NOMURA

Global crude oil supply-demand

EQUITY: JAPAN OIL PRODUCTS

Demand likely to outstrip supply through 2019

Focusing on lower output in Iran, higher output in Saudi Arabia

Global Markets Research

12 July 2018

Research analysts

Japan utilities & oil

Shigeki Matsumoto - NSC
shigeki.matsumoto@nomura.com
+81 3 6703 1137

We see downside risks to demand but this demand will substantially exceed supply in 2019

Based on the International Energy Agency's (IEA) forecasts for global demand and non-OPEC output (in its July Oil Market Report), and assuming OPEC production volume remains at the June 2018 level, we estimate that global crude oil demand will exceed supply by 120,000bbl/day in 2018 and that global crude oil supply will exceed demand by 440,000bbl/day in 2019. However, if we assume that OPEC countries reduce their compliance with their agreement to reduce output to 100% (it stood at 120% in June 2018, equivalent to an increase of 230,000bbl/day), and that Iran and Venezuela reduce their output by 1,500,000bbl/day (down 1,410,000bbl/day in June versus May 2018, when the US announced the restart of sanctions against Iran), we estimate demand outstripping demand by 740,000bbl/day in 2019. Meanwhile, increased trade tariffs between the US and China, rising oil prices, and USD appreciation could cause demand to fall.

US output unlikely to be sharply higher than current forecasts even if oil prices rise

The IEA forecasts that US crude oil production will increase 1,720,000bbl/day in 2018 and 1,190,000bbl/day in 2019. In the Permian region, which has been driving growth in output, the lack of pipeline capacity is likely to persist until 2019. Because of this, Midland oil prices are some USD14/bbl lower than the WTI price. With issues including rising production costs and a lack of engineers, too, we think US shale oil output is unlikely to substantially exceed current forecasts even if tightening supply-demand causes oil prices to rise. See our 11 July 2018 Global research report US crude oil output - Sharp slowdown in pace of increase in 2019.

We estimate that US production forecasts are predicated on WTI price assumptions of USD55-60/bbl for 2018 and USD60-65/bbl for 2019. We estimate WTI of around USD70-75/bbl were the aforementioned short supply to be made up with increased output in the US.

Saudi Arabia starts to increase output

The IEA estimates that OPEC output rose by 180,000bbl/day to 31,870,000bbl/day in June 2018. It said that output in Iran fell 30,000bbl/day to 3,790,00bbl/day, but we think it could fall 1,000,000bbl/day with the resumption of sanctions by the US (it rose about 1mn bbl/day in January 2016 when sanctions were lifted). Output in Venezuela also fell by an unexpectedly sharp 60,000bbl/day to 1,300,000bbl/day, and the IEA estimates that production capacity there will be below 1,000,000bbl/day by end-2018. Output in Saudi Arabia rose 430,000bbl/day to 10,460,000bbl/day, exceeding the reduction obligation (10,050,000bbl/day) for the first time. According to the IEA, Saudi Arabia would have to strengthen its offshore fields as well as its onshore fields to increase output to 11,000,000bbl/day.

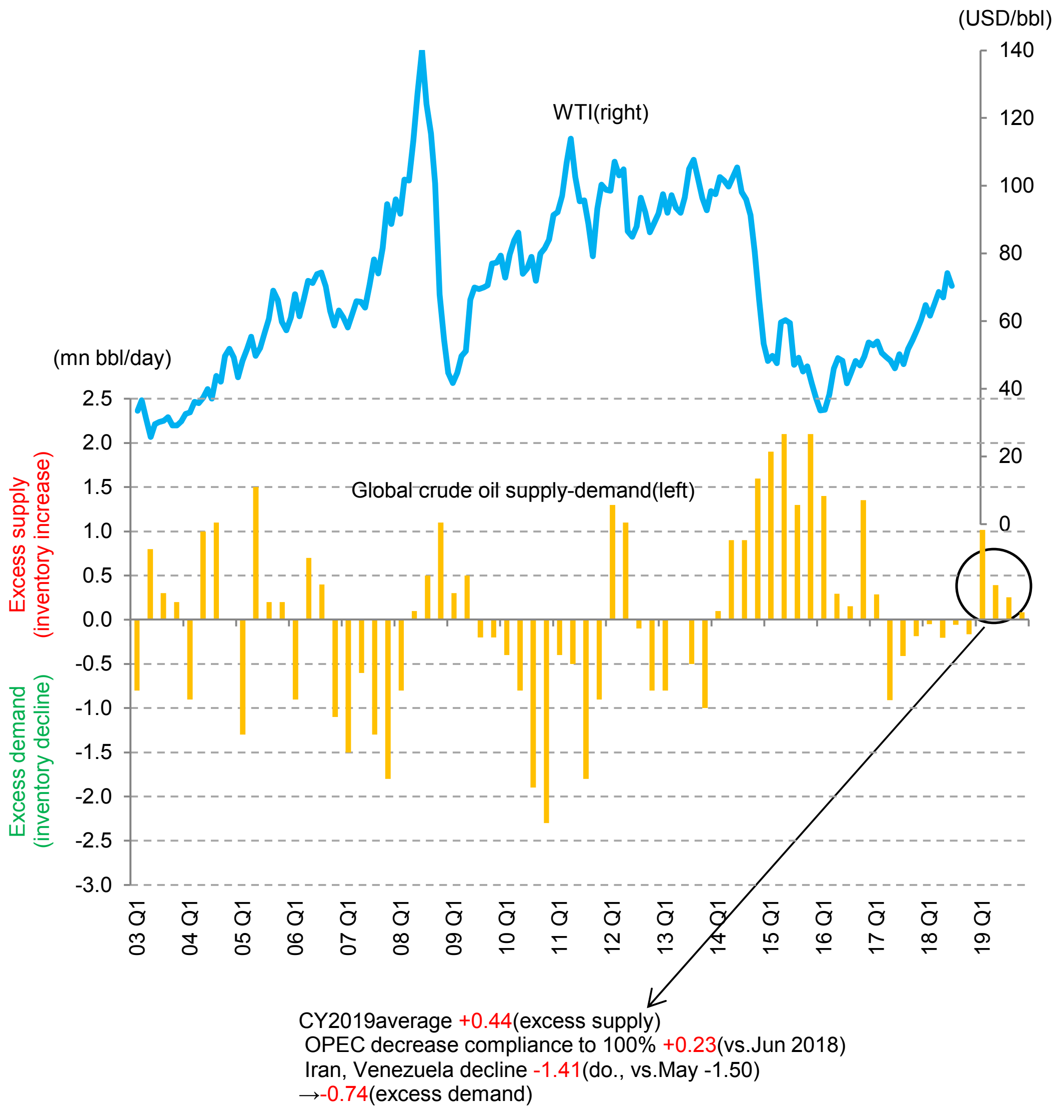
The IEA estimates that output in Russia rose 100,000bbl/day m-m to 11,450,000bbl/day in June 2018, and forecasts a rise of 70,000bbl/day y-y to 11,430,000bbl/day in 2018 and a rise of 130,000bbl/day to 11,560,00bbl/day in 2019.

(Figures shown on pages 2-5.)

Production Complete: 2018-07-12 15:50 UTC

* The EIA says there is a time lag of about six months between the WTI price and production volume data. The IEA does not disclose oil price assumptions, but we think it refers to EIA's view with regard to US production volume. Based on the aforementioned time lag, we think that US production volume estimates for 2018 assume a WTI price close to the 2017 H2-2018 H1 level of USD59/bbl and that estimates for 2019 assume a price close to USD64/bbl for 2018 H2-2019 H1 (assumed in the EIA's Short-Term Energy Outlook report).

Fig. 1: Global crude oil supply-demand and WTI price



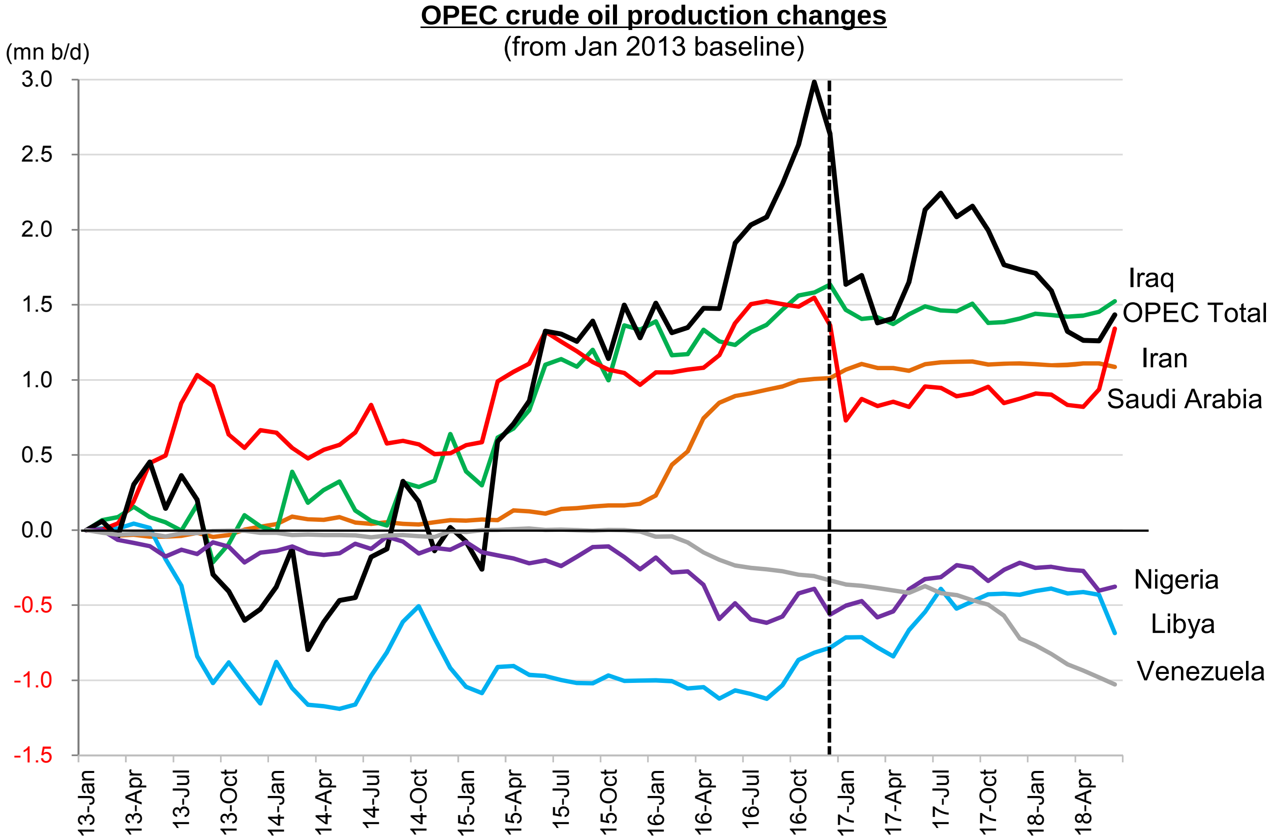
Note: We assume OPEC crude oil output flat at June 2018 levels from July 2018 onward.

Source: Nomura, based on International Energy Agency's (IEA's) *Oil Market Report* July 2018 edition)

See Figure 3 for details.

Fig. 2: OPEC production

The dotted vertical line shows December 2016, before output cutbacks began



Source: Nomura, based on OPEC *Monthly Oil Market Report* (July 2018 edition)

Fig. 3: Crude-oil supply-demand outlook

(mn b/d)

	2017				2018				2019				2016	2017	2018E	2019E
	Q1	Q2	Q3	Q4	Q1	Q2	Q3E	Q4E	Q1E	Q2E	Q3E	Q4E				
Global demand	96.35	97.87	98.29	98.36	98.38	98.75	99.28	100.02	99.18	100.33	100.89	101.53	96.20	97.73	99.12	100.49
US	19.49	20.01	19.92	20.05	20.24	20.25	20.21	20.33	20.09	20.37	20.49	20.56	19.69	19.87	20.26	20.38
Europe	13.82	14.25	14.70	14.40	14.09	14.26	14.70	14.42	14.08	14.43	14.84	14.51	13.99	14.30	14.37	14.47
China	12.22	12.63	12.23	12.52	12.70	13.00	12.63	13.15	13.07	13.47	13.10	13.58	11.78	12.40	12.87	13.31
India	4.58	4.79	4.54	4.84	4.94	5.04	4.77	5.12	5.16	5.27	4.96	5.35	4.56	4.69	4.97	5.19
Non-OPEC supply	57.72	57.76	58.32	59.04	59.43	59.89	60.39	61.01	61.30	61.81	62.24	62.72	57.38	58.21	60.18	62.02
Americas	19.95	19.80	20.22	21.21	21.74	21.89	22.14	22.73	23.25	23.28	23.56	24.01	19.48	20.30	22.13	23.53
FSU	14.45	14.35	14.26	14.38	14.45	14.49	14.46	14.60	14.69	14.68	14.56	14.71	14.24	14.36	14.50	14.66
Call on OPEC	38.63	40.11	39.98	39.32	38.95	38.86	38.90	39.01	37.88	38.52	38.65	38.81	38.82	39.51	38.93	38.47
Crude oil	31.78	33.22	33.09	32.50	32.04	31.94	31.93	32.03	30.86	31.48	31.61	31.79	32.04	32.65	31.99	31.44
NGLs	6.84	6.89	6.89	6.82	6.91	6.93	6.97	6.98	7.03	7.04	7.03	7.03	6.78	6.86	6.95	7.03
OPEC production					18-Apr	May	Jun									
					31.64	31.69	31.87									
	2017				2018				2019				2016	2017	2018E	2019E
(vs. previous)	Q1	Q2	Q3	Q4	Q1	Q2	Q3E	Q4E	Q1E	Q2E	Q3E	Q4E				
Global demand	-0.05	-0.05	+0.02	-0.10	+0.02	-0.17	+0.12	-0.04	-0.04	-0.12	-0.05	-0.07	+0.06	-0.05	-0.02	-0.07
US	0.00	0.00	0.00	0.00	0.00	-0.07	+0.11	+0.10	0.00	-0.07	+0.05	+0.03	0.00	0.00	+0.04	+0.01
Europe	-0.04	-0.04	-0.04	-0.04	-0.01	-0.01	-0.05	-0.08	-0.05	-0.06	-0.06	-0.07	-0.05	-0.04	-0.04	-0.06
China	-0.02	0.00	+0.07	-0.05	0.00	+0.09	+0.10	+0.04	+0.06	+0.15	+0.07	+0.06	-0.01	-0.00	+0.06	+0.09
India	0.00	0.00	0.00	0.00	0.00	-0.01	0.00	0.00	-0.01	-0.01	0.00	0.00	0.00	0.00	0.00	0.00
Non-OPEC supply	-0.02	+0.01	+0.00	+0.00	+0.00	-0.17	-0.14	+0.02	+0.15	+0.15	-0.08	-0.04	-0.03	-0.00	-0.07	+0.04
Americas	0.00	0.00	0.00	-0.00	+0.04	+0.00	-0.18	-0.02	+0.10	+0.14	-0.05	+0.00	0.00	0.00	-0.04	+0.05
FSU	0.00	0.00	0.00	0.00	0.00	+0.02	+0.14	+0.16	+0.09	+0.07	-0.00	+0.04	0.00	0.00	+0.08	+0.05
Call on OPEC	-0.03	-0.06	+0.02	-0.11	+0.02	+0.00	+0.26	-0.06	-0.19	-0.27	+0.03	-0.03	+0.09	-0.05	+0.06	-0.11
Crude oil	-0.03	-0.06	+0.03	-0.08	+0.02	+0.00	+0.26	-0.06	-0.19	-0.27	+0.03	-0.03	+0.09	-0.03	+0.06	-0.11
NGLs	0.00	0.00	-0.01	-0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01	0.00	0.00
	2017				2018				2019				2016	2017	2018E	2019E
(Q-Q)	Q1	Q2	Q3	Q4	Q1	Q2	Q3E	Q4E	Q1E	Q2E	Q3E	Q4E	(Y-Y)			
Global demand	-0.48	+1.52	+0.42	+0.07	+0.02	+0.37	+0.53	+0.73	-0.84	+1.15	+0.56	+0.64	+1.10	+1.52	+1.39	+1.38
US	-0.28	+0.52	-0.09	+0.13	+0.19	+0.01	-0.04	+0.12	-0.24	+0.28	+0.12	+0.07	-	+0.18	+0.39	+0.12
Europe	-0.36	+0.43	+0.45	-0.30	-0.31	+0.18	+0.43	-0.27	-0.35	+0.36	+0.41	-0.34	+0.16	+0.31	+0.07	+0.10
China	+0.33	+0.41	-0.41	+0.29	+0.18	+0.29	-0.36	+0.52	-0.08	+0.40	-0.38	+0.48	+0.22	+0.62	+0.47	+0.44
India	+0.02	+0.21	-0.25	+0.30	+0.10	+0.10	-0.27	+0.35	+0.04	+0.11	-0.31	+0.39	-	+0.13	+0.28	+0.22
Non-OPEC supply	-0.21	+0.04	+0.56	+0.72	+0.39	+0.46	+0.50	+0.62	+0.29	+0.51	+0.44	+0.48	-0.72	+0.83	+1.97	+1.84
Americas	+0.29	-0.15	+0.42	+0.99	+0.53	+0.15	+0.25	+0.59	+0.52	+0.02	+0.28	+0.45	-0.50	+0.82	+1.83	+1.40
FSU	-0.12	-0.10	-0.09	+0.11	+0.07	+0.04	-0.04	+0.14	+0.10	-0.01	-0.12	+0.15	+0.18	+0.12	+0.14	+0.16
Call on OPEC	-0.27	+1.48	-0.13	-0.65	-0.37	-0.09	+0.03	+0.12	-1.13	+0.64	+0.13	+0.17	+1.82	+0.69	-0.58	-0.46
Crude oil	-0.29	+1.44	-0.14	-0.59	-0.46	-0.10	-0.01	+0.11	-1.18	+0.62	+0.14	+0.17	+1.61	+0.61	-0.67	-0.55
NGLs	+0.03	+0.05	+0.00	-0.07	+0.09	+0.02	+0.04	+0.01	+0.05	+0.02	-0.01	-0.01	+0.22	+0.08	+0.09	+0.09

Notes: (1) Values through April–June 2018 stated to be actual results by IEA, but revisions possible in subsequent reports. (2) The Americas includes the US, Canada, Mexico, and Chile. (3) Figures in rows shaded in yellow are Call on OPEC (crude oil) estimates, based on global demand minus non-OPEC output and OPEC output of natural gas liquids (NGLs). OPEC output exceeding (undershooting) this figure would result in excess supply (demand).

Source: Nomura, based on International Energy Agency's (IEA's) *Oil Market Report* (July 2018 edition)

Fig. 4: Crude oil price sensitivity in earnings at related companies

		Recurring profits 19/3E (¥bn)	Crude oil price sensitivity 19/3E (¥bn)	vs recurring profits 19/3E (%)
Chemicals				
3407	Asahi Kasei	224.0	-0.3	-0.1%
4005	Sumitomo Chemical	239.4	0.8	+0.3%
4042	Tosoh	117.6	-0.6	-0.5%
4183	Mitsui Chemicals	117.9	-1.2	-1.0%
4188	Mitsubishi Chemical Holdings	344.0	-0.8	-0.2%
Oil				
1605	Inpex	56.5	3.2	+5.7%
1662	Japan Petroleum Exploration	6.0	0.6	+10.2%
5020	JXTG Holdings	620.5	9.0	+1.5%
5021	Cosmo Energy Holdings	139.7	3.2	+2.3%
Steel				
5423	Tokyo Steel Mfg	13.5	-0.2	-1.3%
5440	Kyoei Steel	5.5	-0.1	-1.5%
5471	Daido Steel	36.0	-0.2	-0.6%
5481	Sanyo Special Steel	9.0	-0.1	-0.9%
Nonferrous metals				
5703	Nippon Light Metal Holdings	30.0	-0.1	-0.2%
5711	Mitsubishi Materials	75.0	-0.3	-0.3%
5714	Dowa Holdings	36.0	-0.1	-0.2%
5741	UACJ	20.0	-0.1	-0.6%
Land transportation				
9062	Nippon Express	81.3	-0.2	-0.2%
9064	Yamato Holdings	72.6	-0.2	-0.3%
9075	Fukuyama Transporting	18.3	-0.1	-0.5%
9076	Seino Holdings	33.7	-0.2	-0.5%
Shipping				
9101	Nippon Yusen	38.9	-1.0	-2.6%
9104	Mitsui OSK Lines	41.7	-0.9	-2.2%
9107	Kawasaki Kisen	5.0	-0.9	-18.7%
Airlines				
9201	Japan Airlines	166.2	-0.4	-0.2%
9202	ANA Holdings	169.1	-0.2	-0.1%
Trading companies				
8001	Itochu	455.0	0.4	+0.1%
8002	Marubeni	235.0	0.5	+0.2%
8031	Mitsui & Co	437.0	2.9	+0.7%
8053	Sumitomo Corp	326.0	0.1	+0.0%
8058	Mitsubishi Corp	645.0	2.5	+0.4%

(1) We use net profits for Inpex and trading companies, operating profits for Japan Petroleum Exploration and JXTG Holdings.

(2) Figures include inventory gains/losses for JXTG Holdings and Cosmo Energy Holdings.

(3) For Asahi Kasei, Tosoh, Mitsui Chemicals, and Mitsubishi Chemical Holdings, we estimate the impact on costs (rather than recurring profits) for the naphtha used in ethylene crackers in Japan. For Sumitomo Chemical we use company comments (cost impact).

(4) Figures for Nippon Yusen, Mitsui OSK Lines, and Kawasaki Kisen reflect the fuel price sensitivity of their equity-method containership operations. We assume that the sensitivity to bunker fuel prices is three times the sensitivity to crude oil prices.

(5) For Japan Airlines and ANA Holdings, we factor in fuel hedging for 19/3 and fuel surcharges on international routes.

(6) For steel and nonferrous metals, we factor in the increase in electric power costs from rising crude oil prices. There is a time lag of 6-9 months from when oil prices rise to when costs rise.

Source: Nomura

Appendix A-1

Analyst Certification

I, Shigeki Matsumoto, hereby certify (1) that the views expressed in this Research report accurately reflect my personal views about any or all of the subject securities or issuers referred to in this Research report, (2) no part of my compensation was, is or will be directly or indirectly related to the specific recommendations or views expressed in this Research report and (3) no part of my compensation is tied to any specific investment banking transactions performed by Nomura Securities International, Inc., Nomura International plc or any other Nomura Group company.

Important Disclosures

The lists of issuers that are affiliates or subsidiaries of Nomura Holdings Inc., the parent company of Nomura Securities Co., Ltd., issuers that have officers who concurrently serve as officers of Nomura Securities Co., Ltd., issuers in which the Nomura Group holds 1% or more of any class of common equity securities and issuers for which Nomura Securities Co., Ltd. has lead managed a public offering of equity or equity linked securities in the past 12 months are available at http://www.nomuraholdings.com/report/. Please contact the Research Product Management Dept. of Nomura Securities Co., Ltd. for additional information.

Online availability of research and conflict-of-interest disclosures

Nomura Group research is available on www.nomuranow.com/research, Bloomberg, Capital IQ, Factset, Reuters and ThomsonOne. Important disclosures may be read at http://go.nomuranow.com/research/globalresearchportal/pages/disclosures/disclosures.aspx or requested from Nomura Securities International, Inc., or Instinet, LLC on 1-877-865-5752. If you have any difficulties with the website, please email grpsupport@nomura.com for help.

The analysts responsible for preparing this report have received compensation based upon various factors including the firm's total revenues, a portion of which is generated by Investment Banking activities. Unless otherwise noted, the non-US analysts listed at the front of this report are not registered/qualified as research analysts under FINRA rules, may not be associated persons of NSI or ILLC, and may not be subject to FINRA Rule 2241 restrictions on communications with covered companies, public appearances, and trading securities held by a research analyst account.

Nomura Global Financial Products Inc. (“NGFP”) Nomura Derivative Products Inc. (“NDPI”) and Nomura International plc. (“NIplc”) are registered with the Commodities Futures Trading Commission and the National Futures Association (NFA) as swap dealers. NGFP, NDPI, and NIplc are generally engaged in the trading of swaps and other derivative products, any of which may be the subject of this report.

Distribution of ratings (Nomura Group)

The distribution of all ratings published by Nomura Group Global Equity Research is as follows:
53% have been assigned a Buy rating which, for purposes of mandatory disclosures, are classified as a Buy rating; 42% of companies with this rating are investment banking clients of the Nomura Group*. 0% of companies (which are admitted to trading on a regulated market in the EEA) with this rating were supplied material services** by the Nomura Group.
42% have been assigned a Neutral rating which, for purposes of mandatory disclosures, is classified as a Hold rating; 53% of companies with this rating are investment banking clients of the Nomura Group*. 0% of companies (which are admitted to trading on a regulated market in the EEA) with this rating were supplied material services by the Nomura Group
5% have been assigned a Reduce rating which, for purposes of mandatory disclosures, are classified as a Sell rating; 13% of companies with this rating are investment banking clients of the Nomura Group*. 0% of companies (which are admitted to trading on a regulated market in the EEA) with this rating were supplied material services by the Nomura Group.
As at 30 June 2018.
**The Nomura Group as defined in the Disclaimer section at the end of this report.*
** As defined by the EU Market Abuse Regulation

Distribution of ratings (Instinet, LLC)

The distribution of all ratings published by Instinet, LLC Equity Research is as follows:
59% have been assigned a Buy rating which, for purposes of mandatory disclosures, are classified as a Buy rating; Instinet LLC has provided investment banking services to 0% of companies with this rating within the previous 12 months.
37% have been assigned a Neutral rating which, for purposes of mandatory disclosures, is classified as a Hold rating; Instinet LLC has provided investment banking services to 0% of companies with this rating within the previous 12 months.
4% have been assigned a Reduce rating which, for purposes of mandatory disclosures, are classified as a Sell rating; Instinet LLC has provided investment banking services to 0% of companies with this rating within the previous 12 months.

Definition of Nomura Group's equity research rating system and sectors

The rating system is a relative system, indicating expected performance against a specific benchmark identified for each individual stock, subject to limited management discretion. An analyst’s target price is an assessment of the current intrinsic fair value of the stock based on an appropriate valuation methodology determined by the analyst. Valuation methodologies include, but are not limited to, discounted cash flow analysis, expected return on equity and multiple analysis. Analysts may also indicate expected absolute upside/downside relative to the stated target price, defined as (target price - current price)/current price.

STOCKS

A rating of **'Buy'**, indicates that the analyst expects the stock to outperform the Benchmark over the next 12 months. A rating of **'Neutral'**, indicates that the analyst expects the stock to perform in line with the Benchmark over the next 12 months. A rating of **'Reduce'**, indicates that the analyst expects the stock to underperform the Benchmark over the next 12 months. A rating of **'Suspended'**, indicates that the rating, target price and estimates have been suspended temporarily to comply with applicable regulations and/or firm policies. Securities and/or companies that are labelled as **'Not rated'** or shown as **'No rating'** are not in regular research coverage. Investors should not expect continuing or additional information from Nomura relating to such securities and/or companies. Benchmarks are as follows: **United States/Europe/Asia ex-Japan**: please see valuation methodologies for explanations of relevant benchmarks for stocks, which can be accessed at: http://go.nomuranow.com/research/globalresearchportal/pages/disclosures/disclosures.aspx; **Global Emerging Markets (ex-Asia)**: MSCI Emerging Markets ex-Asia, unless otherwise stated in the valuation methodology; **Japan:** Russell/Nomura Large Cap.

SECTORS

A **'Bullish'** stance, indicates that the analyst expects the sector to outperform the Benchmark during the next 12 months. A **'Neutral'** stance, indicates that the analyst expects the sector to perform in line with the Benchmark during the next 12 months. A **'Bearish'** stance, indicates that the analyst expects the sector to underperform the Benchmark during the next 12 months. Sectors that are labelled as **'Not rated'** or shown as **'N/A'** are not assigned ratings. Benchmarks are as follows: **United States:** S&P 500; **Europe:** Dow Jones STOXX 600; **Global Emerging Markets (ex-Asia):** MSCI Emerging Markets ex-Asia. **Japan/Asia ex-Japan:** Sector ratings are not assigned.

Target Price

A Target Price, if discussed, indicates the analyst's forecast for the share price with a 12-month time horizon, reflecting in part the analyst's estimates for the company's earnings. The achievement of any target price may be impeded by general market and macroeconomic trends, and by other risks related to the company or the market, and may not occur if the company's earnings differ from estimates.

Disclaimers

originality, accuracy, completeness, merchantability or fitness for a particular purpose with respect to any of this information. Without limiting any of the foregoing, in no event shall MSCI, any of its affiliates or any third party involved in, or related to, computing or compiling the information have any liability for any damages of any kind. MSCI and the MSCI indexes are services marks of MSCI and its affiliates.
The intellectual property rights and any other rights, in Russell/Nomura Japan Equity Index belong to Nomura Securities Co., Ltd. ("Nomura") and Frank Russell Company ("Russell"). Nomura and Russell do not guarantee accuracy, completeness, reliability, usefulness, marketability, merchantability or fitness of the Index, and do not account for business activities or services that any index user and/or its affiliates undertakes with the use of the Index.
Investors should consider this document as only a single factor in making their investment decision and, as such, the report should not be viewed as identifying or suggesting all risks, direct or indirect, that may be associated with any investment decision. Nomura Group produces a number of different types of research product including, among others, fundamental analysis and quantitative analysis; recommendations contained in one type of research product may differ from recommendations contained in other types of research product, whether as a result of differing time horizons, methodologies or otherwise. The Nomura Group publishes research product in a number of different ways including the posting of product on the Nomura Group portals and/or distribution directly to clients. Different groups of clients may receive different products and services from the research department depending on their individual requirements.
Figures presented herein may refer to past performance or simulations based on past performance which are not reliable indicators of future performance. Where the information contains an indication of future performance, such forecasts may not be a reliable indicator of future performance. Moreover, simulations are based on models and simplifying assumptions which may oversimplify and not reflect the future distribution of returns. Any figure, strategy or index created and published for illustrative purposes within this document is not intended for “use” as a “benchmark” as defined by the European Benchmark Regulation.
Certain securities are subject to fluctuations in exchange rates that could have an adverse effect on the value or price of, or income derived from, the investment.
With respect to Fixed Income Research: Recommendations fall into two categories: tactical, which typically last up to three months; or strategic, which typically last from 6-12 months. However, trade recommendations may be reviewed at any time as circumstances change. ‘Stop loss’ levels for trades are also provided; which, if hit, closes the trade recommendation automatically. Prices and yields shown in recommendations are taken at the time of submission for publication and are based on either indicative Bloomberg, Reuters or Nomura prices and yields at that time. The prices and yields shown are not necessarily those at which the trade recommendation can be implemented.
The securities described herein may not have been registered under the US Securities Act of 1933 (the ‘1933 Act’), and, in such case, may not be offered or sold in the US or to US persons unless they have been registered under the 1933 Act, or except in compliance with an exemption from the registration requirements of the 1933 Act. Unless governing law permits otherwise, any transaction should be executed via a Nomura entity in your home jurisdiction.
This document has been approved for distribution in the UK and European Economic Area as investment research by NIplc. NIplc is authorised by the Prudential Regulation Authority and regulated by the Financial Conduct Authority and the Prudential Regulation Authority. NIplc is a member of the London Stock Exchange. This document does not constitute a personal recommendation within the meaning of applicable regulations in the UK, or take into account the particular investment objectives, financial situations, or needs of individual investors. This document is intended only for investors who are 'eligible counterparties' or 'professional clients' for the purposes of applicable regulations in the UK, and may not, therefore, be redistributed to persons who are 'retail clients' for such purposes. This document has been approved by NIHK, which is regulated by the Hong Kong Securities and Futures Commission, for distribution in Hong Kong by NIHK. This document has been approved for distribution in Australia by NAL, which is authorized and regulated in Australia by the ASIC. This document has also been approved for distribution in Malaysia by NSM. In Singapore, this document has been distributed by NSL. NSL accepts legal responsibility for the content of this document, where it concerns securities, futures and foreign exchange, issued by their foreign affiliates in respect of recipients who are not accredited, expert or institutional investors as defined by the Securities and Futures Act (Chapter 289). Recipients of this document in Singapore should contact NSL in respect of matters arising from, or in connection with, this document. Unless prohibited by the provisions of Regulation S of the 1933 Act, this material is distributed in the US, by NSI, a US-registered broker-dealer, which accepts responsibility for its contents in accordance with the provisions of Rule 15a-6, under the US Securities Exchange Act of 1934. The entity that prepared this document permits its separately operated affiliates within the Nomura Group to make copies of such documents available to their clients.
This document has not been approved for distribution to persons other than ‘Authorised Persons’, ‘Exempt Persons’ or ‘Institutions’ (as defined by the Capital Markets Authority) in the Kingdom of Saudi Arabia (‘Saudi Arabia’) or 'professional clients' (as defined by the Dubai Financial Services Authority) in the United Arab Emirates (‘UAE’) or a ‘Market Counterparty’ or ‘Business Customers’ (as defined by the Qatar Financial Centre Regulatory Authority) in the State of Qatar (‘Qatar’) by Nomura Saudi Arabia, NIplc or any other member of the Nomura Group, as the case may be. Neither this document nor any copy thereof may be taken or transmitted or distributed, directly or indirectly, by any person other than those authorised to do so into Saudi Arabia or in the UAE or in Qatar or to any person other than ‘Authorised Persons’, ‘Exempt Persons’ or ‘Institutions’ located in Saudi Arabia or 'professional clients' in the UAE or a ‘Market Counterparty’ or ‘Business Customers’ in Qatar . By accepting to receive this document, you represent that you are not located in Saudi Arabia or that you are an ‘Authorised Person’, an ‘Exempt Person’ or an ‘Institution’ in Saudi Arabia or that you are a 'professional client' in the UAE or a ‘Market Counterparty’ or ‘Business Customers’ in Qatar and agree to comply with these restrictions. Any failure to comply with these restrictions may constitute a violation of the laws of the UAE or Saudi Arabia or Qatar.
Notice to Canadian Investors: This research report is not a personal recommendation and does not take into account the investment objectives, financial situation or particular needs of any particular individual or account. It is made available to you in reliance on NI 31-103, section 8.25.
For report with reference of TAIWAN public companies or authored by Taiwan based research analyst:
THIS DOCUMENT IS SOLELY FOR REFERENCE ONLY. You should independently evaluate the investment risks and are solely responsible for your investment decisions. NO PORTION OF THE REPORT MAY BE REPRODUCED OR QUOTED BY THE PRESS OR ANY OTHER PERSON WITHOUT WRITTEN AUTHORIZATION FROM NOMURA GROUP. Pursuant to Operational Regulations Governing Securities Firms Recommending Trades in Securities to Customers and/or other applicable laws or regulations in Taiwan, you are prohibited to provide the reports to others (including but not limited to related parties, affiliated companies and any other third parties) or engage in any activities in connection with the reports which may involve conflicts of interests. INFORMATION ON SECURITIES / INSTRUMENTS NOT EXECUTABLE BY NOMURA INTERNATIONAL (HONG KONG) LTD., TAIPEI BRANCH IS FOR INFORMATIONAL PURPOSES ONLY AND IS NOT BE CONSTRUED AS A RECOMMENDATION OR A SOLICITATION TO TRADE IN SUCH SECURITIES / INSTRUMENTS.
NO PART OF THIS MATERIAL MAY BE (I) COPIED, PHOTOCOPIED, OR DUPLICATED IN ANY FORM, BY ANY MEANS; OR (II) REDISTRIBUTED WITHOUT THE PRIOR WRITTEN CONSENT OF A MEMBER OF THE NOMURA GROUP. If this document has been distributed by electronic transmission, such as e-mail, then such transmission cannot be guaranteed to be secure or error-free as information could be intercepted, corrupted, lost, destroyed, arrive late or incomplete, or contain viruses. The sender therefore does not accept liability for any errors or omissions in the contents of this document, which may arise as a result of electronic transmission. If verification is required, please request a hard-copy version.

Disclaimers required in Japan

Credit ratings in the text that are marked with an asterisk (*) are issued by a rating agency not registered under Japan's Financial Instruments and Exchange Act ("Unregistered Ratings"). For details on Unregistered Ratings, please contact the Research Product Management Dept. of Nomura Securities Co., Ltd.
Investors in the financial products offered by Nomura Securities may incur fees and commissions specific to those products (for example, transactions involving Japanese equities are subject to a sales commission (all figures on a tax-inclusive basis) of up to 1.404% of the transaction amount or a commission of ¥2,808 for transactions of ¥200,000 or less, while transactions involving investment trusts are subject to various fees, such as commissions at the time of purchase and asset management fees (trust fees), specific to each investment trust). In addition, all products carry the risk of losses owing to price fluctuations or other factors. Fees and risks vary by product. Please thoroughly read the written materials provided, such as documents delivered before making a contract, listed securities documents, or prospectuses.

Transactions involving Japanese equities (including Japanese REITs, Japanese ETFs, and Japanese ETNs) are subject to a sales commission of up to 1.404% of the transaction amount (or a commission of ¥2,808 for transactions of ¥200,000 or less). When Japanese equities are purchased via OTC transactions (including offerings), only the purchase price shall be paid, with no sales commission charged. However, Nomura Securities may charge a separate fee for OTC transactions, as agreed with the customer. Japanese equities carry the risk of losses owing to price fluctuations. Japanese REITs carry the risk of losses owing to fluctuations in price and/or earnings of underlying real estate. Japanese ETFs carry the risk of losses owing to fluctuations in the underlying indexes or other benchmarks.
Transactions involving foreign equities are subject to a domestic sales commission of up to 1.026% of the transaction amount (which equals the local transaction amount plus local fees and taxes in the case of a purchase or the local transaction amount minus local fees and taxes in the case of a sale) (for transaction amounts of ¥750,000 and below, maximum domestic sales commission is ¥7,668). Local fees and taxes in foreign financial instruments markets vary by country/territory. When foreign equities are purchased via OTC transactions (including offerings), only the purchase price shall be paid, with no sales commission charged. However, Nomura Securities may charge a separate fee for OTC transactions, as agreed with the customer. Foreign equities carry the risk of losses owing to factors such as price fluctuations and foreign exchange rate fluctuations.
Margin transactions are subject to a sales commission of up to 1.404% of the transaction amount (or a commission of ¥2,808 for transactions of ¥200,000 or less), as well as management fees and rights handling fees. In addition, long margin transactions are subject to interest on the purchase amount, while short margin transactions are subject to fees for the lending of the shares borrowed. A margin equal to at least 30% of the transaction amount (at least 33% for online transactions) and at least ¥300,000 is required. With margin transactions, an amount up to roughly 3.3x the margin (roughly 3x for online transactions) may be traded. Margin transactions therefore carry the risk of losses in excess of the margin owing to share price fluctuations. For details, please thoroughly read the written materials provided, such as listed securities documents or documents delivered before making a contract.
Transactions involving convertible bonds are subject to a sales commission of up to 1.08% of the transaction amount (or a commission of ¥4,320 if this would be less than ¥4,320). When convertible bonds are purchased via OTC transactions (including offerings), only the purchase price shall be paid, with no sales commission charged. However, Nomura Securities may charge a separate fee for OTC transactions, as agreed with the customer. Convertible bonds carry the risk of losses owing to factors such as interest rate fluctuations and price fluctuations in the underlying stock. In addition, convertible bonds denominated in foreign currencies also carry the risk of losses owing to factors such as foreign exchange rate fluctuations.
When bonds are purchased via public offerings, secondary distributions, or other OTC transactions with Nomura Securities, only the purchase price shall be paid, with no sales commission charged. Bonds carry the risk of losses, as prices fluctuate in line with changes in market interest rates. Bond prices may also fall below the invested principal as a result of such factors as changes in the management and financial circumstances of the issuer, or changes in third-party valuations of the bond in question. In addition, foreign currency-denominated bonds also carry the risk of losses owing to factors such as foreign exchange rate fluctuations.
When Japanese government bonds (JGBs) for individual investors are purchased via public offerings, only the purchase price shall be paid, with no sales commission charged. As a rule, JGBs for individual investors may not be sold in the first 12 months after issuance. When JGBs for individual investors are sold before maturity, an amount calculated via the following formula will be subtracted from the par value of the bond plus accrued interest: (1) for 10-year variable rate bonds, an amount equal to the two preceding coupon payments (before tax) x 0.79685 will be used, (2) for 5-year and 3-year fixed rate bonds, an amount equal to the two preceding coupon payments (before tax) x 0.79685 will be used.
When inflation-indexed JGBs are purchased via public offerings, secondary distributions (uridashi deals), or other OTC transactions with Nomura Securities, only the purchase price shall be paid, with no sales commission charged. Inflation-indexed JGBs carry the risk of losses, as prices fluctuate in line with changes in market interest rates and fluctuations in the nationwide consumer price index.The notional principal of inflation-indexed JGBs changes in line with the rate of change in nationwide CPI inflation from the time of its issuance. The amount of the coupon payment is calculated by multiplying the coupon rate by the notional principal at the time of payment. The maturity value is the amount of the notional principal when the issue becomes due. For JI17 and subsequent issues, the maturity value shall not undercut the face amount.
Purchases of investment trusts (and sales of some investment trusts) are subject to a purchase or sales fee of up to 5.4% of the transaction amount. Also, a direct cost that may be incurred when selling investment trusts is a fee of up to 2.0% of the unit price at the time of redemption. Indirect costs that may be incurred during the course of holding investment trusts include, for domestic investment trusts, an asset management fee (trust fee) of up to 5.4% (annualized basis) of the net assets in trust, as well as fees based on investment performance. Other indirect costs may also be incurred. For foreign investment trusts, indirect fees may be incurred during the course of holding such as investment company compensation.
Investment trusts invest mainly in securities such as Japanese and foreign equities and bonds, whose prices fluctuate. Investment trust unit prices fluctuate owing to price fluctuations in the underlying assets and to foreign exchange rate fluctuations. As such, investment trusts carry the risk of losses. Fees and risks vary by investment trust. Maximum applicable fees are subject to change; please thoroughly read the written materials provided, such as prospectuses or documents delivered before making a contract.
In interest rate swap transactions and USD/JPY basis swap transactions ("interest rate swap transactions, etc."), only the agreed transaction payments shall be made on the settlement dates. Some interest rate swap transactions, etc. may require pledging of margin collateral. In some of these cases, transaction payments may exceed the amount of collateral. There shall be no advance notification of required collateral value or collateral ratios as they vary depending on the transaction. Interest rate swap transactions, etc. carry the risk of losses owing to fluctuations in market prices in the interest rate, currency and other markets, as well as reference indices. Losses incurred as such may exceed the value of margin collateral, in which case margin calls may be triggered. In the event that both parties agree to enter a replacement (or termination) transaction, the interest rates received (paid) under the new arrangement may differ from those in the original arrangement, even if terms other than the interest rates are identical to those in the original transaction. Risks vary by transaction. Please thoroughly read the written materials provided, such as documents delivered before making a contract and disclosure statements.
In OTC transactions of credit default swaps (CDS), no sales commission will be charged. When entering into CDS transactions, the protection buyer will be required to pledge or entrust an agreed amount of margin collateral. In some of these cases, the transaction payments may exceed the amount of margin collateral. There shall be no advance notification of required collateral value or collateral ratios as they vary depending on the financial position of the protection buyer. CDS transactions carry the risk of losses owing to changes in the credit position of some or all of the referenced entities, and/or fluctuations of the interest rate market. The amount the protection buyer receives in the event that the CDS is triggered by a credit event may undercut the total amount of premiums that he/she has paid in the course of the transaction. Similarly, the

amount the protection seller pays in the event of a credit event may exceed the total amount of premiums that he/she has received in the transaction. All other conditions being equal, the amount of premiums that the protection buyer pays and that received by the protection seller shall differ. In principle, CDS transactions will be limited to financial instruments business operators and qualified institutional investors.
No account fee will be charged for marketable securities or monies deposited. Transfers of equities to another securities company via the Japan Securities Depository Center are subject to a transfer fee of up to ¥10,800 per issue transferred depending on volume.

Nomura Securities Co., Ltd.

Financial instruments firm registered with the Kanto Local Finance Bureau (registration No. 142)
Member associations: Japan Securities Dealers Association; Japan Investment Advisers Association; The Financial Futures Association of Japan; and Type II Financial Instruments Firms Association.

The Nomura Group manages conflicts with respect to the production of research through its compliance policies and procedures (including, but not limited to, Conflicts of Interest, Chinese Wall and Confidentiality policies) as well as through the maintenance of Chinese Walls and employee training.
Additional information regarding the methodologies or models used in the production of any investment recommendations contained within this document is available upon request by contacting the Research Analysts listed on the front page. Disclosures information is available upon request and disclosure information is available at the Nomura Disclosure web page: http://go.nomuranow.com/research/globalresearchportal/pages/disclosures/disclosures.aspx