Deutsche Bank
Research

Rating
Hold

Asia
Hong Kong

Banking / Finance
Banks

Company
HSBC Holdings Plc

Reuters	Bloomberg	Exchange	Ticker
0005.HK	5 HK	HSI	0005

Date
11 June 2018

Company Update

Price at 11 Jun 2018 (HKD)	76.95
Price target - 12mth (HKD)	77.00
52-week range (HKD)	85.85 - 67.65
HANG SENG INDEX	30,958

Strategic evolution

Valuation & Risks

David Lock
Research Analyst
+44-20-754-11521

New targets for 2020

HSBC today gave a strategic update and unveiled new targets for 2020. The announcement represents an evolution, rather than revolution of the strategy which the bank has been undertaking for the last 3-5 years - and continues the narrative of recent quarterly updates of a move away from restructuring to focus on growth and investment. Key differences between the targets (which imply c.US$17.9bn 2020 earnings) and consensus (US$16.7bn) are 1% better revenues, 2.5% better costs; materially lower RWAs (7% lower than consensus) driving a far higher implied CET1 (close to 16% on our analysis); cost jaws: around 1% this year, but c.3% implied in 2019/20 - which is higher than management have previously said they would look to operate the business at. The targets are:

- **RoTE** greater than 11% by 2020. Supported by: mid-single digit growth in revenue, low-to-mid-single digit growth in operating expenses, 1-2% growth in RWAs per annum. This should drive revenues/RWAs to c.7% in 2020.
- **Positive adjusted jaws** in each financial year. This compares with c.1% guidance for 2018 given at 1Q18 conference call.
- **Sustain dividends** at current levels (51c) and as appropriate undertake share buybacks to neutralise any share issuance as a result of scrip dividends. This is the first time that HSBC has explicitly linked future buyback to a neutralisation of the scrip.
- **CET1**: expected to be above 14% throughout 2018-20. On the conference call management said that the headwinds from Basel III reforms were more in the timeframe of 2021 and 2022 than 2020 but they think it appropriate to make some allowance to build up capital to cover any impact (i.e. run with excess in 2020 to cover these).

HSBC aims to achieve this >11% RoTE via a number of strategic priorities, including:

- **Accelerating growth from Asian franchise**, particularly in Hong Kong (> $3bn targeted revenue growth by 2020) but also in the Pearl River Delta (>$0.2bn), ASEAN (>$0.2bn), wealth (>$0.4bn), insurance (>$0.4bn) and asset management (>$0.1bn).

Price/price relative

Performance (%)	1m	3m	12m
Absolute	-0.8	0.5	12.2
HANG SENG INDEX	-0.5	-0.1	18.9

Source: Deutsche Bank

Key indicators (FY1)

ROE (%)	8.1
Loan/deposit ratio (%)	72.1
Book value/share (USD)	8.58
Price/book (x)	1.1
NPL/total loans (%)	1.7
Net int margin (%)	1.69
Adjusted ROE (%)	–

Source: Deutsche Bank

- **UK**: grow further in mortgages and commercial (>$0.4bn revenue opportunity each).
- **Gain market share from international network**, particularly in Global Liquidity and Cash Management (>$1bn targeted revenue growth by 2020). as well as trade finance (>$0.4bn), securities services (>$0.4bn) and FX (>$0.1bn).
- **Turn around the US business** (targeting >6% RoTE in 2020 via growth in CMB and in consumer.
- **Further improve capital efficiency** by redeploying capital into higher returning businesses (which underpins the surprisingly low RWA growth p.a. out to 2020).
- **Invest further in the business** (targeting US$6-6.5bn of investments in 2020 vs. US$3bn in 2017) with no below-the-line CTA charges. 1/3 of the investment in regulation and productivity, 2/3 of investment in near- and medium-term opportunities in core business.

Deriving P&L and balance sheet from targets

Figure 1 below shows how we derive a simple P&L of the group over the coming three years from company targets and guidance. 2017 figures have been adjusted for FX translation effects (where disclosed) as at 1Q18.

- We assume 6% growth per annum in revenues to US$63.4bn of revenues. This equates to around 7% revenues/average RWAs in 2020.
- For costs we assume 3.5% growth p.a. (implied cost/income jaws of c.250bps on average). This gives an implied PPP target of E27.7bn, around 6% ahead of current consensus.
- For loan losses, we use 33bps of loan losses on loan growth of 5% per annum. On the conference call, CEO Flint said the bank had assumed towards the low end of the 30-40bps through the cycle range.
- We use consensus assumptions on associates (US$2.5bn) and minorities, AT1s and preference costs (US$2.7bn). For tax we use the new guidance of 22% (consensus was at 23%). This equates to earnings of US$17.9bn in 2020.
- For the intervening years, we use guidance for 2018 already given at 1Q18 (annualised 1Q costs + bank levy; 1% positive jaws), consensus expectations, and the new 22% tax rate. For 2019 we use the midpoint between 2018 and 2020.
- For RWA growth we assume 1.5% per annum (midpoint of guidance).
- TNAV and CET1 we have assumed grow over the period by the earnings in each year (U$50bn on this analysis) less c.US$31bn of cumulative dividends (assuming any scrip is fully offset via a buyback).

Some observations

- The below analysis is consistent with the >11% ROTE target, with earnings around 8% higher than the current consensus for 2020, driven primarily by lower costs and higher revenues.

- This implies that the cost/income jaws improve from 1% in 2018 to c.3% in both in 2018 and 2019 - which is higher than had been guided in previous quarterly calls.
- The RWA growth is materially lower than consensus expectations (albeit there is an implication that RWAs could grow due to Basel III reforms in 2021/22).
- If the earnings and dividends evolve as outlined below, with no significant negative below-the-line charges, CET1 and TNAV should be c.US$19bn higher by 2020. This means HSBC will be running materially higher than 14% CET1 in 2020: our simple maths below would suggest a CET1 of 15.9%.
- We flex revenue and cost growth assumptions in figure 2 - this shows the combinations required to reach 11% RoTE keeping other assumptions unchanged.

Figure 1: Targets in a box

	2017	2018	2019	2020 target	2020 cons	% diff.	US$ diff.	Target / assumptions
Revenue (1Q FX adj)	53,215	56,524	59,952	63,380	62,744	1.0%	636	Mid-single digit growth p.a. (assumed 6% p.a.)
Operating expenses (1Q FX adj)	-32,200	-33,880	-34,790	-35,701	-36,607	-2.5%	906	Low to mid-single digit growth in operating expenses (assumed 3.5% p.a)
PPP	**21,015**	**22,644**	**25,161**	**27,679**	**26,137**	5.9%	**1,542**	
Loan impairments	-1,769	-1,914	-2,982	-3,734	-3,543	5.4%	-191	30-40bps LLPs through the cycle, expect low end of range (assumed 33bps)
Associates	2,375	2,439	2,454	2,476	2,476	0.0%	0	Assumed consensus
PBT	**20,990**	**23,169**	**24,633**	**26,421**	**25,070**	5.4%	**1,351**	
Tax	-4,618	-5,097	-5,419	-5,813	-5,710	1.8%	-103	22% tax rate guidance
Minorities / prefs	-2,812	-2,492	-2,574	-2,673	-2,673	0.0%	0	Assumed consensus
Earnings	**13,560**	**15,579**	**16,640**	**17,935**	**16,687**	7.5%	**1,248**	
C/I ratio	60.5%	59.9%	58.0%	56.3%	58.3%	-2.0%		
C/I jaws	1.4%	1.0%	3.4%	3.1%	1.8%	1.3%		Positive each year
Rev/RWAs	6.1%	6.4%	6.7%	7%	6.3%	0.6%		c.7% in 2020
RWAs (1Q FX adj)	881,300	894,520	907,937	921,556	995,100	-7.4%	-73,544	1-2% annual growth in RWAs
CET1 (1Q FX adj)	127,789	131,208	136,373	146,971	143,294	2.6%	3,677	
CET1 %	14.5%	14.7%	15.0%	15.9%	14.4%	1.5%		> 14%
TNAV (1Q FX adj)	146,545	149,964	155,129	165,727	162,700	1.9%	3,027	
Loan (1Q FX adj)	977,564	1,026,442	1,077,764	1,131,653	1,130,700	0.1%	953	mid-single digit
RoTE	9.3%	10.5%	10.9%	11.2%	10.3%	0.9%		>11% ROTE in 2020
Dividends	0.51	0.51	0.51	0.51	0.52			Flat dividend, buybacks to offset scrip where appriopriate
Implied total dividend/buyback		10,241	10,322	10,409				Assumed 100% offset of scrip, consensus share count

Source: Deutsche Bank estimates, company data. Blue = consensus. Grey = implied from targets/guidance

Figure 2: Flexing assumptions for revenues and costs

		Revenue growth p.a.						
		3.5%	**4.0%**	**4.5%**	**5.0%**	**5.5%**	**6.0%**	**6.5%**
Cost growth p.a.	**2.0%**	9.9%	10.3%	10.7%	11.1%	11.5%	11.9%	12.3%
	2.5%	9.7%	10.1%	10.5%	10.8%	11.2%	11.6%	12.0%
	3.0%	9.4%	9.8%	10.2%	10.6%	11.0%	11.4%	11.8%
	3.5%	9.2%	9.6%	10.0%	10.4%	10.8%	11.2%	11.6%
	4.0%	9.0%	9.4%	9.7%	10.1%	10.5%	10.9%	11.3%
	4.5%	8.7%	9.1%	9.5%	9.9%	10.3%	10.7%	11.1%
	5.0%	8.5%	8.9%	9.3%	9.7%	10.1%	10.5%	10.9%

Source:Deutsche Bank estimates

Clarity on growth plans, but questions on jaws and capital

In conclusion, today's strategy update very much reflects an evolution of the HSBC investment narrative rather than a revolution. The additional detail on sources of revenue growth is helpful, as is the clarity on risk weighted asset expectations. However, the strategy inevitablely raises further questions, particularly on cost jaws and capital.

On cost jaws, having previously indicated during 2017 a 1-2% cost jaw preference (even a 2% ceiling) for the group, and 1% for 2018, the targets imply higher jaws (3%+) in 2019/20. We expect there may be some market scepticism on the 'back-loaded' improvement in cost-jaws, or whether cost inflation (and the temptation to invest further) means the implied cost jaws are too ambitious.

For capital, the further RWA efficiencies are a welcome continuation of the progress HSBC has made in recent years, particularly in the GBM business. But the combination of lower RWA growth (1-2% p.a.), and broadly flat total dividends/buyback of c.$10bn over 2018-20 implies a CET1 which operates well above the 14% level over the next 2-3 years (with no other negative/positive effects in capital or below the line P&L charges, the CET1 would end up close to 16%). This feels overly conservative, even in the context of Basel 3 reforms. Though capital generation in the group is strong (u/l at 170bps+), the proceeds are being used not just for RWA growth or capital return, but also to build further buffers for regulatory inflation in the years to come.

HSBC is trading at 12.5x 2019, 1.3x TNAV and we have a TP of 720p and a Hold rating. On the implied target earnings (from Figure 1) HSBC is trading at 10.9x 2020 EPS which compares to European banks at 8.6x 2020.

Valuation approach

We use two methodologies to value HSBC: Sum-of-the-parts (SoTP) and Dividend-Discount-Model (DDM); our 12-month target price is the average of the two. For the DDM we assume 9% cost of equity and a 4% growth rate and include cash dividends and buybacks out to 2021, as well as a terminal value in 2021 and current excess capital over 13.5%. For the SoTP, we use 2021e bank earnings, and then value each business division based on our assessment of appropriate P/E multiples, incorporate an NPV of non-operating items before discounting back to a 12 month target.

Risks

Key upside risks are higher US rates, an improvement in Emerging Markets outlook, lower-than-expected loan losses, better-than-expected outcomes for regulation, lower costs, and better-than-expected distributions / buybacks, weaker sterling (given USD earnings). Key downside risks relate to regulatory change, legacy liabilities, a slowdown in emerging markets, sustained low interest rate environment, cost inflation, and stronger sterling.

Forecasts and ratios

Year End Dec 31	2016A	2017A	2018E	2019E	2020E
Provisioning (USDm)	3,400	1,769	2,018	3,287	3,947
Pre-prov profit (USDm)	8,158	16,561	20,728	24,100	26,039
Net profit (USDm)	11,599	13,756	15,271	15,691	16,306
EPS (USD)	0.07	0.49	0.68	0.76	0.80
EPS growth (%)	-13.2	17.8	10.3	2.0	3.2
PER (x)	122.8	21.1	14.3	12.9	12.2
Price/book (x)	1.01	1.23	1.14	1.11	1.08
DPS (net) (USD)	0.51	0.51	0.51	0.51	0.52
Yield (net) (%)	7.3	5.6	5.2	5.2	5.3
ROE (%)	0.8	6.0	8.1	8.7	9.0
ROE Adj(%)	–	–	–	–	–

Source: Deutsche Bank estimates, company data

Appendix 1

Important Disclosures

*Other information available upon request

Disclosure checklist

Company	Ticker	Recent price*	Disclosure
HSBC Holdings Plc	0005.HK	76.95 (HKD) 11 Jun 2018	7, 14

*Prices are current as of the end of the previous trading session unless otherwise indicated and are sourced from local exchanges via Reuters, Bloomberg and other vendors . Other information is sourced from Deutsche Bank, subject companies, and other sources. For disclosures pertaining to recommendations or estimates made on securities other than the primary subject of this research, please see the most recently published company report or visit our global disclosure look-up page on our website at https://research.db.com/Research/Disclosures/CompanySearch. Aside from within this report, important risk and conflict disclosures can also be found at https://research.db.com/Research/Topics/Equities?topicId=RB0002. Investors are strongly encouraged to review this information before investing.

Important Disclosures Required by U.S. Regulators

Disclosures marked with an asterisk may also be required by at least one jurisdiction in addition to the United States.See Important Disclosures Required by Non-US Regulators and Explanatory Notes.

7. Deutsche Bank and/or its affiliate(s) has received compensation from this company for the provision of investment banking or financial advisory services within the past year.
14. Deutsche Bank and/or its affiliate(s) has received non-investment banking related compensation from this company within the past year.

Important Disclosures Required by Non-U.S. Regulators

Disclosures marked with an asterisk may also be required by at least one jurisdiction in addition to the United States.See Important Disclosures Required by Non-US Regulators and Explanatory Notes.

7. Deutsche Bank and/or its affiliate(s) has received compensation from this company for the provision of investment banking or financial advisory services within the past year.

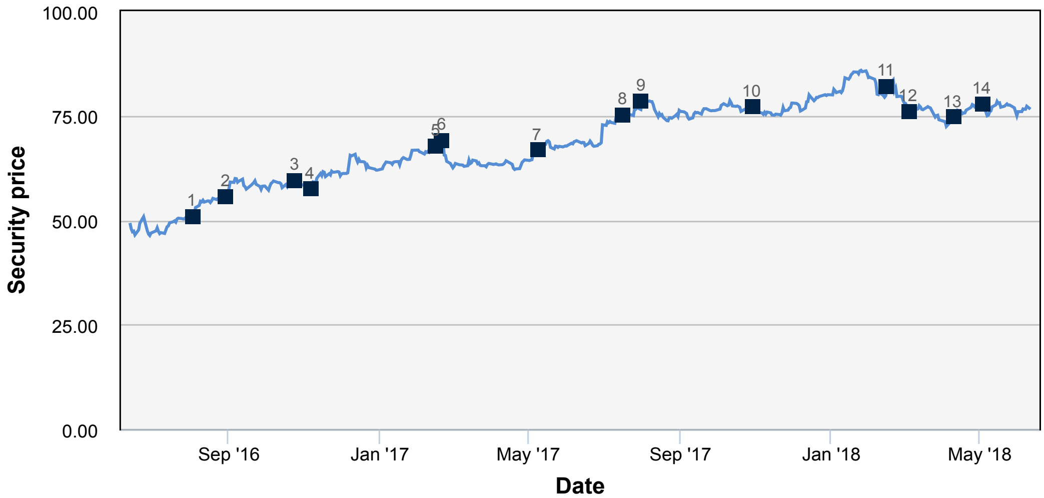
For disclosures pertaining to recommendations or estimates made on securities other than the primary subject of this research, please see the most recently published company report or visit our global disclosure look-up page on our website at https://research.db.com/Research/Disclosures/CompanySearch

Analyst Certification

The views expressed in this report accurately reflect the personal views of the undersigned lead analyst(s) about the subject issuer and the securities of the issuer. In addition, the undersigned lead analyst(s) has not and will not receive any compensation for providing a specific recommendation or view in this report. David Lock

Historical recommendations and target price. HSBC Holdings Plc (0005.HK)

(as of 06/11/2018)



Current Recommendations

Buy
Hold
Sell
Not Rated
Suspended Rating

** Analyst is no longer at Deutsche Bank

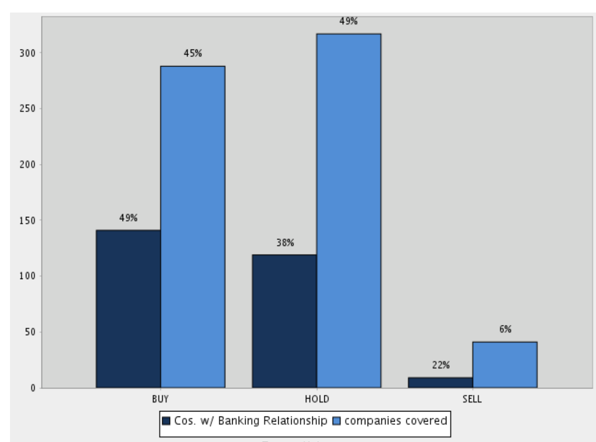
1.	08/03/2016	Hold, Target Price Change HKD 51.30 David Lock
2.	08/30/2016	Hold, Target Price Change HKD 53.00 David Lock
3.	10/25/2016	Hold, Target Price Change HKD 55.00 David Lock
4.	11/07/2016	Hold, Target Price Change HKD 56.00 David Lock
5.	02/16/2017	Hold, Target Price Change HKD 64.00 David Lock
6.	02/21/2017	Hold, Target Price Change HKD 61.00 David Lock
7.	05/09/2017	Hold, Target Price Change HKD 64.00 David Lock
8.	07/17/2017	Hold, Target Price Change HKD 71.00 David Lock
9.	08/01/2017	Hold, Target Price Change HKD 76.00 David Lock
10.	10/30/2017	Hold, Target Price Change HKD 72.00 David Lock
11.	02/15/2018	Hold, Target Price Change HKD 78.00 David Lock
12.	03/05/2018	Hold, Target Price Change HKD 76.00 David Lock
13.	04/10/2018	Hold, Target Price Change HKD 75.00 David Lock
14.	05/04/2018	Hold, Target Price Change HKD 77.00 David Lock

Equity Rating Key

Buy: Based on a current 12- month view of total share-holder return (TSR = percentage change in share price from current price to projected target price plus pro-jected dividend yield) , we recommend that investors buy the stock.
Sell: Based on a current 12-month view of total share-holder return, we recommend that investors sell the stock.
Hold: We take a neutral view on the stock 12-months out and, based on this time horizon, do not recommend either a Buy or Sell.

Newly issued research recommendations and target prices supersede previously published research.

Equity rating dispersion and banking relationships



Additional Information

The information and opinions in this report were prepared by Deutsche Bank AG or one of its affiliates (collectively "Deutsche Bank"). Though the information herein is believed to be reliable and has been obtained from public sources believed to be reliable, Deutsche Bank makes no representation as to its accuracy or completeness. Hyperlinks to third-party websites in this report are provided for reader convenience only. Deutsche Bank neither endorses the content nor is responsible for the accuracy or security controls of those websites.

If you use the services of Deutsche Bank in connection with a purchase or sale of a security that is discussed in this report, or is included or discussed in another communication (oral or written) from a Deutsche Bank analyst, Deutsche Bank may act as principal for its own account or as agent for another person.

Deutsche Bank may consider this report in deciding to trade as principal. It may also engage in transactions, for its own account or with customers, in a manner inconsistent with the views taken in this research report. Others within Deutsche Bank, including strategists, sales staff and other analysts, may take views that are inconsistent with those taken in this research report. Deutsche Bank issues a variety of research products, including fundamental analysis, equity-linked analysis, quantitative analysis and trade ideas. Recommendations contained in one type of communication may differ from recommendations contained in others, whether as a result of differing time horizons, methodologies, perspectives or otherwise. Deutsche Bank and/or its affiliates may also be holding debt or equity securities of the issuers it writes on. Analysts are paid in part based on the profitability of Deutsche Bank AG and its affiliates, which includes investment banking, trading and principal trading revenues.

Opinions, estimates and projections constitute the current judgment of the author as of the date of this report. They do not necessarily reflect the opinions of Deutsche Bank and are subject to change without notice. Deutsche Bank provides liquidity for buyers and sellers of securities issued by the companies it covers. Deutsche Bank research analysts sometimes have shorter-term trade ideas that may be inconsistent with Deutsche Bank's existing longer-term ratings. Some trade ideas for equities are listed as SOLAR ideas on the Research Website (https://research.db.com/Research/) , and can be found on the general coverage list and also on the covered company ’ s page. A SOLAR idea represents a high-conviction belief by an analyst that a stock will outperform or underperform the market and/or a specified sector over a time frame of no less than two weeks and no more than six months. In addition to SOLAR ideas, analysts may occasionally discuss with our clients, and with Deutsche Bank salespersons and traders, trading strategies or ideas that reference catalysts or events that may have a near-term or medium-term impact on the market price of the securities discussed in this report, which impact may be directionally counter to the analysts' current 12-month view of total return or investment return as described herein. Deutsche Bank has no obligation to update, modify or amend this report or to otherwise notify a recipient thereof if an opinion, forecast or estimate changes or becomes inaccurate. Coverage and the frequency of changes in market conditions and in both general and company-specific economic prospects make it difficult to update research at defined intervals. Updates are at the sole discretion of the coverage analyst or of the Research Department Management, and the majority of reports are published at irregular intervals. This report is provided for informational purposes only and does not take into account the particular investment objectives, financial situations, or needs of individual clients. It is not an offer or a solicitation of an offer to buy or sell any financial instruments or to participate in any particular trading strategy. Target prices are inherently imprecise and a product of the analyst ’ s judgment. The financial instruments discussed in this report may not be suitable for all investors, and investors must make their own informed investment decisions. Prices and availability of financial instruments are subject to change without notice, and investment transactions can lead to losses as a result of price fluctuations and other factors. If a financial instrument is denominated in a currency other than an investor's currency, a change in exchange rates may adversely affect the investment. Past performance is not necessarily indicative of future results. Performance calculations exclude transaction costs, unless otherwise indicated. Unless otherwise indicated, prices are current as of the end of the previous trading session and are sourced from local exchanges via Reuters, Bloomberg and other vendors. Data is also sourced from Deutsche Bank, subject companies, and other parties.

The Deutsche Bank Research Department is independent of other business divisions of the Bank. Details regarding our organizational arrangements and information barriers we have to prevent and avoid conflicts of interest with respect to our research are available on our website (https://research.db.com/Research/) under Disclaimer.

Macroeconomic fluctuations often account for most of the risks associated with exposures to instruments that promise to pay fixed or variable interest rates. For an investor who is long fixed-rate instruments (thus receiving these cash flows), increases in interest rates naturally lift the discount factors applied to the expected cash flows and thus cause a loss. The longer the maturity of a certain cash flow and the higher the move in the discount factor, the higher will be the loss. Upside surprises in inflation, fiscal funding needs, and FX depreciation rates are among the most common adverse macroeconomic shocks to receivers. But counterparty exposure, issuer creditworthiness, client segmentation, regulation (including changes in assets holding limits for different types of investors), changes in tax policies, currency convertibility (which may constrain currency conversion, repatriation of profits and/or liquidation of positions), and settlement issues related to local clearing houses are also important risk factors. The sensitivity of fixed-income instruments to macroeconomic shocks may be mitigated by indexing the contracted cash flows to inflation, to FX depreciation, or to specified interest rates – these are common in emerging markets. The index fixings may – by construction – lag or mis-measure the actual move in the underlying variables they are intended to track. The choice of the proper fixing (or metric) is particularly important in swaps markets, where floating coupon rates (i.e., coupons indexed to a typically short-dated interest rate reference index) are exchanged for fixed coupons. Funding in a currency that differs from the currency in which coupons are denominated carries FX risk. Options on swaps (swaptions) the risks typical to options in addition to the risks related to rates movements.

Derivative transactions involve numerous risks including market, counterparty default and illiquidity risk. The appropriateness of these products for use by investors depends on the investors' own circumstances, including their tax position, their regulatory environment and the nature of their other assets and liabilities; as such, investors should take expert legal and financial advice before entering into any transaction similar to or inspired by the contents of this publication. The risk of loss in futures trading and options, foreign or domestic, can be substantial. As a result of the high degree of leverage obtainable in futures and options trading, losses may be incurred that are greater than the amount of funds initially deposited – up to theoretically unlimited losses. Trading in options involves risk and is not suitable for all investors. Prior to buying or selling an option, investors must review the "Characteristics and Risks of Standardized Options", at http://www.optionsclearing.com/about/publications/character-risks.jsp . If you are unable to access the website, please contact your Deutsche Bank representative for a copy of this important document.

Participants in foreign exchange transactions may incur risks arising from several factors, including: (i) exchange rates can be volatile and are subject to large fluctuations; (ii) the value of currencies may be affected by numerous market factors, including world and national economic, political and regulatory events, events in equity and debt markets and changes in interest rates; and (iii) currencies may be subject to devaluation or government-imposed exchange controls, which could affect the value of the currency. Investors in securities such as ADRs, whose values are affected by the currency of an underlying security, effectively assume currency risk.

Deutsche Bank is not acting as a financial adviser, consultant or fiduciary to you or any of your agents with respect to any information provided in this report. Deutsche Bank does not provide investment, legal, tax or accounting advice, and is not acting as an impartial adviser. Information contained herein is being provided on the basis that the recipient will make an independent assessment of the merits of any investment decision, and is not meant for retirement accounts or for any specific person or account type. The information we provide is directed only to persons we believe to be financially sophisticated, who are capable of evaluating investment risks independently, both in general and with regard to particular transactions and investment strategies, and who understand that Deutsche Bank has financial interests in the offering of its products and services. If this is not the case, or if you or your agent are an IRA or other retail investor receiving this directly from us, we ask that you inform us immediately.

Unless governing law provides otherwise, all transactions should be executed through the Deutsche Bank entity in the investor's home jurisdiction. Aside from within this report, important conflict disclosures can also be found at https://research.db.com/Research/ on each company ’ s research page. Investors are strongly encouraged to review this information before investing.

United States: Approved and/or distributed by Deutsche Bank Securities Incorporated, a member of FINRA, NFA and SIPC. Analysts located outside of the United States are employed by non-US affiliates that are not subject to FINRA regulations, including those regarding contacts with issuer companies.

Germany: Approved and/or distributed by Deutsche Bank AG, a joint stock corporation with limited liability incorporated in the Federal Republic of Germany with its principal office in Frankfurt am Main. Deutsche Bank AG is authorized under German Banking Law and is subject to supervision by the European Central Bank and by BaFin, Germany ' s Federal Financial Supervisory Authority.

United Kingdom: Approved and/or distributed by Deutsche Bank AG acting through its London Branch at Winchester House, 1 Great Winchester Street, London EC2N 2DB. Deutsche Bank AG in the United Kingdom is authorised by the Prudential Regulation Authority and is subject to limited regulation by the Prudential Regulation Authority and Financial Conduct Authority. Details about the extent of our authorisation and regulation are available on request.

Hong Kong: Distributed by Deutsche Bank AG, Hong Kong Branch or Deutsche Securities Asia Limited (save that any research relating to futures contracts within the meaning of the Hong Kong Securities and Futures Ordinance Cap. 571 shall be distributed solely by Deutsche Securities Asia Limited). The provisions set out above in the "Additional Information" section shall apply to the fullest extent permissible by local laws and regulations, including without limitation the Code of Conduct for Persons Licensed or Registered with the Securities and Futures Commission. .

India: Prepared by Deutsche Equities India Private Limited (DEIPL) having CIN: U65990MH2002PTC137431 and registered office at 14th Floor, The Capital, C-70, G Block, Bandra Kurla Complex Mumbai (India) 400051. Tel: + 91 22 7180 4444. It is registered by the Securities and Exchange Board of India (SEBI) as a Stock broker bearing registration nos.: NSE (Capital Market Segment) - INB231196834, NSE (F&O Segment) INF231196834, NSE (Currency Derivatives Segment) INE231196834, BSE (Capital Market Segment) INB011196830; Merchant Banker bearing SEBI Registration no.: INM000010833 and Research Analyst bearing SEBI Registration no.: INH000001741. DEIPL may have received administrative warnings from the SEBI for breaches of Indian regulations. The transmission of research through DEIPL is Deutsche Bank's determination and will not make a recipient a client of DEIPL. Deutsche Bank and/or its affiliate(s) may have debt holdings or positions in the subject company. With regard to information on associates, please refer to the "Shareholdings" section in the Annual Report at: https://www.db.com/ir/en/annual-reports.htm .

Japan: Approved and/or distributed by Deutsche Securities Inc.(DSI). Registration number - Registered as a financial instruments dealer by the Head of the Kanto Local Finance Bureau (Kinsho) No. 117. Member of associations: JSDA, Type II Financial Instruments Firms Association and The Financial Futures Association of Japan. Commissions and risks involved in stock transactions - for stock transactions, we charge stock commissions and consumption tax by multiplying the transaction amount by the commission rate agreed with each customer. Stock transactions can lead to losses as a result of share price fluctuations and other factors. Transactions in foreign stocks can lead to additional losses stemming from foreign exchange fluctuations. We may also charge commissions and fees for certain categories of investment advice, products and services. Recommended investment strategies, products and services carry the risk of losses to principal and other losses as a result of changes in market and/or economic trends, and/or fluctuations in market value. Before deciding on the purchase of financial products and/or services, customers should carefully read the relevant disclosures, prospectuses and other documentation. "Moody's", "Standard & Poor's", and "Fitch" mentioned in this report are not registered credit rating agencies in Japan unless Japan or "Nippon" is specifically designated in the name of the entity. Reports on Japanese listed companies not written by analysts of DSI are written by Deutsche Bank Group's analysts with the coverage companies specified by DSI. Some of the foreign securities stated on this report are not disclosed according to the Financial Instruments and Exchange Law of Japan. Target prices set by Deutsche Bank's equity analysts are based on a 12-month forecast period..

Korea: Distributed by Deutsche Securities Korea Co.

South Africa: Deutsche Bank AG Johannesburg is incorporated in the Federal Republic of Germany (Branch Register Number in South Africa: 1998/003298/10).

Singapore: This report is issued by Deutsche Bank AG, Singapore Branch or Deutsche Securities Asia Limited, Singapore Branch (One Raffles Quay #18-00 South Tower Singapore 048583, +65 6423 8001), which may be contacted in respect of any matters arising from, or in connection with, this report. Where this report is issued or promulgated by Deutsche Bank in Singapore to a person who is not an accredited investor, expert investor or institutional investor (as defined in the applicable Singapore laws and regulations), they accept legal responsibility to such person for its contents.

Taiwan: Information on securities/investments that trade in Taiwan is for your reference only. Readers should independently evaluate investment risks and are solely responsible for their investment decisions. Deutsche Bank research may not be distributed to the Taiwan public media or quoted or used by the Taiwan public media without written consent. Information on securities/instruments that do not trade in Taiwan is for informational purposes only and is not to be construed as a recommendation to trade in such securities/instruments. Deutsche Securities Asia Limited, Taipei Branch may not execute transactions for clients in these securities/instruments.

Qatar: Deutsche Bank AG in the Qatar Financial Centre (registered no. 00032) is regulated by the Qatar Financial Centre Regulatory Authority. Deutsche Bank AG - QFC Branch may undertake only the financial services activities that fall within the scope of its existing QFCRA license. Its principal place of business in the QFC: Qatar Financial Centre, Tower, West Bay, Level 5, PO Box 14928, Doha, Qatar. This information has been distributed by Deutsche Bank AG. Related financial products or services are only available only to Business Customers, as defined by the Qatar Financial Centre Regulatory Authority.

Russia: The information, interpretation and opinions submitted herein are not in the context of, and do not constitute, any appraisal or evaluation activity requiring a license in the Russian Federation.

Kingdom of Saudi Arabia: Deutsche Securities Saudi Arabia LLC Company (registered no. 07073-37) is regulated by the Capital Market Authority. Deutsche Securities Saudi Arabia may undertake only the financial services activities that fall within the scope of its existing CMA license. Its principal place of business in Saudi Arabia: King Fahad Road, Al Olaya District, P.O. Box 301809, Faisaliah Tower - 17th Floor, 11372 Riyadh, Saudi Arabia.

United Arab Emirates: Deutsche Bank AG in the Dubai International Financial Centre (registered no. 00045) is regulated by the Dubai Financial Services Authority. Deutsche Bank AG - DIFC Branch may undertake only the financial services activities that fall within the scope of its existing DFSA license. Its principal place of business in the DIFC: Dubai International Financial Centre, The Gate Village, Building 5, PO Box 504902, Dubai, U.A.E. This information has been distributed by Deutsche Bank AG. Related financial products or services are available only to Professional Clients, as defined by the Dubai Financial Services Authority.

Australia and New Zealand: This research is intended only for "wholesale clients" within the meaning of the Australian Corporations Act and New Zealand Financial Advisors Act, respectively. Please refer to Australia-specific research disclosures and related information at https://australia.db.com/australia/content/research-information.html Where research refers to any particular financial product recipients of the research should consider any product disclosure statement, prospectus or other applicable disclosure document before making any decision about whether to acquire the product.

David Folkerts-Landau
Group Chief Economist and Global Head of Research

Raj Hindocha
Global Chief Operating Officer
Research

Michael Spencer
Head of APAC Research
Global Head of Economics

Steve Pollard
Head of Americas Research
Global Head of Equity Research

Anthony Klarman
Global Head of
Debt Research

Paul Reynolds
Head of EMEA
Equity Research

Dave Clark
Head of APAC
Equity Research

Pam Finelli
Global Head of
Equity Derivatives Research

Andreas Neubauer
Head of Research - Germany

Spyros Mesomeris
Global Head of Quantitative
and QIS Research

International Production Locations

Deutsche Bank AG
Deutsche Bank Place
Level 16
Corner of Hunter & Phillip Streets
Sydney, NSW 2000
Australia
Tel: (61) 2 8258 1234

Deutsche Bank AG
Mainzer Landstrasse 11-17
60329 Frankfurt am Main
Germany
Tel: (49) 69 910 00

Deutsche Bank AG
Filiale Hongkong
International Commerce Centre,
1 Austin Road West,Kowloon,
Hong Kong
Tel: (852) 2203 8888

Deutsche Securities Inc.
2-11-1 Nagatacho
Sanno Park Tower
Chiyoda-ku, Tokyo 100-6171
Japan
Tel: (81) 3 5156 6770

Deutsche Bank AG London
1 Great Winchester Street
London EC2N 2EQ
United Kingdom
Tel: (44) 20 7545 8000

Deutsche Bank Securities Inc.
60 Wall Street
New York, NY 10005
United States of America
Tel: (1) 212 250 2500