TAIWAN SEMICONDUCTOR MANUFACTURING COMPANY

SECTOR : INFORMATION TECHNOLOGY

INDUSTRY : SEMICONDUCTOR AND SEMICONDUCTOR EQUIPMENT

RECOMMENDATION : BUY

DISCLOSURE STATEMENT

- We have no positions in any stocks mentioned, and no plans to initiate any positions within the next 72 hours.
- We do not own any stocks in the portfolio

AGENDA

- *Company Overview*
- *Stock overview*
- *Industry Analysis*
- *Semiconductor Manufacturing process & End user applications*
- *Porter's five forces*
- *Drivers to Buy*
- *Market News and Other key factors*
- *Risk Analysis*
- *Technical Analysis*
- *The Valuation glimpse*
- *Expert Rating*

COMPANY OVERVIEW

- Taiwan Semiconductor Manufacturing Company Limited was founded in 1987 and is headquartered in HsinChu, Taiwan.
- Manufactures and sells integrated circuits and semiconductors.
- World's most valuable semiconductor company, the world's largest dedicated independent (pure-play) semiconductor foundry
- Offers customer service, account management, and engineering services.
- Serves customers in computer, communications, consumer, and industrial and standard segments
- Presence in North America, Europe, Japan, China, and South Korea.

A FEW OTHER DETAILS ABOUT TSMC

Annual revenue - $48.21B

Net income – $18.65B (38.68% of Annual Revenue)

Total number of employees – 56,831 (Year 2020)

Total Assets - $99.38B

KEY STATASTICS

- CURRENT SHARE PRICE (11/26/2021) - $117.02
- MARKET CAP - **$607.238 Billion**
- 52WEEK RANGE - **96.20 - 142.20**
- BETA (5Y)- **1.01**
- PE(TTM)- **29.46X**
- TARGET PRICE - $212.89

INDUSTRY ANALYSIS

What is this INDUSTRY?

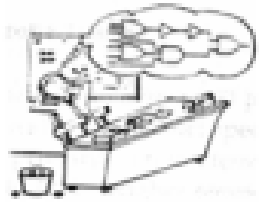
The semiconductor industry manufacturers integrated circuits ***("chips")*** for a variety of electronics, including computing devices, network equipment, and storage devices.

The rise of new technological advancements such as autonomous vehicles, big data analytics, edge computing, immersive devices (e.g., virtual reality), internet of things, machine learning, robotics, and so on are not only requiring more chips but continually more advanced chips.

There are three categories of chip manufacturers that buy equipment: Logic, memory, and foundry.

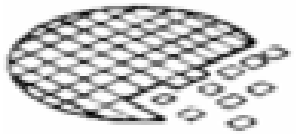
Competitors : Intel, Samsung, SK Hynix, Micron, Qualcomm, Broadcom, NVIDIA, Texas Instruments and Infineon

SEMICONDUCTOR MANUFACTURING PROCESS

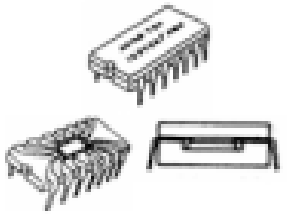


Logic Design

Mask Design



Fabrication, Wafer Probing and Dicing



Packaging and assembly

Final Product Testing

IC Design → Mask → Manufacturing → Assembly → Testing

Wafer, Chemicals → Manufacturing

Lead Frame, Substrate → Assembly

Grow Crystal

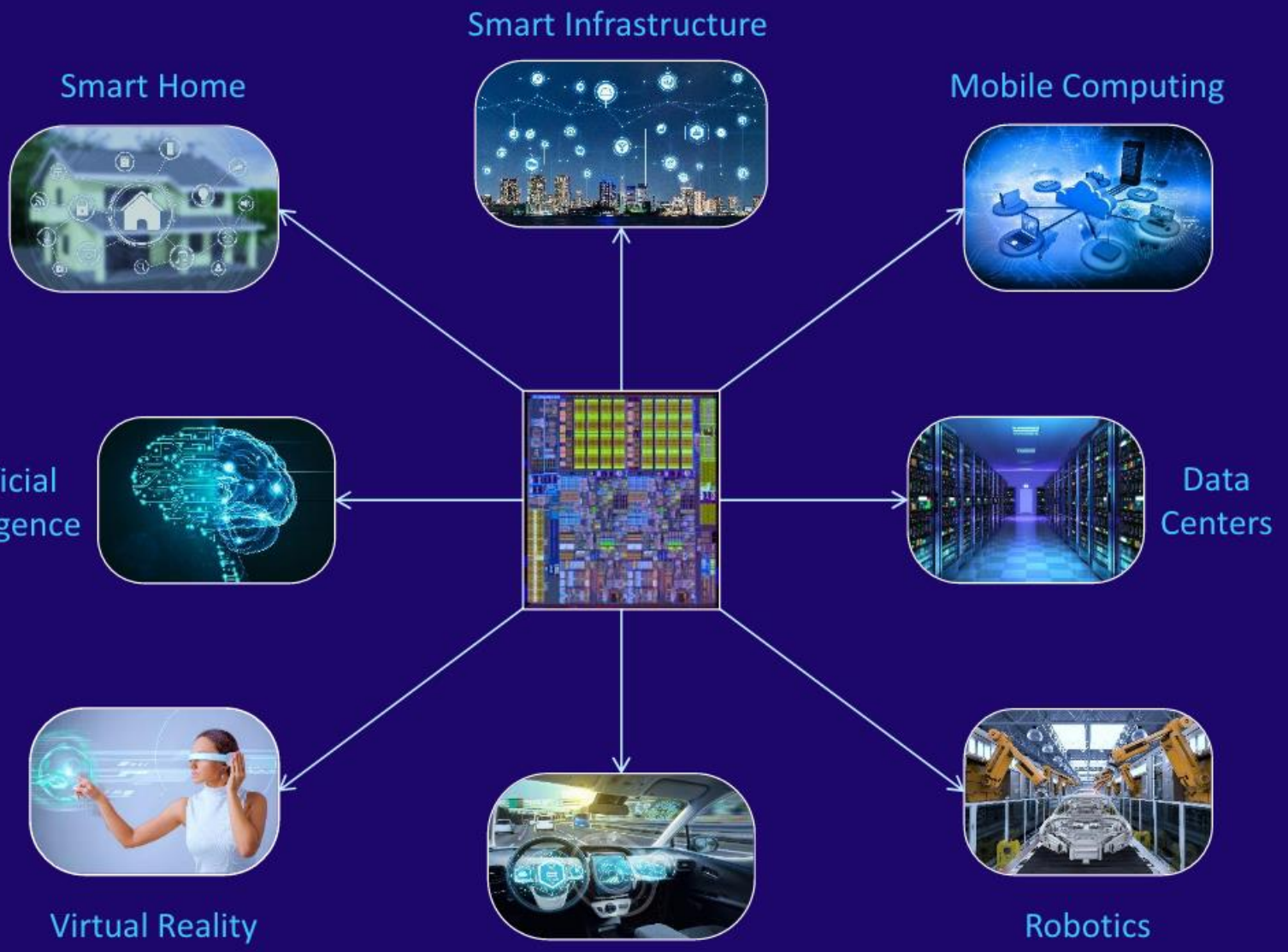
Wafer Dicing/Polishing

Source: Televisory's Research, Industrial Economics & Knowledge Center of Technology Research Institute (IEK/TRI)

Broad Range of End-User Applications

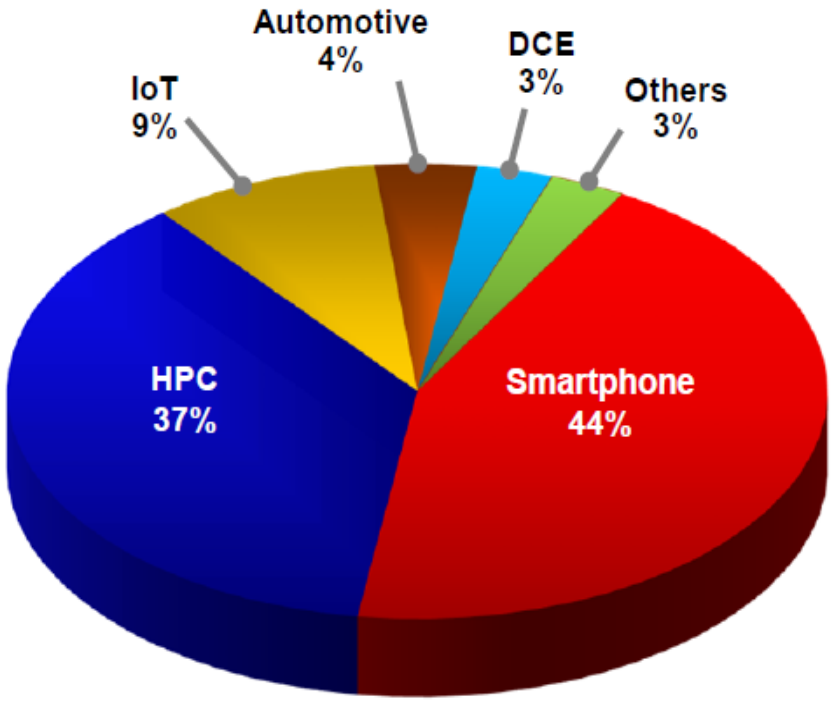
The “Data” Era

everything becomes smart producing an enormous amount of data

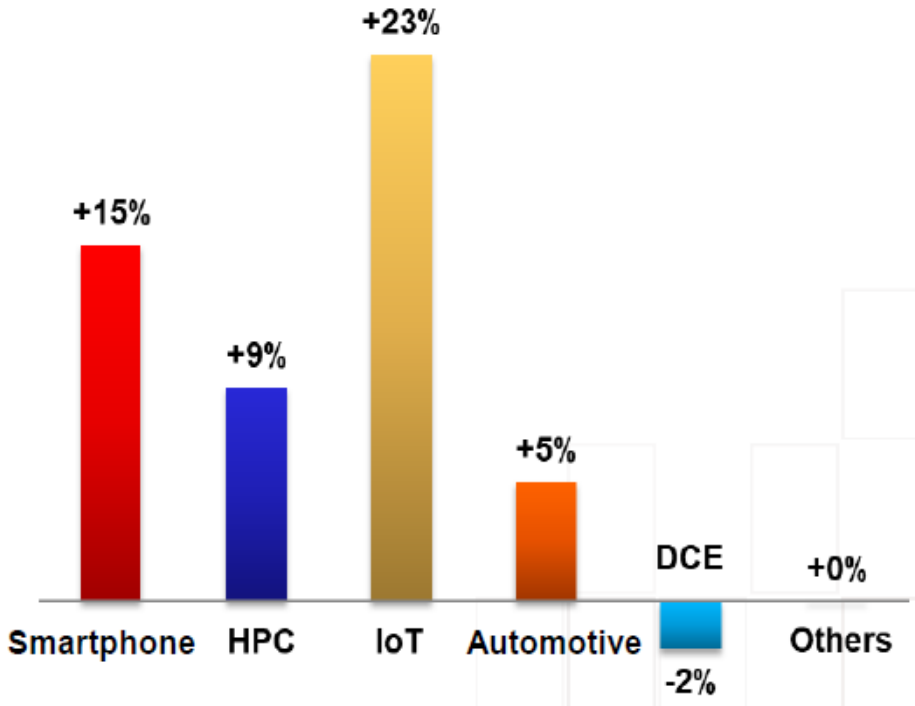


KLA-Tencor

3Q21 Revenue by Platform



Growth Rate by Platform (QoQ)



PORTERS 5 FORCES

- **Threats of New Competition (LOW)**

1. *High startup costs*
2. *Significant capital investments*

- **Bargaining Power of Suppliers (LOW)**

High number of suppliers allow semiconductor firms to apply pricing pressures on their suppliers.

- **Bargaining Power of Buyers (HIGH)**

1. *Chips are not sold to individual consumers, but rather to original equipment manufacturers (OEMs)*
2. *Purchases are in large volumes.*

- **Threats of Substitute (LOW)**

Currently, there are "no substitutes" for semiconductor chips.

- **Intensity of competitive rivalry (MED/HIGH)**

Each sub-industry may have a few big players based on various parameters.

Infographics

SUMMARY MODEL OF TSMC

PORTER'S FIVE FORCES MODEL

LOW

Threat from new entrants

Lorem Ipsum is simply dummy text of the printing and typesetting industry. Lorem Ipsum has been the industry's standard dummy text ever since the 1500s,

HIGH

Bargaining power of buyers

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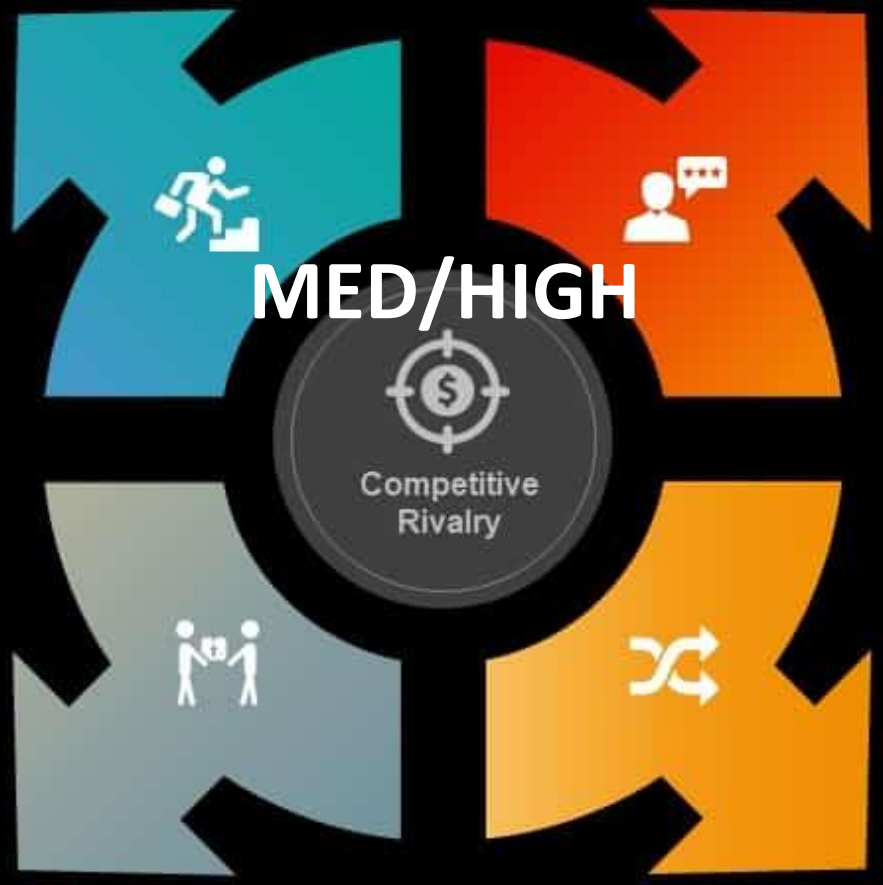

LOW

Bargaining power of suppliers

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LOW

Threat from substitutions product

Lorem Ipsum is simply dummy text of the printing and typesetting industry. Lorem Ipsum has been the industry's standard dummy text ever since the 1500s,

DRIVERS TO BUY

DRIVERS TO BUY

1. ***TECHNOLOGICAL DRIVERS***

A. First in making the most-advanced 3nm node chips and it will be the first foundry to roll out 3nm & 2 nm trial runs this year.

B. TSMC are using EUV in production for their 7nm and 5nm chips, and Intel is preparing to deploy it for the first time.

2. ***POLITICAL DRIVERS***

A. Congress is considering legislation called the FABS Act that would establish a semiconductor investment tax credit. The FABS Act should be expanded to include expenditures for both manufacturing and design to help strengthen the entire semiconductor ecosystem.

B. In December 2020, the U.S. Commerce Department announced the blacklisting of China's top chipmaker, Semiconductor Manufacturing International Corp. (SMIC),to protect U.S. national security, giving TSMC the boost.

3. ***INNOVATION DRIVERS***

A. **Data Centers**

The most powerful long-term secular opportunity for the semiconductor market, resides in the data center. Driven by greater online usage from work from home employees has resulted in rising demand for data to be created via video communication and an increase in the number of downloaded/streamed videos from consumers.

B. **5G Provides Enormous Growth Potential**

As 5G is rolled out, both end-user devices like smartphones and base stations will need to support 5G-related multiple-input and multiple-output (MIMO) and beam-steering technologies, which will require expanded demand for bulk acoustic wave filters, antennae, power management, and other devices.

Greater penetration for Organic LED (OLED) displays in mobile devices has further aided.

C. **Megatrends Within the Automotive Market Unlock Content Growth for Chipmakers**

TSMC will be a major beneficiary of all the three trends as a 10% annual growth in silicon content is expected. Shift to electric vehicles will further aid avg. semiconductor content per vehicle growth.

DRIVERS TO BUY

4. ***SOCIAL DRIVERS***

TSMC Commits to Reach Net Zero Emissions by 2050, Acting on Responsibility to Environmental Sustainability.
Ref: https://pr.tsmc.com/english/news/2865

5. ***ECONOMIC DRIVERS***

A. Capital spending from the foundry players is set to rise considerably in 2021 and 2022, TSMC raising capex up to $28 billion plus in 2021 from $17 billion in 2020.

B. Semiconductor producers managed to decrease the cost of products by continually shrinking transistor sizes, increasing wafer sizes, and improving throughput.

6. ***EXPANSION DRIVERS***

A. $12 B plant in Arizona, USA is under construction.
B. $7 B plant in Japan with Sony is under construction.

FRESH FROM THE MARKET TO YOUR EARS:

- **TSMC to produce Apple's 5G iPhone modem in 2023. –Nov 24/2021**

Ref : https://asia.nikkei.com/Business/Tech/Semiconductors/Apple-taps-TSMC-to-build-custom-iPhone-5G-modem-in-2023

- Apple and TSMC plan to produce new 3nm chipsets for iPhones and MacBooks. Experts claimed that these new SoCs could allow the giant tech manufacturer to have great advantages for laptops against Intel. –Nov 5/2021

Ref: https://appleinsider.com/articles/21/11/02/apple-gets-preferential-treatment-in-close-tsmc-partnership

- Apple Inc (AAPL.O) and Intel Corp (INTC.O) will be the first adopters of TSMC next-generation chip 3 nm production technology ahead of its deployment, possibly next year, Nikkei. – July/2021

Ref : https://asia.nikkei.com/Business/Tech/Semiconductors/Apple-taps-TSMC-to-build-custom-iPhone-5G-modem-in-2023


intel
FIRED!
tsmc
HIRED

The Risks of Semiconductor & Semiconductor Equipment Industry

- **Competitive environment** : Revenue advances have slowed over recent decades, competitors are facing increasingly brutal competition, rapid technological changes, and falling product prices.

***Mitigant:* TSMC's ability of making the most advanced chips and always trying to take the first mover advantage in almost every breakthrough.**

- **Pain from Supply Constraints** : The shortage of semiconductors has been most pronounced within the automotive space but is disrupting a host of other end-markets, like PCs and factory automation.

***Mitigants: 1.* The principal pieces of equipment used to manufacture semiconductors are owned by TSMC.**

***2.* Its relationships with equipment suppliers are good and it enjoys the edge of being a major purchaser of fabrication.**

3. *Raw material procurement policy is to select only those vendors who have demonstrated quality control and reliability on delivery time and maintain multiple sources for each raw material.*

4. *TSMC **bring together fab operations, materials management, quality system and risk management teams to mitigate potential supply chain risks and enhance supply chain agility.***

- **Delayed breakthroughs in R&D** : The lifeblood of the industry is R&D. The innovation drivers of the industry depends so much on the state of R&D that any hinderance or delayed results can hamper industry's outlook and can let consumer loose interest.

*Mitigants: **Considering the history of the company, it has never failed to deliver results with-in no abnormal time span. Also, the way company has announced its future projects be it rolling out 3nm & 2nm trial runs recently or upcoming partnership contracts shows its commitment.***

- **Reliance on limited customers/clients**.

*Mitigants: **TSMC is a big supplier and it enters into long term contracts with its clients. Being the first one to bring innovative product to the market, gives company a favorable position in the market.***

- **President Joe Biden's infrastructure investment package includes $50 billion for semiconductor production**.

*Mitigants: **It is still unclear whether the benefits of the project will accrue to only native American companies or to all the American listed companies under this sector. Moreover, the bill was passed in only one house as of now and has not become a 'law' yet.***

TECHNICAL ANALYSIS


TSM
5m 15m 30m 1h 4h D M
Unnamed
Taiwan Semiconductor Manufacturing Company Ltd. · 1D · NYSE
O117.50 H119.04 L116.52 C117.09 −3.62 (−3.00%)
USD
117.09 0.00 117.09
BB 21 close 2 0 118.67 125.10 112.25
EMA 13 close 0
Vol 6.767M
140.00
130.00
125.55
121.81
117.09
113.51
110.00
107.45
100.00
90.00
80.00
%R 14 close −95.07
0.00
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ov
2021
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THE VALUATION

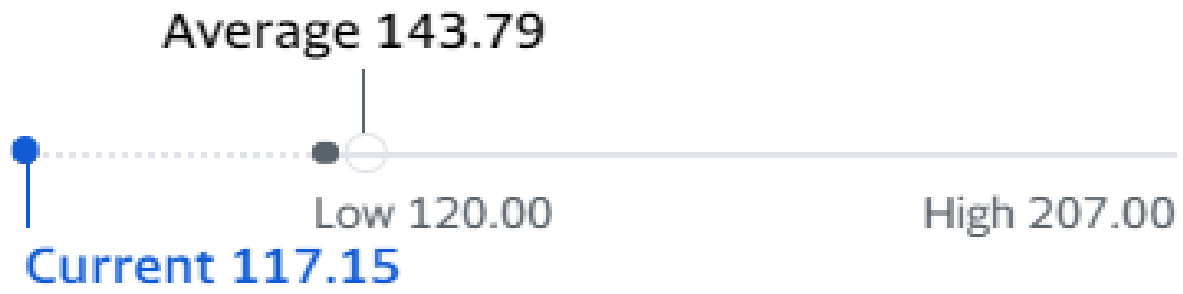
Taiwan SemiConductor Manufacturing Co. Ltd.	Ticker:	TSM
Summary		
	Value	Weight
DDM - 2 Stage	$32.54	25%
FCFF Model	$272.87	65%
Historical Relative P/E	$273.89	10%
		100%
Current Price	$119.28	
Target	**$212.89**	
% Undervalued	**78.5%**	
Expected Alpha	**67.5%**	

Company Data		
EPS (TTM)	$	22.12
Dividends (TTM)	$	1.45
SPS (TTM)	$	58.26
BPS (TTM)	$	71.37
TBVPS (TTM)	$	69.31

Pitching Analyst(s):	Ayush Goel & Khushbu Dudani
Presentation Date:	13-Dec-21

Recommendation Rating >

Analyst Price Targets (9) >



Q&A