

Both Palladium and Rhodium have had wild moves in both outright and forwards, culminating in what looks like a blow-off top reaction last week. Palladium surged through \$2550, at one point (already) posting 35% YTD gains and putting in a monthly range of \$750+ (10x the average monthly ranges*); similarly Rhodium repriced +\$3800 so far this year toward \$10,000 (more than its entire range traded during during the bear market years of 2010-2018). Clearly both moves outdid the major record-breaking repricings in 2001 (Palladium) and even 2008 (Rhodium) on just scale alone. This disorder warrants a quick take (see our 2020 Precious Outlook* [here](#) for further insights).

CONTACTS

Nicky Shiels
Commodity Strategist (Metals)
212-225-6724
Commodities Derivatives
nicky.shiels@scotiabank.com

 Follow us on Twitter @ScotiaMetals

5 takeaways:

1. The path of least resistance is higher; the collective markets expectations/forecasts and hedges weren't and aren't bullish enough
2. Palladium outright prices and forward rates have overshot in the short-term, very similar to Q4'18/Q1'19 tightening episode; this seasonal tightness should be alleviated somewhat into Q2'20.
3. However, short term forward rates are unlikely to *fully* unwind (to low single digit rates), given critically stock levels, an expected auto market recovery in Europe and China & tighter the emissions regulations that will outweigh only incremental increases in production in 2020.
4. The statement repricing in the Rand PGM Basket, synchronized repricing in Rhodium and Palladium and lack of viable substitution outside of the complex marks a new cycle - an era of higher (PGM) prices vs the previous decade but also higher volatility.
5. Palladium 2020 forecasts require a revision (already!): \$2000 low, \$2300 average, \$3000 high. Palladium's largest downside risk stems from the macroeconomic backdrop – the later the business cycle extends, the larger the subsequent risk to US auto sales & risk assets (its favored tailwind)

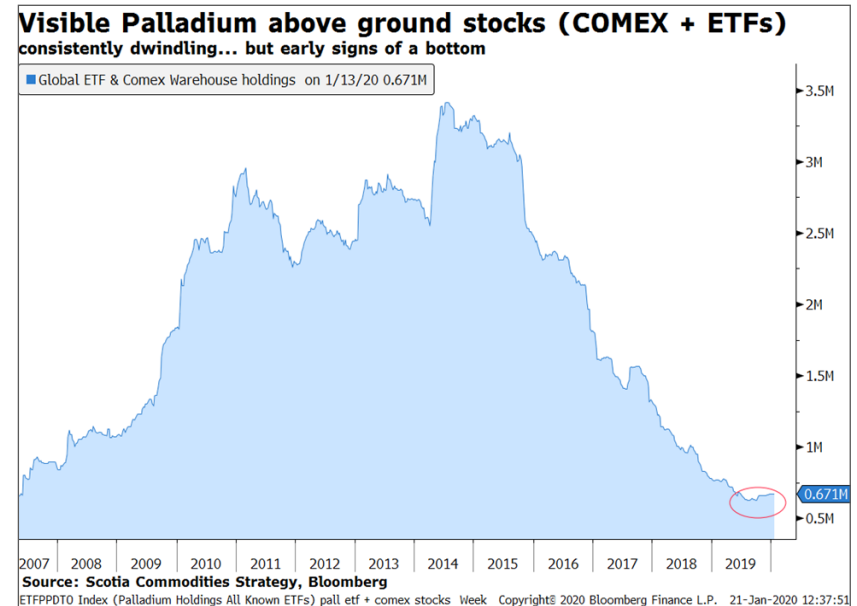
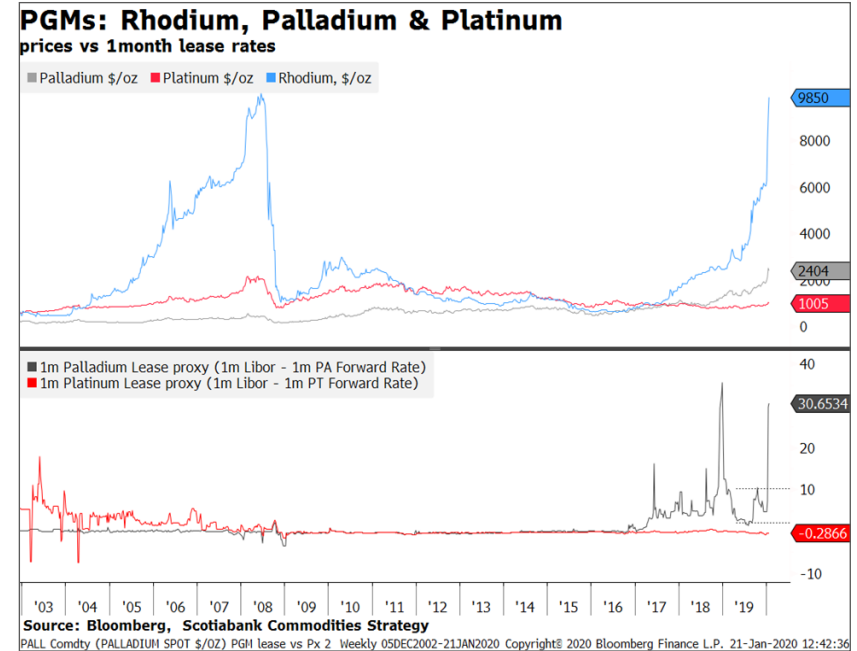
FUNDAMENTALS: Nothing has officially changed --> stricter emission regulations and technology (especially in Europe and China) moving faster than supply responses have created structural deficits in both Palladium and Rhodium for ~3 years now. There is good coverage in the following [Reuters](#) and [FT](#) articles outlining this fundamental story the market has known (but its full price implications seems underappreciated). The market is structurally under owned and any fresh uncertainty or trigger (trade, price risk, supply-side fears) injects a flurry of buying and/or borrowing in a very opaque market. These recent parabolic moves in Rhodium & Palladium had only a handful of core 'triggers' which accentuated many underlying 'contributors':

- **Triggers:** Eskom power cuts & supply fears beginning in December 2019, the strong Rhodium repricing and seasonally lower PGM supply (Northern Hemisphere) accentuated the supply gap needed to fulfill demand, especially Asian contractual obligations.
- **Contributors:** multi-years of structural deficits; critically low levels of stocks; insatiable Asian demand due to emission regulations (despite slower auto sales in 2019); structurally declining diesel market share in Europe; stronger auto sales in Europe (recent data surprises) and China (low base) expected in 2020; reduced sell-side market visibility & research (and thus arguably liquidity)

- ESKOM & other SUPPLY RISK:** While S.A labor risk is somewhat reduced in 2020 (given the 3 year pay deal struck between AMu and producers in 2019), the unexpected, frequent and rather stringent (stage 6) power cuts in December 2019 /January 2020, is a clear and growing risk for 2020. The system continues to be vulnerable, where load-shedding could be implemented at short notice, which will upend consumer buying trends, impact production and thus prices. Other less immediate threats to the SA PGM mining industry is the threat of rating downgrades (arguably this year) which lifts borrowing costs (and thus the PGM cost floor), and the unpredictable alliance between labor unions, the government and producers. The relatively fundamentally tighter PGMs – Rhodium and Palladium – have shown that they were and continue to be unusually more sensitive to any supply-side risk.

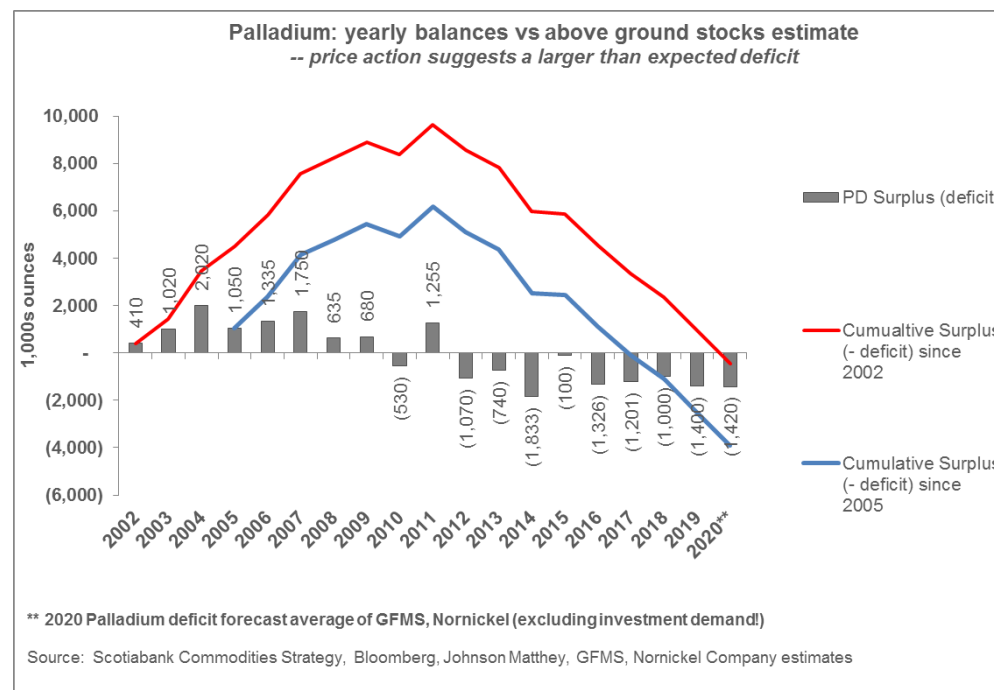
- SUPPLY RESPONSE:** Supply-side adjustments (increases in primary supply and/or of scrap) is currently not occurring fast enough to offset the increase in auto demand, due to the rise in loadings. Palladiums by-product nature has historically complicated that supply response, but given the major and high conviction repricing in the Rand PGM Basket, it shouldn't but its still likely to complicate the response (for other reasons including lack of investment and Eskom). Overall, S.A supply should mildly contract over the next few years (there are few capex projects with only Mogalakwena, Stillwater and Booyendal together adding mabe >100K oz in PGMS, not Palladium, 2020). Russian production (due to new projects/South Cluster, improvements in efficiencies) only has a material impact in 2021 and NA growth is strong but insufficient at current consumption rate. The risk for a larger response in scrap continues to grow given surging prices. Ultimately, similar to the Q4'18/Q1'19 tightening episode, this seasonal tightness should be alleviated somewhat into Q2'20 (but not fully unwound given critically stock levels).

- CHINA & DEMAND:** Chinas “car crash” in 2019, while prices remained in tireless price uptrends, proved that the complexity of catalyst technologies and emission regulations (China 6) are real, where changes (higher loadings) are occurring faster than supply responses. That has larger implications for 2020, given expectations that the worst of auto sales stats are behind us, combined with the tailwinds from a 'phase one' trade deal (its positive impact on Chinese consumer sentiment). The fact that industrial users consumption trends can switch *within* Palladium (from leasing to purchasing) but not to alternative metals suggests limited substitution, while auto / OEMs are hamstrung and in a “do whatever it takes” mode to meet (current and future) emission regulations. Overall, Palladium and Rhodium have been successfully marketed as the ‘go-to’ inputs in hybrids before the Electric Vehicles hit an inflection point, and given the lack of substitutes (except *within* the PGM complex), they will remain a key part of auto mix in the medium-long term.



STOCKS:

- Nornickels Global Palladium Fund (established in 2016) delivered and supplied ~1 moz over 2 years (2017-2018), and aims to bridge the deficit in the medium-term by supplying 300-500K oz of palladium (above current production). This was sufficient in keeping volatility subdued and limiting price spikes during 2017-2019, but the synchronized repricing (in forwards, physical, outright and vol) in January '20 suggests either metal is very scarce or demand has abnormally ramped up.
- Overall, known visible Palladium stocks (Comex + ETF holdings***), are at 671K oz; those would in theory run out in less than 3 months if the unwind rate the past 3 years continues. Others estimates** have Palladiums above ground (unknown) stocks basically finished in 2017, which not coincidentally marked the year when forwards started to 'react' and when ETFs really began drawing down, essentially verifying a new era of structural shortages.



- CYCLES: PRODUCER OR CONSUMER ERA?** OEMs and consumers have mostly benefited from price risk & availability risk being exceptionally low across all PGMs during the bear market years 2009 - 2017. That was at the expense of producer community who had to contend with increasing labor and other unit costs, and a complex regulatory, operating and political environment that fostered a lack of capital investment now arguably coming home to roost. The PGM basket price (in R/kg) ran through the psychological R1m/kg, which puts even the most costly shafts back in the black - however frustrating for some, the fact that while prices have turned around (vs 2011-2018 bear years), Eskom (amongst other country-specific factors) likely remain their Achilles heel in capitalizing fast enough. Overall, statement repricing across the complex, suggests that a new era has begun; higher (PGM) prices but also higher volatility.

- PALLADIUM FORWARDS, PHYSICAL VS PAPER:** Palladium forwards skyrocketed (1m lease rate PROXY spiking through 35%), the EFP was quoted \$40 wide, Zurich was the source of main tightness which started affecting loco London all which indicated large scale illiquidity that mirrored the physical dislocation in Dec '18/Jan'19. Yet financially, volumes consistently traded on CME last week as though nothing has happened, there was no exchange halt (stop spike), which is wildly different to the palladium repricing in 2001 which had many casualties including an exchange. The disconnect between (physical) illiquidity, and perceived (paper) liquidity continues to grow, perhaps best depicted by a very volatile EFP.

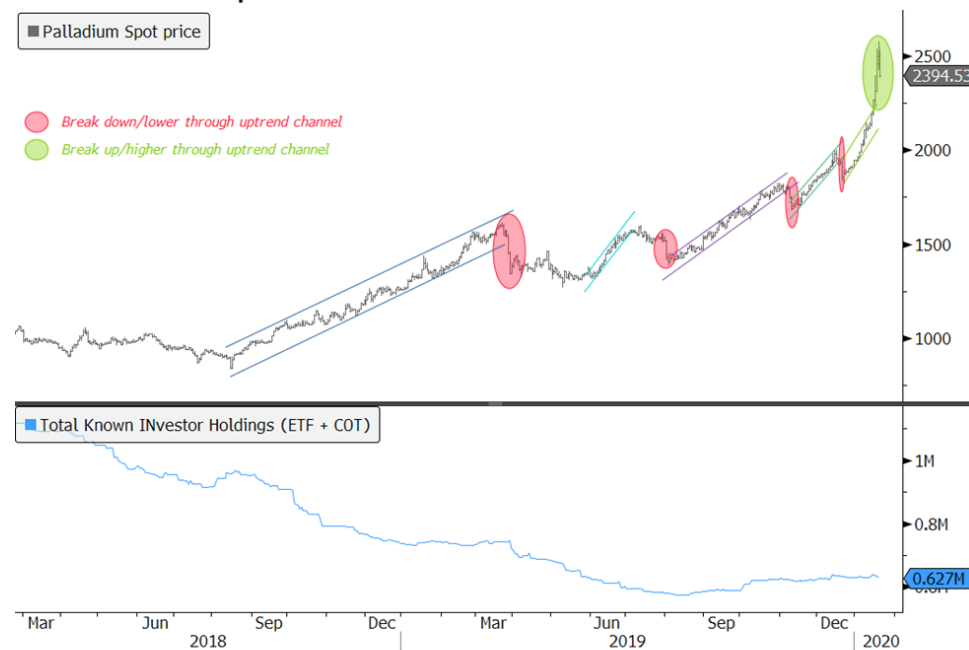
- TECHNICALS:** \$2400 was palladiums (very short-term) lid, before being triggered and setting off run-away prices. For over a year, Palladium has a tendency to clock in very strong and convincing uptrend channels for a few months (which were getting incrementally bullish/steeper) before flushing out hard & fast and resetting; its 5 steps forward, 1 back on the chart. The breakup last week was very different in that prices broke UP through the uptrend channel (not down, as has been the case since 2018). We don't see that pattern changing (a continued affinity for prices to bust into a new higher ranges) and expect another uptrend to form. However major and painful intermittent price flush outs and unusually volatile forward rates still remain a key feature for 2020; any dips should be capitalized

- FORECASTS:** similar to last year, it seems like most expectations proved 'off-market' very quickly in Q1 (already current prices are well through our expected *high* price of \$2300/oz). The average of all analysts (in LBMA's forecast survey) for 2019 was \$1268; Palladium ended up averaging ~\$1540 or 22% higher in 2019! The point is not to highlight how right/wrong forecasts are but to point to the severe dislocations and the fact that the collective market and street don't seem to be bullish enough.

- PLATINUM:** at some point it will be the preferred input (low price risk & low availability risk) for OEMs, but timing the substitution switch is almost impossible given the opaqueness of consumer trends. There are 2 contending theories on how the byproduct repricing impacts platinum. 1) The idea that with the strong out performance in the Rand PGM basket (spiking to new ATHs), the higher Palladium and Rhodium rally, the larger the Platinums surplus becomes due to an imminent primary supply response. 2) The major repricing in its sisters does raise the platinum floor via either a resurgence in substitution talk or action, or the threat of consumers ensuring all Platinum needs are well-covered given 'lessons learnt' in the other two. The latter (#2) is likely to occur before the former in the immediate term.

Palladium technicals

series of contained uptrends and vicious flushouts



Source: Bloomberg, Scotiabank Commodities Strategy

PALL Comdty (PALLADIUM SPOT \$/OZ) Palladium Daily 17JAN2018-21JAN2020 Copyright© 2020 Bloomberg Finance L.P. 21-Jan-2020 15:41:08

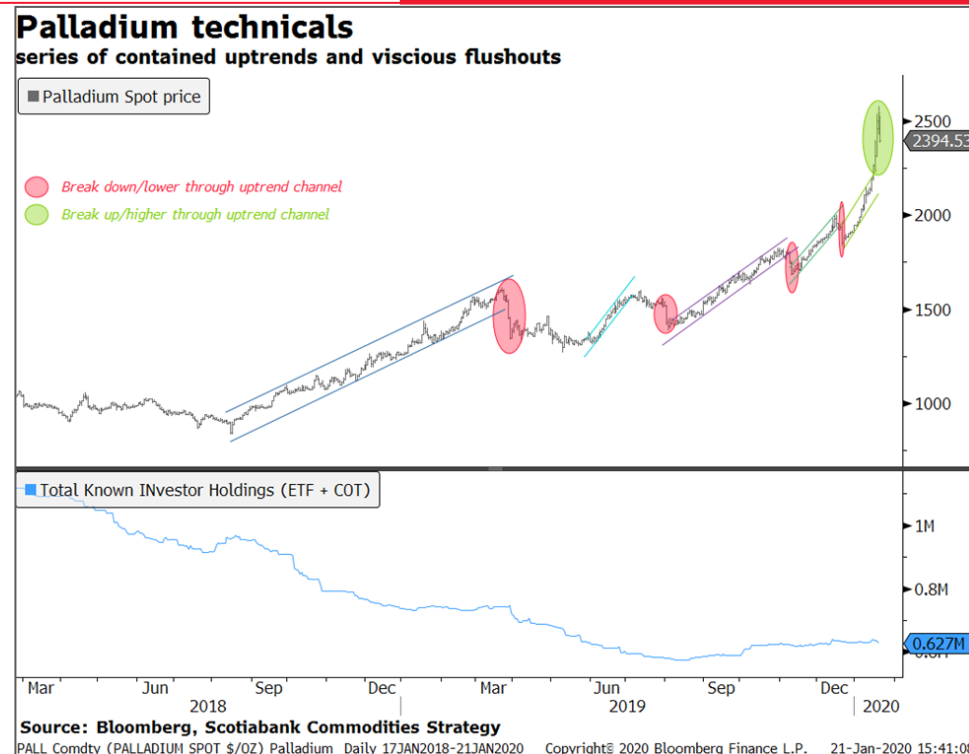
- INVESTORS:** Speculators are not the main culprit driving upside price action where exchange limits and lack of liquidity are also a deterrent. Known investor holdings (COT & ETF) only own 1/5th of their peak positioning held seen in 2014/15 of > 3m oz. Essentially, investor flows were 'kind' in 2019, by delivering metal back to market, to supply these structural shortages (they supplied a total of 110k oz, all driven by ETFs, whereas COT flows have remained rather range bound).

- MACRO:** Palladium is the best responder to sentiment-on / liquidity-on macro backdrop:

- SENTIMENT:** it is perhaps no coincidence that the palladium rally aligns with the recent breakout in small sub sectors (Small cap stocks, "IWM") which all ties back to the Feds expansion of its balance sheet leading to a "meltup" in US Stocks. Liquidity will always find where it is 'best treated' (high beta higher performers like Palladium and small caps); Silver being the better responder to QE 1/2/3 (over Gold) is a standout example.

- TRADE DEALS :** The 18 month period of uncertainty over global trade has arguably upended consumer buying trends especially in those physically tightening metals with no substitute with - Rhodium, Palladium. Thus, in theory, the "phase one" trade deal could alleviate some physical tightness in PGMs as it simply alleviates uncertainty. That was not the case, since global supply chains will continue to shift (post 'phase one'), uncertainty remains over a EU/US trade deal, and the core fundamental dislocations are still too powerful for swings in macro & financial sentiment .

- CLIMATE DEALS:** The (overlooked) climate development last week was the European parliament vote for a greater push to "go green" (steeper 2030 EU emissions cuts). That was responsible/ cited for the aggressive Nickel repricing to \$14,400, and it certainly is a 'contributor' and explains away the major tightness in Palladium and Rhodium . While there are roadblocks & issues to be worked out, Ursula von der Leyen intends to make this her cornerstone of European policy, 50% of EU citizens say climate change (above UE and health!) is their biggest worry, and a quarter of the EUs budget is dedicated to tackling climate change (shifting EUR1tn in investment).



Overall, the skittishness of the intraday Palladium moves, ranges and forward markets, and dislocations between physical and paper (which remain tough to explain given the opaqueness of the market) has not been comforting the past 3 years. Thats led to this recent 'showdown' but its unlikely to stop there. Rhodium has broken up and out serves as a bullish reminder which could drive further potential substitution into (Palladium) in gasoline vehicles. That'll draw down the very last of stocks before substitution switches again and begins to favor Platinum. There'll thus be a continued affinity for Rhodium & Palladium prices to bust into a new higher ranges, but major and painful intermittent price flush outs and unusually volatile forward rates still remain a key feature for 2020; soon that'll become a feature of the (notoriously) boring Platinum market.

Commodities Strategists are not research analysts, and this report was not reviewed by the Research Departments of Scotiabank, nor prepared in accordance with legal requirements designed to promote the independence of investment research. Commodities Strategist publications are not research reports and should be considered for regulatory purposes as marketing communications. The views expressed by Commodities Strategists in this and other reports may differ from the views expressed by other departments, including the Research Department, of Scotiabank.

The information contained in this presentation is being provided for information and discussion purposes only. An investment decision should not be made solely on the basis of the contents of this presentation. This presentation is being provided upon the express understanding that no representation or warranty, express or implied, is made, or responsibility of any kind accepted, by The Bank of Nova Scotia, Scotiabank Europe plc, or any of their respective affiliates ("Scotiabank"™), their directors, agents or employees with respect to the completeness or accuracy of the information, conclusions and opinions provided herein, or as to the achievement or reasonableness of any projections, targets, estimates, or forecasts and nothing in this presentation should be relied upon as a promise or representation as to the future. Past performance or simulated past performance is not a reliable indicator of future results. Forecasts are not a reliable indicator of future performance. This presentation has not been prepared (i) by a member of the research department of Scotiabank, or (ii) in accordance with the legal requirements designed to promote the independence of investment research. It is considered a marketing communication for regulatory purposes and is solely for the use of sophisticated institutional investors. This presentation does not constitute investment advice or any personal recommendation to invest in a financial instrument or "investment research" as defined by the UK Prudential Regulation Authority and the UK Financial Conduct Authority, and its content is not subject to any prohibition on dealing ahead of the dissemination of investment research.

The information contained in this presentation reflects prevailing conditions and our judgment as of the date of the presentation, all of which are subject to change or amendment without notice, and the delivery of any such amended information at any time does not imply that the information (whether amended or not) contained in this presentation is correct as of any time subsequent to its date. Scotiabank undertakes no obligation to update or correct any information contained herein or otherwise to advise as to any future change to it. Scotiabank does not provide any applicable tax, accounting or legal advice and in all cases independent professional advice should be sought in those areas.

This presentation incorporates information which is either non-public, confidential or proprietary in nature, and is being furnished on the express basis that this information will not be used in a manner inconsistent with its confidential nature or be disclosed to anyone other than as may be required by law or to those who have been informed of the confidential and proprietary nature of this presentation. This presentation and its contents are strictly confidential to the person to whom it is delivered and may not be copied or distributed in whole or in part or disclosed by such persons to any other person without the prior written consent of Scotiabank. This presentation and the information contained herein remain the property of Scotiabank.

This presentation is not and shall not be construed as an offer, invitation, recommendation or solicitation to sell, issue, purchase or subscribe any securities or bank debt in any jurisdiction or to enter into any transaction. Nothing in this document contains a commitment by Scotiabank to sell, issue, purchase or subscribe for financial instruments, or securities, to provide debt or to invest in any way in any transaction described herein, or otherwise provide monies to any party. Any participation by Scotiabank in any transaction would only be provided in writing after satisfactory legal, financial, tax, accounting and commercial due diligence, as well as being subject to internal approval processes. Any transaction implementing any proposal discussed in this document shall be exclusively upon the terms and subject to the conditions set out in the definitive agreement related thereto.

This presentation is not directed to or intended for use by any person resident or located in any country where the distribution of such information is contrary to the laws of such country. Scotiabank, its directors, officers, employees or clients may currently or from time to time own or hold interests in long or short positions in any securities referred to herein, and may at any time make purchases or sales of these securities as principal or agent. Scotiabank may also have provided or may provide investment banking, capital markets or other services to the companies referred to in this presentation.

™ Trademark of The Bank of Nova Scotia. Used under license, where applicable. Scotiabank, together with "Global Banking and Markets", is a marketing name for the global corporate and investment banking and capital markets businesses of The Bank of Nova Scotia and certain of its affiliates in the countries where they operate, including Scotia Capital Inc., Scotia Capital (USA) Inc., Scotiabanc Inc.; Citadel Hill Advisors L.L.C.; The Bank of Nova Scotia Trust Company of New York; Scotiabank Europe plc; Scotiabank (Ireland) Designated Activity Company; Scotiabank Inverlat S.A., Institución de Banca Múltiple, Scotia Inverlat Casa de Bolsa S.A. de C.V., Scotia Inverlat Derivados S.A. de C.V. – all members of the Scotiabank Group and authorized users of the mark. The Bank of Nova Scotia is incorporated in Canada with limited liability. Scotia Capital Inc. is a member of CIPF. Scotia Capital (USA) Inc. is a registered broker-dealer with the SEC and is a member of the NASD and SIPC. The Bank of Nova Scotia is authorised and regulated by the Office of the Superintendent of Financial Institutions of Canada. Scotia Capital Inc. is authorised and regulated by the Investment Industry Regulatory Organization of Canada. The Bank of Nova Scotia and Scotiabank Europe plc. are authorised by the UK Prudential Regulation Authority. The Bank of Nova Scotia is subject to regulation by the UK Financial Conduct Authority and limited regulation by the UK Prudential Regulation Authority. Scotiabank Europe plc is regulated by the UK Financial Conduct Authority and the UK Prudential Regulation Authority. Details about the extent of The Bank of Nova Scotia's regulation by the UK Prudential Regulation Authority are available upon request. Scotiabank Inverlat, S.A., Scotia Inverlat Casa de Bolsa, S.A. de C.V., and Scotia Derivados, S.A. de C.V., are each authorized and regulated by the Mexican financial authorities.

The information contained in this presentation is being provided for information and discussion purposes only. An investment decision should not be made solely on the basis of the contents of this presentation. This presentation is being provided upon the express understanding that no representation or warranty, express or implied, is made, or responsibility of any kind accepted, by The Bank of Nova Scotia, Scotiabank Europe plc, or any of their respective affiliates ("Scotiabank"™), their directors, agents or employees with respect to the completeness or accuracy of the information, conclusions and opinions provided herein, or as to the achievement or reasonableness of any projections, targets, estimates, or forecasts and nothing in this presentation should be relied upon as a promise or representation as to the future. Past performance or simulated past performance is not a reliable indicator of future results. Forecasts are not a reliable indicator of future performance.. This presentation has not been prepared (i) by a member of the research department of Scotiabank, or (ii) in accordance with the legal requirements designed to promote the independence of investment research. It is considered a marketing communication for regulatory purposes and is solely for the use of sophisticated institutional investors. This presentation does not constitute investment advice or any personal recommendation to invest in a financial instrument or "investment research" as defined by the UK Prudential Regulation Authority and the UK Financial Conduct Authority, and its content is not subject to any prohibition on dealing ahead of the dissemination of investment research.

The information contained in this presentation reflects prevailing conditions and our judgment as of the date of the presentation, all of which are subject to change or amendment without notice, and the delivery of any such amended information at any time does not imply that the information (whether amended or not) contained in this presentation is correct as of any time subsequent to its date. Scotiabank undertakes no obligation to update or correct any information contained herein or otherwise to advise as to any future change to it. Scotiabank does not provide any applicable tax, accounting or legal advice and in all cases independent professional advice should be sought in those areas.

This presentation incorporates information which is either non-public, confidential or proprietary in nature, and is being furnished on the express basis that this information will not be used in a manner inconsistent with its confidential nature or be disclosed to anyone other than as may be required by law or to those who have been informed of the confidential and proprietary nature of this presentation. This presentation and its contents are strictly confidential to the person to whom it is delivered and may not be copied or distributed in whole or in part or disclosed by such persons to any other person without the prior written consent of Scotiabank. This presentation and the information contained herein remain the property of Scotiabank.

This presentation is not and shall not be construed as an offer, invitation, recommendation or solicitation to sell, issue, purchase or subscribe any securities or bank debt in any jurisdiction or to enter into any transaction. Nothing in this document contains a commitment by Scotiabank to sell, issue, purchase or subscribe for financial instruments, or securities, to provide debt or to invest in any way in any transaction described herein, or otherwise provide monies to any party. Any participation by Scotiabank in any transaction would only be provided in writing after satisfactory legal, financial, tax, accounting and commercial due diligence, as well as being subject to internal approval processes. Any transaction implementing any proposal discussed in this document shall be exclusively upon the terms and subject to the conditions set out in the definitive agreement related thereto.

This presentation is not directed to or intended for use by any person resident or located in any country where the distribution of such information is contrary to the laws of such country. Scotiabank, its directors, officers, employees or clients may currently or from time to time own or hold interests in long or short positions in any securities referred to herein, and may at any time make purchases or sales of these securities as principal or agent. Scotiabank may also have provided or may provide investment banking, capital markets or other services to the companies referred to in this presentation.

™ Trademark of The Bank of Nova Scotia. Used under license, where applicable. Scotiabank, together with "Global Banking and Markets", is a marketing name for the global corporate and investment banking and capital markets businesses of The Bank of Nova Scotia and certain of its affiliates in the countries where they operate, including Scotia Capital Inc., Scotia Capital (USA) Inc., Scotiabanc Inc.; Citadel Hill Advisors L.L.C.; The Bank of Nova Scotia Trust Company of New York; Scotiabank Europe plc; Scotiabank (Ireland) Designated Activity Company; Scotiabank Inverlat S.A., Institución de Banca Múltiple, Scotia Inverlat Casa de Bolsa S.A. de C.V., Scotia Inverlat Derivados S.A. de C.V. – all members of the Scotiabank Group and authorized users of the mark. The Bank of Nova Scotia is incorporated in Canada with limited liability. Scotia Capital Inc. is a member of CIPF. Scotia Capital (USA) Inc. is a registered broker-dealer with the SEC and is a member of the NASD and SIPC. The Bank of Nova Scotia is authorised and regulated by the Office of the Superintendent of Financial Institutions of Canada. Scotia Capital Inc. is authorised and regulated by the Investment Industry Regulatory Organization of Canada. The Bank of Nova Scotia and Scotiabank Europe plc. are authorised by the UK Prudential Regulation Authority. The Bank of Nova Scotia is subject to regulation by the UK Financial Conduct Authority and limited regulation by the UK Prudential Regulation Authority. Scotiabank Europe plc is regulated by the UK Financial Conduct Authority and the UK Prudential Regulation Authority. Details about the extent of The Bank of Nova Scotia 's regulation by the UK Prudential Regulation Authority are available upon request. Scotiabank Inverlat, S.A., Scotia Inverlat Casa de Bolsa, S.A. de C.V., and Scotia Derivados, S.A. de C.V., are each authorized and regulated by the Mexican financial authorities.