

# The value of digital payment

Equity preferences 30 August 2019 – 08:28 am BST

**Chief Investment Office GWM** 

Toru Ibayashi, Analyst, toru.ibayashi@ubs.com, Chisa Kobayashi, Analyst, chisa.kobayashi@ubs.com

- Japan is one of the last holdouts for cash in the developed world, but with government encouragement, it should now transition more rapidly to digital payment systems.
- The country is well-positioned to transform from an analog cashbased economy to a digital-money economy, given that it needs to improve productivity due to a shrinking workforce.

Over the past decade, smartphones have brought many of the things we use and consume daily onto a single hand-held device. Messages, pictures, movies, music, books and newspapers are now stored on or fed through to our smartphones, which have replaced other forms of media and communication.

Smartphones now look ready to take on one of the last great analog holdouts. Soon, we believe cash will no longer move so readily from hand to hand in Japan, and along with the rising use of plastic, we expect transactions via the smartphone to make headway.

Eighty percent of all payments in the country are currently in cash; only 20% are via plastic. The slow adoption of IC-chip-based cards is partly due to their cost given the still relatively low level of competition among Japanese banks, and partly because the ATM network is so ubiquitous. China, South Korea and many other countries are more advanced in terms of cashless payments.

The government's "Cashless Vision" initiative expects a boost in the cashless ratio from 20% currently to 40% by 2027. Even before this initiative, Japan had changed its banking laws in 2017, allowing third-party players access to accounts with the holder's approval. This regulation allows account holders to move money more easily from a bank to a digital wallet using their mobile phone.

By 2026, we expect 40% of total payments in Japan to be noncash, and 7–10% to be made via digital cash – online, contactless payment systems linked to digital wallets and bank accounts. Despite its low popularity currently, we are optimistic digital money will gain momentum in the next two to three years and its use will also exceed that of prepaid travel cards such as Suica and Pasmo by 2026.

## **Recent developments**

Over the past six months, several internet-related companies have launched digital payment systems, including Pay Pay by one of the largest internet operators, LINE Pay and Rakuten Pay.

The value-added tax in Japan will rise to 10% from 8% in October, but consumers can get back 5% if they use cashless payments. Though this move will end in June 2020, it will likely motivate many people to start using digital payments in their daily transactions. While momentum is gaining pace, most existing users of digital pay-



Most Preferred	
KDDI	JPY
LINE	JPY
NTT	JPY
Rakuten	JPY
Sumitomo Mitsui Financial Group	JPY
Yahoo Japan	JPY
Source: LIRS	

Thematic Benchmark: MSCI Japan

The value of digital payment Equity preferences

ments are early adapters or heavy internet users who already shop almost exclusively online. So we believe the Japanese government's support for cashless payments will be a game-changer for consumer behavior.

Recent CIO selection changes	<b>i</b>		
Company / Trade Date	Old	New	Comment
Rakuten		Most Preferred	Rakuten is one of the major digital payment platformers in Japan, but unlike its rivals, the company does not spend much on marketing promotion. Also, its operations are
30/8/2019			supported by Rakuten EC and credit card users. We like Rakuten's strength in credit card business in Japan.
Japan Post Holdings	Most Preferred	Removed	The recovery of Japan Post's insurance earnings will likely take longer than we expected, thus we remove the stock from our EPL.
27/8/2019		,	
LINE		Most Preferred	We think LINE Pay is well positioned to become a leading mobile cashless payment system in Japan that will reduce labor costs and improve efficiency. The upcoming
26/7/2019			government digital cash-back initiative (5% of sales if payment is made by cashless) should cashless payment adoption in Japan to the next level, in our view.
Screen Holdings	Most Preferred	Removed	After recent outperformance of the share price, we believe near-term positive catalysts have mostly priced into the share price. Thus, we remove SCREEN from our
9/7/2019			EPL.
Rakuten	Most Preferred	Removed	After recent outperformance of the share price, we believe near-term positive catalysts have mostly priced into the share price. Thus, we remove Rakuten from our
28/6/2019			EPL.
Mizuho Financial Group	Most Preferred	Removed	The company revealed the new mid-term plan, in which they touched upon a possible use of capital for growth investments and dividends/share buybacks. However, we
27/6/2019			believe it will take a bit more time until we see catalysts. Thus, we remove Mizuho Financial Group from our EPL.
Rakuten		Most Preferred	Rakuten is one of the major digital payment platformers in Japan, but unlike its rivals,
27/5/2019			the company does not spend much on marketing promotions. Also, its operations are supported by Rakuten EC and credit card users.
Fujitsu	Most Preferred	Removed	After recent outperformance of the share price, we believe near-term positive catalysts have mostly priced into the share price. Thus, we remove Fujitsu from our
22/5/2019			EPL.
LINE	Most Preferred	Removed	While we still believe LINE Pay will be a leading mobile payment application over the long term, its strategic business is in the investment phase and operating losses are
22/5/2019			expected to widen for some time. Thus, we are removing LINE from our EPL.
Rakuten	Most Preferred	Removed	After recent outperformance of the share price, we believe near-term positive catalysts have mostly priced into the share price. Thus, we remove Rakuten from our
1/4/2019			EPL.
Tokyo Electron	Most Preferred	Removed	After recent outperformance of the share price, we believe near-term positive catalysts have mostly priced into the share price. Thus, we remove Tokyo Electron
22/2/2019			from our EPL.
GMO Internet	Most Preferred	Removed	After recent outperformance of the share price, we believe near-term positive catalysts have mostly priced into the share price. Thus, we remove GMO Internet from
14/2/2019			our EPL.
KDDI		Most Preferred	We believe KDDI's smartphone-based payment platform and financial services business should boost customer retention and average revenue per user (ARPU) over
14/2/2019			the long term. A relatively high dividend yield should support its share price.
Mitsubishi UFJ Financial Group	Most Preferred	Removed	UBS CIO has become restricted on the name and, thus, removed it from the Equity Preference List where it has been previously.
6/11/2018			
Screen Holdings		Most Preferred	We believe higher digital payment needs will lead to larger data saver capacity and stronger DRAM demand, which should benefit Screen Holdings' earnings
5/11/2018			over the long term. Given Screen's world-leading position in the semiconductor manufacturing equipment sector, we believe its shares are undervalued.

M	C-1+!	ICINI	ccv	Share	52 V	Veek	P	Æ	Div '	Yield	P/BV	Div. Cover
Name	Selection	ISIN	CCY	Price	High	Low	19E	20E	19E	20E	19E	19E
KDDI	Most Preferred	JP3496400007	JPY	2,830.00	3,173.00	2,331.50	10.8 x	11.2 x	3.92%	4.15%	1.5 x	2.4 x
LINE	Most Preferred	JP3966750006	JPY	3,650.00	5,140.00	2,911.00					5.3 x	
NTT	Most Preferred	JP3735400008	JPY	5,061.00	5,294.00	4,050.00	10.9 x	10.4 x	3.73%	4.01%	1.0 x	2.4 x
Rakuten	Most Preferred	JP3967200001	JPY	954.00	1,313.00	707.00	16.2 x	57.3 x	0.46%	0.46%	1.5 x	13.4 x
Sumitomo Mitsui Financial Group	Most Preferred	JP3890350006	JPY	3,429.00	4,775.00	3,380.00	6.6 x	6.4 x	5.47%	5.80%	0.4 x	2.8 x
Yahoo Japan	Most Preferred	JP3933800009	JPY	263.00	415.00	250.00	15.3 x	13.8 x	3.38%	3.38%	1.5 x	1.9 x

Based on consensus estimates provided by Factset as of August 29, 2019

Name	Sector	ISIN	Currency	52w High	Selection
	Country	Valor	Share Price	52w Low	Analyst
KDDI	Communication Services	JP3496400007	JPY	3.173.00	Most Preferred
	Japan	249625	2.830.00	2,331.50	toru.ibayashi@ubs.com
	Japan	213023	2,030.00	2,331.30	UBS Securities Japan Co., Ltd.

## Company profile

KDDI was founded in October 2000 through the merger of DDI, KDD and IDO, becoming KDDI in April 2001. The company's core segments include Personal (au mobile, FTTH, CATV), Value (financial/commerce, apps, movie/music distribution), Business (ICT solutions, corporate data centre services), Global (overseas communications for corporates/individuals) and Others (telecom facility construction/maintenance). The current three-year plan calls for a transformation from a telecoms provider to a life design company by offering settlement, merchandise sales, energy/financial services and further growth in domestic telecoms.

## What drives our opinion

KDDI's Smart Money Concept aims to establish strong and long-term engagement with its subscribers by strengthening smartphone-based payment settlements and by reinforcing its smartphone-based financial services offering. It currently offers credit card, prepayment, bank and loan services, and will soon start online securities services through a partnership. We believe KDDI can bolster its smartphone-based payment services and increase ARPU over the long term. The telecom company targets EPS to grow by 1.5x in FY25 driven by earnings growth and continuous share buyback. A relatively stable dividend policy and high dividend yield should support the share price's downside risk.

#### Why it is Most Preferred

We believe KDDI's smartphone-based payment platform and financial services business should boost customer retention and average revenue per user (ARPU) over the long term. A relatively high dividend yield should support its share price.

LINE	Information Technology	JP3966750006	JPY	5,140.00	Most Preferred
	Japan	32886296	3,650.00	2,911.00	toru.ibayashi@ubs.com UBS Securities Japan Co., Ltd.

## Company profile

LINE Corp operates the mobile messaging application LINE, which is a global platform started in Japan in 2011. It has 165m global monthly active users in its four major markets: Japan, Taiwan, Thailand and Indonesia (as of Q118). The company was dual listed on the Tokyo Stock Exchange and the New York Stock Exchange in July 2016. Naver Corp, based in Korea, is its parent company (73.3% stake as of Q118).

## What drives our opinion

We believe Japan will transform into a cashless society in the next few years, and LINE is well positioned for future growth through its LINE Pay platform. Although there is no clear winner yet among the mobile payment platforms in Japan, LINE has disclosed the most aggressive loyalty scheme and vendor acquisition initiative in Japan so far. LINE's strength is that it has a very large number of monthly active users (164m) through its messenger service applications. A UBS survey highlighted that millennials regard LINE Pay as the leading service in the cashless space. We believe LINE Pay will be a game changer for the company, as it should improve LINE's sales mix and drive the company's profit for the next few years.

## Why it is Most Preferred

We think LINE Pay is well positioned to become a leading mobile cashless payment system in Japan that will reduce labor costs and improve efficiency. The upcoming government digital cashback initiative (5% of sales if payment is made by cashless) should cashless payment adoption in Japan to the next level, in our view.

NTT	Communication Services	JP3735400008	JPY	5,294.00	Most Preferred
	Japan	764057	5,061.00	4,050.00	toru.ibayashi@ubs.com UBS Securities Japan Co., Ltd.

## Company profile

First established in August 1952, NTT was privatized in April 1985. It realigned its corporate structure in July 1999 with NTT as a holding company and fully-owned subsidiaries NTT East/West and NTT Communications. Its core segments include regional, long-distance and international and mobile communications; data, including network system services and system integration; and others (real estate, finance, construction, electric power). Its current medium-term plan pursues a B2B2X model for sustainable growth and aims to provide individual and corporate clients with value through a variety of service providers.

## What drives our opinion

Japan is moving towards becoming a cashless society. We believe NTT is in a very good position to take advantage of this movement through its subsidies NTT Data and NTT Docomo. NTT Data is one of the major data management companies in Japan and will likely play a crucial part in the big data business, while NTT Docomo is a core telecom player working closely with the Japanese government on its cashless society vision. NTT's mid-term plan is to increase EPS by 40% from FY2019 to FY2023 by earnings expansion and share buybacks. NTT offers a relatively high dividend yield which reduces downside risks for the share price, in our view.

## Why it is Most Preferred

NTT plays a crucial part in digital payments, mainly through its subsidies. The telecommunication company's stable cash-flow every year and relatively high dividend yield buoy the share price.

Name	Sector	ISIN	Currency	52w High	Selection
	Country	Valor	Share Price	52w Low	Analyst
Rakuten	Consumer Discretionary Japan	JP3967200001 1065454	JPY 954.00	1,313.00 707.00	Most Preferred chisa.kobayashi@ubs.com UBS Securities Japan Co., Ltd.

## Company profile

Japan's biggest e-commerce operator, Rakuten has created a unique 'eco-system' by combining merchandise e-commerce (Rakuten Ichiba), services e-commerce (Rakuten Travel, etc.), and financial operations (credit cards, banking, securities, etc.). The company has established a good balance between the analogue (e-commerce consultants, strong confidence with outlets) and digital areas (including data science). Rakuten also stands out on the global stage as an Internet firm. The Vision 2020 plan that it announced in February 2016 targets OP of Y300bn in December 2020

Sumitomo Mitsui	Financials
Financial Group	Japan

#### Company profile

SMFG is one of the three leading Japanese financial groups. It was established in December 2002. Group companies include Sumitomo Mitsui Banking Corp., Sumitomo Mitsui Card, and The Japan Research Institute. SMBC Nikko Securities (the former Nikko Cordial Securities) and Cedyna Financial became wholly owned subsidiaries in 2009 and 2010, respectively.

Yahoo Japan	Communication Services
	Japan

## Company profile

Yahoo Japan is Japan's number one Internet company. Media and commerce are the core business segments. The media business runs the Yahoo! JAPAN portal and various internet services/mobile apps. The company earns revenue mainly from display ads (Yahoo! Display Ad Network and brand panels) and search-linked advertisements. The commerce business runs e-commerce related services (Yahoo! Auction, Yahoo! Shopping, Yahoo! Travel, etc.), subscriber services (Yahoo! Premium, Yahoo! BB, etc.), settlement and finance-related services (Yahoo! Wallet, Yahoo! Card, etc.) and obtains fee income and member revenues.

## What drives our opinion

Rakuten is one of the largest e-commerce operators in Japan and issues credit cards by leveraging its large number of e-commerce users. While Rakuten's plan to launch a mobile phone operation is not welcomed by investors due to the large amount of capital expenditures required, this cost should be less than initially expected. In recent months, its peers have also launched mobile payment services that should drive digital payment usage in Japan. We believe Rakuten is one of the leading companies in the fintech area and that it can leverage its e-commerce user base to expose customers to other services, boosting future earnings. Thus, we still believe the shares are undervalued.

## Why it is Most Preferred

Rakuten is one of the major digital payment platformers in Japan, but unlike its rivals, the company does not spend much on marketing promotion. Also, its operations are supported by Rakuten EC and credit card users. We like Rakuten's strength in credit card business in Japan.

JP3890350006	JPY	4.775.00	Most Preferred
1479596	3,429.00	3,380.00	toru.ibayashi@ubs.com UBS Securities Japan Co., I

## What drives our opinion

While the company's share price has significantly underperformed against the market benchmark index for the last two years, we believe a modest hike of long-term interest rates should drive its share price up from 2H18 onwards. Also, Sumitomo Mitsui Financial Group's medium-term business plan focuses on cost reduction and business concentration, unlike the previous one that called for top-line growth. Digitalization should also enhance a business environment and should optimize its cost structure. The company's price-to-book value is trading well below 1x, and its relatively high dividend yield should limit the share price's downside risk.

## Why it is Most Preferred

Sumitomo Mitsui FG is one of the core major banks that would lead digital payments in Japan. The bank revealed its cashless strategy in early 2018. Cashless payments would benefit the bank not only from cost reductions in note/coin management and ATM operations, but they will also enable the bank to leverage customers' payment data to improve services, in our view.

JP3933800009	JPY	415.00	Most Preferred
721046	263.00	250.00	toru.ibayashi@ubs.com
			UBS Securities Japan Co., Ltd.

## What drives our opinion

Yahoo Japan operates a popular search engine in Japan. Its new management team is changing the company's business model to focus on new revenue streams. With Japan becoming a cashless society, we believe its new cashless payment service, PayPay, operated along with Softbank, will drive earnings. Yahoo Japan's e-commerce businesses allow users to make purchases by using their Yahoo points, Softbank mobile payments and other financial services via PayPay. The Japanese government also supports the cashless market and is planning a rebate program for cashless payments to offset the impact of the VAT hike due in October. This should encourage consumers to embrace cashless payments.

## Why it is Most Preferred

We believe Yahoo is well-positioned to take advantage of the potential long-term growth of Japan's cashless market. The government also plans to assist new technologies, which should also support the company's earnings growth.

Ltd

## Toru Ibayashi, Analyst, UBS Securities Japan Co., Ltd.



Based in Tokyo, I'm responsible for interpreting Japan's economy, corporate earnings, political changes, and providing investment insights. I was senior investment manager at another asset management firm before joining UBS in 2006. I have an MBA from the Goizueta Business School at Emory University in Atlanta, Georgia, and am a chartered member of the Securities Analysts' Association of Japan.

Toru Ibayashi

## Chisa Kobayashi, Analyst, UBS Securities Japan Co., Ltd.



Chisa Kobayashi is an Analyst at UBS CIO WM in Tokyo, joining the team at the end of 2013. Prior to joining UBS, Chisa worked in sell-side research starting 2007, covering the Japanese auto sector as well as global auto sector research. Chisa also had covered Japanese mid- and small-cap stocks. Chisa Kobayashi

## **Appendix**

#### Contact

If you require information on UBS Chief Investment Office WM and its research products, please contact the mailbox ubs-cio-wm@ubs.com (please note that e-mail communication is unsecured) or contact your client advisor for assistance.

## Frequency of updates

Equity recommendation lists can be updated on a daily basis, and are refreshed at least every two weeks. Risk views on bond issuers and instruments are affirmed sporadically and changed ad hoc, subject to market developments.

#### Competent authority of the producer

UBS Switzerland AG is regulated by the Swiss Financial Market Regulatory Authority (FINMA). UBS Europe SE, Succursale Italia is regulated by Commissione Nazionale per le Società e la Borsa (CONSOB). UBS AG Tokyo Branch is regulated by the Financial Services Agency (FSA). UBS Asesores Mexico, S.A. de C.V. is regulated by Comisión Nacional Bancaria y de Valores (CNBV). UBS AG Singapore Branch is regulated by the Monetary Authority of Singapore (MAS). UBS Europe SE, sucursal en España is regulated by Comisión Nacional del Mercado de Valores (CNMV). UBS AG London Branch is regulated by the Prudential Regulatory Authority (PRA) and the Financial Conduct Authority (FCA). UBS AG Hong Kong Branch is regulated by the Securities and Futures Commission (Hong Kong) and the Hong Kong Monetary Authority. UBS Brasil Administradora de Valores Mobiliarios Ltda is regulated by Comissão de Valores Mobiliários. UBS Financial Services Inc. is registered as a broker-dealer with the Securities and Exchange Commission ("CFTC") and the National Futures Association and is a member of various exchanges and the Financial Industry Regulatory Authority ("FINRA").

## Competent authority of the disseminator

This publication has been disseminated by the UBS Group entity you have a banking relationship with. The full name of the disseminating entity and its competent authority can be found in the country-specific disclaimer at the end of this document.

## **Equity selection system**

## **UBS CIO GWM equity selection system**

We provide two equity selections: Most Preferred (MP) and Least Preferred (LP).

#### Most preferred

We expect the stock to outperform the benchmark in the next 12 months.

## Least preferred

We expect the stock to underperform the benchmark in the next 12 months.

## Suspended

Sometimes legal, regulatory, contractual or best-business-practice obligations restrict us from issuing research on a company. This situation normally stems from UBS Investment Bank's involvement in an investment banking transaction associated with that company.

## Equity selection: An assessment relative to a benchmark

Equity selections in Equity Preferences lists (EPLs) are assessments made relative to a sector/industry, country/regional or thematic benchmark. The chosen benchmark is disclosed on the front page of each EPL. It is also used to measure the performance of the individual analyst. Including a stock in the EPL constitutes neither a view on its expected, standalone absolute performance nor a price target. Rather, EPLs are meant to support the UBS House View, with the stocks included in them selected for their superior risk/return profiles.

Our selection is based on an assessment of the company's fundamental outlook and valuation, the risks owning the stock entails and the diversification benefits it provides in an investment portfolio, among many other factors. UBS WM CIO's selection methodology enables wealth management clients to invest in a specific investment theme or focus on a sector/industry or country/region.

Stocks can be selected for multiple EPLs. For consistency's sake, a stock can only be selected as either Most Preferred or Least Preferred, not both simultaneously. As EPL benchmarks differ, stocks do not need to be included on every list to which they could theoretically be added.

Only stock views prepared by UBS Financial Services Inc. (UBS FS) which are compatible with the above equity selection system are provided. A stock cannot be selected as Most Preferred if it is rated Sell, while a Buy-rated stock cannot be selected as Least Preferred.

Whenever CIO has an investment view (such as with the tactical asset allocation TAA) on an entire country/region, or sector/industry on a three to 12-month time horizon, we state our preference by using the terms overweight, neutral and underweight.

For more information about our present and past recommendations, please contact ubs-cio-wm@ubs.com

## Current UBS CIO global rating distribution (as of last month-end) Least Preferred 14% Most Preferred 86%

## Disclosures (30 August 2019)

Within the past 12 months UBS AG, its affiliates or subsidiaries may have received or provided investment services and activities or ancillary services as per MiFID II which may have given rise to a payment or promise of a payment in relation to these services from or to each company mentioned in the publication.

LINE 4, Rakuten 3, 5, Sumitomo Mitsui Financial Group 1, 2, 3, 4, 5, 6, 7, 8; Yahoo Japan 3,

- 1. Within the past 12 months, UBS AG, its affiliates or subsidiaries has received compensation for investment banking services from this company/ entity or one of its affiliates.
- 2. UBS AG, its affiliates or subsidiaries beneficially owned 1% or more of a class of this company's common equity securities as of last month's end (or the prior month's end if this report is dated less than 10 days after the most recent month's end).
- 3. Within the past 12 months, UBS Securities LLC and/or its affiliates have received compensation for products and services other than investment banking services from this company/entity.

- 4. UBS Securities LLC makes a market in the securities and/or ADRs of this company.
- 5. UBS AG, its affiliates or subsidiaries expect to receive or intend to seek compensation for investment banking services from this company/entity within the next three months.
- 6. UBS AG, its affiliates or subsidiaries held other significant financial interests in this company/entity as of last month's end (or the prior month's end if this report is dated less than 10 working days after the most recent month's end).
- 7. This company/entity is, or within the past 12 months has been, a client of UBS Financial Services Inc, and non-investment banking securities related services are being, or have been, provided.
- 8. Within the past 12 months, UBS Financial Services Inc has received compensation for products and services other than investment banking services from this company.

## **Required Disclosures**

For a complete set of required disclosures relating to the companies that are the subject of this report, please mail a request to UBS CIO Global Wealth Management Business Management, 1285 Avenue of the Americas, 20th Floor, Avenue of the Americas, New York, NY 10019.

<b>History of Selectio</b>	n Changes (past 12 months)		
Company	Selection Date	Selection Status	
Fujitsu	22.5.2019	Not Listed	
GMO Internet	14.2.2019	Not Listed	
Japan Post Holdings	27.8.2019	Not Listed	
KDDI	14.2.2019	Most Preferred	
LINE	26.7.2019	Most Preferred	
	22.5.2019	Not Listed	
Mitsubishi UFJ Fina	ancial6.11.2018	Not Listed	
Group			
Mizuho Financial Group	27.6.2019	Not Listed	
Rakuten	30.8.2019	Most Preferred	
	28.6.2019	Not Listed	
	27.5.2019	Most Preferred	
	1.4.2019	Not Listed	
Screen Holdings	9.7.2019	Not Listed	
	5.11.2018	Most Preferred	
Tokyo Electron	22.2.2019	Not Listed	
	18.9.2018	Most Preferred	

## Disclaimer

UBS Chief Investment Office's ("CIO") investment views are prepared and published by the Global Wealth Management business of UBS Switzerland AG (regulated by FINMA in Switzerland) or its affiliates ("UBS").

The investment views have been prepared in accordance with legal requirements designed to promote the independence of investment research.

#### Instrument/issuer-specific investment research - Risk information:

This publication is **for your information only** and is not intended as an offer, or a solicitation of an offer, to buy or sell any investment or other specific product. The analysis contained herein does not constitute a personal recommendation or take into account the particular investment objectives, investment strategies, financial situation and needs of any specific recipient. It is based on numerous assumptions. Different assumptions could result in materially different results. Certain services and products are subject to legal restrictions and cannot be offered worldwide on an unrestricted basis and/or may not be eligible for sale to all investors. All information and opinions expressed in this document were obtained from sources believed to be reliable and in good faith, but no representation or warranty, express or implied, is made as to its accuracy or completeness (other than disclosures relating to UBS). All information and opinions as well as any forecasts, estimates and market prices indicated are current as of the date of this report, and are subject to change without notice. This publication is not intended to be a complete statement or summary of the securities, markets or developments referred to in the report. Opinions expressed herein may differ or be contrary to those expressed by other business areas or divisions of UBS as a result of using different assumptions and/or criteria.

In no circumstances may this document or any of the information (including any forecast, value, index or other calculated amount ("Values")) be used for any of the following purposes (i) valuation or accounting purposes; (ii) to determine the amounts due or payable, the price or the value of any financial instrument or financial contract; or (iii) to measure the performance of any financial instrument including, without limitation, for the purpose of tracking the return or performance of any Value or of defining the asset allocation of portfolio or of computing performance fees. By receiving this document and the information you will be deemed to represent and warrant to UBS that you will not use this document or otherwise rely on any of the information for any of the above purposes. UBS and any of its directors or employees may be entitled at any time to hold long or short positions in investment instruments referred to herein, carry out transactions involving relevant investment instruments in the capacity of principal or agent, or provide any other services or have officers, who serve as directors, either to/for the issuer, the investment instrument itself or to/for any company commercially or financially affiliated to such issuers. At any time, investment decisions (including whether to buy, sell or hold securities) made by UBS and its employees may differ from or be contrary to the opinions expressed in UBS research publications. Some investments may not be readily realizable since the market in the securities is illiquid and therefore valuing the investment and identifying the risk to which you are exposed may be difficult to quantify. UBS relies on information barriers to control the flow of information contained in one or more areas within UBS, into other areas, units, divisions or affiliates of UBS. Futures and options trading is not suitable for every investor as there is a substantial risk of loss, and losses in excess of an initial investment may occur. Past performance of an investment is no guaran

Research publications from CIO are written by UBS Global Wealth Management. UBS Global Research is written by UBS Investment Bank. Except for economic forecasts, the research process of CIO is independent of UBS Global Research. As a consequence research methodologies applied and assumptions made by CIO and UBS Global Research may differ, for example, in terms of investment horizon, model assumptions, and valuation methods. Therefore investment recommendations independently provided by the two UBS research organizations can be different. The compensation of the analyst(s) who prepared this report is determined exclusively by research management and senior management (not including investment banking). Analyst compensation is not based on investment banking, sales and trading or principal trading revenues, however, compensation may relate to the revenues of UBS as a whole, of which investment banking, sales and trading are a part.

Tax treatment depends on the individual circumstances and may be subject to change in the future. UBS does not provide legal or tax advice and makes no representations as to the tax treatment of assets or the investment returns thereon both in general or with reference to specific client's circumstances and needs. We are of necessity unable to take into account the particular investment objectives, financial situation and needs of our individual clients and we would recommend that you take financial and/or tax advice as to the implications (including tax) of investing in any of the products mentioned herein.

This material may not be reproduced or copies circulated without prior authority of UBS. Unless otherwise agreed in writing UBS expressly prohibits the distribution and transfer of this material to third parties for any reason. UBS accepts no liability whatsoever for any claims or lawsuits from any third parties arising from the use or distribution of this material. This report is for distribution only under such circumstances as may be permitted by applicable law. For information on the ways in which CIO manages conflicts and maintains independence of its investment views and publication offering, and research and rating methodologies, please visit <a href="https://www.ubs.com/research">www.ubs.com/research</a>. Additional information on the relevant authors of this publication and other CIO publication(s) referenced in this report; and copies of any past reports on this topic; are available upon request from your client advisor.

Important Information about Sustainable Investing Strategies: Incorporating environmental, social and governance (ESG) factors or Sustainable Investing considerations may inhibit the portfolio manager's ability to participate in certain investment opportunities that otherwise would be consistent with its investment objective and other principal investment strategies. The returns on a portfolio consisting primarily of ESG or sustainable investments may be lower than a portfolio where such factors are not considered by the portfolio manager. Because sustainability criteria can exclude some investments, investors may not be able to take advantage of the same opportunities or market trends as investors that do not use such criteria. Companies may not necessarily meet high performance standards on all aspects of ESG or sustainable investing issues; there is also no guarantee that any company will meet expectations in connection with corporate responsibility, sustainability, and/or impact performance.

Distributed to US persons by UBS Financial Services Inc. or UBS Securities LLC, subsidiaries of UBS AG. UBS Switzerland AG, UBS Europe SE, UBS Bank, S.A., UBS Brasil Administradora de Valores Mobiliarios Ltda, UBS Asesores Mexico, S.A. de C.V., UBS Securities Japan Co., Ltd, UBS Wealth Management Israel Ltd and UBS Menkul Degerler AS are affiliates of UBS AG. UBS Financial Services Incorporated of Puerto Rico is a subsidiary of UBS Financial Services Inc. UBS Financial Services Inc. accepts responsibility for the content of a report prepared by a non-US affiliate when it distributes reports to US persons. All transactions by a US person in the securities mentioned in this report should be effected through a US-registered broker dealer affiliated with UBS, and not through a non-US affiliate. The contents of this report have not been and will not be approved by any securities or investment authority in the United States or elsewhere. UBS Financial Services Inc. is not acting as a municipal advisor to any municipal entity or obligated person within the meaning of Section 15B of the Securities Exchange Act (the "Municipal Advisor Rule") and the opinions or views contained herein are not intended to be, and do not constitute, advice within the meaning of the Municipal Advisor Rule.

**External Asset Managers / External Financial Consultants:** In case this research or publication is provided to an External Asset Manager or an External Financial Consultant, UBS expressly prohibits that it is redistributed by the External Asset Manager or the External Financial Consultant and is made available to their clients and/or third parties.

Austria: This publication is not intended to constitute a public offer under Austrian law. It is distributed only for information purposes to clients of UBS Europe SE, Niederlassung Österreich, with place of business at Wächtergasse 1, A-1010 Wien. UBS Europe SE, Niederlassung Österreich is subject to the joint supervision of the European Central Bank ("ECB"), the German Central Bank (Deutsche Bundesbank), the German Federal Financial Services Supervisory Authority (Bundesanstalt für Finanzdienstleistungsaufsicht), as well as of the Austrian Financial Market Authority (Finanzmarktaufsicht, FMA), to which this publication has not been submitted for approval. UBS Europe SE is a credit institution constituted under German law in the form of a Societas Europaea, duly authorized by the ECB. Bahrain: UBS is a Swiss bank not licensed, supervised or regulated in Bahrain by the Central Bank of Bahrain and does not undertake banking or investment business activities in Bahrain. Therefore, clients have no protection under local banking and investment services laws and regulations. Canada: The information contained herein is not, and under no circumstances is to be construed as, a prospectus, an advertisement, a public offering, an offer to sell securities described herein, solicitation of an offer to buy securities described herein, in Canada

#### Disclaimer

or any province or territory thereof. Any offer or sale of the securities described herein in Canada will be made only under an exemption from the requirements to file a prospectus with the relevant Canadian securities regulators and only by a dealer properly registered under applicable securities laws or, alternatively, pursuant to an exemption from the dealer registration requirement in the relevant province or territory of Canada in which such offer or sale is made. Under no circumstances is the information contained herein to be construed as investment advice in any province or territory of Canada and is not tailored to the needs of the recipient. To the extent that the information contained herein references securities of an issuer incorporated, formed or created under the laws of Canada or a province or territory of Canada, any trades in such securities must be conducted through a dealer registered in Canada or, alternatively, pursuant to a dealer registration exemption. No securities commission or similar regulatory authority in Canada has reviewed or in any way passed upon these materials, the information contained herein or the merits of the securities described herein and any representation to the contrary is an offence. In Canada, this publication is distributed by UBS Investment Management Canada Inc.. China: This research report is neither intended to be distributed to PRC investors nor to provide securities investment consultancy services within the territory of PRC. Czech Republic: UBS is not a licensed bank in the Czech Republic and thus is not allowed to provide regulated banking or investment services in the Czech Republic. Please notify UBS if you do not wish to receive any further correspondence. **Denmark:** This publication is not intended to constitute a public offer under Danish law. It is distributed only for information purposes to clients of UBS Europe SE, Denmark Branch, filial af UBS Europe SE, with place of business at Sankt Annae Plads 13, 1250 Copenhagen, Denmark, registered with the Danish Commerce and Companies Agency, under No. 38 17 24 33. UBS Europe SE, Denmark Branch, filial af UBS Europe SE is subject to the joint supervision of the European Central Bank ("ECB"), the German Central Bank (Deutsche Bundesbank), the German Federal Financial Services Supervisory Authority (Bundesanstalt für Finanzdienstleistungsaufsicht), as well as of the Danish Financial Supervisory Authority (Finanstilsynet), to which this publication has not been submitted for approval. UBS Europe SE is a credit institution constituted under German law in the form of a Societas Europaea, duly authorized by the ECB. Egypt: Securities or other investment products are not being offered or sold by UBS to the public in Egypt and they have not been and will not be registered with the Egyptian Financial Supervisory Authority. France: This publication is distributed by UBS (France) S.A., French "société anonyme" with share capital of € 132.975.556, 69, boulevard Haussmann F-75008 Paris, R.C.S. Paris B 421 255 670, to its clients and prospects. UBS (France) S.A. is a provider of investment services duly authorized according to the terms of the "Code Monétaire et Financier", regulated by French banking and financial authorities as the "Autorité de Contrôle Prudentiel et de Résolution." Germany: This publication is not intended to constitute a public offer under German law. It is distributed only for information purposes to clients of UBS Europe SE, Germany, with place of business at Bockenheimer Landstrasse 2-4, 60306 Frankfurt am Main, UBS Europe SE is a credit institution constituted under German law in the form of a Societas Europaea, duly authorized by the European Central Bank ("ECB"), and supervised by the ECB, the German Central Bank (Deutsche Bundesbank) and the German Federal Financial Services Supervisory Authority (Bundesanstalt für Finanzdienstleistungsaufsicht), to which this publication has not been submitted for approval. Greece: UBS Switzerland AG and its affiliates (UBS) are not licensed as a bank or financial institution under Greek legislation and do not provide banking and financial services in Greece. Consequently, UBS provides such services from branches outside of Greece, only. This document may not be considered as a public offering made or to be made to residents of Greece. Hong Kong: This publication is distributed to clients of UBS AG Hong Kong Branch by UBS AG Hong Kong Branch, a licensed bank under the Hong Kong Banking Ordinance and a registered institution under the Securities and Futures Ordinance. UBS AG Hong Kong Branch is incorporated in Switzerland with limited liability. Indonesia, Malaysia, Phillipines, Thailand: This material was provided to you as a result of a request received by UBS from you and/or persons entitled to make the request on your behalf. Should you have received the material erroneously, UBS asks that you kindly destroy/delete it and inform UBS immediately. Any and all advice provided and/or trades executed by UBS pursuant to the material will only have been provided upon your specific request or executed upon your specific instructions, as the case may be, and may be deemed as such by UBS and you. The material may not have been reviewed, approved, disapproved or endorsed by any financial or regulatory authority in your jurisdiction. The relevant investments will be subject to restrictions and obligations on transfer as set forth in the material, and by receiving the material you undertake to comply fully with such restrictions and obligations. You should carefully study and ensure that you understand and exercise due care and discretion in considering your investment objective, risk appetite and personal circumstances against the risk of the investment. You are advised to seek independent professional advice in case of doubt. India: UBS Securities India Private Ltd. (Corporate Identity Number U67120MH1996PTC097299) 2/F, 2 North Avenue, Maker Maxity, Bandra Kurla Complex, Bandra (East), Mumbai (India) 400051. Phone: +912261556000. It provides brokerage services bearing SEBI Registration Number INZ000259830; merchant banking services bearing SEBI Registration Number: INM000010809 and Research Analyst services bearing SEBI Registration Number: INH000001204, UBS AG, its affiliates or subsidiaries may have debt holdings or positions in the subject Indian company/companies. Within the past 12 months, UBS AG, its affiliates or subsidiaries may have received compensation for non-investment banking securities-related services and/or non-securities services from the subject Indian company/companies. The subject company/companies may have been a client/clients of UBS AG, its affiliates or subsidiaries during the 12 months preceding the date of distribution of the research report with respect to investment banking and/or non-investment banking securities-related services and/or non-securities services. With regard to information on associates, please refer to the Annual Report at: http://www.ubs.com/global/en/about\_ubs/investor\_relations/annualreporting.html. Israel: UBS is a premier global financial firm offering wealth management, asset management and investment banking services from its headquarters in Switzerland and its operations in over 50 countries worldwide to individual, corporate and institutional investors. In Israel, UBS Switzerland AG is registered as Foreign Dealer in cooperation with UBS Wealth Management Israel Ltd., a wholly owned UBS subsidiary. UBS Wealth Management Israel Ltd. is a Portfolio Manager licensee which engages also in Investment Marketing and is regulated by the Israel Securities Authority. This publication is intended for information only and is not intended as an offer to buy or solicitation of an offer. Furthermore, this publication is not intended as an investment advice and/or investment marketing and is not replacing any investment advice and/or investment marketing provided by the relevant licensee which is adjusted to each person needs. No action has been, or will be, taken in Israel that would permit an offering of the product(s) mentioned in this document or a distribution of this document to the public in Israel. In particular, this document has not been reviewed or approved by the Israeli Securities Authority. The product(s) mentioned in this document is/are being offered to a limited number of sophisticated investors who qualify as one of the investors listed in the first supplement to the Israeli Securities Law, 5728-1968. This document may not be reproduced or used for any other purpose, nor be furnished to any other person other than those to whom copies have been sent. Anyone who purchases the product(s) mentioned herein shall do so for its own benefit and for its own account and not with the aim or intention of distributing or offering the product(s) to other parties. Anyone who purchases the product(s) shall do so in accordance with its own understanding and discretion and after it has received any relevant financial, legal, business, tax or other advice or opinion required by it in connection with such purchase(s). The word "advice" and/or any of its derivatives shall be read and construed in conjunction with the definition of the term "investment marketing" as defined under the Israeli Regulation of Investment Advice, Investment Marketing and Portfolio Management Law, 1995. Italy: This publication is not intended to constitute a public offer under Italian law. It is distributed only for information purposes to clients of UBS Europe SE, Succursale Italia, with place of business at Via del Vecchio Politecnico, 3-20121 Milano. UBS Europe SE, Succursale Italia is subject to the joint supervision of the European Central Bank ("ECB"), the German Central Bank (Deutsche Bundesbank), the German Federal Financial Services Supervisory Authority (Bundesanstalt für Finanzdienstleistungsaufsicht), as well as of the Bank of Italy (Banca d'Italia) and the Italian Financial Markets Supervisory Authority (CONSOB -Commissione Nazionale per le Società e la Borsa), to which this publication has not been submitted for approval. UBS Europe SE is a credit institution constituted under German law in the form of a Societas Europaea, duly authorized by the ECB. Jersey: UBS AG, Jersey Branch, is regulated and authorized by the Jersey Financial Services Commission for the conduct of banking, funds and investment business. Where services are provided from outside Jersey, they will not be covered by the Jersey regulatory regime. UBS AG, Jersey Branch is a branch of UBS AG a public company limited by shares, incorporated in Switzerland whose registered offices are at Aeschenyorstadt 1, CH-4051 Basel and Bahnhofstrasse 45, CH 8001 Zurich, UBS AG, Jersey Branch's principal place business is 1, IFC Jersey, St Helier, Jersey, JE2 3BX. Luxembourg: This publication is not intended to constitute a public offer under Luxembourg law. It is distributed only for information purposes to clients of UBS Europe SE, Luxembourg Branch, with place of business at 33A. Avenue J. F. Kennedy, L-1855 Luxembourg, UBS Europe SE, Luxembourg Branch is subject to the joint supervision of the European Central Bank ("ECB"), the German Central bank (Deutsche Bundesbank), the German Federal Financial Services Supervisory Authority (Bundesanstalt für Finanzdienstleistungsaufsicht), as well as of the Luxembourg supervisory authority (Commission de Surveillance du Secteur Financier), to which this publication has not been submitted for approval. UBS Europe SE is a credit institution constituted under German law in the form of a Societas Europaea, duly authorized by the ECB, Mexico: This information is distributed by UBS Assores México, S.A. de C.V. ("UBS Assores"), an affiliate of UBS Switzerland AG, incorporated as a non-independent investment advisor under the Securities Market Law due to the relation with a Foreign Bank. UBS Assores is a regulated entity and it is subject to the supervision of the Mexican Banking and Securities Commission ("CNBV"), which exclusively regulates UBS Assesores regarding the rendering of portfolio management, as well as on securities investment advisory services, analysis and issuance of individual investment recommendations, so that the CNBV has no surveillance faculties nor may have over any other service provided by UBS Asesores. UBS Asesores is registered before CNBV under Registry number 30060. You are being provided with this UBS publication or material because you have indicated to UBS Asesores that you are a Sophisticated Qualified Investor located in Mexico. The compensation of the analyst(s) who prepared this report is determined exclusively by research management and senior management of any entity of UBS Group to which such analyst(s) render services. Nigeria: UBS Switzerland AG and its affiliates (UBS) are not licensed, supervised or regulated in Nigeria by the Central Bank of Nigeria or the Nigerian Securities and Exchange Commission (SEC) and do not undertake banking or investment business activities in Nigeria. The investment products mentioned in this material are not being offered or sold by UBS to the public in Nigeria and they have not been submitted for approval nor registered with the Nigerian SEC.

## Disclaimer

If you are interested in products of this nature, please let us know and we will direct you to someone who can advise you. The investment products mentioned in this material are not being directed to, and are not being made available for subscription by any persons within Nigeria other than the selected investors to whom the offer materials have been addressed as a private sale or domestic concern within the exemption and meaning of Section 69(2) of the Investments and Securities Act, 2007 (ISA). Portugal: UBS Switzerland AG is not licensed to conduct banking and financial activities in Portugal nor is UBS Switzerland AG supervised by the portuguese regulators (Bank of Portugal "Banco de Portugal" and Portuguese Securities Exchange Commission "Comissão do Mercado de Valores Mobiliários"). Russia: This document or information contained therein is for information purposes only and constitute neither a public nor a private offering. is not an invitation to make offers, to sell, exchange or otherwise transfer any financial instruments in the Russian Federation to or for the benefit of any Russian person or entity and does not constitute an advertisement or offering of securities in the Russian Federation within the meaning of Russian securities laws. Singapore: This material was provided to you as a result of a request received by UBS from you and/or persons entitled to make the request on your behalf. Should you have received the material erroneously, UBS asks that you kindly destroy/delete it and inform UBS immediately. Clients of UBS AG Singapore branch are asked to please contact UBS AG Singapore branch, an exempt financial adviser under the Singapore Financial Advisers Act (Cap. 110) and a wholesale bank licensed under the Singapore Banking Act (Cap. 19) regulated by the Monetary Authority of Singapore, in respect of any matters arising from, or in connection with, the analysis or report. Spain: This publication is is not intended to constitute a public offer under Spanish law. It is distributed only for information purposes to clients of UBS Europe SE, Sucursal en España, with place of business at Calle María de Molina 4. C.P. 28006. Madrid, UBS Furope SE, Sucursal en España is subject to the joint supervision of the European Central Bank ("FCB"), the German Central bank (Deutsche Bundesbank), the German Federal Financial Services Supervisory Authority (Bundesanstalt für Finanzdienstleistungsaufsicht), as well as of the Spanish supervisory authority (Banco de España), to which this publication has not been submitted for approval. Additionally it is authorized to provide investment services on securities and financial instruments, regarding which it is supervised by the Comisión Nacional del Mercado de Valores as well. UBS Europe SE, Sucursal en España is a branch of UBS Europe SE, a credit institution constituted under German law in the form of a Societas Europaea, duly authorized by the ECB. Sweden: This publication is not intended to constitute a public offer under Swedish law. It is distributed only for information purposes to clients of UBS Europe SE, Sweden Bankfillal, with place of business at Regeringsgatan 38, 11153 Stockholm, Sweden, registered with the Swedish Companies Registration Office under Reg. No 516406-1011. UBS Europe SE, Sweden Bankfilial is subject to the joint supervision of the European Central Bank ("ECB"), the German Central bank (Deutsche Bundesbank), the German Federal Financial Services Supervisory Authority (Bundesanstalt für Finanzdienstleistungsaufsicht), as well as of the Swedish supervisory authority (Finansinspektionen), to which this publication has not been submitted for approval. UBS Europe SE is a credit institution constituted under German law in the form of a Societas Europaea, duly authorized by the ECB. Taiwan: This material is provided by UBS AG, Taipei Branch in accordance with laws of Taiwan, in agreement with or at the request of clients/prospects. **Turkey:** No information in this document is provided for the purpose of offering, marketing and sale by any means of any capital market instruments and services in the Republic of Turkey. Therefore, this document may not be considered as an offer made or to be made to residents of the Republic of Turkey in the Republic of Turkey. UBS Switzerland AG is not licensed by the Turkish Capital Market Board (the CMB) under the provisions of the Capital Market Law (Law No. 6362). Accordingly neither this document nor any other offering material related to the instruments/services may be utilized in connection with providing any capital market services to persons within the Republic of Turkey without the prior approval of the CMB. However, according to article 15 (d) (ii) of the Decree No. 32 there is no restriction on the purchase or sale of the instruments by residents of the Republic of Turkey. UAE: UBS is not licensed in the UAE by the Central Bank of UAE or by the Securities & Commodities Authority. The UBS AG Dubai Branch is licensed in the DIFC by the Dubai Financial Services Authority as an authorised firm. UK: This document is issued by UBS Wealth Management, a division of UBS AG which is authorised and regulated by the Financial Market Supervisory Authority in Switzerland. In the United Kingdom, UBS AG is authorised by the Prudential Regulation Authority and is subject to regulation by the Financial Conduct Authority and limited regulation by the Prudential Regulation Authority. Details about the extent of regulation by the Prudential Regulation Authority are available from us on request. A member of the London Stock Exchange. This publication is distributed to retail clients of UBS Wealth Management. Ukraine: UBS is not registered and licensed as a bank/financial institution under Ukrainian legislation and does not provide banking and other financial services in Ukraine. UBS has not made and will not make any offer of the mentioned products to the public in Ukraine. No action has been taken to authorize an offer of the mentioned products to the public in Ukraine and the distribution of this document shall not constitute financial services for the purposes of the Law of Ukraine "On Financial Services and State Regulation of Financial Services Markets" dated 12 July 2001, Accordingly, nothing in this document or any other document. information or communication related to the mentioned products shall be interpreted as containing an offer or invitation to offer, or solicitation of securities in the territory of Ukraine. Electronic communication must not be considered as an offer to enter into an electronic agreement or electronic instrument within the meaning of the Law of Ukraine "On Electronic Commerce" dated 3 September 2015. This document is strictly for private use by its holder and may not be passed on to third parties or otherwise publicly distributed. Version 05/2019. CIO82652744

© UBS 2019. The key symbol and UBS are among the registered and unregistered trademarks of UBS. All rights reserved.