50	498,837	-	-	50	500,000	\$ 50,000	\$ -
	Publicly traded stocks Semiconductor Manufacturing International Corporation	Financial assets at fair value through other comprehensive income	-	-	21,105	568,150	-	-	21,105	775,282	522,975	252,307
TSMC Global	Corporate bond Bank of America Corp	Financial assets at fair value through other comprehensive income	-	-	US\$ 44,755	-	US\$ 26,624	-	US\$ 26,924	US\$ 26,897	US\$ 27	-
	Citigroup Inc	"	-	-	US\$ 28,602	-	US\$ 27,307	-	US\$ 21,481	US\$ 21,386	US\$ 95	-
	AbiVie Inc	"	-	-	US\$ 11,504	-	US\$ 36,780	-	US\$ 17,687	US\$ 17,576	US\$ 111	-
	AT&T Inc	"	-	-	US\$ 23,123	-	US\$ 16,412	-	US\$ 14,343	US\$ 14,218	US\$ 125	-
	Goldman Sachs Group Inc/The CVS Health Corp	"	-	-	US\$ 17,619	-	US\$ 12,935	-	US\$ 5,709	US\$ 5,703	US\$ 6	-
	Bristol-Myers Squibb Co	"	-	-	US\$ 27,238	-	US\$ 25,647	-	US\$ 31,861	US\$ 31,310	US\$ 551	-
	Mitsubishi UFJ Financial Group Inc	"	-	-	US\$ 9,547	-	US\$ 25,338	-	US\$ 4,409	US\$ 4,342	US\$ 67	-
	JPMorgan Chase & Co	"	-	-	US\$ 13,962	-	US\$ 2,670	-	US\$ 2,646	US\$ 24	-	US\$ 21,332
	Morgan Stanley	"	-	-	US\$ 16,577	-	US\$ 14,544	-	US\$ 10,973	US\$ 10,974	US\$ (1)	-
	HSBC Holdings PLC	"	-	-	US\$ 19,581	-	US\$ 17,212	-	US\$ 16,990	US\$ 16,874	US\$ 116	-
	Apple Inc	"	-	-	US\$ 15,571	-	US\$ 13,265	-	US\$ 9,205	US\$ 9,074	US\$ 131	-
	Sumitomo Mitsui Financial Group Inc	"	-	-	US\$ 12,585	-	US\$ 10,796	-	US\$ 3,939	US\$ 3,997	US\$ (58)	-
	Toronto-Dominion Bank/The Verizon Communications Inc	"	-	-	US\$ 10,008	-	US\$ 16,956	-	US\$ 8,327	US\$ 8,288	US\$ 39	-
	Wells Fargo & Co	"	-	-	US\$ 5,000	-	US\$ 17,437	-	US\$ 7,765	US\$ 7,669	US\$ 96	-
	Morgan Stanley	"	-	-	US\$ 15,927	-	US\$ 9,920	-	US\$ 12,478	US\$ 12,447	US\$ 31	-
	Banque Federative du Credit Mutuel SA	"	-	-	US\$ 576	-	US\$ 11,967	-	US\$ 8,113	US\$ 815	US\$ (2)	-
	American International Group Inc Equifax Inc	"	-	-	US\$ 8,928	-	US\$ 10,113	-	US\$ 7,610	US\$ 7,463	US\$ 147	-
	Ryder System Inc	"	-	-	US\$ 4,028	-	US\$ 11,726	-	US\$ 4,096	US\$ 4,088	US\$ 8	-
	International Business Machines Corp	"	-	-	US\$ 10,737	-	US\$ 10,471	-	US\$ 10,247	US\$ 10,213	US\$ 34	-
	NextEra Energy Capital Holdings Inc	"	-	-	US\$ 174	-	US\$ 10,748	-	US\$ -	US\$ -	US\$ -	US\$ 11,423
	Fiserv Inc	"	-	-	US\$ 4,778	-	US\$ 11,957	-	US\$ 6,218	US\$ 6,121	US\$ 97	-
	Comcast Corp	"	-	-	US\$ -	-	US\$ 13,545	-	US\$ 3,265	US\$ 3,266	US\$ (1)	-
	JPMorgan Chase & Co	"	-	-	US\$ 1,455	-	US\$ 15,881	-	US\$ 11,397	US\$ 11,366	US\$ 31	-
	Anheuser-Busch InBev	"	-	-	US\$ 18,894	-	US\$ 12,324	-	US\$ 4,902	US\$ 4,770	US\$ 132	-
	Worldwide Inc	"	-	-	US\$ 25,423	-	US\$ 3,773	-	US\$ 14,933	US\$ 14,452	US\$ 481	-
	American Express Co	"	-	-	US\$ -	-	US\$ 5,887	-	US\$ 23,845	US\$ 23,737	US\$ 108	-
	Walt Disney Co/The	"	-	-	US\$ 6,644	-	US\$ 11,641	-	US\$ 6,093	US\$ 5,824	US\$ 269	-
	Hyundai Capital America	"	-	-	US\$ 8,783	-	US\$ 10,414	-	US\$ 9,023	US\$ 8,890	US\$ 133	-
					US\$ -	-	US\$ 10,719	-	US\$ 7,387	US\$ 7,428	US\$ (41)	-
					US\$ 6,644	-	US\$ 8,783	-	US\$ 12,403	US\$ 12,333	US\$ 70	-

(Continued)

Company Name	Marketable Securities Type and Name	Financial Statement Account	Counter-party	Nature of Relationship	Beginning Balance		Shares/Units (In Thousands)	Amount (In Thousands)	Acquisition		Shares/Units (In Thousands)	Amount (In Thousands)	Disposal		Shares/Units (In Thousands)	Ending Balance (Note) Amount
					Shares/Units (In Thousands)	Amount			Shares/Units (In Thousands)	Amount			Carrying Value	Gain/Loss on Disposal		
TSMC Global	AXA Equitable Holdings Inc			Financial assets at fair value through other comprehensive income	-	-	USS 5,662	-	USS 6,917	-	-	USS 12,532	USS 12,265	USS 267	-	USS 393
	Ford Motor Credit Co LLC			"	-	-	USS 10,153	-	USS 7,177	-	-	USS 10,252	USS 10,454	USS (202)	-	USS -
	European Investment Bank			Financial assets at amortized cost	-	-	USS 3,903	-	USS 10,187	-	-	USS 11,181	USS 11,123	USS 58	-	USS 160,098
	Wells Fargo & Co			"	-	-	USS 149,941	-	USS -	-	-	USS 40,000	USS 40,000	USS -	-	USS 84,967
	JPMorgan Chase & Co.			"	-	-	USS 124,948	-	USS -	-	-	USS 100,000	USS 100,000	USS -	-	USS -
	Goldman Sachs Group, Inc.			"	-	-	USS 99,900	-	USS -	-	-	USS 50,000	USS 50,000	USS -	-	USS -
	Bank of Nova Scotia			"	-	-	USS 49,976	-	USS -	-	-	USS 50,000	USS 50,000	USS -	-	USS -
	Commonwealth Bank of Australia			"	-	-	USS 49,994	-	USS -	-	-	USS 100,000	USS 100,000	USS -	-	USS -
	Westpac Banking Corp.			"	-	-	USS 99,987	-	USS -	-	-	USS 50,000	USS 50,000	USS -	-	USS -
	National Australia Bank			"	-	-	USS 49,994	-	USS -	-	-	USS 1,201,895	USS 1,197,309	USS 4,586	-	USS 419,942
	Government bond			United States Treasury Note/Bond	-	-	USS 1,330,414	-	USS -	-	-	USS 30,306	USS 30,583	USS 8	-	USS -
	Financial assets at fair value through other comprehensive income			"	-	-	USS 2,248	-	USS 50,193	-	-	USS 50,290	USS 50,290	USS -	-	USS -
	United States Treasury Bill			"	-	-	USS -	-	USS -	-	-	USS 68,186	USS 68,239	USS (53)	-	USS -
	United States Cash Management Bill			"	-	-	USS 68,164	-	USS -	-	-	USS -	USS -	USS -	-	USS -
	United States Treasury Floating Rate Note			"	-	-	USS -	-	USS -	-	-	USS 43,868	USS 448	USS (12)	-	USS 43,455
	Agency bonds/Agency mortgage-backed securities			Fannie Mae Pool	-	-	USS -	-	USS -	-	-	USS 41,510	USS 1,017	USS (30)	-	USS 40,438
	Financial assets at fair value through other comprehensive income			"	-	-	USS -	-	USS 30,338	-	-	USS 917	USS 941	USS (24)	-	USS 29,463
	Fannie Mae Pool			"	-	-	USS -	-	USS 27,922	-	-	USS 3,870	USS 3,876	USS (6)	-	USS 23,932
	GNMA II Pool1MA6155			"	-	-	USS -	-	USS 24,616	-	-	USS 1,855	USS 1,855	USS (96)	-	USS 22,981
	Fannie Mae Pool			"	-	-	USS -	-	USS 23,676	-	-	USS 1,506	USS 1,572	USS (66)	-	USS 22,677
	Fannie Mae Pool			"	-	-	USS -	-	USS 22,063	-	-	USS 1,716	USS 1,771	USS (55)	-	USS 20,518
	FNMA TBA 30 Yr 4.5			"	-	-	USS -	-	USS 466,768	-	-	USS 446,909	USS 446,629	USS 280	-	USS 20,165
	Fannie Mae Pool			"	-	-	USS -	-	USS 21,757	-	-	USS 2,297	USS 2,329	USS (32)	-	USS 19,901
	Freddie Mac Gold Pool			"	-	-	USS -	-	USS 20,910	-	-	USS 1,702	USS 1,770	USS (68)	-	USS 19,392
	Fannie Mae Pool			"	-	-	USS -	-	USS 18,806	-	-	USS -	USS -	USS -	-	USS 18,834
	Freddie Mac Gold Pool			"	-	-	USS -	-	USS 19,929	-	-	USS 1,965	USS 2,050	USS (85)	-	USS 18,011
	Fannie Mae Pool			"	-	-	USS -	-	USS 18,859	-	-	USS 1,475	USS 1,582	USS (107)	-	USS 17,529
	FNMA TBA 30 Yr 4			"	-	-	USS -	-	USS 251,219	-	-	USS 23,880	USS 233,875	USS 5	-	USS 17,372
	Fannie Mae Pool			"	-	-	USS -	-	USS 17,117	-	-	USS 155	USS 161	USS (6)	-	USS 16,840
	Freddie Mac Gold Pool			"	-	-	USS -	-	USS 19,605	-	-	USS 3,315	USS 3,436	USS (121)	-	USS 16,230
	Fannie Mae Pool			"	-	-	USS -	-	USS 16,126	-	-	USS -	USS -	USS -	-	USS 16,122
	Freddie Mac Gold Pool			"	-	-	USS -	-	USS 206,260	-	-	USS 191,534	USS 191,171	USS 363	-	USS 15,095
	GNMA II TBA 30 Yr 3			"	-	-	USS -	-	USS 15,995	-	-	USS 1,319	USS 1,349	USS (30)	-	USS 14,828
	Freddie Mac Gold Pool			"	-	-	USS -	-	USS 17,665	-	-	USS 3,584	USS 3,755	USS (171)	-	USS 13,966
	Freddie Mac Gold Pool			"	-	-	USS -	-	USS 13,217	-	-	USS -	USS -	USS -	-	USS 13,261
	Fannie Mae Pool			"	-	-	USS -	-	USS 14,044	-	-	USS 1,004	USS 1,028	USS (24)	-	USS 13,152
	Freddie Mac Gold Pool			"	-	-	USS -	-	USS 16,635	-	-	USS 3,686	USS 3,832	USS (146)	-	USS 12,793
	GNMA II Pool MA5264			"	-	-	USS -	-	USS 12,611	-	-	USS -	USS -	USS -	-	USS 12,628
	Freddie Mac Gold Pool			"	-	-	USS -	-	USS 13,778	-	-	USS 1,615	USS 1,636	USS (21)	-	USS 12,480
	Freddie Mac Gold Pool			"	-	-	USS -	-	USS 12,394	-	-	USS 148	USS 158	USS (10)	-	USS 12,281
	Fannie Mae Pool			"	-	-	USS -	-	USS 14,112	-	-	USS 2,091	USS 2,197	USS (106)	-	USS 11,962
	Fannie Mae Pool			"	-	-	USS -	-	USS 12,515	-	-	USS 1,472	USS 1,497	USS (25)	-	USS 11,248
	GNMA II TBA 30 Yr 3.5			"	-	-	USS -	-	USS 270,651	-	-	USS 261,544	USS 261,292	USS 252	-	USS 10,517

(Continued)

Company Name	Marketable Securities Type and Name	Financial Statement Account	Counter-party	Nature of Relationship	Beginning Balance		Acquisition Amount (In Thousands)	Shares/Units (In Thousands)	Disposal Amount (In Thousands)	Carrying Value	Gain/Loss on Disposal	Shares/Units (In Thousands)	Ending Balance (Note) Amount
					Shares/Units (In Thousands)	Amount							
TSMC Global	Fannie Mae	Financial assets at fair value through other comprehensive income	-	-	US\$ 1,889	-	US\$ 10,203	-	US\$ 1,938	US\$ 1,918	US\$ 20	-	US\$ 10,258
	Fannie Mae Pool	"	-	-	US\$ -	-	US\$ 10,110	-	US\$ 38	US\$ 39	US\$ (1)	-	US\$ 10,057
	Fannie Mae Pool	"	-	-	US\$ -	-	US\$ 10,205	-	US\$ 471	US\$ 486	US\$ (15)	-	US\$ 9,703
	Fannie Mae Pool	"	-	-	US\$ -	-	US\$ 11,094	-	US\$ 1,529	US\$ 1,594	US\$ (65)	-	US\$ 9,596
	Fannie Mae Pool	"	-	-	US\$ -	-	US\$ 10,064	-	US\$ 642	US\$ 652	US\$ (10)	-	US\$ 9,384
	Fannie Mae Pool	"	-	-	US\$ -	-	US\$ 10,212	-	US\$ 1,100	US\$ 1,118	US\$ (18)	-	US\$ 9,306
	FNMA TBA 30 Yr 3.5	"	-	-	US\$ -	-	US\$ 622,622	-	US\$ 613,991	US\$ 613,385	US\$ 606	-	US\$ 9,259
	Fannie Mae	"	-	-	US\$ 9,370	-	US\$ 9,467	-	US\$ 10,271	US\$ 10,267	US\$ 4	-	US\$ 8,700
	Fannie Mae Pool	"	-	-	US\$ -	-	US\$ 28,050	-	US\$ 19,505	US\$ 19,498	US\$ 7	-	US\$ 8,538
	GNMA II TBA 30 Yr 4.5	"	-	-	US\$ 587	-	US\$ 37,238	-	US\$ 30,291	US\$ 30,323	US\$ (32)	-	US\$ 7,496
	Fannie Mae-Accs	"	-	-	US\$ -	-	US\$ 11,110	-	US\$ 4,196	US\$ 4,077	US\$ 119	-	US\$ 7,112
	Fannie Mae	"	-	-	US\$ 11,146	-	US\$ 6,657	-	US\$ 11,945	US\$ 11,922	US\$ 23	-	US\$ 6,200
	Freddie Mac Gold Pool	"	-	-	US\$ -	-	US\$ 21,042	-	US\$ 16,462	US\$ 16,381	US\$ 81	-	US\$ 8,706
	FNMA TBA 30 Yr 5	"	-	-	US\$ 24,761	-	US\$ 112,529	-	US\$ 133,871	US\$ 133,727	US\$ 144	-	US\$ 3,603
	FNMA TBA 15 Yr 3	"	-	-	US\$ -	-	US\$ 142,803	-	US\$ 138,801	US\$ 138,711	US\$ 90	-	US\$ 3,073
	Freddie Mac Gold Pool	"	-	-	US\$ -	-	US\$ 23,067	-	US\$ 20,672	US\$ 20,453	US\$ 219	-	US\$ 2,673
	Fannie Mae-Accs	"	-	-	US\$ -	-	US\$ 19,910	-	US\$ 18,513	US\$ 17,849	US\$ 664	-	US\$ 2,181
	FNMA TBA 30 Yr 3	"	-	-	US\$ -	-	US\$ 274,335	-	US\$ 272,691	US\$ 272,314	US\$ 377	-	US\$ 2,028
	FNMA Pool BM4493	"	-	-	US\$ 16,915	-	US\$ 1,795	-	US\$ 17,390	US\$ 17,262	US\$ 128	-	US\$ 1,588
	Freddie Mac Multifamily Structured Pass Through Certificates	"	-	-	US\$ -	-	US\$ 33,864	-	US\$ 33,705	US\$ 32,603	US\$ 1,102	-	US\$ 1,321
	Government National Mortgage Association	"	-	-	US\$ 16,485	-	US\$ 860	-	US\$ 17,209	US\$ 16,942	US\$ 267	-	US\$ 763
	Government National Mortgage Association	"	-	-	US\$ 10,590	-	US\$ 665	-	US\$ 10,652	US\$ 10,728	US\$ (76)	-	US\$ 640
	Fannie Mae or Freddie Mac	"	-	-	US\$ 360	-	US\$ 11,135	-	US\$ 11,138	US\$ 11,127	US\$ 11	-	US\$ 367
	Freddie Mac Gold Pool	"	-	-	US\$ -	-	US\$ 19,951	-	US\$ 20,336	US\$ 19,929	US\$ 407	-	US\$ -
	Government National Mortgage Association	"	-	-	US\$ 15,253	-	US\$ -	-	US\$ 15,929	US\$ 15,671	US\$ 258	-	US\$ -
	Government National Mortgage Association	"	-	-	US\$ 12,897	-	US\$ -	-	US\$ 13,248	US\$ 13,269	US\$ (21)	-	US\$ -
	Fannie Mae Pool	"	-	-	US\$ -	-	US\$ 11,390	-	US\$ 11,544	US\$ 11,369	US\$ 175	-	US\$ -
	Freddie Mac Multifamily Structured Pass Through Certificates	"	-	-	US\$ -	-	US\$ 9,824	-	US\$ 10,426	US\$ 9,819	US\$ 607	-	US\$ -
	FED HMLN PC Pool G61603	"	-	-	US\$ 25,515	-	US\$ -	-	US\$ 25,966	US\$ 25,627	US\$ 339	-	US\$ -
	Freddie Mac Gold Pool	"	-	-	US\$ -	-	US\$ 19,788	-	US\$ 19,817	US\$ 19,783	US\$ 34	-	US\$ -
	Freddie Mac Pool	"	-	-	US\$ -	-	US\$ 19,993	-	US\$ 20,102	US\$ 19,993	US\$ 109	-	US\$ -
	Freddie Mac Gold Pool	"	-	-	US\$ -	-	US\$ 31,117	-	US\$ 30,924	US\$ 31,115	US\$ (191)	-	US\$ -
	Freddie Mac Gold Pool	"	-	-	US\$ -	-	US\$ 19,999	-	US\$ 20,332	US\$ 19,982	US\$ 350	-	US\$ -
	Freddie Mac Gold Pool	"	-	-	US\$ -	-	US\$ 14,988	-	US\$ 15,037	US\$ 14,987	US\$ 50	-	US\$ -
	FNMA Pool BM4495	"	-	-	US\$ 27,324	-	US\$ -	-	US\$ 28,065	US\$ 27,635	US\$ 430	-	US\$ -
	FED HMLN PC Pool G61592	"	-	-	US\$ 21,507	-	US\$ -	-	US\$ 21,673	US\$ 21,448	US\$ 225	-	US\$ -
	Fannie Mae Pool	"	-	-	US\$ -	-	US\$ 23,009	-	US\$ 23,035	US\$ 23,003	US\$ 32	-	US\$ -
	FED HMLN PC Pool G61654	"	-	-	US\$ 18,555	-	US\$ -	-	US\$ 18,883	US\$ 18,606	US\$ 277	-	US\$ -
	FNMA II Pool MA3468	"	-	-	US\$ 17,490	-	US\$ -	-	US\$ 17,460	US\$ 17,591	US\$ (131)	-	US\$ -
	Fannie Mae-Accs	"	-	-	US\$ -	-	US\$ 10,575	-	US\$ 11,022	US\$ 10,560	US\$ 462	-	US\$ -
	FNMA Pool CA2169	"	-	-	US\$ 13,859	-	US\$ -	-	US\$ 13,966	US\$ 13,892	US\$ 74	-	US\$ -
	Fannie Mae Pool	"	-	-	US\$ 9,743	-	US\$ -	-	US\$ 9,881	US\$ 10,148	US\$ (267)	-	US\$ -
	FED HMLN PC Pool G61553	"	-	-	US\$ 15,045	-	US\$ -	-	US\$ 15,177	US\$ 15,109	US\$ 68	-	US\$ -
	Freddie Mac Gold Pool	"	-	-	US\$ -	-	US\$ 10,296	-	US\$ 10,337	US\$ 10,289	US\$ 48	-	US\$ -
	FHLMC TBA 30 Yr 3	"	-	-	US\$ 15	-	US\$ 51,813	-	US\$ 52,028	US\$ 51,828	US\$ 200	-	US\$ -
	FNMA TBA 15 Yr 3	"	-	-	US\$ 2,020	-	US\$ 48,272	-	US\$ 50,364	US\$ 50,283	US\$ 81	-	US\$ -

(Continued)

Company Name	Marketable Securities Type and Name	Financial Statement Account	Counter-party	Nature of Relationship	Beginning Balance		Acquisition Amount (In Thousands)	Shares/Units (In Thousands)	Shares/Units (In Thousands)	Disposal Amount	Carrying Value	Gain/Loss on Disposal	Shares/Units (In Thousands)	Ending Balance (Note) Amount	
					Shares/Units (In Thousands)	Amount									
TSMC Global	Fannie Mae or Freddie Mac	Financial assets at fair value through other comprehensive income	-	-	US\$ -	-	US\$ 13,314	-	US\$ 13,301	US\$ 13,314	US\$ (13)	-	US\$ -	US\$ -	
	Fannie Mae or Freddie Mac	"	-	-	US\$ -	-	US\$ 76,846	-	US\$ 76,925	US\$ 76,846	US\$ 79	-	US\$ -	US\$ -	
	Freddie Mac Gold Pool	"	-	-	US\$ -	-	US\$ 16,687	-	US\$ 16,832	US\$ 16,668	US\$ 164	-	US\$ -	US\$ -	
	Fannie Mae Pool	"	-	-	US\$ -	-	US\$ 24,951	-	US\$ 24,902	US\$ 24,951	US\$ 489	-	US\$ -	US\$ -	
	Freddie Mac Gold Pool	"	-	-	US\$ -	-	US\$ 14,610	-	US\$ 14,728	US\$ 14,594	US\$ 134	-	US\$ -	US\$ -	
	Fannie Mae Pool	"	-	-	US\$ -	-	US\$ 61,366	-	US\$ 61,130	US\$ 61,332	US\$ (202)	-	US\$ -	US\$ -	
	GNMA II TBA 30 Yr 5	"	-	-	US\$ 12,209	-	US\$ 38,655	-	US\$ 50,926	US\$ 50,878	US\$ 48	-	US\$ -	US\$ -	
	FNMA Pool CA2352	"	-	-	US\$ 25,130	-	US\$ -	-	US\$ 25,161	US\$ 25,104	US\$ 57	-	US\$ -	US\$ -	
	Fannie Mae Pool	"	-	-	US\$ -	-	US\$ 15,430	-	US\$ 15,615	US\$ 15,461	US\$ 154	-	US\$ -	US\$ -	
	GNMA II TBA 30 Yr 4	"	-	-	US\$ 2,129	-	US\$ 61,671	-	US\$ 63,840	US\$ 63,791	US\$ 49	-	US\$ -	US\$ -	
	Fannie Mae Pool	"	-	-	US\$ -	-	US\$ 21,932	-	US\$ 22,196	US\$ 21,977	US\$ 219	-	US\$ -	US\$ -	
	Fannie Mae Pool	"	-	-	US\$ 40,059	-	US\$ -	-	US\$ 41,005	US\$ 41,421	US\$ (416)	-	US\$ -	US\$ -	
	FNMA Pool BM1948	"	-	-	US\$ 26,046	-	US\$ -	-	US\$ 26,835	US\$ 26,938	US\$ (103)	-	US\$ -	US\$ -	
	Freddie Mac Gold Pool	"	-	-	US\$ -	-	US\$ 15,441	-	US\$ 15,631	US\$ 15,460	US\$ 171	-	US\$ -	US\$ -	
	Fannie Mae Pool	"	-	-	US\$ -	-	US\$ 16,982	-	US\$ 17,040	US\$ 16,958	US\$ 82	-	US\$ -	US\$ -	
	Fannie Mae Pool	"	-	-	US\$ -	-	US\$ 12,893	-	US\$ 13,190	US\$ 12,889	US\$ 301	-	US\$ -	US\$ -	
	Fannie Mae Pool	"	-	-	US\$ -	-	US\$ 26,015	-	US\$ 26,560	US\$ 26,015	US\$ 545	-	US\$ -	US\$ -	
	FNMA Pool BM4681	"	-	-	US\$ 31,784	-	US\$ -	-	US\$ 32,259	US\$ 31,819	US\$ 440	-	US\$ -	US\$ -	
	Freddie Mac Multifamily Structured Pass Through Certificates	"	-	-	US\$ 513	-	US\$ 10,877	-	US\$ 11,560	US\$ 11,380	US\$ 180	-	US\$ -	US\$ -	
	Asset-backed securities	Hyundai Auto Receivables Trust	Financial assets at fair value through other comprehensive income	"	-	US\$ -	-	US\$ 9,921	-	US\$ -	US\$ -	US\$ -	-	US\$ 9,925	
	Citibank Credit Card Issuance Trust	American Express Credit Account Master Trust	American Express Credit Account Master Trust	"	-	US\$ 68,487	-	US\$ 2,693	-	US\$ 64,194	US\$ 64,146	US\$ 48	-	US\$ 7,321	
	Discover Card Execution Note Trust	"	-	-	US\$ 27,285	-	US\$ 1,300	-	US\$ 26,647	US\$ 26,678	US\$ (31)	-	US\$ 2,070		
	Ford Credit Floorplan Master Owner Trust A Chase Issuance Trust	"	-	-	US\$ 8,861	-	US\$ 2,055	-	US\$ 10,143	US\$ 10,116	US\$ 27	-	US\$ 865		
	Discover Card Execution Note Trust	"	-	-	US\$ 37,495	-	US\$ 868	-	US\$ 38,510	US\$ 38,529	US\$ (19)	-	US\$ -		
	Ford Credit Floorplan Master Owner Trust A Chase Issuance Trust	"	-	-	US\$ 26,702	-	US\$ -	-	US\$ 26,696	US\$ 26,748	US\$ (52)	-	US\$ -		
					US\$ 43,604	-	US\$ -	-	US\$ 43,763	US\$ 43,697	US\$ 66	-	US\$ -		

Note: The ending balance includes the amortization of premium/discount on bonds investments, share of profits/losses of investees and other related adjustment.

(Concluded)

**TABLE 5****Taiwan Semiconductor Manufacturing Company Limited and Investees**

**ACQUISITION OF INDIVIDUAL REAL ESTATE PROPERTIES AT COSTS OF AT LEAST NT\$300 MILLION OR 20% OF THE PAID-IN CAPITAL  
FOR THE YEAR ENDED DECEMBER 31, 2019**  
(Amounts in Thousands of New Taiwan Dollars, Unless Specified Otherwise)

Company Name	Types of Property	Transaction Date	Transaction Amount (Foreign Currencies in Thousands)	Payment Term	Counter-party	Nature of Relationships	Owner	Relationships	Transfer Date	Amount	Price Reference	Purpose of Acquisition	Other Terms
TSMC	Fab	September 11, 2018 to August 12, 2019	\$ 1,008,210	Monthly settlement by the construction progress and acceptance	KEDGE Construction Co., Ltd.	-	N/A	N/A	N/A	N/A	Price comparison and price negotiation	Manufacturing purpose	None
	Fab	March 25, 2019	888,800	Monthly settlement by the construction progress and acceptance	PAN ASIA Corp.	-	N/A	N/A	N/A	N/A	Price comparison and price negotiation	Manufacturing purpose	None
	Fab	June 27, 2019 to October 2, 2019	348,935	Based on the terms in the purchase order	Fu Tsu Construction Co., Ltd.	-	N/A	N/A	N/A	N/A	Price comparison and price negotiation	Manufacturing purpose	None
	Fab	November 12, 2019	74,800,000	Based on the terms in the purchase order	72 counterparties, including:  Lead-Fu Industrials Corporation San Fu Chemical Co., Ltd. Chenfull International Co., Ltd. Shihlin Electric & Engineering Corporation TASA Construction Corporation China Steel Structure Co., Ltd. Capital Machinery Limited Fu Tsu Construction Co., Ltd. Mandartech Interiors Inc. Techgo Industrial Co., Ltd. Ovivo Taiwan Co., Ltd. Cica-Huntek Chemical Technology Taiwan Co., Ltd. Cheng Deh Fire Protection Industrial Corp. Zhao-Cheng Corp.	-	N/A	N/A	N/A	N/A	Price comparison and price negotiation	Manufacturing purpose	None

(Continued)

Company Name	Types of Property	Transaction Date	Transaction Amount (Foreign Currencies in Thousands)	Payment Term	Counter-party	Nature of Relationships	Prior Transaction of Related Counter-party			Price Reference	Purpose of Acquisition	Other Terms
							Owner	Relationships	Transfer Date			
TSMC	Fab				Jinn-Clean-Air Solution Tech Services Co., Ltd. Mega Union Technology Incorporated Am-Power Machine International Enterprise Co., Ltd. Markitech International Corp. ABB Ltd. Siemens Limited Hueng Luei Process Industry Co., Ltd. Jusun Instruments Co., Ltd. Weltall Technology Corporation Allis Electric Co., Ltd. Air Liquide Far Eastern Ltd. L&K Engineering Co., Ltd. Hsieh Kun Co., Ltd. Taiwan Purif Corp. Solomon Technology Corporation Exyte Taiwan Co., Ltd. Pan Asia (Engineers & Constructors) Corporation Evergreen Steel Corporation Atlas Copco Taiwan Ltd. Trusval Technology Co., Ltd. Yangtze Engineering Co., Ltd. Schneider Electric Taiwan Co., Ltd. Chun Yuan Steel Industry Co., Ltd. Yankey Engineering Co., Ltd. Ying Pao Technology Inc. Swift Engineering Co., Ltd. Chen Yuan International Co., Ltd. Uangyh-Tech Industrial Co., Ltd. Kedge Construction Co., Ltd. Taiwan Gieno Enterprise Co., Ltd.							

(Continued)

Company Name	Types of Property	Transaction Date	Transaction Amount (Foreign Currencies in Thousands)	Payment Term	Counter-party	Nature of Relationships	Prior Transaction of Related Counter-party			Price Reference	Purpose of Acquisition	Other Terms
							Owner	Relationships	Transfer Date			
TSMC	Fab				Unelectra International Corp. JG Environmental Technology Co., Ltd. Fortune Electric Co., Ltd. Desiccant Technology Corporation Organo Technology Co., Ltd. Ingersoll-Rand Southeast Asia (Pte) Ltd. Taiwan Branch (Singapore) Da-Cin Construction Co., Ltd. Wholotech System Hitech Limited United Integrated Services Co., Ltd. Hantech Engineering Co., Ltd. Kinetics Technology Corporation Versum Materials Taiwan Co., Ltd. Confederate Technology Co., Ltd. Atlas Technology Corp. Accudevice Co., Ltd.							

(Concluded)

TABLE 6

Taiwan Semiconductor Manufacturing Company Limited and Investees

**TOTAL PURCHASES FROM OR SALES TO RELATED PARTIES OF AT LEAST NTS\$100 MILLION OR 20% OF THE PAID-IN CAPITAL  
FOR THE YEAR ENDED DECEMBER 31, 2019  
(Amounts in Thousands of New Taiwan Dollars, Unless Specified Otherwise)**

Company Name	Related Party	Nature of Relationships	Transaction Details			Abnormal Transaction Unit Price	Notes/Accounts Payable or Receivable Ending Balance (Foreign Currencies in Thousands)	% to Total	Note
			Purchases/ Sales	Amount (Foreign Currencies in Thousands)	% to Total				
TSMC	TSMC North America GUC	Subsidiary Associate	Sales Sales	\$ 636,441,507 4,024,495	58	Net 30 days from invoice date (Note) - Net 30 days from the end of the month of when invoice is issued	-	(Note)	\$ 81,732,281 458,292
	TSMC Nanjing	Subsidiary	Purchases	16,970,404	18	Net 30 days from the end of the month of when invoice is issued	-		(1,266,002)
	TSMC China	Subsidiary	Purchases	16,584,706	17	Net 30 days from the end of the month of when invoice is issued	-		(1,538,971)
	WaferTech	Indirect subsidiary	Purchases	6,864,201	7	Net 30 days from the end of the month of when invoice is issued	-		(1,097,625)
	SSMC	Associate	Purchases	3,208,817	4	Net 30 days from the end of the month of when invoice is issued	-		(487,944)
	VIS	Associate	Purchases	3,092,600	3	Net 30 days from the end of the month of when invoice is issued	-		(153,977)
	Associate of TSMC		Sales	1,628,944	-	Net 30 days from invoice date	-		
	TSMC North America GUC		Sales	(USS\$ 52,821)		Net 30 days from invoice date	-		
	Xintec	Associate of TSMC	Sales	571,537	17	Net 30 days from the end of the month of when invoice is issued	(USS\$ 120,172)	18	

Note : The tenor is 30 days from TSMC's invoice date or determined by the payment terms granted to its clients by TSMC North America.

TABLE 7

Taiwan Semiconductor Manufacturing Company Limited and Investees

RECEIVABLES FROM RELATED PARTIES AMOUNTING TO AT LEAST NTS100 MILLION OR 20% OF THE PAID-IN CAPITAL  
DECEMBER 31, 2019  
(Amounts in Thousands of New Taiwan Dollars, Unless Specified Otherwise)

Company Name	Related Party	Nature of Relationships	Ending Balance (Foreign Currencies in Thousands)	Turnover Days (Note 1)	Amount	Overdue Action Taken		Amount Received in Subsequent Period	Allowance for Bad Debts
						Amount	Action Taken		
TSMC	TSMC North America	Subsidiary	\$ 82,535,007	48	\$ 1,109,577	-	-	\$ 30,688,822	\$ -
	TSMC Nanjing	Subsidiary	101,559	Note 2	-	-	-	-	-
	GUC	Associate	458,292	38	32,753	-	-	32,753	-
TSMC North America	GUC	Associate of TSMC	(US\$ 284,674	45	24,377	-	-	24,377	-
			9,493)		813)			(US\$ 813)	
TSMC China	TSMC Nanjing	The same parent company	24,200,839	Note 2	-	-	-	-	-
	TSMC	Parent company	(RMB 5,621,827)		-	-	-	-	-
			1,338,971	32	-	-	-	-	-
	TSMC	Parent company	(RMB 357,502)		-	-	-	-	-
	Xintec	Associate of TSMC	1,266,002	19	-	-	-	-	-
			(RMB 294,092)		-	-	-	-	-
VisEra Tech	TSMC	The ultimate parent of the Company	120,172	36	-	-	-	-	-
TSMC Technology	TSMC	The ultimate parent of the Company	249,993	Note 2	-	-	-	-	-
			(US\$ 8,336)		-	-	-	-	-
WaferTech	TSMC	The ultimate parent of the Company	1,097,625	59	598,169	-	-	598,169	-
			(US\$ 36,602)		(US\$ 19,947)			(US\$ 19,947)	

Note 1 : The calculation of turnover days excludes other receivables from related parties.

Note 2 : The ending balance is primarily consisted of other receivables, which is not applicable for the calculation of turnover days.

TABLE 8

**Taiwan Semiconductor Manufacturing Company Limited and Investees**

NAMES, LOCATIONS, AND RELATED INFORMATION OF INVESTEES OVER WHICH THE COMPANY EXERCISES SIGNIFICANT INFLUENCE (EXCLUDING INFORMATION ON INVESTMENT IN MAINLAND CHINA)  
FOR THE YEAR ENDED DECEMBER 31, 2019  
(Amounts in Thousands of New Taiwan Dollars, Unless Specified Otherwise)

Investor Company	Investee Company	Location	Main Businesses and Products	Original Investment Amount			Balance as of December 31, 2019		Share of Profits/Losses of Investee (Foreign Currencies in Thousands)	Note
				December 31, 2019 (Foreign Currencies in Thousands)	December 31, 2018 (Foreign Currencies in Thousands)	Shares (In Thousands)	Percentage of Ownership	Carrying Value (Foreign Currencies in Thousands)		
TSMC	TSMC Global TSMC Partners	Tortola, British Virgin Islands Tortola, British Virgin Islands	Investment activities Investing in companies involved in the design, manufacture and other related business in the semiconductor industry and other investment activities Manufacturing, selling, packaging, testing and computer-aided design of integrated circuits and other semiconductor devices and the manufacturing and design service of masks Manufacturing and selling of integrated circuits and other semiconductor devices Selling and marketing of integrated circuits and other semiconductor devices	\$ 355,162,309 31,456,130	\$ 355,162,309 31,456,130	988,268 11	100 100	\$ 397,737,270 53,388,267	\$ 11,592,187 2,202,709	Subsidiary Subsidiary
VIS	Hsin-Chu, Taiwan		Engaged in manufacturing electronic spare parts and in researching, developing, designing, manufacturing, selling, packaging and testing of color filter Wafer level chip size packaging and wafer level post passivation interconnection service Researching, developing, manufacturing, testing and marketing of integrated circuits Customer service and supporting activities Investing in new start-up technology companies Customer service and supporting activities Investing in new start-up technology companies Customer service and supporting activities Selling of solar related products and providing customer service	10,180,677	10,180,677	464,223	28	9,027,572	5,860,497	1,654,799 Associate
SSMC	Singapore			5,120,028	5,120,028	314	39	6,502,174	2,286,743	887,028 Associate
TSMC North America	San Jose, California, U.S.A			333,718	333,718	11,000	100	4,569,825	416,366	416,366 Subsidiary
VisEra Tech	Hsin-Chu, Taiwan			5,005,171	5,005,171	253,120	87	4,541,741	613,841	533,656 Subsidiary
Xintec GLC	Taoyuan, Taiwan			1,988,317	1,988,317	111,282	41	1,846,145	181,978	75,329 Associate
TSMC Europe	Hsin-Chu, Taiwan			386,568	386,568	46,688	35	1,284,377	633,467	220,700 Associate
VTAF III	Amsterdam, The Netherlands			15,749	15,749	-	100	462,479	37,621	37,621 Subsidiary
TSMC Japan	Cayman Islands			1,318,846	1,308,244	-	98	231,504	1,191	1,168 Subsidiary
VTAF II	Yokohama, Japan			83,760	83,760	6	100	142,620	3,254	3,254 Subsidiary
TSMC Korea	Cayman Islands			260,300	278,800	-	98	75,095	(3,409)	(3,409) Subsidiary
TSMC Solar Europe GmbH	Seoul, Korea			13,656	13,656	80	100	40,727	2,196	2,196 Subsidiary
TSMC Development	Hamburg, Germany			-	25,266	-	-	-	-	-
TSMC Partners	Delaware, U.S.A			17,601,121	17,601,121	-	100	29,825,099	1,338,673	Note 2 Subsidiary
TSMC Technology	(USS 586,939)	(USS 586,939)	Investing in companies involved in the manufacturing related business in the semiconductor industry	-	-	-	100	(USS 670,538	100,661	Note 2 Subsidiary
TSMC Canada	Ontario, Canada		Engineering support activities	(USS 428,289)	(USS 428,289)	-	100	(USS 22,360)	(USS 3,264)	
ISDF	Cayman Islands		Engineering support activities	(USS 68,972)	(USS 68,972)	2,300	100	(USS 239,150)	30,494	Note 2 Subsidiary
ISDF II	Cayman Islands		Investing in new start-up technology companies	(USS 2,300)	(USS 2,300)	-	97	(USS 7,975)	987	Note 2 Subsidiary
VTAF III	Cayman Islands		Investing in new start-up technology companies	(USS 14,250)	(USS 14,250)	583	97	(USS 10)	-	Note 2 Subsidiary
Growth Fund	New Taipei, Taiwan		Investing in new start-up technology companies	-	-	9,299	97	-	-	
Mutual-Pak	New Taipei, Taiwan		Manufacturing of electronic parts, wholesaling and retailing of electronic materials, and research, developing and testing of RFID	(USS 75,083)	(USS 64,587)	-	100	(USS 124,648)	(1,351)	Note 2 Subsidiary
				(USS 47,781)	(USS 21,154)	4,693	28	(USS 38,520)	(44)	Note 2 Associate
				(USS 1,593)	(USS 1,593)	(USS 1,285)	(USS 671)	(USS 20,941)	20,941	

(Continued)

Investor Company	Investee Company	Location	Main Businesses and Products	Original Investment Amount				Balance as of December 31, 2019		Share of Profits/Losses of Investee (Note 1) (Foreign Currencies in Thousands)	Note
				December 31, 2019 (Foreign Currencies in Thousands)	December 31, 2018 (Foreign Currencies in Thousands)	Shares (In Thousands)	Percentage of Ownership	Carrying Value (Foreign Currencies in Thousands)			
TSMC Development	WaferTech	Washington, U.S.A	Manufacturing, selling and testing of integrated circuits and other semiconductor devices	\$ -	\$ -	293,637	100	\$ 4,402,646 (USS 146,814)	\$ 843,483 (USS 27,326)	Note 2	Subsidiary

Note 1 : The share of profits/losses of investee includes the effect of unrealized gross profit on intercompany transactions.

Note 2 : The share of profits/losses of the investee company is not reflected herein as such amount is already included in the share of profits/losses of the investor company.

(Concluded)

TABLE 9

Taiwan Semiconductor Manufacturing Company Limited and Investees

INFORMATION ON INVESTMENT IN MAINLAND CHINA

FOR YEAR ENDED DECEMBER 31, 2019

(Amounts in Thousands of New Taiwan Dollars, Unless Specified Otherwise)

Investee Company	Main Businesses and Products	Total Amount of Paid-in Capital (RMB in Thousands)	Method of Investment	Accumulated Outflow of Investment from Taiwan as of January 1, 2019 (US\$ in Thousands)	Investment Flows	Accumulated Outflow of Investment from Taiwan as of December 31, 2019 (US\$ in Thousands)	Net Income (Losses) of the Investee Company	Percentage of Ownership	Share of Profits/Losses	Carrying Amount as of December 31, 2019	Accumulated Inward Remittance of Earnings as of December 31, 2019
TSMC China	Manufacturing, selling, testing and computer-aided design of integrated circuits and other semiconductor devices	\$ 18,939,667 (RMB 4,502,080)	Note 1	\$ 18,939,667 (US\$ 596,000)	\$ -	\$ -	\$ 18,939,667 (US\$ 596,000)	100%	\$ 4,070,094 (Note 2)	\$ 57,289,154	\$ -
TSMC Nanjing	Manufacturing, selling, testing and computer-aided design of integrated circuits and other semiconductor devices	\$ 30,521,412 (RMB 6,650,119)	Note 1	\$ 30,521,412 (US\$ 1,000,000)	\$ -	\$ -	\$ 30,521,412 (US\$ 1,000,000)	100%	\$ 1,289,672	\$ 1,213,021 (Note 2)	\$ 21,364,939

Accumulated Investment in Mainland China as of December 31, 2019 (US\$ in Thousands)	Investment Amounts Authorized by Investment Commission, MOEA (US\$ in thousands)	Upper Limit on Investment
\$ 49,461,079 (US\$ 1,596,000)	\$ 119,412,667 (US\$ 3,596,000)	\$ 973,257,256 (Note 3)

Note 1: TSMC directly invested US\$596,000 thousand in TSMC China and US\$1,000,000 thousand in TSMC Nanjing.

Note 2: Amount was recognized based on the audited financial statements.

Note 3: The upper limit on investment in mainland China is determined by sixty percent (60%) of the Company's consolidated net worth.

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**STATEMENT 1**

**Taiwan Semiconductor Manufacturing Company Limited**

**STATEMENT OF CASH AND CASH EQUIVALENTS**

**DECEMBER 31, 2019**

**(In Thousands of New Taiwan Dollars, Unless Specified Otherwise)**

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Item	Description	Amount
Cash		
Petty cash		\$ 460
Cash in banks		
Checking accounts and demand deposits		5,497,624
Foreign currency deposits	Including US\$385,487 thousand @29.988, JPY3,439,861 thousand @0.2751 and EUR2,327 thousand @33.653	12,584,607
Time deposits	From 2019.10.01 to 2020.10.14, interest rates at 0.19%-2.40%, including NT\$115,277,800 thousand and US\$269,781 thousand @29.988	<u>123,368,007</u>
Total		<u>\$ 141,450,698</u>

**STATEMENT 2**

**Taiwan Semiconductor Manufacturing Company Limited**

**STATEMENT OF NOTES AND ACCOUNTS RECEIVABLE, NET  
DECEMBER 31, 2019  
(In Thousands of New Taiwan Dollars)**

---

Client Name	Amount
Client A	\$ 20,435,306
Client B	4,419,372
Client C	3,914,138
Client D	3,375,702
Others (Note)	<u>17,299,460</u>
	49,443,978
Less: Loss allowance	<u>(319,045)</u>
Total	<u>\$ 49,124,933</u>

Note: The amount of individual client included in others does not exceed 5% of the account balance.

**STATEMENT 3**

**Taiwan Semiconductor Manufacturing Company Limited**

**STATEMENT OF RECEIVABLES FROM RELATED PARTIES**

**DECEMBER 31, 2019**

**(In Thousands of New Taiwan Dollars)**

---

<b>Client Name</b>	<b>Amount</b>
TSMC North America	\$ 81,732,281
Others (Note)	<u>462,220</u>
Total	<u>\$ 82,194,501</u>

Note: The amount of individual client included in others does not exceed 5% of the account balance.

**STATEMENT 4**

**Taiwan Semiconductor Manufacturing Company Limited**

**STATEMENT OF INVENTORIES**

**DECEMBER 31, 2019**

**(In Thousands of New Taiwan Dollars)**

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Item	Amount	
	Cost	Net Realizable Value
Finished goods	\$ 8,533,179	\$ 25,069,823
Work in process	49,268,466	236,694,719
Raw materials	15,046,116	14,064,902
Supplies and spare parts	<u>3,416,090</u>	<u>3,591,225</u>
Total	<u>\$ 76,263,851</u>	<u>\$ 279,420,669</u>

### Taiwan Semiconductor Manufacturing Company Limited

STATEMENT OF CHANGES IN INVESTMENTS ACCOUNTED FOR USING EQUITY METHOD  
FOR THE YEAR ENDED DECEMBER 31, 2019  
(On Thousands of New Taiwan Dollars, Unless Specified Otherwise)

Investees	Balance, January 1, 2019		Additions in Investment		Decrease in Investment		Shares (In Thousands)	Amount (In Thousands)	Shares (In Thousands)	Amount (In Thousands)	Shares (In Thousands)	Amount (In Thousands)	Market Value or Net Assets Value		
	Shares (In Thousands)	Amount	Shares (In Thousands)	Amount	Shares (In Thousands)	Amount									
<b>Increase (Decrease) in Using the Equity Method</b>															
Stocks															
TSMC Global	11	\$393,577,931	-	\$-	-	\$-	\$-	\$4,159,339	11	100	\$397,737,270		\$397,737,270	Nil	
TSMC Partners	988,268	52,339,094	-	\$-	-	\$-	\$-	1,049,173	988,268	100	53,388,267		53,388,267	Nil	
VIS	464,223	9,006,126	-	\$-	-	\$-	\$-	21,446	464,223	28	9,027,572	\$ 79 (Note 1)	36,812,923	Nil	
SSMC	314	5,772,815	-	\$-	-	\$-	\$-	729,359	314	39	6,502,174		6,288,190	Nil	
TSMC North America	11,000	4,269,393	-	\$-	-	\$-	\$-	300,432	11,000	100	4,569,825		4,569,825	Nil	
VisEra Tech	253,120	4,531,929	-	\$-	-	\$-	\$-	9,812	253,120	87	4,541,741		4,508,249	Nil	
Xintec	111,282	1,764,607	-	\$-	-	\$-	\$-	81,538	111,282	41	1,846,145	\$ 81 (Note 1)	8958,195	Nil	
GLIC	46,688	1,299,423	-	\$-	-	\$-	\$-	(15,046)	46,688	35	1,284,377	241 (Note 1)	11,251,774	Nil	
TSMC Europe	-	445,828	-	\$-	-	\$-	\$-	16,651	-	100	462,479		462,479	Nil	
TSMC Japan	6	141,136	-	\$-	-	\$-	\$-	1,484	-	6	142,620		142,620	Nil	
TSMC Korea	80	40,966	-	\$-	-	\$-	\$-	(239)	80	100	40,727		40,727	Nil	
TSMC Solar Europe GmbH	1	(20,106)	-	\$-	(1)	\$-	\$-	20,106	-	-	-		-	Nil	
Subtotal		<u>473,169,142</u>						<u>6,354,257</u>						<u>524,227,770</u>	
Capital															
TSMC China	-	55,466,911	-	\$-	-	\$-	\$-	1,822,243	-	-	100	57,289,154		57,289,154	Nil
TSMC Nanjing	-	20,601,413	-	\$-	-	\$-	\$-	763,526	-	-	100	21,364,939		21,364,939	Nil
VTAF III	-	194,660	-	\$-	10,602	\$-	\$-	26,242	-	-	98	231,504		208,227	Nil
VTAF II	-	128,758	-	\$-		\$-	\$-	(18,500)	(18,500)	(53,163)	-	98		68,348	Nil
Subtotal		<u>76,391,742</u>			<u>10,602</u>			<u>2,576,848</u>						<u>78,960,692</u>	
Total		<u>\$ 549,560,884</u>			<u>\$ 10,602</u>			<u>\$ 6,354,257</u>						<u>\$ 555,503,889</u>	
															<u>\$ 603,272,162</u>

Note 1: The unit price is calculated by closing price of the Taipei Exchange or the TWSE as of December 31, 2019.

Note 2: Mainly including share of profit or loss of subsidiaries and associates, share of other comprehensive income of subsidiaries and associates, cash dividends received from subsidiaries and associates, cash dividends, liquidation amount of subsidiaries and associates, etc.

**STATEMENT 6**

**Taiwan Semiconductor Manufacturing Company Limited**  
**STATEMENT OF CHANGE IN RIGHT-OF-USE ASSETS**  
**FOR THE YEAR ENDED DECEMBER 31, 2019**  
**(In Thousands of New Taiwan Dollars)**

Item	Land	Buildings	Machinery and Equipment	Office Equipment	Total	Remark
Cost					\$ -	
Balance at January 1, 2019	\$ -	\$ -	\$ -	\$ -	\$ -	-
Adjustments arising from initial application of accounting standards	14,825,426	429,023	2,559,303		17,831,257	
Additions	536,552	88,403	-		639,879	
Deductions	(593,427)	(8,717)	-		(604,009)	
Transfers out of right-of-use assets	-	-	(619,779)		(619,779)	
Balance at December 31, 2019	<u>\$ 14,768,551</u>	<u>\$ 508,709</u>	<u>\$ 1,939,524</u>	<u>\$ 30,564</u>	<u>\$ 17,247,348</u>	
Accumulated depreciation						
Balance at January 1, 2019	\$ -	\$ -	\$ -	\$ -	\$ -	
Additions	944,052	105,873	1,184,374		2,244,453	
Deductions	(5,700)	-	-		(6,466)	
Transfers out of right-of-use assets	-	-	(20,659)		(20,659)	
Balance at December 31, 2019	<u>\$ 938,352</u>	<u>\$ 105,873</u>	<u>\$ 1,163,715</u>	<u>\$ 9,388</u>	<u>\$ 2,217,328</u>	
Carrying amounts at December 31, 2019	<u>\$ 13,830,199</u>	<u>\$ 402,836</u>	<u>\$ 775,809</u>	<u>\$ 21,176</u>	<u>\$ 15,030,020</u>	

**STATEMENT 7**

**Taiwan Semiconductor Manufacturing Company Limited**

**STATEMENT OF SHORT-TERM LOANS**

**DECEMBER 31, 2019**

**(In Thousands of New Taiwan Dollars, Unless Specified Otherwise)**

Type	Balance, End of Year	Contract Period	Range of Interest Rates (%)	Loan Commitments	Collateral	Remark
Unsecured loans						
Crédit Agricole CIB	\$ 25,071,485	2019.09.27-2020.05.25	0.01	USD 1,100,000	Nil	-
Bank of America	14,994,000	2019.11.19-2020.01.14	2.16	USD 600,000	Nil	-
DBS	14,840,973	2019.10.30-2020.04.07	0.01	USD 500,000	Nil	-
Sumitomo Mitsui Banking Corporation	13,194,720	2019.11.08-2020.01.13	2.19-2.20	USD 500,000	Nil	-
Megabank	10,495,800	2019.11.06-2020.01.06	2.08-2.10	TWD 12,000,000	Nil	-
ING Bank N.V.	7,538,272	2019.12.27-2020.05.25	0.01	USD 1,000,000	Nil	-
Standard Chartered Bank	7,497,000	2019.12.04-2020.01.06	2.08	USD 450,000	Nil	-
First Commercial Bank	6,597,360	2019.11.08-2020.01.08	2.15	TWD 9,000,000	Nil	-
JPMorgan Chase Bank N.A.	5,697,720	2019.11.27-2020.01.09	2.22	USD 200,000	Nil	-
Citibank Taiwan	4,198,320	2019.11.08-2020.01.10	2.15	USD 145,000	Nil	-
Hua Nan Commercial Bank Ltd.	3,598,560	2019.12.05-2020.01.06	2.1	TWD 4,000,000	Nil	-
BNP Paribas Taiwan	1,796,280	2019.11.19-2020.01.13	2.16	USD 75,000	Nil	-
Citibank Taipei	1,499,400	2019.11.08-2020.01.07	2.15	USD 555,000	Nil	-
The Bank of Tokyo-Mitsubishi UFJ, Ltd.	1,499,400	2019.11.27-2020.01.09	2.22	USD 300,000	Nil	-
Subtotal	118,522,290					
Related parties						
TSMC Global	<u>\$ 29,988,000</u>	2019.07.18-2020.07.17	-	USD 1,000,000	Nil	
Total	<u>\$ 148,510,290</u>					

**STATEMENT 8**

**Taiwan Semiconductor Manufacturing Company Limited**

**STATEMENT OF ACCOUNTS PAYABLES  
DECEMBER 31, 2019  
(In Thousands of New Taiwan Dollars)**

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Accounts payables was NT\$36,029,135 thousands. The amount of individual vendor does not exceed 5% of the account balance.

**STATEMENT 9**

**Taiwan Semiconductor Manufacturing Company Limited**

**STATEMENT OF PAYABLES TO RELATED PARTIES  
DECEMBER 31, 2019  
(In Thousands of New Taiwan Dollars)**

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Vendor Name	Amount
TSMC China	\$ 1,538,971
TSMC Nanjing	1,266,002
WaferTech	1,097,625
Xintec	736,747
SSMC	487,944
Others (Note)	<u>589,346</u>
Total	<u>\$ 5,716,635</u>

Note: The amount of individual vendor in others does not exceed 5% of the account balance.

**STATEMENT 10**

**Taiwan Semiconductor Manufacturing Company Limited**

**STATEMENT OF PAYABLES TO CONTRACTORS AND EQUIPMENT SUPPLIERS  
DECEMBER 31, 2019  
(In Thousands of New Taiwan Dollars)**

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<b>Vendor Name</b>	<b>Amount</b>
Vendor A	\$ 30,277,721
Vendor B	23,758,769
Vendor C	12,331,155
Vendor D	10,909,698
Vendor E	8,523,195
Others (Note)	<u>53,953,953</u>
Total	<u>\$ 139,754,491</u>

Note: The amount of individual vendor included in others does not exceed 5% of the account balance.

**STATEMENT 11**

**Taiwan Semiconductor Manufacturing Company Limited**

**STATEMENT OF LEASE LIABILITIES**

**DECEMBER 31, 2019**

**(In Thousands of New Taiwan Dollars)**

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Item	Description	Lease Term	Discount Rate (%)	Balance, End of Year
Land	Mainly for the use of plants and offices	2 to 22 years	0.67-0.94	\$ 13,882,035
Buildings	Mainly for the use of offices	2 to 6 years	0.67-0.71	397,849
Machinery and equipment	For operation use	2 years	3.24	842,185
Office equipment	For operation use	1 to 3 years	0.64-0.71	<u>21,750</u>
				15,143,819
Less: Current portion				<u>(1,843,556)</u>
Noncurrent portion				<u>\$ 13,300,263</u>

**STATEMENT 12**

**Taiwan Semiconductor Manufacturing Company Limited**

**STATEMENT OF ACCRUED EXPENSES AND OTHER CURRENT LIABILITIES  
DECEMBER 31, 2019  
(In Thousands of New Taiwan Dollars)**

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<b>Item</b>	<b>Amount</b>
Refund liability	\$ 17,673,937
Contract liabilities	4,095,915
Utilities	2,758,347
Others (Note)	<u>18,583,433</u>
Total	<u>\$ 43,111,632</u>

Note: The amount of each item in others does not exceed 5% of the account balance.

## Taiwan Semiconductor Manufacturing Company Limited

STATEMENT OF BONDS PAYABLE  
DECEMBER 31, 2019  
(in Thousands of New Taiwan Dollars)

Bonds Name	Trustee	Issuance Date	Interest Payment Date	Coupon Rate (%)	Total Amount	Amount			Balance, End of Year (Carrying Value)
						Repayment paid	Repayment	Collateral	
Domestic unsecured bonds-100-2	Mega International Commercial Bank Co., Ltd.	2012.01.11	On 01.11 annually	1.46	\$ 7,000,000	\$ 7,000,000	\$ -	Bullet repayment	Nil
- B	Mega International Commercial Bank Co., Ltd.	2012.08.02	On 08.02 annually	1.40	9,000,000	9,000,000	\$ -	Bullet repayment	Nil
Domestic unsecured bonds-101-1	Taipei Fibon Commercial Bank Co., Ltd.	2012.09.26	On 09.26 annually	1.39	9,000,000	9,000,000	\$ -	Bullet repayment	Nil
- B	Taipei Fibon Commercial Bank Co., Ltd.	2012.10.09	On 10.09 annually	1.53	4,400,000	4,400,000	\$ -	Bullet repayment	Nil
Domestic unsecured bonds-101-2	Taipei Fibon Commercial Bank Co., Ltd.	2013.01.04	On 01.04 annually	1.35	10,000,000	10,000,000	\$ -	Bullet repayment	Nil
Domestic unsecured bonds-101-3	Taipei Fibon Commercial Bank Co., Ltd.	2013.01.04	On 01.04 annually	1.49	3,000,000	3,000,000	\$ -	Bullet repayment	Nil
Domestic unsecured bonds-101-4	Taipei Fibon Commercial Bank Co., Ltd.	2013.02.06	On 02.06 annually	1.38	11,600,000	11,600,000	\$ -	Bullet repayment	Nil
- B	Taipei Fibon Commercial Bank Co., Ltd.	2013.02.06	On 02.06 annually	1.50	3,600,000	3,600,000	\$ -	Bullet repayment	Nil
Domestic unsecured bonds-102-1	Taipei Fibon Commercial Bank Co., Ltd.	2013.07.16	On 07.16 annually	1.50	10,200,000	10,200,000	\$ -	Bullet repayment	Nil
- B	Taipei Fibon Commercial Bank Co., Ltd.	2013.07.16	On 07.16 annually	1.70	3,500,000	3,500,000	\$ -	Bullet repayment	Nil
Domestic unsecured bonds-102-2	Taipei Fibon Commercial Bank Co., Ltd.	2013.08.09	On 08.09 annually	1.52	8,500,000	8,500,000	\$ -	Bullet repayment	Nil
- C	Taipei Fibon Commercial Bank Co., Ltd.	2013.09.25	On 09.25 annually	1.60	1,400,000	1,400,000	\$ -	Bullet repayment	Nil
Domestic unsecured bonds-102-3	Taipei Fibon Commercial Bank Co., Ltd.	2013.09.25	On 09.25 annually	1.85	2,600,000	2,600,000	\$ -	Bullet repayment	Nil
- A	Taipei Fibon Commercial Bank Co., Ltd.	2013.09.25	On 09.25 annually	2.05	5,400,000	5,400,000	\$ -	Bullet repayment	Nil
- B	Taipei Fibon Commercial Bank Co., Ltd.	2013.09.25	On 09.25 annually	2.10	2,600,000	2,600,000	\$ -	Bullet repayment	Nil
Domestic unsecured bonds-102-4	Taipei Fibon Commercial Bank Co., Ltd.	2013.09.25	On 09.25 annually	1.60	\$ 91,800,000	\$ 91,800,000	\$ 56,900,000		
- C	Taipei Fibon Commercial Bank Co., Ltd.	2013.09.25	On 09.25 annually	1.85			\$ (31,800,000)		
- D	Taipei Fibon Commercial Bank Co., Ltd.	2013.09.25	On 09.25 annually	2.05					
- E	Taipei Fibon Commercial Bank Co., Ltd.	2013.09.25	On 09.25 annually	2.10					
- F	Taipei Fibon Commercial Bank Co., Ltd.								
<b>TOTAL</b>									
Less: current portion									

Less: current portion  
  
\$ 25,100,000

**STATEMENT 14**

**Taiwan Semiconductor Manufacturing Company Limited**

**STATEMENT OF NET REVENUE  
FOR THE YEAR ENDED DECEMBER 31, 2019  
(In Thousands of New Taiwan Dollars, Unless Specified Otherwise)**

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Item	Shipments (Piece) (Note)	Amount
Wafer	10,050,665	\$ 921,095,318
Other		<u>138,551,475</u>
Net revenue		<u><u>\$ 1,059,646,793</u></u>

Note: 12-inch equivalent wafers.

**STATEMENT 15**

**Taiwan Semiconductor Manufacturing Company Limited**

**STATEMENT OF COST OF REVENUE  
FOR THE YEAR ENDED DECEMBER 31, 2019  
(In Thousands of New Taiwan Dollars)**

---

<b>Item</b>	<b>Amount</b>
Raw materials used	
Balance, beginning of year	\$ 14,110,534
Raw material purchased	46,165,054
Raw materials, end of year	(15,046,116)
Transferred to manufacturing or operating expenses	(8,192,083)
Others	<u>(247,853)</u>
Subtotal	36,789,536
Direct labor	13,679,542
Manufacturing expenses	<u>473,793,547</u>
Manufacturing cost	524,262,625
Work in process, beginning of year	70,405,998
Work in process, end of year	(49,268,466)
Transferred to manufacturing or operating expenses	<u>(24,537,651)</u>
Cost of finished goods	520,862,506
Finished goods, beginning of year	10,920,351
Finished goods purchased	49,626,845
Finished goods, end of year	(8,533,179)
Transferred to manufacturing or operating expenses	(12,000,597)
Scrapped	<u>(308,304)</u>
Subtotal	560,567,622
Others	<u>18,939,425</u>
Total	<u>\$ 579,507,047</u>

**STATEMENT 16**

**Taiwan Semiconductor Manufacturing Company Limited**

**STATEMENT OF OPERATING EXPENSES  
FOR THE YEAR ENDED DECEMBER 31, 2019  
(In Thousands of New Taiwan Dollars)**

Item	Research and Development Expenses	General and Administrative Expenses	Selling Expenses
Payroll and related expense	\$ 28,605,548	\$ 7,310,041	\$ 2,141,162
Depreciation expense	23,129,545	1,113,860	42,164
Consumables	22,820,487	363,967	619
Repair and maintenance expense	4,429,076	1,228,740	441
Service fee	19,426	2,101,536	14,681
Management fees of the Science Park Administration	-	1,928,907	-
Patents	-	1,726,083	-
Commission	-	-	859,045
Others (Note)	<u>11,478,733</u>	<u>4,580,193</u>	<u>173,665</u>
Total	<u>\$ 90,482,815</u>	<u>\$ 20,353,327</u>	<u>\$ 3,231,777</u>

Note: The amount of each item in others does not exceed 5% of the account balance.

**Taiwan Semiconductor Manufacturing Company Limited**

**STATEMENT OF LABOR, DEPRECIATION AND AMORTIZATION BY FUNCTION  
FOR THE YEAR ENDED DECEMBER 31, 2019 AND 2018  
(In Thousands of New Taiwan Dollars, Unless Specified Otherwise)**

	Year Ended December 31, 2019			Year Ended December 31, 2018		
	Classified as Cost of Revenue	Classified as Operating Expenses	Classified as Other Operating Income and Expenses	Classified as Cost of Revenue	Classified as Operating Expenses	Classified as Other Operating Income and Expenses
	Classified as Cost of Revenue	Classified as Operating Expenses	Classified as Other Operating Income and Expenses	Total	Total	Total
Labor cost						
Salary and bonus	\$ 32,887,855	\$ 34,021,777	\$ -	\$ 86,909,632	\$ 51,980,310	\$ 34,454,020
Labor and health insurance	2,688,910	1,828,610	-	4,517,520	2,691,200	1,708,463
Pension	1,412,525	910,355	-	2,322,880	1,457,996	852,315
Board compensation	-	376,433	-	376,433	-	378,092
Others	1,513,328	919,576	-	2,432,904	1,604,091	878,328
	<u>\$ 38,502,618</u>	<u>\$ 38,056,751</u>	<u>\$ -</u>	<u>\$ 96,559,369</u>	<u>\$ 57,733,597</u>	<u>\$ 38,271,218</u>
Depreciation Amortization	<u>\$ 243,160,463</u>	<u>\$ 24,285,569</u>	<u>\$ 18,511</u>	<u>\$ 267,464,543</u>	<u>\$ 251,292,565</u>	<u>\$ 23,020,118</u>
	<u><u>\$ 2,971,336</u></u>	<u><u>\$ 2,367,550</u></u>	<u><u>\$ -</u></u>	<u><u>\$ 5,338,886</u></u>	<u><u>\$ 2,018,702</u></u>	<u><u>\$ 2,334,145</u></u>

Note 1: For the year of 2019 and 2018, the Company had average 44,058 and 43,447 employees, respectively, which included 8 non-employee directors for both years.

Note 2: Average labor cost for the year ended December 31, 2019 and 2018 were NT\$2,183 thousand and 2,201 thousand, respectively.

Note 3: Average salary and bonus for the year ended December 31, 2019 and 2018 were NT\$1,973 thousand and 1,990 thousand, respectively. The average salary and bonus decreased by 0.85% year over year.







## Taiwan Semiconductor Manufacturing Company, Ltd.

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Taiwan Semiconductor Manufacturing Company, Ltd.



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