J.P.Morgan

Economic Research

November 2016

Comments on "BOJ's QQE with Yield Curve Control" by Shigeto Nagai and "Macroeconomic Policy Mix in the euro area" by Isabel Vansteenkiste

Session 2: "Coping with Macroeconomic Vulnerabilities and Spillovers" organized by the University of Tokyo and the IMF

November 7, 2016

Hiroshi Ugai
Senior Economist
TEL：+81-3-6736-1173
E Mail: hiroshi.ugai@jpmorgan.com
JPMorgan Securities Japan

Contents

1. Progress and challenge of monetary policy in Japan and Euro area

2. BoJ's Device
   (1) Yield Curve Control
   (2) Inflation-overshooting Commitment

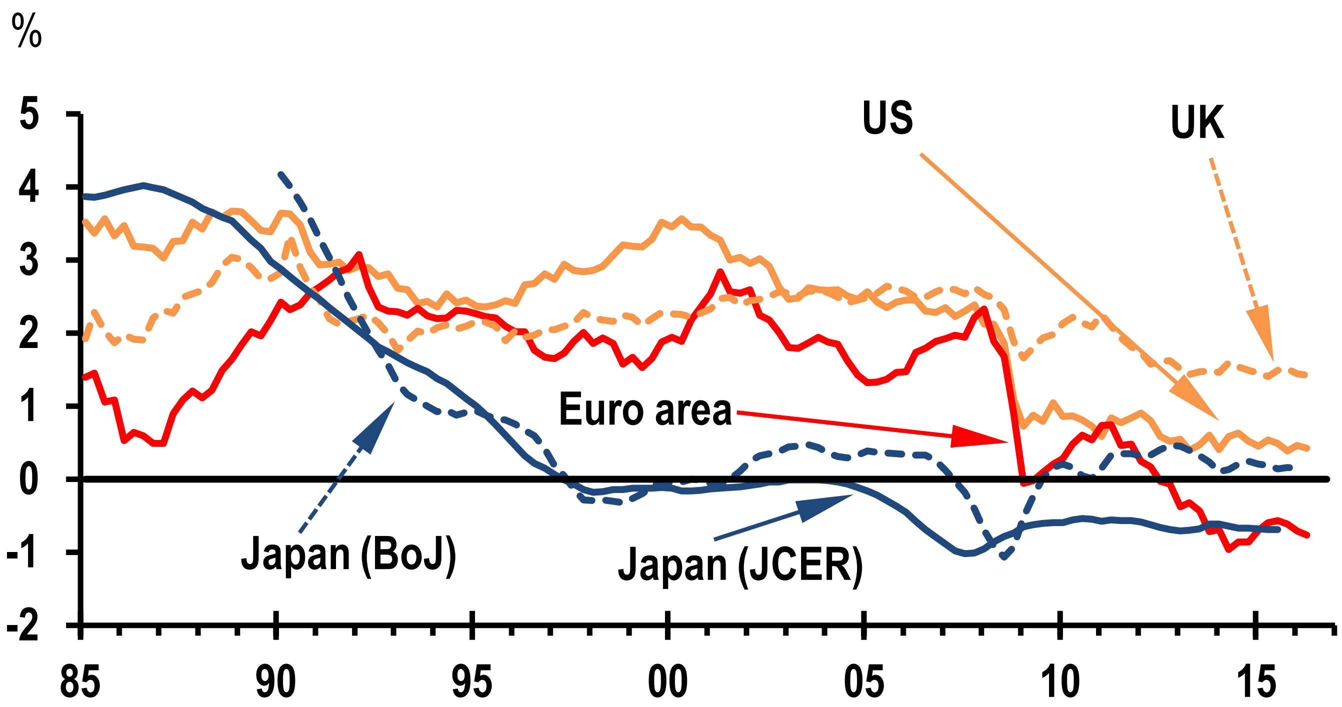
   Issue (1) Strength of negative impact on financial institutions
   Issue (2) Effectiveness of Inflation-overshooting Commitment
   Issue (3) Market communication
   Issue (4) Role of monetary base under YCC
   Issue (5) Controllability of the yield when 2% target and the exit come in sight

3. Consequence: What's next policy in Japan and Euro area?
   (1) Without shock
   (2) Unlikely to exit before another recession risk

1. Progress and challenge of monetary policy in Japan and Euro area (1)

The decline of natural rate of interest into negative territory and existence of ZLB prompted CBs to adopt the QE first and naturally move to NIRP to break ZLB.

Natural rate of interest in DM



Source: Holston, Laubach and Williams (2016), JCER Financial Research Team (2016), BoJ (2016)

1. Progress and challenge of monetary policy in Japan and Euro area (2)

Pursuing price stability single-mindedly by monetary easing would face the challenge of financial system where indirect financing shares a large percentage.

- Steepness of the yield curve is needed to retain net interest income
- “Reversal interest rate” at which accommodative monetary policy reverses its effect
- The damage to the financial system would lead to a weakening in the credit intermediation function and / or an excessive risk taking

-- BoJ (2016), “Financial System Report, Oct 2016”
-- Brunnermeier, M. and Y. Koby (2016), “The ‘Reversal Interest Rate’; An Effective Lower Bound on Monetary Policy”

Negative impact on insurance companies, pension funds, and firms’ pension benefit obligations (defined benefit plan)

- Possible negative impact through a deterioration in people’s sentiment

2. BoJ’s Device (1) Yield Curve Control

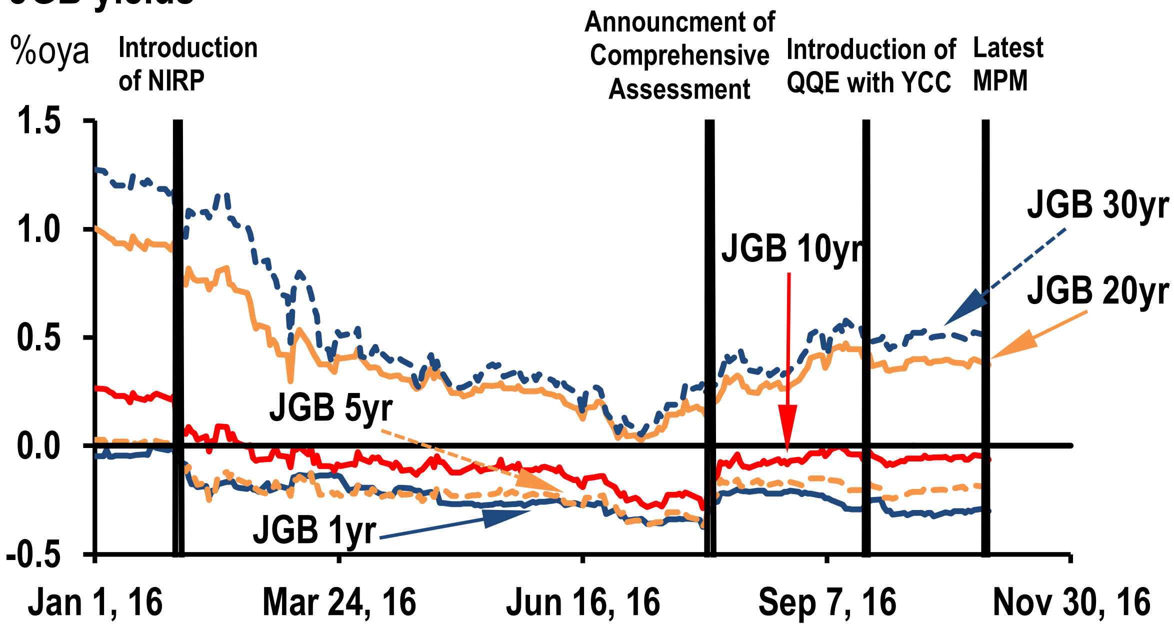
Motivation: Shift from short-term battle to long drawn-out battle by adopting more sustainable framework.

- Possible adverse impact on financial system
- Limits of purchasing JGBs in the market

YCC has brought the market stability in Japan’s markets so far.

- US: Expectation for Fed’s rate hike
- Euro area: A kind of VaR shock

JGB yields



Source: Bloomberg

2. BoJ's Device (2) Inflation-overshooting Commitment

Motivation: Gaining the credibility for attaining inflation target at the earliest possible time

Merits of the commitment

- Recommitment to the target to mitigate the market speculation that BoJ may abandon its fight
- Tolerating higher inflation in the short run
  History dependence

Issue (1) Strength of negative impact on financial institutions

The negative impact on banks will be alleviated if banks impose fees on deposits of companies and financial institutions.

- Providing a room for BoJ to conduct further monetary easing
- Strengthening banks' profitability (rise in lending margin, rise in loan-to-deposit ratio)

This change in pass through of rate can change the reversal interest rate level.

Issue (2) Effectiveness of Inflation-overshooting Commitment

Conditions

- Largely adaptive inflation expectations
- Need credibility for the BoJ and dispel of the perception that monetary policy is constrained to strengthen the forward-looking characteristics
- Even the introduction of QQE did not shift inflation expectations formation (Fujiwara, Nakazono, and Ueda (2014), Nakazono (2016), Ugai (2015))
- No rise in inflation expectations via yen depreciation now

Will the inflation expectations become forward-looking?

- Market participants interpret the BoJ as shifting to long drawn-out battle of attaining inflation target, thereby not paying much attention to this commitment before 2% inflation comes in sight

Issue (3) Market communication

Adoption of a variety of communication tools by BoJ to enhance the transparency so far

Big change since July

- Thorough explanations about monetary policy stance since July, though a leap from the announcement of the Comprehensive Assessment at July MPM to the adoption of the New Framework at September MPM
- It works since September MPM

Difficulty remains

- Prerequisite for a forward guidance to work
  - Dispelling markets’ concern for another surprise
  - Realistic inflation outlook

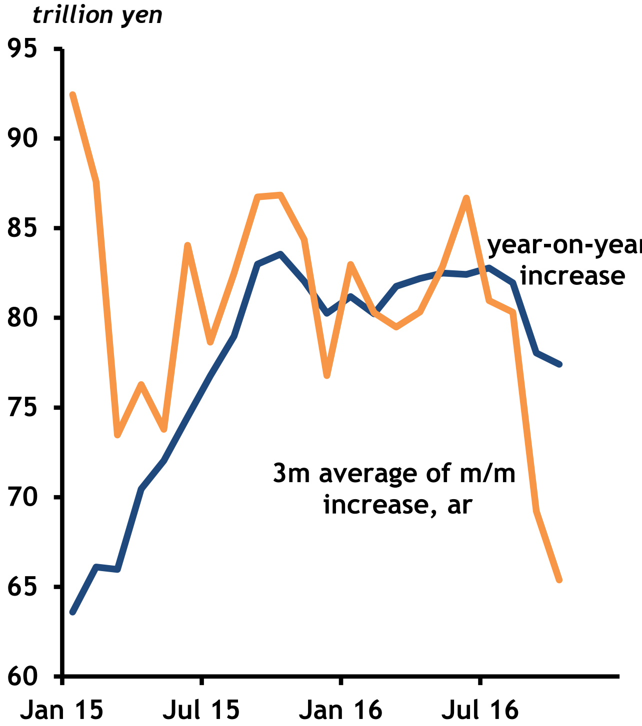
Issue (4) Role of monetary base under YCC

QQE with YCC is interpreted to be as essentially a yield curve control.

- Asymmetric response to the divergence of 10yr JGB yield from 0% target?
  - If large downward shift of 10yr yield is offset by BoJ cutting massively the JGB purchase, markets may interpret this as monetary tightening without knowing BoJ's views on MB
  - If this shift is left by BoJ maintaining massive JGB purchase, this may mean further easing

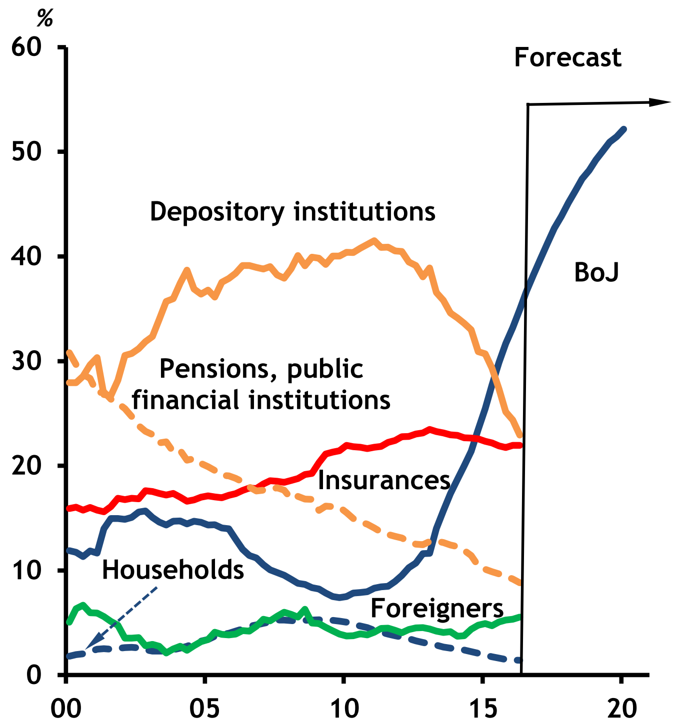
- How to sustain this scheme until exit?
  - JGB purchases by BoJ: Stealth tapering without tantrum? Even tapering 10 trillion yen every year, BoJ will reach 50% share of JGBs within FY2018.

BoJ's JGB purchase



Source: BoJ, J.P. Morgan

JGB holders' share



Source: BoJ, J.P. Morgan

J.P.Morgan

Issue (5) Controllability of the yield when 2% target and the exit come in sight

When the 2% target and / or exit come in sight, 10yr yield will rise.

- Credibility of BoJ needed to avoid the volatile 10yr yield
- Paying attention to secure the financial system stability
- Room for the political intervention

3. Consequence: What's next policy in Japan and Euro area?

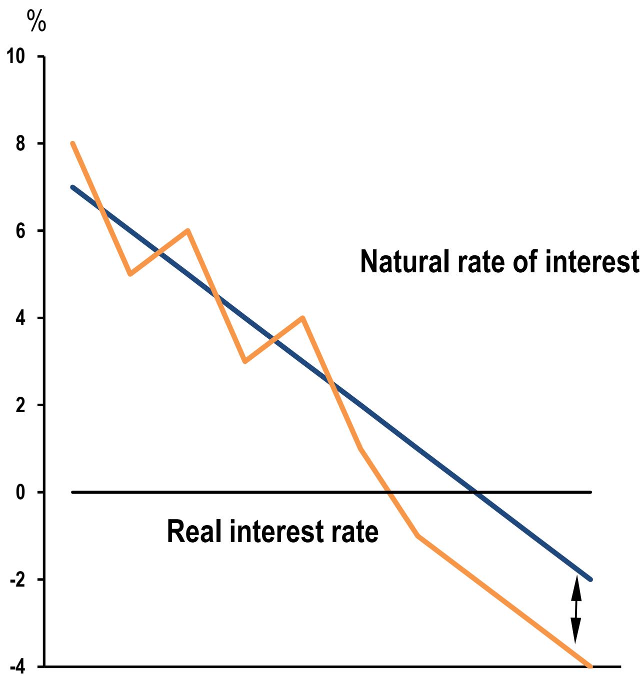
(1) Without shock

Structural reform to raise the natural rate of interest

- Japan: Labor reform ("job-style" employment system & labor mobility)
- Euro area: Labor reform, product market deregulation in some countries

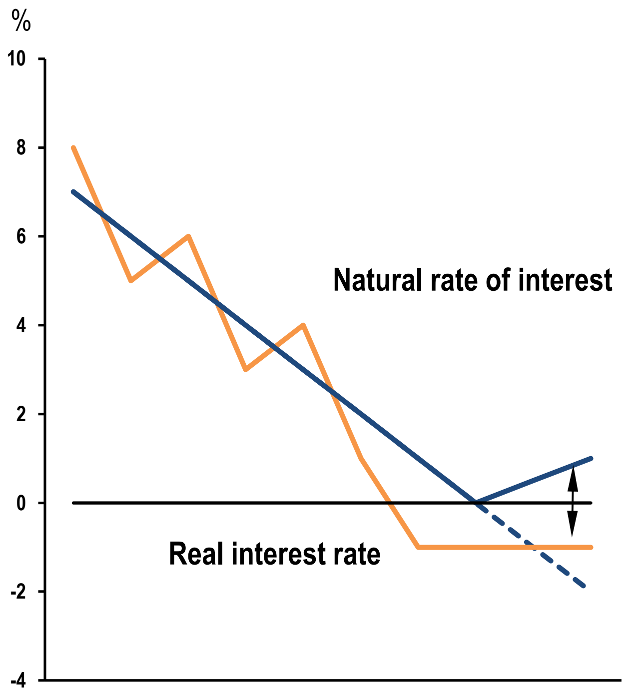
In the Euro area, use more of fiscal space to help lift the burden from ECB and help the region return to macroeconomic balance more quickly?

Aggressive monetary policy



Source: J.P. Morgan

Structural reform



Source: J.P. Morgan

3. Consequence: What's next policy in Japan and Euro area?

(2) Unlikely to exit before another recession risk

Long time to attain the inflation target
(weak inflation expectations, weak wage sensitivity to labor conditions)

Uncertainty about the sustainability of US expansion. Thus probability of global recession will rise before the unconventional monetary policy exits in Japan and Euro area.

What policy options left?

Inflation forecasts (core CPI)

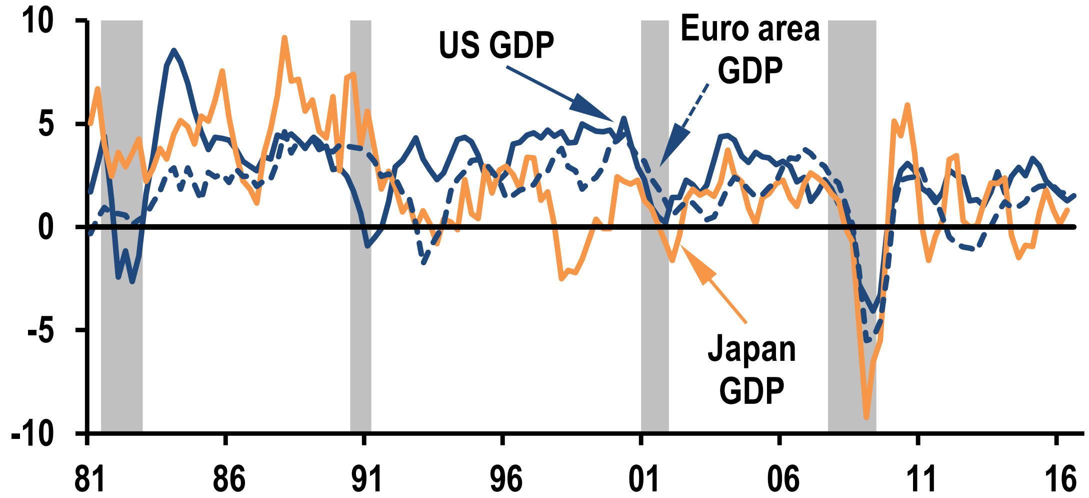
%oya	BoJ	(J.P. Morgan)
FY2016	-0.1	-0.3
FY2017	1.5	0.7
FY2018	1.7	1.1

%oya	ECB	(J.P. Morgan)
CY2016	0.9	0.9
CY2017	1.2	1.0
CY2018	1.5	1.2

Source: BoJ, ECB, J.P. Morgan

US, Japan and Euro area business cycles

%oya, shaded area shows US recessions



Source: BEA, Cabinet Office, Eurostat, ECB, J.P. Morgan

J.P.Morgan

3. Consequence: What's next policy in Japan and Euro area?

(2) Unlikely to exit before another recession risk <contd>

The risk of a US recession within three years at about 2/3

Probabilities of US recession from medium-term indicators

Indicator	1 year	2 years	3 years	4 years
Historical average unconditional probability	18%	34%	48%	59%
Unemployment rate	31%	52%	69%	80%
Unemployment gap	24%	40%	56%	71%
Compensation growth	28%	48%	64%	75%
Prime-age male labor force participation	35%	55%	71%	81%
Margin difference from cycle peak	45%	65%	79%	88%
Durables and structures share of GDP	21%	35%	49%	61%
Composite probability from medium-term indicators	35%	55%	70%	81%
Composite from near and medium-term indicators	30%	51%	66%	78%

Source: J.P. Morgan. "Historical average unconditional probability" is the historical average probability of a recession starting within a given horizon when beginning in an expansion, unconditional on any data. All other probabilities are based on regression models. Indicators are transformed as follows: compensation growth is difference from 10-year average, prime-age male participation is the difference over three years in the 12-month average, durables and structures share is difference from 10-year average. "Composite probability from medium-term indicators" is the probability from a model based on the first principal component of the indicators in the table. "Composite from near and medium-term indicators" is the probability from a model including the first principal component of our near-term indicators and the first component of the medium-term indicators.

3. Consequence: What's next policy in Japan and Euro area?

(2) Unlikely to exit before another recession risk <contd>

Comprehensive approach? **Structural reform takes time to take effect.*

- Fiscal spending amid credible medium-term consolidation plan?
- Deeper NIRP?

(In case of Japan)

- -50bp is possible under the current framework. The degree depends on to what extent banks can impose fees on deposits of companies and financial institutions.
- More than -100bp? Prerequisites are imposing fees or negative rates on all deposits, and decreasing the threshold rate of cash storage (next page).

	Monetary policy	Fiscal policy	Structural reform
Policy tools	Deeper NIRP, etc.	Fiscal spending	Labor reform, etc.
Time lag before it becomes effective	Short term	Short term	Long term
Effect	Decline in real interest rates far below natural rate of interest	Rise in natural rate of interest	Rise in natural rate of interest
Caveats	Negative impact on FIs Negative rate threshold (cost of saving cash)	Large government debts	Possible adverse impacts in the short term

Source: J.P. Morgan

Appendix: How can paper currency be depreciated to decrease (or eliminate) the negative threshold rate in future?

Mechanisms for avoiding cash storage

Mechanisms	Prerequisite
A) Replacing large paper currency to electronic money	Development of Fintech
B) Depreciating paper currency by CB adopting time-varying deposit fee for paper currency	Change in CB's policy framework
C) Tax currency and stamp it	Change in tax system

Source: Kimball (2015, 2016), Buiter (2010), J.P. Morgan

Other Disclosures

J.P. Morgan ("JPM") is the global brand name for J.P. Morgan Securities LLC ("JPMS") and its affiliates worldwide. J.P. Morgan Cazenove is a marketing name for the U.K. investment banking businesses and EMEA cash equities and equity research businesses of JPMorgan Chase & Co. and its subsidiaries. All research reports made available to clients are simultaneously available on our client website, J.P. Morgan Markets. Not all research content is redistributed, e-mailed or made available to third-party aggregators. For all research reports available on a particular stock, please contact your sales representative.

Options related research: If the information contained herein regards options related research, such information is available only to persons who have received the proper option risk disclosure documents. For a copy of the Option Clearing Corporation's Characteristics and Risks of Standardized Options, please contact your J.P. Morgan Representative or visit the OCC's website at http://www.optionsclearing.com/publications/risks/riskstoc.pdf

Legal Entities Disclosures

U.S.: JPMS is a member of NYSE, FINRA, SIPC and the NFA. JPMorgan Chase Bank, N.A. is a member of FDIC. **U.K.**: JPMorgan Chase N.A., London Branch, is authorised by the Prudential Regulation Authority and is subject to regulation by the Financial Conduct Authority and to limited regulation by the Prudential Regulation Authority. Details about the extent of our regulation by the Prudential Regulation Authority are available from J.P. Morgan on request. J.P. Morgan Securities plc (JPMS plc) is a member of the London Stock Exchange and is authorised by the Prudential Regulation Authority and regulated by the Financial Conduct Authority and the Prudential Regulation Authority. Registered in England & Wales No. 2711006. Registered Office 25 Bank Street, London, E14 5JP. **South Africa**: J.P. Morgan Equities South Africa Proprietary Limited is a member of the Johannesburg Securities Exchange and is regulated by the Financial Services Board. **Hong Kong**: J.P. Morgan Securities (Asia Pacific) Limited (CE number AAJ321) is regulated by the Hong Kong Monetary Authority and the Securities and Futures Commission in Hong Kong and/or J.P. Morgan Broking (Hong Kong) Limited (CE number AAB027) is regulated by the Securities and Futures Commission in Hong Kong. **Korea**: This material is issued and distributed in Korea by or through J.P. Morgan Securities (Far East) Limited, Seoul Branch, which is a member of the Korea Exchange(KRX) and is regulated by the Financial Services Commission (FSC) and the Financial Supervisory Service (FSS). **Australia**: J.P. Morgan Australia Limited (JPMAL) (ABN 52 002 888 011/AFS Licence No: 238188) is regulated by ASIC and J.P. Morgan Securities Australia Limited (JPMSAL) (ABN 61 003 245 234/AFS Licence No: 238066) is regulated by ASIC and is a Market, Clearing and Settlement Participant of ASX Limited and CHI-X. **Taiwan**: J.P.Morgan Securities (Taiwan) Limited is a participant of the Taiwan Stock Exchange (company-type) and regulated by the Taiwan Securities and Futures Bureau. **India**:J.P. Morgan India Private Limited (Corporate Identity Number - U67120MH1992FTC068724), having its registered office at J.P. Morgan Tower, Off. C.S.T. Road, Kalina, Santacruz - East, Mumbai – 400098, is registered with Securities and Exchange Board of India (SEBI) as a 'Research Analyst' having registration number INH000001873. J.P. Morgan India Private Limited is also registered with SEBI as a member of the National Stock Exchange of India Limited (SEBI Registration Number - INB 230675231/INF 230675231/INE 230675231) and Bombay Stock Exchange Limited (SEBI Registration Number - INB 010675237/INF 010675237). Telephone: 91-22-6157 3000, Facsimile: 91-22-6157 3990 and Website: www.jpmipl.com. For non local research reports, this material is not distributed in India by J.P. Morgan India Private Limited. **Thailand**: This material is issued and distributed in Thailand by JPMorgan Securities (Thailand) Ltd., which is a member of the Stock Exchange of Thailand and is regulated by the Ministry of Finance and the Securities and Exchange Commission and its registered address is 3rd Floor, 20 North Sathorn Road, Silom, Bangrak, Bangkok 10500. **Indonesia**: PT J.P. Morgan Securities Indonesia is a member of the Indonesia Stock Exchange and is regulated by the OJK a.k.a. BAPEPAM LK. **Philippines**: J.P. Morgan Securities Philippines Inc. is a Trading Participant of the Philippine Stock Exchange and a member of the Securities Clearing Corporation of the Philippines and the Securities Investor Protection Fund. It is regulated by the Securities and Exchange Commission. **Brazil**: Banco J.P. Morgan S.A. is regulated by the Comissao de Valores Mobiliarios (CVM) and by the Central Bank of Brazil. **Mexico**: J.P. Morgan Casa de Bolsa, S.A. de C.V., J.P. Morgan Grupo Financiero is a member of the Mexican Stock Exchange and authorized to act as a broker dealer by the National Banking and Securities Exchange Commission. **Singapore**: This material is issued and distributed in Singapore by or through J.P. Morgan Securities Singapore Private Limited (JPMSS) [MCI (P) 193/03/2016 and Co. Reg. No.: 199405335R] which is a member of the Singapore Exchange Securities Trading Limited and is regulated by the Monetary Authority of Singapore (MAS) and/or JPMorgan Chase Bank, N.A., Singapore branch (JPMCB Singapore) which is regulated by the MAS. This material is provided in Singapore only to accredited investors, expert investors and institutional investors, as defined in Section 4A of the Securities and Futures Act, Cap. 289. Recipients of this document are to contact JPMSS or JPMCB Singapore in respect of any matters arising from, or in connection with, the document. **Japan**: JPMorgan Securities Japan Co., Ltd. and JPMorgan Chase Bank, N.A., Tokyo Branch are regulated by the Financial Services Agency in Japan. **Malaysia**: This material is issued and distributed in Malaysia by JPMorgan Securities (Malaysia) Sdn Bhd (18146-X) which is a Participating Organization of Bursa Malaysia Berhad and a holder of Capital Markets Services License issued by the Securities Commission in Malaysia. **Pakistan**: J. P. Morgan Pakistan Broking (Pvt.) Ltd is a member of the Karachi Stock Exchange and regulated by the Securities and Exchange Commission of Pakistan. **Saudi Arabia**: J.P. Morgan Saudi Arabia Ltd. is authorized by the Capital Market Authority of the Kingdom of Saudi Arabia (CMA) to carry out dealing as an agent, arranging, advising and custody, with respect to securities business under licence number 35-07079 and its registered address is at 8th Floor, Al-Faisaliyah Tower, King Fahad Road, P.O. Box 51907, Riyadh 11553, Kingdom of Saudi Arabia. **Dubai**: JPMorgan Chase Bank, N.A., Dubai Branch is regulated by the Dubai Financial Services Authority (DFSA) and its registered address is Dubai International Financial Centre - Building 3,Level 7, PO Box 506551, Dubai, UAE.

Country and Region Specific Disclosures

U.K. and European Economic Area (EEA): Unless specified to the contrary, issued and approved for distribution in the U.K. and the EEA by JPMS plc. Investment research issued by JPMS plc has been prepared in accordance with JPMS plc's policies for managing conflicts of interest arising as a result of publication and distribution of investment research. Many European regulators require a firm to establish, implement and maintain such a policy. Further information about J.P. Morgan's conflict of interest policy and a description of the effective internal organisations and administrative arrangements set up for the prevention and avoidance of conflicts of interest is set out at the following link https://www.jpmorgan.com/jpmpdf/1320678075935.pdf. This report has been issued in the U.K. only to persons of a kind described in Article 19 (5), 38, 47 and 49 of the Financial Services and Markets Act 2000 (Financial Promotion) Order 2005 (all such persons being referred to as "relevant persons"). This document must not be acted on or relied on by persons who are not relevant persons. Any investment or investment activity to which this document relates is only available to relevant persons and will be engaged in only with relevant persons. In other EEA countries, the report has been issued to persons regarded as professional investors (or equivalent) in their home jurisdiction. **Australia:** This material is issued and distributed by JPMSAL in Australia to "wholesale clients" only. This material does not take into account the specific investment objectives, financial situation or particular needs of the recipient. The recipient of this material must not distribute it to any third party or outside Australia without the prior written consent of JPMSAL. For the purposes of this paragraph the term "wholesale client" has the meaning given in section 761G of the Corporations Act 2001. **Germany:** This material is distributed in Germany by J.P. Morgan Securities plc, Frankfurt Branch and J.P.Morgan Chase Bank, N.A., Frankfurt Branch which are regulated by the Bundesanstalt für Finanzdienstleistungsaufsicht. **Hong Kong:** The 1% ownership disclosure as of the previous month end satisfies the requirements under Paragraph 16.5(a) of the Hong Kong Code of Conduct for Persons Licensed by or Registered with the Securities and Futures Commission. (For research published within the first ten days of the month, the disclosure may be based on the month end data from two months prior.) J.P. Morgan Broking (Hong Kong) Limited is the liquidity provider/market maker for derivative warrants, callable bull bear contracts and stock options listed on the Stock Exchange of Hong Kong Limited. An updated list can be found on HKEx website: http://www.hkex.com.hk. **Japan:** There is a risk that a loss may occur due to a change in the price of the shares in the case of share trading, and that a loss may occur due to the exchange rate in the case of foreign share trading. In the case of share trading, JPMorgan Securities Japan Co., Ltd., will be receiving a brokerage fee and consumption tax (shouhizei) calculated by multiplying the executed price by the commission rate which was individually agreed between JPMorgan Securities Japan Co., Ltd., and the customer in advance. Financial Instruments Firms: JPMorgan Securities Japan Co., Ltd., Kanto Local Finance Bureau (kinsho) No. 82 Participating Association / Japan Securities Dealers Association, The Financial Futures Association of Japan, Type II Financial Instruments Firms Association and Japan Investment Advisers Association. **Korea:** This report may have been edited or contributed to from time to time by affiliates of J.P. Morgan Securities (Far East) Limited, Seoul Branch. **Singapore:** As at the date of this report, JPMSS is a designated market maker for certain structured warrants listed on the Singapore Exchange where the underlying securities may be the securities discussed in this report. Arising from its role as designated market maker for such structured warrants, JPMSS may conduct hedging activities in respect of such underlying securities and hold or have an interest in such underlying securities as a result. The updated list of structured warrants for which JPMSS acts as designated market maker may be found on the website of the Singapore Exchange Limited: http://www.sgx.com.sg. In addition, JPMSS and/or its affiliates may also have an interest or holding in any of the securities discussed in this report – please see the Important Disclosures section above. For securities where the holding is 1% or greater, the holding may be found in the Important Disclosures section above. For all other securities mentioned in this report, JPMSS and/or its affiliates may have a holding of less than 1% in such securities and may trade them in ways different from those discussed in this report. Employees of JPMSS and/or its affiliates not involved in the preparation of this report may have investments in the securities (or derivatives of such securities) mentioned in this report and may trade them in ways different from those discussed in this report. **Taiwan**: This material is issued and distributed in Taiwan by J.P. Morgan Securities (Taiwan) Limited. **India:** For private circulation only, not for sale. **Pakistan:** For private circulation only, not for sale. **New Zealand:** This material is issued and distributed by JPMSAL in New Zealand only to persons whose principal business is the investment of money or who, in the course of and for the purposes of their business, habitually invest money. JPMSAL does not issue or distribute this material to members of "the public" as determined in accordance with section 3 of the Securities Act 1978. The recipient of this material must not distribute it to any third party or outside New Zealand without the prior written consent of JPMSAL. **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, or solicitation of an offer to buy securities described herein, in Canada 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. The information contained herein is under no circumstances 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. No securities commission or similar regulatory authority in Canada has reviewed or in any way passed judgment upon these materials, the information contained herein or the merits of the securities described herein, and any representation to the contrary is an offence. **Dubai:** This report has been issued to persons regarded as professional clients as defined under the DFSA rules. **Brazil**: Ombudsman J.P. Morgan: 0800- 7700847 / ouvidoria.jp.morgan@jpmorgan.com.

General: Additional information is available upon request. Information has been obtained from sources believed to be reliable but JPMorgan Chase & Co. or its affiliates and/or subsidiaries (collectively J.P. Morgan) do not warrant its completeness or accuracy except with respect to any disclosures relative to JPMS and/or its affiliates and the analyst's involvement with the issuer that is the subject of the research. All pricing is indicative as of the close of market for the securities discussed, unless otherwise stated. Opinions and estimates constitute our judgment as of the date of this material and are subject to change without notice. Past performance is not indicative of future results. This material is not intended as an offer or solicitation for the purchase or sale of any financial instrument. The opinions and recommendations herein do not take into account individual client circumstances, objectives, or needs and are not intended as recommendations of particular securities, financial instruments or strategies to particular clients. The recipient of this report must make its own independent decisions regarding any securities or financial instruments mentioned herein. JPMS distributes in the U.S. research published by non-U.S. affiliates and accepts responsibility for its contents. Periodic updates may be provided on companies/industries based on company specific developments or announcements, market conditions or any other publicly available information. Clients should contact analysts and execute transactions through a J.P. Morgan subsidiary or affiliate in their home jurisdiction unless governing law permits otherwise.

"Other Disclosures" last revised October 8, 2016.