July 23, 2019

Follow the Barrel – Q3'19 Global Oil Trade & Flow Scorecard

RBC Capital Markets, LLC
Michael Tran
Commodity Strategist
(212) 266-4020
michael.tran@rbccm.com

Helima Croft
Global Head of Commodity Strategy
(212) 618-7798
helima.croft@rbccm.com

Christopher Louney
Commodity Strategist
(212) 437-1925
christopher.louney@rbccm.com

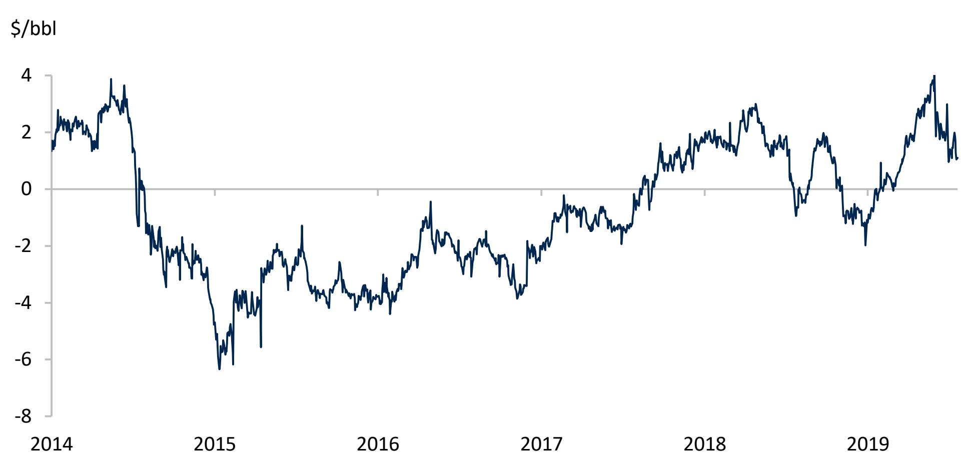
Megan Schippmann
Associate Strategist
(212) 301-1531
megan.schippmann@rbccm.com

- **The fluid nature of the market makes static supply and demand balances an overly simplistic way of analyzing a dynamic oil complex. Here, we aim to strip out the noise and focus on global physical flows to ascertain whether fundamentals are tightening or loosening. We highlight the foremost indicators for a real-time read on the health of the global oil market.**

Barrel Counting

Regional oil balances have ebbed and flowed through pockets of over- and under-supply in recent quarters and prices have swung violently in both directions. The fluid nature of market forces stemming from Iranian exports to US production leaves global supply and demand models stale, static, and overly simplistic as a way of analyzing a dynamic oil complex. The primary driver of price is physical trade and whether the marginal global barrel is finding a buyer. As always, our *Follow the Barrel* series tracks market indicators that can drive near-term price action given the asymmetric pace of physical oil flows. We look to **strip out the headline noise and focus purely on the physical barrels** to assess whether global oil trade patterns are trending bullish or bearish. The inability for prices to stage a material and sustained rally despite escalating disruption risk suggests that the current spot market is sufficiently supplied. Compounding geopolitical tensions leave price risk asymmetrically skewed to the upside, but softening Brent backwardation, despite bullish headlines, is telling. Q3 is typically the peak season for global oil demand, but Brent timespreads are pricing at the weakest point in months and the marginal barrel is having difficulty finding buyers of late. What is causing the physical sogginess and how long will it persist? There are not many places globally that are growing production meaningfully, which suggests that demand growth has been slowing. As is always the case, China warrants watching. Not only have Chinese crude imports slowed from record levels earlier this year, but distillate and gasoline exports are near record highs. This is saturating the Asian region and putting downward pressure on refining margins. The redrawing of the refined product map will continue until either demand improves, refiners cut runs, or fall turnarounds take place. US exports are, perhaps, the focal point of the global oil trade. Our current tanker count suggests an easing of outbound shipments from last month's record-high export print. Given the oversupplied Atlantic Basin, we keenly track the type of ships loading in the US Gulf to assess the degree of saturation or cannibalization that shale may cause in the Atlantic Basin. In short, we highlight the foremost leading physical indicators for a real-time read on the health of the global oil market.

Figure 1: Brent Spreads (Month 1 – Month 6 Contract)



Source: RBC Capital Markets, Bloomberg

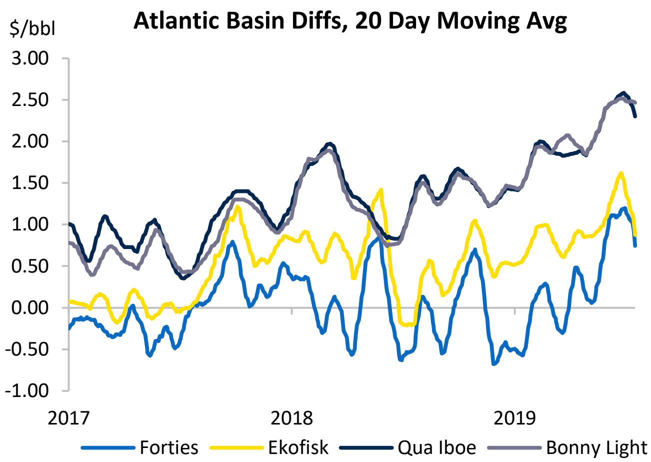
All values in USD unless otherwise noted.

Priced as of prior trading day's market close, ET (unless otherwise stated).

For Required Conflicts Disclosures, please see page 5.

Disseminated: July 23, 2019 00:15ET; Produced: July 22, 2019 22:23ET

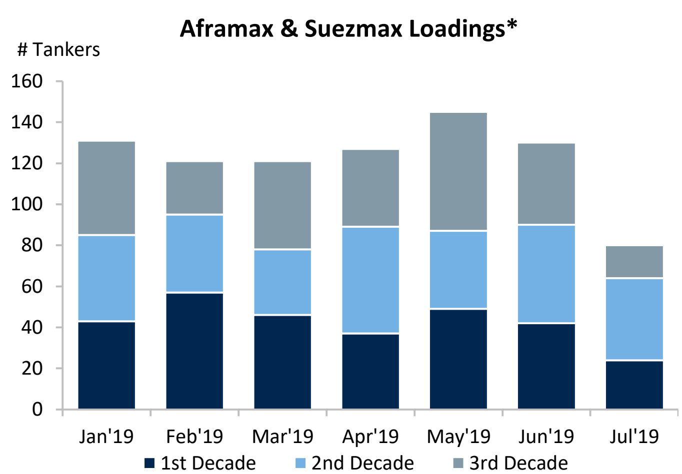
Atlantic Basin Physical Crude Differentials to Dated Brent – *Market Ranking: Trending Weaker*



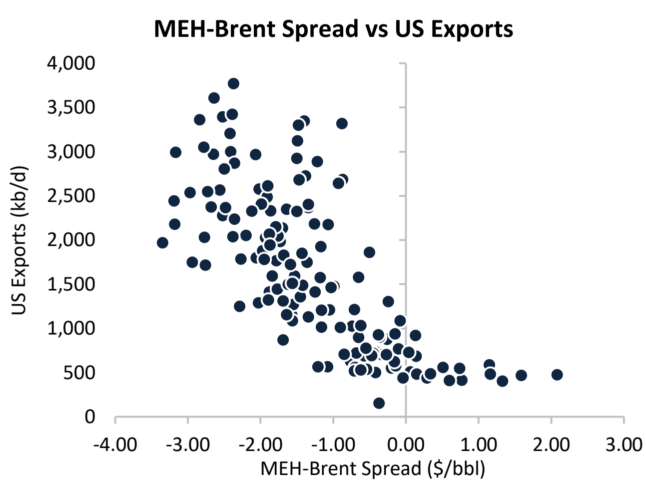
Atlantic Basin physical differentials are the foremost indicator of the market's ability to absorb global supply given that North Sea and West African crudes are the first to reflect a loosening or tightening of **global fundamentals**. A series of both transient and structural supply side outages, coupled with record Chinese imports, kept physical balances tight through 1H'19. Spot pricing differentials across North Sea and Nigerian crudes, the world's marginal barrels, have weakened of late, which has prompted Brent timespreads to ease from multi-year highs. Chinese imports are slowing and the PES refinery closure has left several tankers carrying North Sea crudes stranded along the US East Coast. The ships can either wait for regional buyers to emerge or venture back across the Atlantic, but balances will remain loose until these barrels clear. A dearth of buyers means the barrels are priced to sell.

US Crude Exports – *Market Ranking: Trending Weaker Short-Term*

Following record June exports, outbound US crude shipments will likely trend softer over the coming weeks given our observed tanker count. Twenty-one Very Large Crude Carriers (VLCC) loaded in the US Gulf last month when export economics were favorable. July fixtures and loadings have sunk to 13, a touch shy of the 14 averaged this year. More importantly, July fixtures and loadings of Suez and Aframaxes are trending at a low point. The type of tanker fixed provides an indication of destination. VLCCs loading in the US Gulf conduct longer voyages, typically to Asia, while smaller ships move cross the Atlantic. In other words, more VLCC loadings indicate firmer Asian demand, while shipments to Europe suggest increased competition in the heated Atlantic Basin battleground. Given the recent dearth of physical buyers, increased **US exports** would likely be a function of a US push rather than a European demand pull.



US Export Arbitrage Window – *Market Ranking: Bearish Near-Term, Potentially Bullish Late Summer*

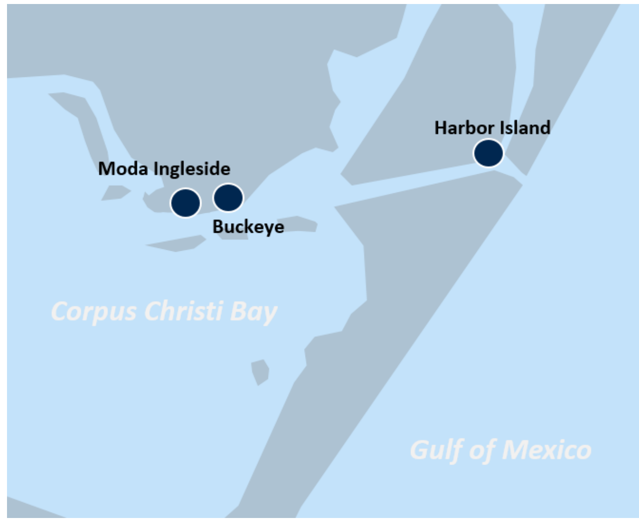


Since US crude inventories peaked this spring, barrels have, on balance, been priced for export. However, since the late-June record crude export print of 3.8 mb/d, fixtures and loadings in the US Gulf have been weak given unfavorable **export economics**. While varying by route and destination, a steady discount in the -$1.90/bbl range is required to clear barrels on the water, globally. The Houston – Brent spread narrowed to -$1.35/bbl earlier this month, a level not economic for a VLCC to ship barrels to Asia. VLCCs typically fix four to six weeks before departure, meaning that current export economics will not show up in the EIA data until mid-August. A major pickup in export activity could stem from Suez and Aframaxes, which can be fixed on shorter time frames, typically a week or two ahead of loading and export.

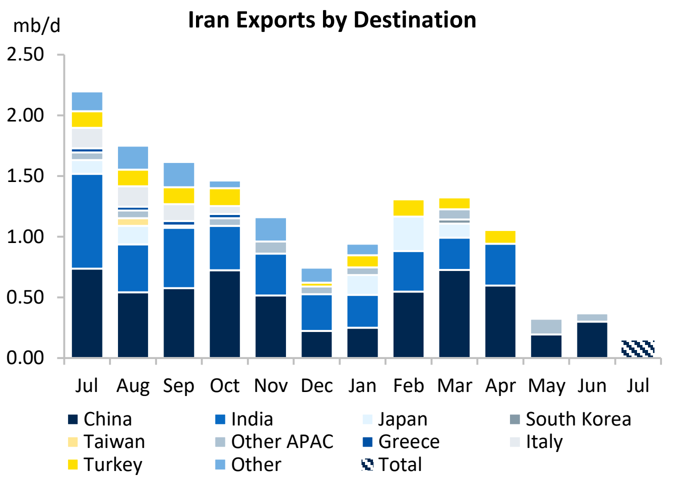
Source: RBC Capital Markets, True North Chartering, Bloomberg, Refinitiv, Reuters, S&P Global Platts, EIA *Includes US and Caribbean fixtures through July 17

Corpus Christi Exports – *Market Ranking: Basis Prices at Risk of Widening for West Texas Crudes*

While Permian bottlenecks dominated headlines last year, the ramp-up of Cactus II, EPIC, and Grey Oak will provide egress and soon unlock 2 mb/d of West Texas crude. Most measure bottlenecks by takeaway capacity or dock space at export terminals, but after our recent investor tour of Corpus Christi, we see **storage logistics** as the underestimated impediment. Corpus is exporting about 900 kb/d and plans to grow to 5 mb/d. Logistically speaking, storage capacity needs to be four times export capacity, meaning that 20 mb of storage is required. Tangentially, the storage requirement is 10 times the feeder pipeline capacity. The race to build capacity is on, and given that current levels are in the high single digits, the key project to watch is Moda Midstream's 10 mb storage facility breaking ground this summer. The inability to thread the needle sets the scene for basis pricing volatility this fall as the pipeline bottleneck morphs into an export issue.



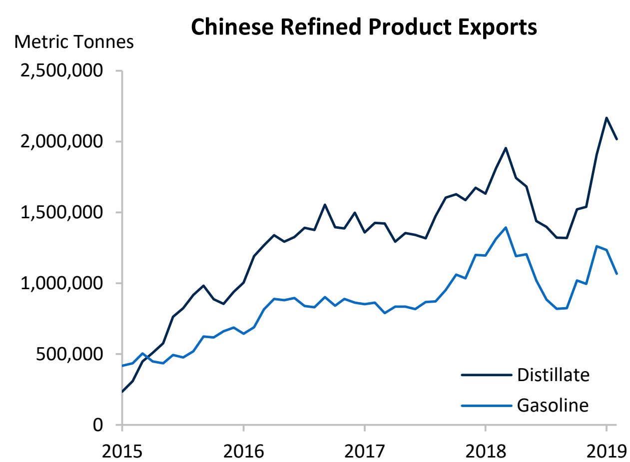
Iranian Crude Exports – *Market Ranking: Bullish*



Given the White House decision to zero out waivers for consumers of Iranian crude, Tehran's already dwindled exports have fallen further of late. After averaging 1.3 mb/d in April, Iran's exports averaged 344 kb/d over May and June, with the majority earmarked for China. Japan and South Korea **halted imports** following the April decision, while India and Turkey also ceased purchases. Our data suggests that crude exports have averaged a trifling 142 kb/d so far this month. Tensions have continued to escalate, with Iran seizing a British oil vessel in the Strait of Hormuz and the Trump Administration stating that the US Navy shot down an Iranian drone last week. In our view, the chances of a diplomatic breakthrough in the near term are slim, as the Iranian leadership continues to insist on lifting of sanctions as a precondition for returning to the negotiating table.

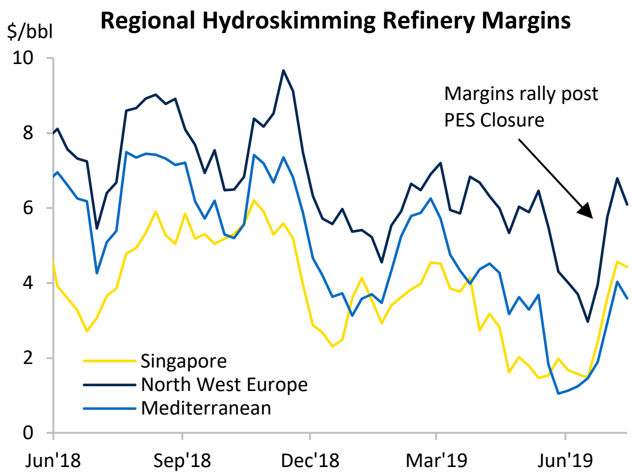
Chinese Refined Product Exports – *Market Ranking: Bearish*

Asia has built a considerable amount of refining capacity over recent years. Refining margins are weak, prompting questions of whether refining capacity been overbuilt. This would not be the case if Chinese product demand growth were occurring at a faster pace. **Chinese gasoline and distillate exports** are near all-time highs. This is indicative that refined product production is outpacing domestic demand. Excess product is being pushed out to the region, which means that competing suppliers of refined product to Emerging Asia, such as the Middle East, are redirecting barrels into the Mediterranean. Refined products are being diverted in attempts to locate the marginal buyer. The inability to find the incremental bid leads to widespread weaker margins. The redrawing of the refined product map will continue until either demand improves, refiners cut runs, or fall turnarounds take place.



Source: RBC Capital Markets, EIA, Petro-Logistics SA, Chinese Customs General Administration, country reports

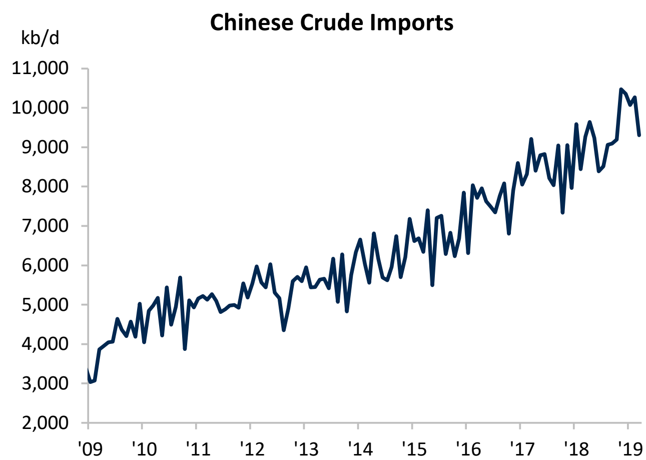
US East Coast Gasoline Imports – *Market Ranking: Bullish*



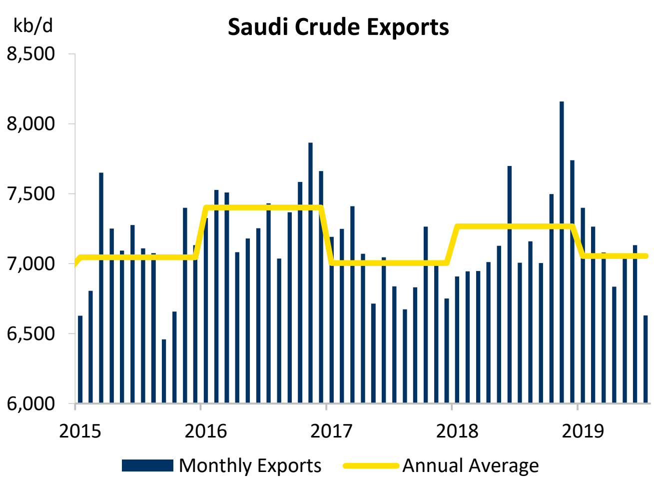
The closure of the Philadelphia refinery following a recent fire is bearish for crude but can be viewed as a temporary release valve for a saturated **global gasoline** market. Naturally, shutting a refinery destroys crude demand, meaning that the 235 kb/d of light crude that PES imported will be left behind in the Atlantic Basin (hence the recent physical weakness). On the bullish front, gasoline comprises nearly 50% of the US East Coast refinery yield, meaning that PADD 1 will be left perpetually short and must lean heavily on cross Atlantic imports. This means that the East Coast can act as a release valve and give lift to the largely lackluster global gasoline refining margins. The bottom line is that the East Coast is pulling otherwise stranded barrels of gasoline across Atlantic, which is temporarily supporting gasoline margins.

Chinese Crude Oil Imports – *Market Ranking: Cautious*

While record Chinese buying was a major driving force behind the physical tightness through much of the first half of the year, we suggested that even a slight easing could leave the global physical market soggy. Year-to-date **Crude imports** grew by a staggering 740 kb/d YoY, but the breakneck pace of imports has slowed to 9.8 mb/d over the last three months relative to the prior three months when imports averaged 10.2 mb/d. China also built inventories at a ferocious rate of over 360 kb/d, on average, over 1H'19. Why import at a record pace only to stuff barrels into storage? Iran and Venezuela historically comprised nearly 10% of Chinese imports, indicating that recent stockpiling was largely for energy security purposes. Funding peak demand season by de-stocking rather than continuing the rapid import pace could create transient pockets of oversupply.



Saudi Crude Oil Exports – *Market Ranking: Bullish*



Saudi crude production has averaged 10 mb/d so far this year, almost exactly 300 kb/d below quota. The commitment to rebalancing the market remains steadfast and the Kingdom has indicated that output will remain below quota as needed and **softer exports** have reflected the Saudi resolve. Domestic summer crude burn has historically meant increased production, but output since June has averaged nearly 500 kb/d below last year's levels, while the July export print has outbound shipments falling to the lowest point since late 2015. The Kingdom is sending fewer barrels to visible regions like the US, but even with lower exports, the Saudis are winning market share where it matters. Saudi Arabia has increased shipments to China by 339 kb/d, capturing more than 45% of the world's fastest import growth market (see box above).

Source: RBC Capital Markets, EIA, Petro-Logistics SA, Chinese Customs General Administration, Bloomberg, country reports

Required disclosures

Conflicts disclosures

The analyst(s) responsible for preparing this research report received compensation that is based upon various factors, including total revenues of the member companies of RBC Capital Markets and its affiliates, a portion of which are or have been generated by investment banking activities of the member companies of RBC Capital Markets and its affiliates.

Conflicts policy

RBC Capital Markets Policy for Managing Conflicts of Interest in Relation to Investment Research is available from us on request. To access our current policy, clients should refer to https://www.rbccm.com/global/file-414164.pdf or send a request to RBC Capital Markets Research Publishing, P.O. Box 50, 200 Bay Street, Royal Bank Plaza, 29th Floor, South Tower, Toronto, Ontario M5J 2W7. We reserve the right to amend or supplement this policy at any time.

Dissemination of research and short-term trade ideas

RBC Capital Markets endeavors to make all reasonable efforts to provide research simultaneously to all eligible clients, having regard to local time zones in overseas jurisdictions. RBC Capital Markets' equity research is posted to our proprietary website to ensure eligible clients receive coverage initiations and changes in ratings, targets and opinions in a timely manner. Additional distribution may be done by the sales personnel via email, fax, or other electronic means, or regular mail. Clients may also receive our research via third party vendors. RBC Capital Markets also provides eligible clients with access to SPARC on the Firm's proprietary INSIGHT website, via email and via third-party vendors. SPARC contains market color and commentary regarding subject companies on which the Firm currently provides equity research coverage. Research Analysts may, from time to time, include short-term trade ideas in research reports and / or in SPARC. A short-term trade idea offers a short-term view on how a security may trade, based on market and trading events, and the resulting trading opportunity that may be available. A short-term trade idea may differ from the price targets and recommendations in our published research reports reflecting the research analyst's views of the longer-term (one year) prospects of the subject company, as a result of the differing time horizons, methodologies and/or other factors. Thus, it is possible that a subject company's common equity that is considered a long-term 'Sector Perform' or even an 'Underperform' might present a short-term buying opportunity as a result of temporary selling pressure in the market; conversely, a subject company's common equity rated a long-term 'Outperform' could be considered susceptible to a short-term downward price correction. Short-term trade ideas are not ratings, nor are they part of any ratings system, and the firm generally does not intend, nor undertakes any obligation, to maintain or update short-term trade ideas. Short-term trade ideas may not be suitable for all investors and have not been tailored to individual investor circumstances and objectives, and investors should make their own independent decisions regarding any securities or strategies discussed herein. Please contact your investment advisor or institutional salesperson for more information regarding RBC Capital Markets' research.

For a list of all recommendations on the company that were disseminated during the prior 12-month period, please click on the following link: https://rbcnew.bluematrix.com/sellside/MAR.action

Analyst certification

All of the views expressed in this report accurately reflect the personal views of the responsible analyst(s) about any and all of the subject securities or issuers. No part of the compensation of the responsible analyst(s) named herein is, or will be, directly or indirectly, related to the specific recommendations or views expressed by the responsible analyst(s) in this report.

Third-party-disclaimers

References herein to "LIBOR", "LIBO Rate", "L" or other LIBOR abbreviations means the London interbank offered rate as administered by ICE Benchmark Administration (or any other person that takes over the administration of such rate).

Disclaimer

RBC Capital Markets is the business name used by certain branches and subsidiaries of the Royal Bank of Canada, including RBC Dominion Securities Inc., RBC Capital Markets, LLC, RBC Europe Limited, Royal Bank of Canada, Hong Kong Branch and Royal Bank of Canada, Sydney Branch. The information contained in this report has been compiled by RBC Capital Markets from sources believed to be reliable, but no representation or warranty, express or implied, is made by Royal Bank of Canada, RBC Capital Markets, its affiliates or any other person as to its accuracy, completeness or correctness. All opinions and estimates contained in this report constitute RBC Capital Markets' judgement as of the date of this report, are subject to change without notice and are provided in good faith but without legal responsibility. Nothing in this report constitutes legal, accounting or tax advice or individually tailored investment advice. This material is prepared for general circulation to clients and has been prepared without regard to the individual financial circumstances and objectives of persons who receive it. The investments or services contained in this report may not be suitable for you and it is recommended that you consult an independent investment advisor if you are in doubt about the suitability of such investments or services. This report is not an offer to sell or a solicitation of an offer to buy any securities. Past performance is not a guide to future performance, future returns are not guaranteed, and a loss of original capital may occur. RBC Capital Markets research analyst compensation is based in part on the overall profitability of RBC Capital Markets, which includes profits attributable to investment banking revenues. Every province in Canada, state in the U.S., and most countries throughout the world have their own laws regulating the types of securities and other investment products which may be offered to their residents, as well as the process for doing so. As a result, the securities discussed in this report may not be eligible for sale in some jurisdictions. RBC Capital Markets may be restricted from publishing research reports, from time to time, due to regulatory restrictions and/ or internal compliance policies. If this is the case, the latest published research reports available to clients may not reflect recent material changes in the applicable industry and/or applicable subject companies. RBC Capital Markets research reports are current only as of the date set forth on the research reports. This report is not, and under no circumstances should be construed as, a solicitation to act as securities broker or dealer in any jurisdiction by any person or company that is not legally permitted to carry on the business of a securities broker or dealer in that jurisdiction. To the full extent permitted by law neither RBC Capital Markets nor any of its affiliates, nor any other person, accepts any liability whatsoever for any direct, indirect or consequential loss arising from, or in connection with, any use of this report or the information contained herein. No matter contained in this document may be reproduced or copied by any means without the prior written consent of RBC Capital Markets in each instance.

Additional information is available on request.

To U.S. Residents: This publication has been approved by RBC Capital Markets, LLC (member FINRA, NYSE, SIPC), which is a U.S. registered broker-dealer and which accepts responsibility for this report and its dissemination in the United States. Any U.S. recipient of this report that is not a registered broker-dealer or a bank acting in a broker or dealer capacity and that wishes further information regarding, or to effect any transaction in, any of the securities discussed in this report, should contact and place orders with RBC Capital Markets, LLC.

To Canadian Residents: This publication has been approved by RBC Dominion Securities Inc. (member IIROC). Any Canadian recipient of this report that is not a Designated Institution in Ontario, an Accredited Investor in British Columbia or Alberta or a Sophisticated Purchaser in Quebec (or similar permitted purchaser in any other province) and that wishes further information regarding, or to effect any transaction in, any of the securities discussed in this report should contact and place orders with RBC Dominion Securities Inc., which, without in any way limiting the foregoing, accepts responsibility for this report and its dissemination in Canada.

To U.K. Residents: This publication has been approved by RBC Europe Limited ('RBCEL'), which is authorized by the Prudential Regulation Authority and regulated by the Financial Conduct Authority ('FCA') and the Prudential Regulation Authority, in connection with its distribution in the United Kingdom. This material is not for general distribution in the United Kingdom to retail clients, as defined under the rules of the FCA. RBCEL accepts responsibility for this report and its dissemination in the United Kingdom.

To German Residents: This material is distributed in Germany by RBC Europe Limited, Frankfurt Branch, which is regulated by the Bundesanstalt für Finanzdienstleistungsaufsicht (BaFin).

To Persons Receiving This Advice in Australia: This material has been distributed in Australia by Royal Bank of Canada, Sydney Branch (ABN 86 076 940 880, AFSL No. 246521). This material has been prepared for general circulation and does not take into account the objectives, financial situation or needs of any recipient. Accordingly, any recipient should, before acting on this material, consider the appropriateness of this material having regard to their objectives, financial situation and needs. If this material relates to the acquisition or possible acquisition of a particular financial product, a recipient in Australia should obtain any relevant disclosure document prepared in respect of that product and consider that document before making any decision about whether to acquire the product. This research report is not for retail investors as defined in section 761G of the Corporations Act.

To Hong Kong Residents: To Hong Kong Residents: This publication is distributed in Hong Kong by Royal Bank of Canada, Hong Kong Branch, which is regulated by the Hong Kong Monetary Authority and the Securities and Futures Commission (SFC) in Hong Kong, RBC Investment Services (Asia) Limited and RBC Global Asset Management (Asia) Limited, both entities are regulated by the SFC. This material is not for general distribution in Hong Kong to persons who are not professional investors (as defined in the Securities and Futures Ordinance of Hong Kong (Cap. 571) and any rules made thereunder.

To Singapore Residents: This publication is distributed in Singapore by the Royal Bank of Canada, Singapore Branch, a registered entity licensed by the Monetary Authority of Singapore. This material has been prepared for general circulation and does not take into account the objectives, financial situation, or needs of any recipient. You are advised to seek independent advice from a financial adviser before purchasing any product. If you do not obtain independent advice, you should consider whether the product is suitable for you. Past performance is not indicative of future performance. If you have any questions related to this publication, please contact the Royal Bank of Canada, Singapore Branch. Royal Bank of Canada, Singapore Branch accepts responsibility for this report and its dissemination in Singapore.

To Japanese Residents: Unless otherwise exempted by Japanese law, this publication is distributed in Japan by or through RBC Capital Markets (Japan) Ltd. which is a Financial Instruments Firm registered with the Kanto Local Financial Bureau (Registered number 203) and a member of the Japan Securities Dealers Association (“JSDA”) and the Financial Futures Association of Japan (“FFAJ”).

Global Macro, Economics & Rates Strategy Research Team

Europe

RBC Europe Limited:

Vatsala Datta	UK Rates Strategist	+44 20 7029 0184	vatsala.datta@rbccm.com
Cathal Kennedy	European Economist	+44 20 7029 0133	cathal.kennedy@rbccm.com
Megum Muhic	Associate	+44 20 7029 0092	megum.muhic@rbccm.com
Peter Schaffrik	Global Macro Strategist	+44 20 7029 7076	peter.schaffrik@rbccm.com

Asia-Pacific

Royal Bank of Canada – Sydney Branch:

Su-Lin Ong	Head of Australian and New Zealand FIC Strategy	+612-9033-3088	su-lin.ong@rbccm.com
Robert Thompson	Macro Rates Strategist	+612 9033 3088	robert.thompson@rbccm.com

North America

RBC Dominion Securities Inc.:

Mark Chandler	Head of Canadian Rates Strategy	(416) 842-6388	mark.chandler@rbccm.com
Simon Deeley	Rates Strategist	(416) 842-6362	simon.deeley@rbccm.com

RBC Capital Markets, LLC:

Jacob Oubina	Senior US Economist	(212) 618-7795	jacob.oubina@rbccm.com
Tom Porcelli	Chief US Economist	(212) 618-7788	tom.porcelli@rbccm.com

Commodities Strategy Research Team

North America

RBC Capital Markets, LLC:

Helima Croft	Global Head of Commodity Strategy	(212) 618-7798	helima.croft@rbccm.com
Christopher Louney	Commodity Strategist	(212) 437-1925	christopher.louney@rbccm.com
Michael Tran	Commodity Strategist	(212) 266-4020	michael.tran@rbccm.com
Megan Schippmann	Associate	(212) 301-1531	megan.schippmann@rbccm.com