Update and 2020 Outlook for Base Metals

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Scotiabank™

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Base metals update & outlook

Metals performances over the past decade

Annual returns of most metals

2010	2011	2012	2013	2014	2015	2016	2017	2018	Average return since 2010	stddev	2019 % performance
Palladium 102.80%	Gold 8.93%	Tin 24.01%	Iron Ore 5.63%	Rhodium 27.69%	Lead -2.75%	Iron Ore 101.49%	Rhodium 122.73%	Rhodium 43.44%	Rhodium 23.24%	Rhodium 62.09%	Rhodium
Silver 80.28%	Silver -8.00%	Lead 18.18%	Zinc 2.51%	Palladium 13.27%	Gold -12.11%	Zinc 60.19%	Palladium 54.18%	Palladium 22.94%	Palladium 20.87%	Iron Ore 42.32%	Palladium
Tin 61.11%	Iron Ore -18.92%	Platinum 12.78%	Palladium 1.70%	Nickel 6.91%	Silver -13.46%	Tin 44.52%	Aluminium 30.81%	Gold -0.93%	Gold 4.48%	Palladium 36.89%	Iron Ore
Nickel 35.06%	Aluminium -19.93%	Palladium 11.75%	Tin -4.04%	Zinc 3.91%	Aluminium -17.69%	Palladium 20.72%	Copper 30.10%	Tin -1.89%	Silver 4.00%	Silver 29.62%	Nickel
Copper 32.58%	Palladium -20.95%	Zinc 11.30%	Lead -5.73%	Aluminium 3.80%	Tin -25.13%	Silver 17.51%	Zinc 29.11%	Iron Ore -2.92%	Tin 3.29%	Tin 28.47%	Gold
Gold 29.24%	Copper -22.44%	Gold 8.26%	Copper -6.58%	Gold 0.12%	Copper -26.06%	Copper 16.99%	Lead 25.69%	Silver -8.30%	Zinc 1.79%	Zinc 25.64%	Silver
Platinum 20.12%	Platinum -22.85%	Silver 6.28%	Rhodium -9.72%	Platinum -11.13%	Zinc -26.17%	Rhodium 16.67%	Nickel 22.48%	Platinum -13.52%	Iron Ore 1.17%	Nickel 24.69%	Platinum
Aluminium 11.46%	Lead -23.46%	Copper 4.78%	Platinum -11.13%	Tin -13.53%	Platinum -28.03%	Nickel 15.52%	Gold 12.66%	Nickel -13.58%	Nickel 0.32%	Copper 19.97%	Copper
Lead 8.02%	Zinc -24.85%	Aluminium 3.53%	Aluminium -13.50%	Copper -14.00%	Palladium -31.57%	Aluminium 13.67%	Silver 3.85%	Aluminium -16.60%	Copper 0.09%	Platinum 16.00%	Aluminium
Rhodium -3.00%	Nickel -26.76%	Iron Ore -5.80%	Nickel -18.23%	Lead -16.00%	Nickel -41.98%	Lead 10.16%	Platinum 2.12%	Copper -16.66%	Aluminium -0.79%	Aluminium 15.72%	Lead
Zinc -5.35%	Tin -29.67%	Nickel -6.54%	Gold -27.33%	Silver -18.10%	Iron Ore -42.57%	Gold 8.10%	Tin -5.81%	Lead -19.48%	Lead -0.99%	Lead 15.47%	Zinc
Iron Ore n/a%	Rhodium -42.27%	Rhodium -22.86%	Silver -34.89%	Iron Ore -49.25%	Rhodium -46.99%	Platinum 3.46%	Iron Ore -10.62%	Zinc -24.13%	Platinum -2.31%	Gold 15.03%	Tin

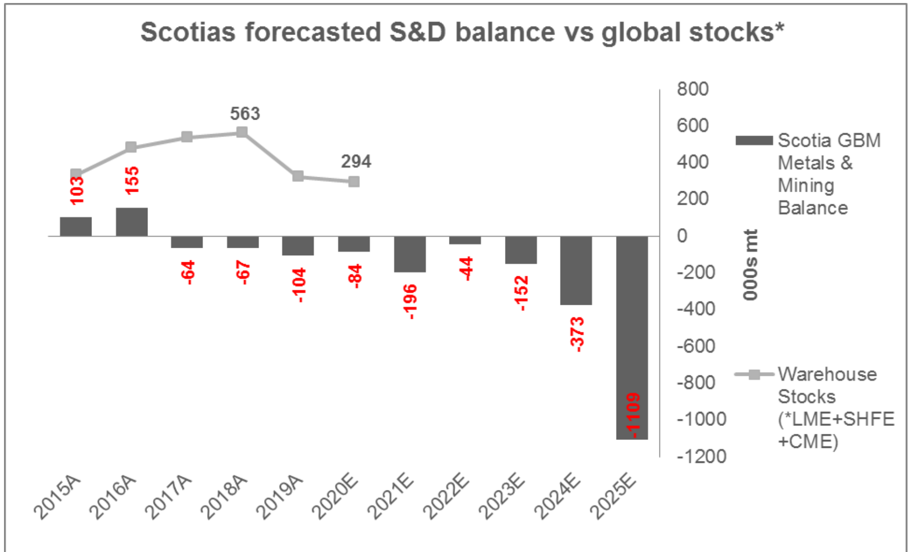
Scotiabank Commodities Strategy, Macrobond

Outlook for Copper

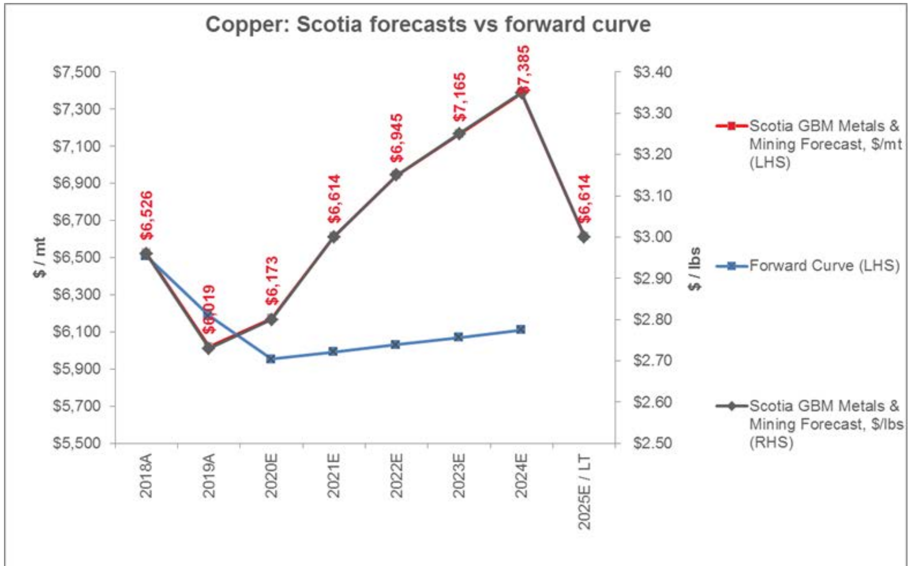
Coppers fundamental balances – shifting into structural deficits

- **Coppers market was largely balanced in 2017-2018, but beginning in 2019, begins to shift in consecutive years of deficits**
- **This is led by supply underperformance, which more than offsets low & weak demand assumptions. That is against a backdrop of falling and cyclically low global inventories***
- **Copper is in the early stage of entering a physical tightening cycle (most recently seen in zinc market), IF prices don't sustainably rally**
- **Scotia GBM forecasts Copper to average ~$6170/mt ($2.70/lbs) in 2020, ramping up to $6600 ($3/lbs) in 2021**
- **Depletions & grade declines materially affect output in the medium term (mid 2020), requiring large-scale reinvestment in new capacity. Without that, deficits are set to soar to > 1m mt in 2025**

Inventories in listed exchange warehouse (CME, SHFE, & LME) have fallen to under 400k mt as of January 2020



Source: Scotiabank Commodities Strategy, Bloomberg, Woodmac, Scotiabank GBM, LME, SHFE, CME



Source: Scotiabank Commodities Strategy, Scotia GBM Equity Reserach, Bloomberg

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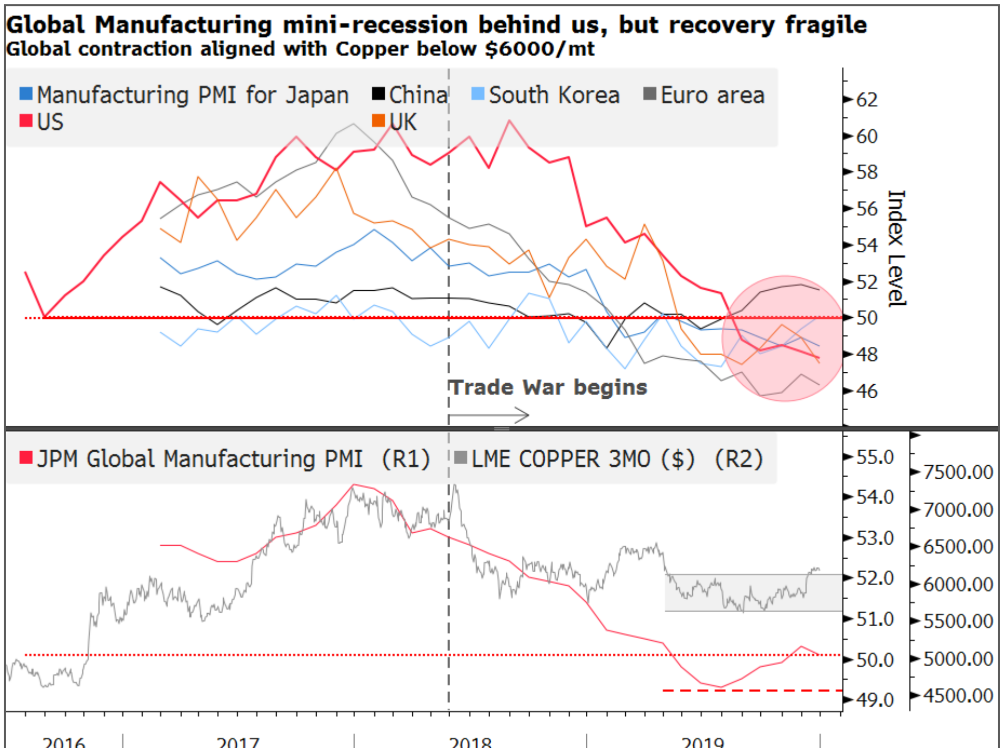
Macro (usually) trumps micros: demand double-whammy in 2019

"Sentiment recession" - Escalating trade war then; a pause and trade truce now

- An unpredictable multi-front trade/economic war; more aggregate tariffs now, than before summer 2019
- Aggressive paper shorts, not coincidentally, correlated to trade headlines & rhetoric, dictating price trends
- Phase one trade agreement a necessary reprieve for sentiment and manufacturing activity in 2020

Global manufacturing "mini-recession" then; rebound now

- Collective rollover in Global PMIS since the trade war begun in Jun e 2018
- But global CB easing in 2019 allays the worst of fears; bottom is likely in
- Despite a pickup in some manufacturing PMIs (production), disinflationary demand signals persist (declining World Trade volumes, low physical premia), implying a fragile recovery into 2020



Source: Scotiabank Commodities Strategy, ISM, Bloomberg, IHS Markit, JP Morgan

MPMIJPMA Index (Jibun Bank Japan Manufacturing PMI SA) Global Manufactor PMI 2 Copyright© 2020 Bloomberg Finance L.P. 03-Feb-2020 14:21:19

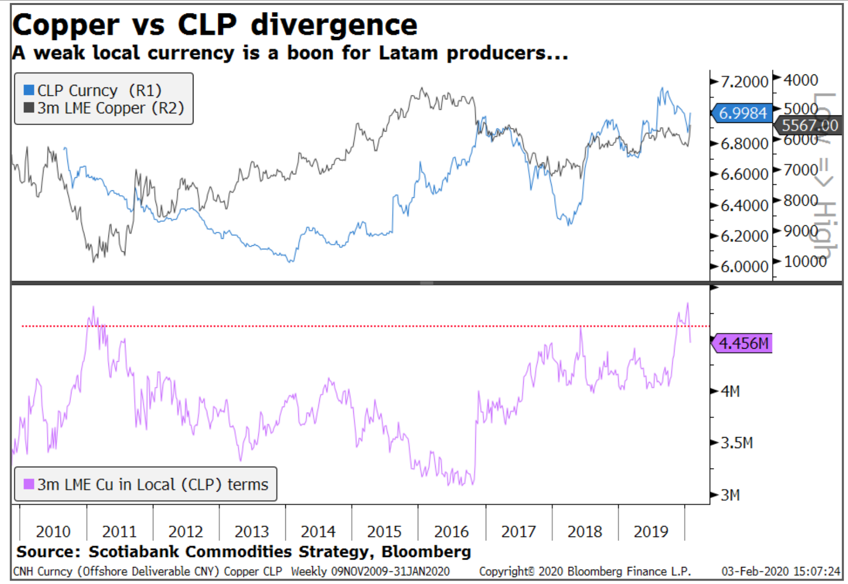
Macro (usually) always trumps micros: FX & EM implications

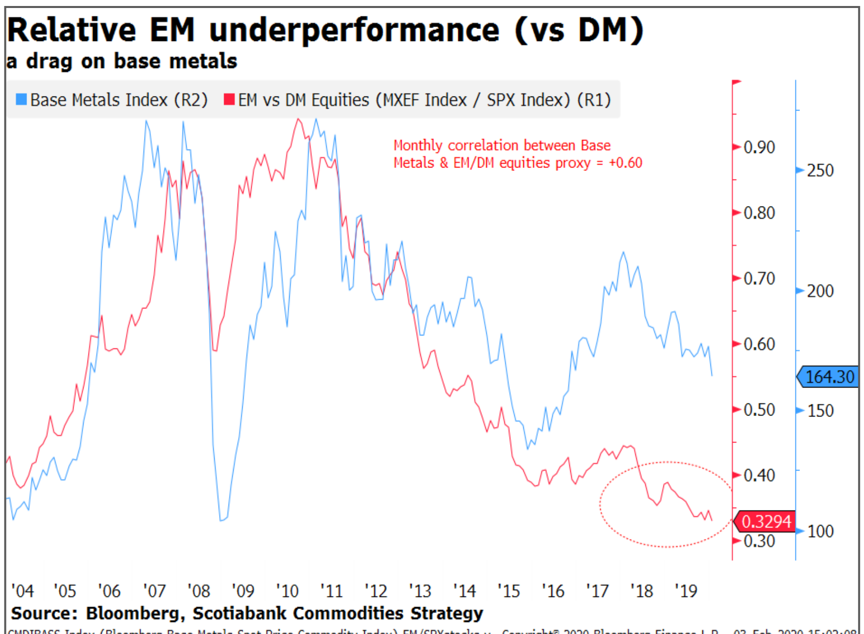
FX Headwinds:

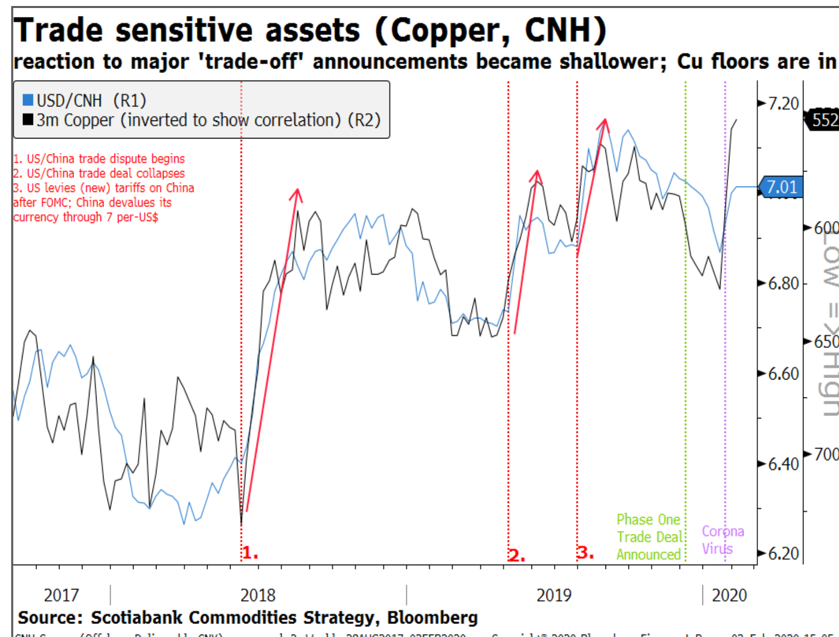
- Base Metals more sensitive to EM growth; Softer EM growth profiles, weaker EM currencies negatively impact purchasing power
- Weak Latam currencies a boon for local base metal producers, indirectly incentivizing supply and potential hedging

FX Tailwinds:

- The Copper fundamental floor around $5500 is in with trade headline fatigue. Weakening of the yuan through 7 was/is a game changer for base but *major* negative trade headlines (#1-3) resulted in shallower dips
- Yuan appreciation could continue to be a significant tailwind for Copper in 2020
- Expected US$ weakness is also an upside risk *(see macro section & FX outlook on slide 35)*







The short term fundamentals: Global inventories and demand vs supply fears

- **Falling and cyclically low global exchange inventories is not reflected in spreads & physical premia, which remain historically low and contained.**

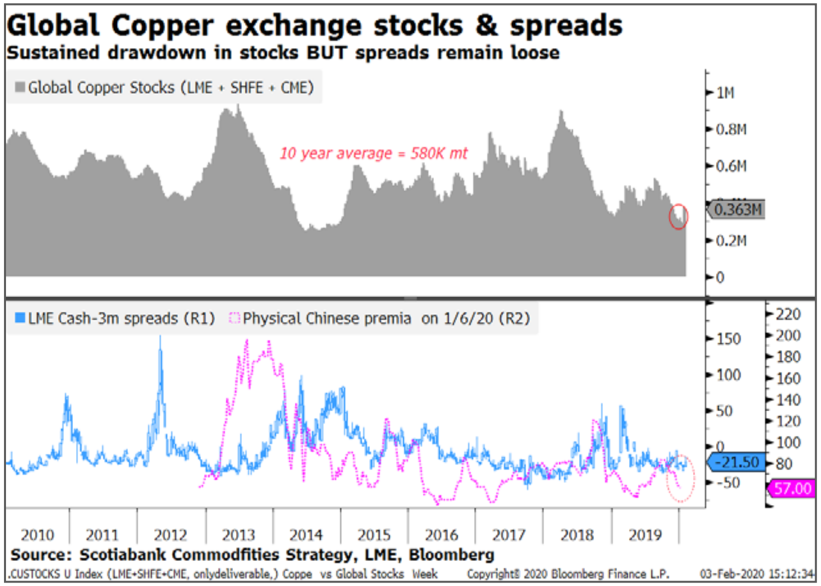
→ Inventories are required to remain low for sustainable periods (e.g.: ~30 weeks seen in 2013/14), before physical tightness is induced

- **Trade war and potential impact on demand hasn't given supply a chance to matter & those supply-side risks to be effectively priced in.**

- **Negative supply growth in 2019 *(but ramp ups in 2020-2023)*, with disruptions totaling just over ~1m mt and no shortage of recent supply-side risks, while the buffer (global inventories) remains thin**

- **Forecasted and known 2019-2022 average net deficits of ~110k mt (vs balanced market of ~30k mt in 2015-2018 period), *despite* a weaker demand outlook, still persists**

→ There was an asymmetric response to the *fear* of demand-shocks (in the short-term), over any supply-risks in 2019. However with sentiment improving given the phase one trade deal, supply-side dynamics should play a greater role in 2020 IF other demand fears (Corona virus) aren't as impactful as currently being priced in



SUPPLY RISKS	DEMAND RISKS
CHILE: Climate change: Heavy rains & Mega drought. Crippling civil unrest (Q4'19). SLTO (Escondida strike 2017 and threat of repeat in 2018)	**US / CHINA:** Trade war & Geopolitical Instability; impact on trade flows and manufacturing
MONGOLIA: Resource nationalism (Oyu Tolgoi uncertainty)	
PERU: SLTO (Las Bambas protests & Matarani port blockade over Tia Maria). Climate change (extreme rainfall in 2017)	
ZAMBIA: Resource nationalism (KCM expropriation)	
INDONESIA: Resource nationalism (New divestment & export rules introduced in January 2017) and SLTO (Grasberg strike 2017).	
DR CONGO: Resource nationalism (New mining code in 2018)	

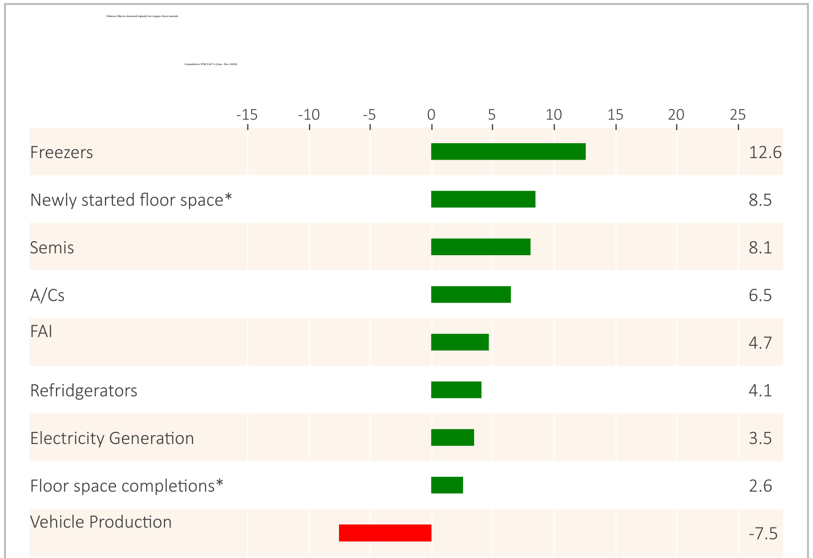
*SLTO = Social License to Operate
Source: Woodmac, Scotiabank Commodities Strategy

The short term fundamentals: Chinese demand was OK, and set to improve

- Overall supportive (not recessionary) demand trends in 2019 → auto sector was weak & investment in power grid ran behind budget but that was offset by solid growth in machinery & household appliances and semis

- Chinese growth indicators: signs of improvement (production side with official China PMI in expansionary territory) but some demand-side signals are still soft (South Korea exports extending slump, factory deflation continuing) while market sentiment gauges (Copper, Iron Ore, Property prices, Chinese equities) provide a mixed outlook given US/China trade uncertainties and Coronavirus fears

- Potential upside in 2020: rebound in grid investment, floor space completions reversing, & a ramp up of semis projects



**Floor space starts are up strongly YTD, with floor space completions lagging.
That supports bulk metals (used in 1st stage of construction) but have yet to impact Copper (and Ali) which are used toward the end of the construction cycle.

Source: Scotiabank Commodities Strategy, Macrobond [Last, sort desc.]

MACROBOND

Heat Map - Indicators for Chinas Economy

	GDP YoY	GDP Tracker YoY	Industrial output YoY	Retail Sales YoY	Fixed Asset Investment YoY	Exports YoY	Unemployment rate YoY	CPI YoY	PPI YoY	House Prices YoY	CNY per USD	Monetary conditions index	Soputh Korea Exports YoY
Jan-17	6.9	7.0	6.0	10.9	17.4	-4.0		2.1	6.3	10.8	6.9	96.9	6.3
Feb-17	6.9	6.8	6.0	10.9	17.4	8.1	5.2	2.5	8.4	10.7	6.9	96.2	11.0
Mar-17	6.9	7.0	6.0	10.9	27.3	6.1	5.4	0.8	9.9	10.6	6.9	86.6	20.2
Apr-17	7.0	7.6	7.6	10.9	23.5	16.9	5.2	0.9	10.0	10.3	6.9	85.4	13.1
May-17	7.0	7.1	6.5	10.7	23.3	9.8	5.0	1.2	9.0	9.9	6.9	87.4	23.8
Jun-17	7.0	7.1	6.5	10.7	20.9	9.4	5.0	1.5	8.0	9.7	6.8	89.9	13.1
Jul-17	7.0	7.7	7.6	11.0	21.1	7.6	5.0	1.5	7.3	9.6	6.8	87.1	13.4
Aug-17	7.0	7.0	6.4	10.4	20.9	8.7	5.1	1.4	7.0	9.3	6.7	85.5	19.4
Sep-17	7.0	6.8	6.0	10.1	19.8	4.0	5.1	1.8	7.7	8.2	6.6	86.5	17.4
Oct-17	6.9	7.2	6.6	10.3	19.8	5.9	5.1	1.6	8.5	6.5	6.7	83.3	34.9
Nov-17	6.9	7.0	6.2	10.0	19.6	8.2	5.1	1.9	8.4	5.7	6.6	84.7	6.7
Dec-17	6.9	6.9	6.1	10.2	20.1	12.8	4.9	1.7	7.1	5.5	6.6	85.1	9.7
Jan-18	6.8	6.8	6.2	9.4	19.0	12.7	5.0	1.8	5.9	5.8	6.5	85.5	8.8
Feb-18	6.8	7.3	6.2	9.4	19.0	5.6	5.0	1.5	5.2	5.4	6.3	83.5	22.3
Mar-18	6.8	6.8	6.2	9.4	16.1	15.4	5.0	2.9	4.4	5.8	6.4	86.0	3.1
Apr-18	6.9	7.0	6.0	10.1	13.0	13.0	5.1	2.1	3.7	5.5	6.3	79.7	5.5
May-18	6.9	7.2	7.0	9.4	12.4	13.7	4.9	1.8	3.7	5.3	6.3	75.1	-2.0
Jun-18	6.9	7.0	6.8	8.5	9.4	10.3	4.8	1.8	4.3	5.4	6.4	72.0	12.8
Jul-18	6.9	6.7	6.0	9.0	7.3	12.4	4.8	1.9	5.1	5.8	6.6	74.6	-0.4
Aug-18	6.9	6.7	6.0	8.8	5.7	11.3	5.1	2.1	5.2	6.6	6.8	82.3	6.1
Sep-18	6.9	6.8	6.1	9.0	4.2	10.3	5.0	2.3	4.8	8.0	6.8	86.5	8.7
Oct-18	6.7	6.6	5.8	9.2	3.3	15.2	4.9	2.5	4.2	8.9	6.9	89.0	-8.1
Nov-18	6.7	6.5	5.9	8.6	3.7	13.4	4.9	2.5	4.0	9.7	6.9	90.2	22.5
Dec-18	6.7	6.4	5.4	8.1	3.7	5.7	4.8	2.2	3.3	10.3	7.0	87.6	3.6
Jan-19	6.5	6.6	5.7	8.2	3.8	-4.4	4.9	1.9	1.6	10.6	6.9	85.2	-1.7
Feb-19	6.5	6.3	5.7	8.2	3.8	9.5	5.1	1.7	0.2	10.8	6.7	84.2	-6.2
Mar-19	6.5	6.6	5.7	8.2	4.3	1.5	5.3	1.5	-0.1	11.1	6.7	84.8	-11.3
Apr-19	6.4	7.9	8.5	8.7	4.4	16.9	5.2	2.3	0.2	11.3	6.7	90.4	-8.4
May-19	6.4	6.3	5.4	7.2	4.4	-8.3	5.0	2.5	0.4	11.4	6.7	92.6	-2.1
Jun-19	6.4	6.3	5.0	8.6	4.0	3.4	5.0	2.7	0.2	11.3	6.9	96.6	-9.8
Jul-19	6.2	7.1	6.3	9.8	4.1	2.6	5.1	2.7	-0.3	10.8	6.9	96.6	-13.8
Aug-19	6.2	6.0	4.8	7.6	3.8	0.7	5.3	2.8	-0.6	10.1	6.9	90.8	-11.1
Sep-19	6.2	5.8	4.4	7.5	4.2	-0.4	5.2	2.8	-1.3	9.1	7.2	91.1	-14.0
Oct-19	6.0	6.6	5.8	7.8	4.5	1.2	5.2	3.0	-1.7	8.6	7.1	93.2	-11.8
Nov-19	6.0	5.9	4.7	7.2	4.2	-1.3	5.1	3.8	-2.1	8.0	7.0	97.1	-14.9
Dec-19	6.0	6.7	6.2	8.0	4.0	-0.7	5.1	4.5	-2.2	7.3	7.0	100.6	-14.4
Jan-20	6.0	6.3	6.9	8.0	3.8	6.3	5.2	4.5	-1.3	6.8	7.0	101.9	-5.2

Source: Scotiabank Commodities Strategy, Bloomberg

The longer-term term fundamentals: key themes to consider

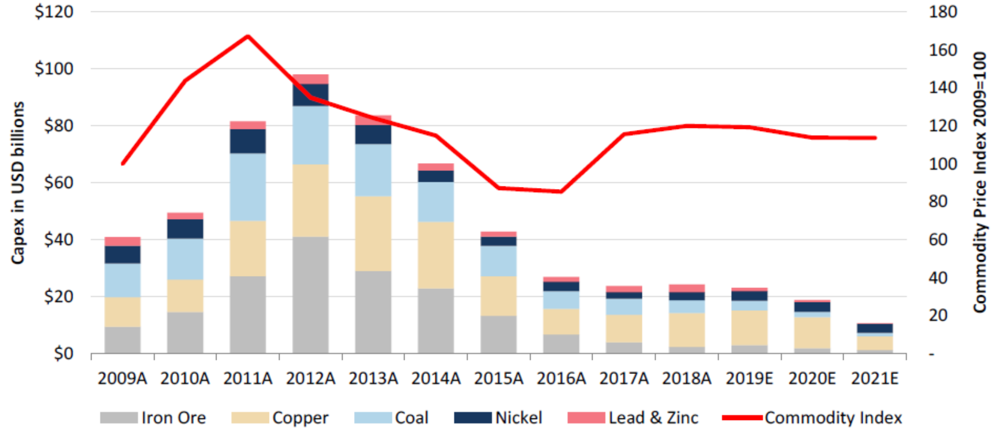
- Cannot achieve low carbon world without metals, but need to contend with very late business cycle, supercycle commodity downswing, ESG and falling capex

- Current commodity capex 1/5th of peak → Capital investment into production of commodities likely to continue declining due to:
    1. firms' constrains & a focus on ESG
    2. climate change & the energy transition
    3. uncertainty around trade and a late business cycle.

- Electric vehicles contain between 4 -10x as much copper as conventional vehicles; growth in Energy Transition related consumption over the next 10 years requires ~5m mt of additional Copper from *possible* projects*. Thus, the mismatch between future demand needs - "green revolution" - and supply, likely to be larger than previous commodity cycles

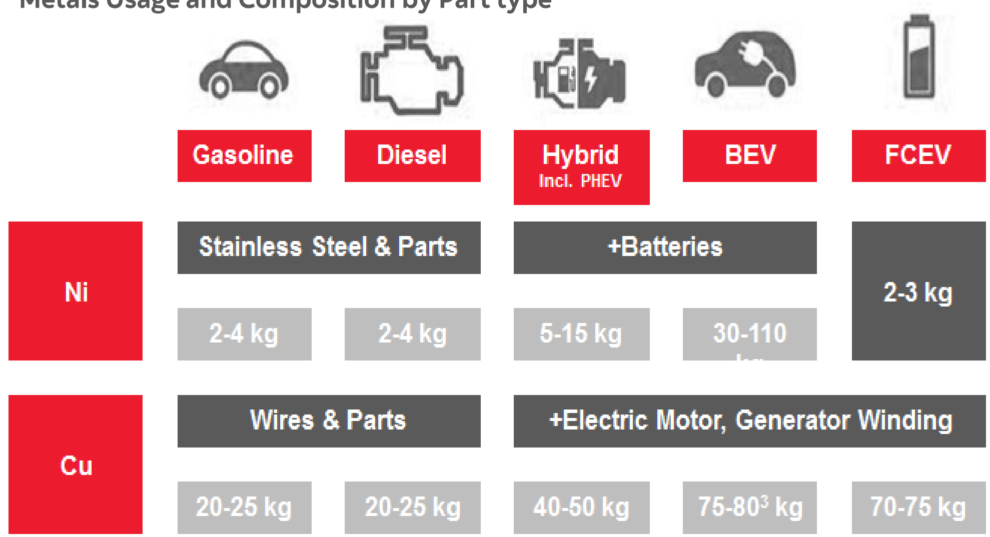
- Overall, these (supply) constraints are cost inflationary, and point to broad-based tight future supply across commodities. That will exacerbate an already large long-term Copper deficit of 1.1m mt in 2025*

Capex expansion by commodity vs Commodity Price Index, 2009 - 2021



Source: Bloomberg, Wood Mackenzie, Scotiabank Equities Metals & Mining estimates

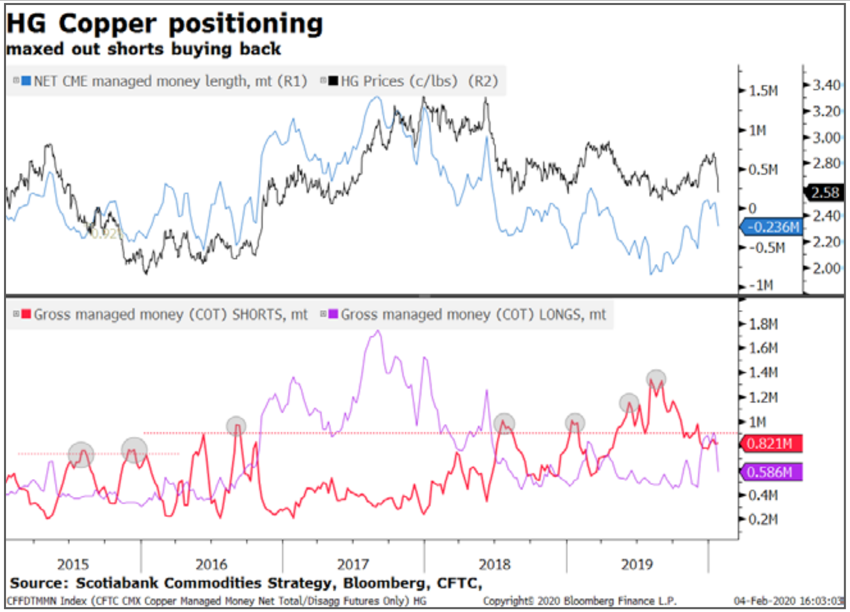
Metals Usage and Composition by Part type

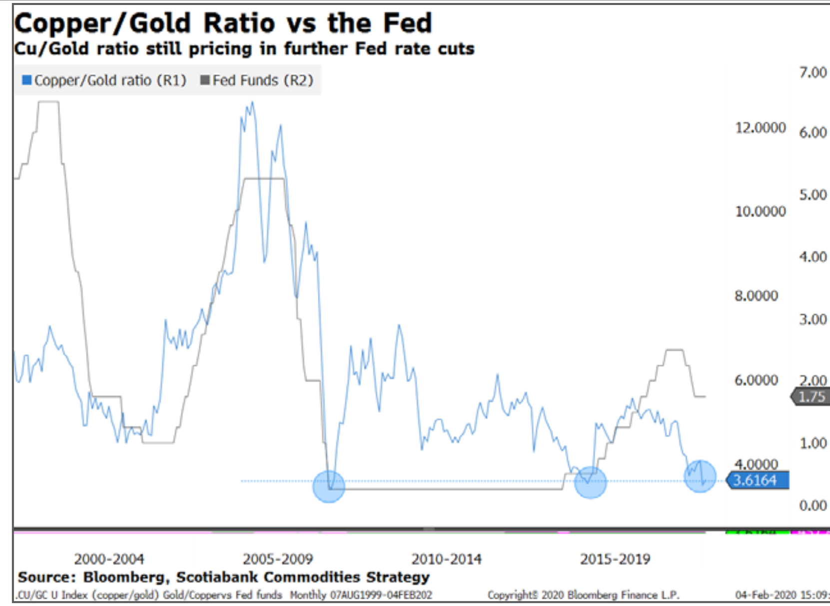


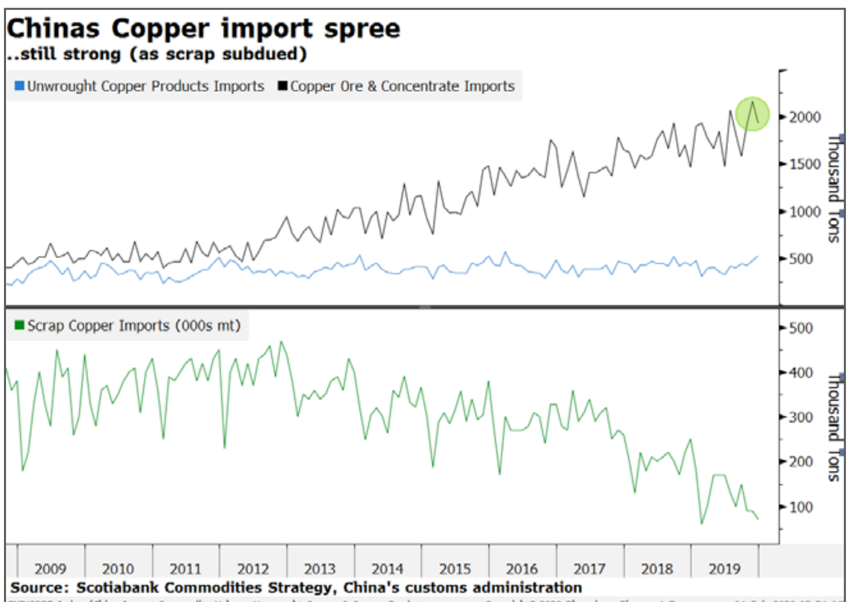
Sources: Scotiabank, BNEF as of 08/28/19.

***Source: Woodmac, Scotia GBM estimates**

Copper: chart pack







Summary: Current Bullish vs Bearish Drivers for Copper

	Tailwinds	Neutral / supportive	Headwinds	
<<----LONGER-TERM ---- SHORT-TERM --->	**1H'20 reflation risk** on Global data outperformance, phase one trade deal and/or Chinese manufacturing improvement (post Coronavirus unleashing pent-up demand); that will promote inflows into growth-sensitive commodities	**The Fed** pre-emptively cuts rates in 2020 due to trade, geopolitical/off-calendar risks & slower growth. **Global central bank** policies follow suit which supports manufacturing PMIs	An unpredictable multi-front **trade/economic war.** Despite phase 1 deal, 25% tariffs remain on most imported Chinese goods ($250bn), with Phase 2 and/or any comprehensive US/China trade deal unlikely before US 2020 elections	<<----LONGER-TERM ---- SHORT-TERM --->
	Exchange inventories running well below 10 year average; LME + SHFE + CME hold under 400k mt	**Chinese macro demand data** remains overall supportive --> auto sector remains weak & investment in the power grid behind budget but offset by solid growth in machinery & household appliances & a ramp up in semis	A stubbornly perky **US$ and overall still weak EM/FX & yuan** (despite recent strength). Outlook on whether the $ extends into cyclical weakness is mixed, given its reserve currency status & historical resilience	
	Negative supply growth in 2019 (the second year the past 3 years) potentially having a lagged impact on prices, spreads and inventories	Collective rollover in **Global Manufacturing** sector in 2019, but a bottom has formed, followed by with a fragile recovery due to steady CB easing	Geopolitical / off-calendar event risks re-emerge with **Coronavirus** a hit to Chinese demand potentially causing **Chinese GDP to fall** toward to 5.5% (vs 6%)	
	Fundamental balances shifting from period of surpluses to deficits, as highlighted by large downward trend in TCRCs indicating a structurally tightening path	Extreme negative sentiment reflected in outsized **short paper positioning,** with around half of the original positioning already covered	Scrap supply and **aluminum substitution** (given low availability risk and relatively lower prices) are constraints to upside Copper pricing	
	The **decarbonisation** of stationary power (wind technology) and **electrification** of transport (Electric Vehicles) should progress.	**Chinese stimulus:** past fiscal response (increase in project approvals and special bond issuance by local gov) could translate into more infrastructure spending; monetary policy (loan prime rate guided lower, cut in RRR) meant to fade on trade optimism but will be reignited due to virus/growth fears	**Late business cycle** & late **super commodity** cycle, provide structural headwinds	
	Emerging Asia (China, India, ASEAN), China's **Belt and Road** initiative, population growth, rising living standards and the continuation of **urbanization** are opportunities for rising Cu demand growth			
	Grade declines, rising input costs, a scarcity of high-quality future developments and **ESG** should constrain the ability to meet growing demand at low cost and with limited political risk			

Source: Scotiabank Commodities Strategy

Copper outlook: *macro* destabilized copper, it will take *macro to* reprice

Base: a tactical rally requires:

1. Easing of **trade tensions** enough to boost Chinese confidence and deter paper shorts **(✓)**
2. A weaker **U.S. Dollar** **(×)**
3. Collectively dovish **global CBs** **(✓)**, especially the PBOC, giving EM assets a chance to outperform **(×)**
4. A bottoming out AND rebound in global **manufacturing** **(✓)**,
5. Sustained rebound in disinflationary **Chinese macro** data **(×)**

→ **2 out of 5 requirements currently *fully* fulfilled**

(✓) Achieved. (-) Undecided; TBD. (x) Not achieved

Short-term Copper outlook

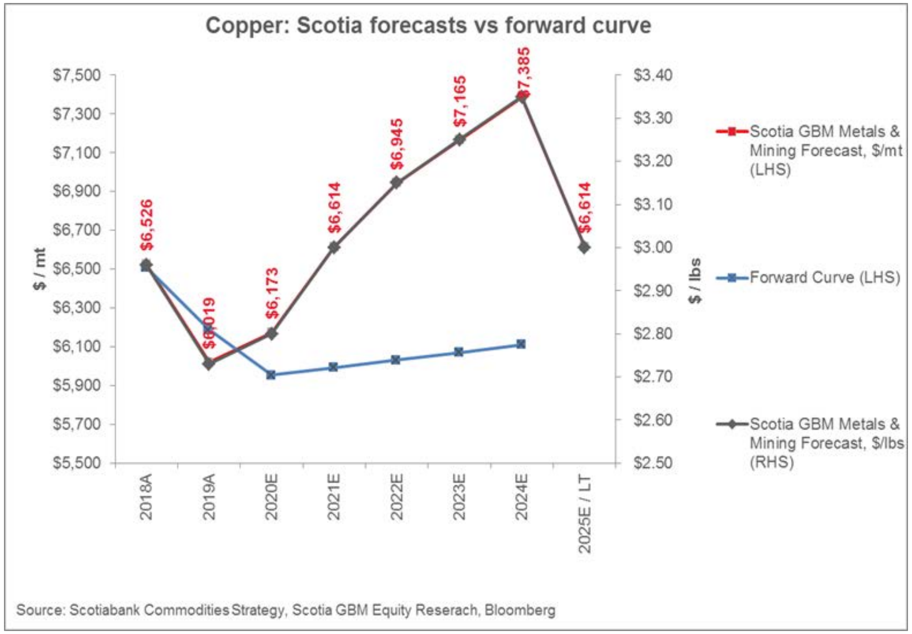
(Commodities Strategy):

- **Fundamental Floors are in; neutral range $5700-$6100** due to a US/China trade deal, a bottoming & rebound in the 'manufacturing sector' but a persistently strong US$ and uncertainty over demand impact of the Corona virus ***(50%)***
- **Upside risk ($6000-$6400):** Reflation trade takes hold in commodities, China data & manufacturing improves further, sustained short covering preceding and inducing fresh investment ***(30%)***
- **Downside risk ($5300):** tendency to trade to pain levels, rising inventories, recession fears re-emerge due to tail risk events (Coronavirus, Geopolitical risks) ***(20%)***

****Probability***

Medium-Longterm Copper outlook:

(ScotiaBank GBM Equities Metals & Mining Research):



Copper: balances shifting into structural deficits

Scotiabank GBM Copper Supply–Demand Model (kt)

	2012	2013	2014	2015	2016	2017	2018	2019E	2020E	2021E	2022E	2023E	2024E	2025E
GROSS TOTAL MINE PRODUCTION	16,661	18,034	18,476	19,253	20,238	20,139	20,821	20,944	21,985	22,541	23,204	23,517	23,612	22,957
LESS: DISRUPTION ALLOWANCE								(147)	(989)	(1127)	(1160)	(1176)	(1181)	(1148)
NET TOTAL MINE PRODUCTION	16,661	18,034	18,476	19,253	20,238	20,139	20,821	20,798	20,996	21,414	22,044	22,342	22,431	21,809
Mined Cu production growth %	*3.6%*	*8.2%*	*2.5%*	*4.2%*	*5.1%*	*-0.5%*	*3.4%*	*-0.1%*	*1.0%*	*2.0%*	*2.9%*	*1.4%*	*0.4%*	*-2.8%*
REFINED COPPER PRODUCTION	20,150	20,816	21,758	22,020	22,733	22,992	23,466	23,421	23,766	24,125	24,754	25,129	25,339	25,002
Refined Cu production growth %	*2.2%*	*3.3%*	*4.5%*	*1.2%*	*3.2%*	*1.1%*	*2.1%*	*-0.2%*	*1.5%*	*1.5%*	*2.6%*	*1.5%*	*0.8%*	*-1.3%*
CONSUMPTION	19,587	20,710	21,602	21,917	22,578	23,056	23,533	23,525	23,851	24,320	24,798	25,281	25,712	26,111
Global Cu consumption growth %	*-0.1%*	*5.7%*	*4.3%*	*1.5%*	*3.0%*	*2.1%*	*2.1%*	*0.0%*	*1.4%*	*2.0%*	*2.0%*	*1.9%*	*1.7%*	*1.6%*
NET SURPLUS/(DEFICIT)	**563**	**106**	**156**	**103**	**155**	**(64)**	**(67)**	**(104)**	**(84)**	**(196)**	**(44)**	**(152)**	**(373)**	**(1109)**
Total exchange inventories (LME/SHFE/CMX/Bonded)	1,339	1,007	845	872	1,024	993	763	568	484	288	244	92	-280	-1,389
Days of forw ard consumption	25	18	14	15	17	16	12	9	7	4	4	1	-4	-19
Total inventories (exchange + non-exchange)	3,947	4,052	4,209	4,312	4,468	4,404	4,336	4,232	4,148	3,953	3,909	3,757	3,384	2,275
Days of forw ard consumption	74	71	71	72	72	70	67	66	63	59	58	54	48	32
LME spot price (USD/lb)	$3.61	$3.33	$3.12	$2.50	$2.21	$2.80	$2.96	$2.73	$2.80	$3.00	$3.15	$3.25	$3.35	
Production Disruption Allow ance %								0.7%	4.5%	5.0%	5.0%	5.0%	5.0%	5.0%
Total Scrap	4,895	4,620	4,525	4,399	4,575	4,767	4,302	4,247	4,403	4,516	4,584	4,703	4,850	5,118
Scrap as a % Consumption	25.0%	22.3%	20.9%	20.1%	20.3%	20.7%	18.3%	18.1%	18.5%	18.6%	18.5%	18.6%	18.9%	19.6%
Consumption Grow th by Region %														
China	5.3%	11.7%	7.3%	3.5%	4.8%	3.5%	5.7%	1.0%	1.7%	2.2%	2.1%	2.0%	1.7%	1.5%
Rest of Asia (Ex China)	-3.3%	0.5%	4.3%	1.7%	3.6%	2.4%	-3.9%	0.3%	1.6%	2.2%	2.9%	3.2%	3.0%	2.6%
Europe	-8.4%	0.9%	0.7%	-4.1%	0.6%	1.0%	0.1%	-3.3%	0.5%	1.3%	1.1%	1.1%	0.8%	0.7%
North America	0.4%	2.1%	-1.7%	2.4%	0.7%	-0.8%	0.1%	1.0%	0.5%	1.4%	0.9%	0.9%	0.9%	0.9%
Latin America	2.8%	3.6%	-0.5%	-5.4%	-4.9%	-1.9%	0.7%	1.0%	1.5%	1.7%	1.7%	1.8%	1.8%	1.8%
Rest of w orld	-0.7%	2.0%	5.6%	4.2%	2.3%	0.2%	-1.3%	-2.6%	1.2%	1.7%	1.8%	1.8%	1.8%	1.8%
Consumption Mix by Country/Region:														
China	42.4%	44.8%	46.1%	47.0%	47.8%	48.5%	50.2%	50.7%	50.9%	51.0%	51.1%	51.1%	51.1%	51.1%
Rest of Asia (Ex China)	17.5%	16.7%	16.7%	16.7%	16.8%	16.8%	15.9%	15.9%	15.9%	16.0%	16.1%	16.3%	16.5%	16.7%
Europe	19.0%	18.1%	17.5%	16.5%	16.2%	16.0%	15.7%	15.2%	15.0%	14.9%	14.8%	14.7%	14.6%	14.4%
North America	9.8%	9.4%	8.9%	9.0%	8.8%	8.5%	8.4%	8.4%	8.4%	8.3%	8.2%	8.1%	8.1%	8.0%
Latin America	4.6%	4.5%	4.3%	4.0%	3.7%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%
Rest of w orld	6.8%	6.5%	6.6%	6.8%	6.7%	6.6%	6.4%	6.2%	6.2%	6.2%	6.2%	6.2%	6.2%	6.2%

Source: Wood Mackenzie; Scotiabank GBM estimates.

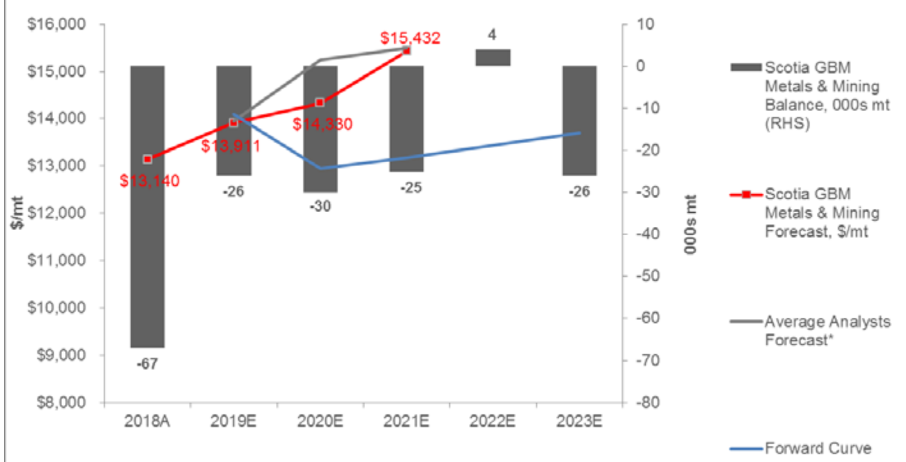
Outlook for Nickel

Nickel: policy wild child in 2019, fundamentally 2020 a struggle

- Nickel market is expected to be physically balanced in 2019, with a constructive medium-term outlook brought forward given the surprise Indonesian ore ban coming into effect in January 2020
- In the short-term, the Indonesian shortfall due to the ore export ban should be fully covered by:
    - A ramp up in Filipino ore exports,
    - Higher NPI production in Indonesia,
    - Indonesian ore sales/exports and processing brought forward in Q4'19
    - Restarts of projects due to favorable & higher price environment

- Chinese stainless steel is expected to soften into the 1H'2020 due to Chinese oversupply & strong production rates despite weak demand for stainless steel especially in Europe.
- Following the change in Chinese EV subsidies announced in mid 2019, battery demand is also due to remain lackluster in 1H'2020.
- NPI supply in Indonesia (even despite the unlikelihood of a significant ramp up in output at Tsingshans Morowali) is an additional headwind for prices
- Thus, the (fundamental) price outlook remains neutral in short-term. Conviction around this outlook remains *low*, given the risk of a EV demand catalyst (into a year where climate change policies are being prioritized) and / or unpredictable supply policy risk

Nickel: Scotia forecasts & balances vs the street and the forward curve

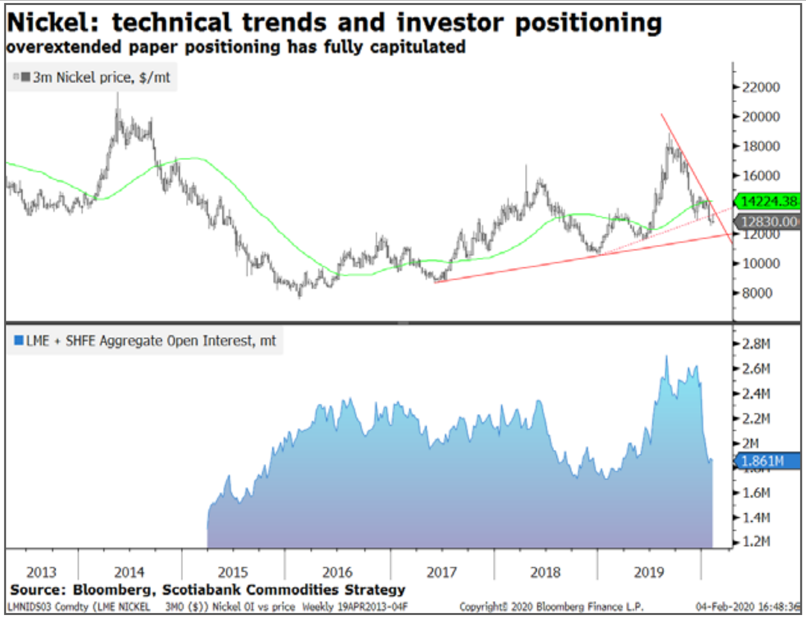


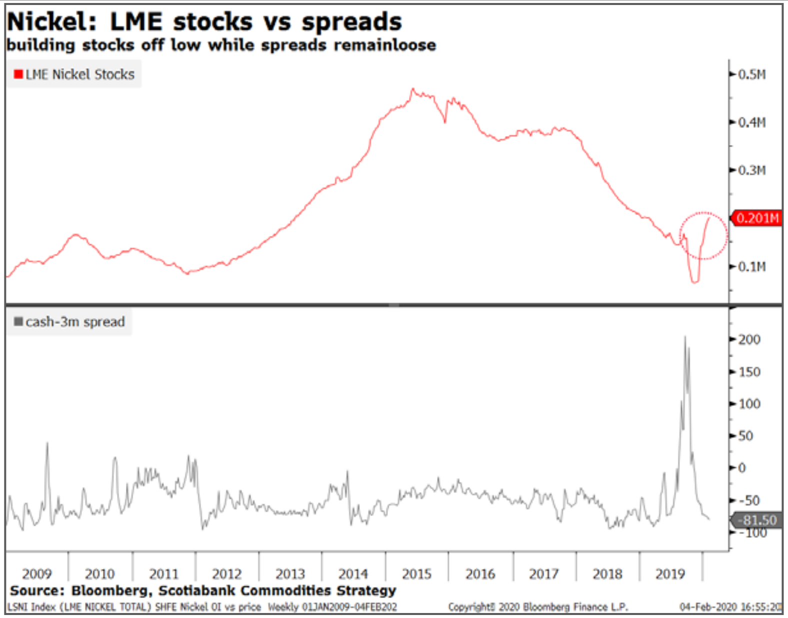
* Average forecasts of all analysts contributing to Bloomberg Commodity price forecast

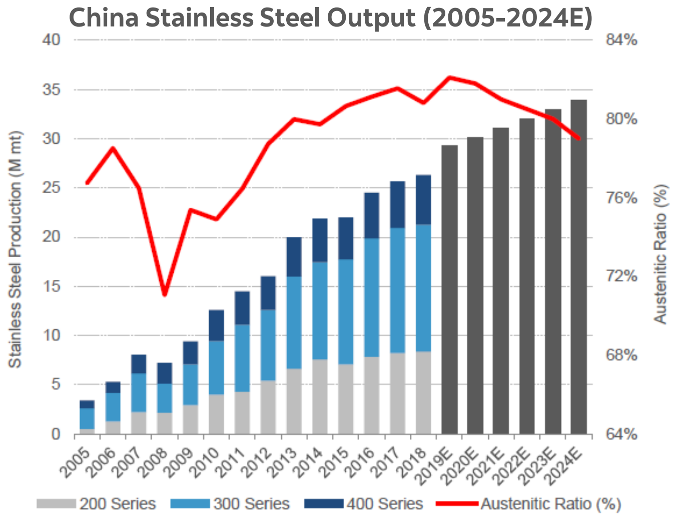
Source: Scotiabank Commodities Strategy, Bloomberg

- The full fundamental implication of the Indonesian ore ban and thus key inflection point in the balances, is likely only in 2021 driven by materially constrained Chinese NPI production impacted by the export ban. Scotia GBM expects the Nickel to average deficits of ~30K mt in 2020-2021, with price forecast of $14,330/mt ($6.50/lbs) in 2020 and ~$15,430 ($7/lbs) in 2021.

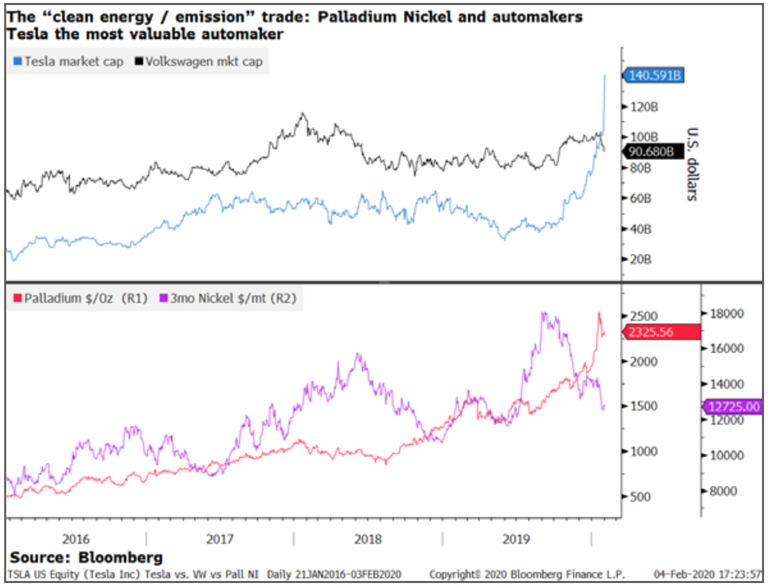
Nickel chart pack







Source: Bloomberg; Scotiabank GBM.



Nickel: the policy wild child in 2019, fundamentally 2020 a struggle

Scotiabank GBM Nickel Supply–Demand Model (kt)

	2012	2013	2014	2015	2016	2017	2018	2019E	2020E	2021E	2022E	2023E	2024E
GROSS TOTAL REFINED PRODUCTION	1,772	1,997	2,025	2,016	2,029	2,103	2,233	2,428	2,522	2,590	2,686	2,723	2,740
LESS: DISRUPTION ALLOWANCE @ 3.0%								(17)	(76)	(78)	(81)	(82)	(82)
NET TOTAL REFINED PRODUCTION	**1,772**	**1,997**	**2,025**	**2,016**	**2,029**	**2,103**	**2,233**	**2,411**	**2,447**	**2,513**	**2,606**	**2,642**	**2,658**
Refined Ni production growth %	*6.8%*	*12.7%*	*1.4%*	*-0.5%*	*0.7%*	*3.7%*	*6.2%*	*7.9%*	*1.5%*	*2.7%*	*3.7%*	*1.4%*	*0.6%*
CONSUMPTION:													
FROM STAINLESS	1,060	1,185	1,234	1,263	1,427	1,490	1,539	1,649	1,665	1,702	1,740	1,780	1,796
FROM NON-STAINLESS	564	582	611	622	655	708	761	788	812	836	862	888	915
TOTAL CONSUMPTION	**1,624**	**1,767**	**1,845**	**1,885**	**2,082**	**2,198**	**2,300**	**2,437**	**2,477**	**2,538**	**2,602**	**2,668**	**2,712**
Annual Consumption growth %	*2.8%*	*8.8%*	*4.4%*	*2.2%*	*10.5%*	*5.6%*	*4.6%*	*6.0%*	*1.6%*	*2.5%*	*2.5%*	*2.5%*	*1.6%*
NET SURPLUS/(DEFICIT)	**148**	**230**	**180**	**131**	**(53)**	**(95)**	**(67)**	**(26)**	**(30)**	**(25)**	**4**	**(26)**	**(54)**
Total exchange inventories (LME/SHFE/Bonded)	185	302	448	557	552	443	251	198	168	143	147	120	66
Days of forward consumption	42	62	89	108	97	74	40	30	25	21	21	16	9
Total inventories (exchange + non-exchange)	1,013	1,249	1,434	1,567	1,514	1,420	1,352	1,326	1,296	1,271	1,274	1,248	1,194
Days of forward consumption	228	258	284	303	265	236	215	199	191	183	179	171	161
LME spot Nickel price (USD/lb)	$7.95	$6.82	$7.66	$5.38	$4.35	$4.72	$5.96	$6.31	$6.50	$7.00	$7.50	$7.75	$8.00
Global Stainless Steel Production growth %	4.0%	11.5%	5.9%	0.1%	7.3%	6.0%	4.9%	3.3%	2.8%	2.7%	2.6%	2.6%	2.5%
Global Stainless Nickel Consumption growth %	1.9%	11.8%	4.1%	2.4%	13.0%	4.4%	3.3%	7.1%	1.0%	2.2%	2.3%	2.3%	0.9%
Global Non-Stainless Consumption growth %	4.4%	3.2%	5.0%	1.8%	5.3%	8.1%	7.5%	3.5%	3.0%	3.0%	3.0%	3.1%	3.1%
Austenitic Ratio	74.4%	75.3%	75.3%	76.0%	76.5%	76.9%	77.8%	78.8%	78.0%	77.6%	77.3%	77.0%	76.5%
Scrap Ratio	42.4%	41.3%	41.4%	41.1%	38.9%	40.3%	41.6%	39.0%	37.8%	37.8%	37.7%	37.6%	38.1%
Chinese Nickel Pig Iron Supply (kt)	306	494	479	391	365	420	474	575	450	350	350	350	350
Indonesian Nickel Pig Iron Supply (kt)		6	7	37	106	183	267	365	488	603	629	637	640
Global Nickel Pig Iron Supply (kt)	306	500	486	428	471	603	741	940	938	953	979	987	990
Chinese Nickel Pig Iron Supply growth %	15.2%	61.4%	-2.9%	-18.5%	-6.7%	15.4%	12.7%	21.3%	-21.7%	-22.2%	0.0%	0.0%	0.0%
Indonesian Nickel Pig Iron Supply growth %		NM	14.8%	431.4%	184.9%	72.6%	46.0%	36.5%	33.8%	23.5%	4.3%	1.3%	0.5%
Global Nickel Pig Iron Supply growth %	15.2%	63.4%	-2.7%	-12.0%	9.9%	28.3%	22.8%	26.8%	-0.2%	1.6%	2.7%	0.8%	0.3%
Global Nickel Pig Iron as % Total Production	17.3%	25.0%	24.0%	21.2%	23.2%	28.7%	33.2%	38.7%	37.2%	36.8%	36.4%	36.2%	36.1%
Consumption Growth by Region %													
China	7.0%	19.4%	5.5%	6.3%	13.9%	3.2%	-1.4%	14.6%	2.0%	2.1%	2.7%	2.7%	1.2%
Rest of Asia (Ex China)	0.0%	0.0%	5.6%	-0.3%	11.9%	16.0%	28.7%	-2.0%	0.9%	4.3%	3.4%	3.4%	3.1%
Europe	-2.1%	-2.2%	-0.3%	-3.1%	6.9%	1.1%	-2.7%	-5.5%	0.8%	1.5%	0.9%	1.0%	1.0%
North America	0.0%	1.5%	11.3%	-6.8%	-5.8%	14.6%	0.7%	0.7%	0.4%	1.5%	1.5%	1.5%	1.5%
Latin America	-4.5%	4.8%	4.5%	-8.7%	-19.0%	-23.5%	23.1%	0.0%	7.5%	2.7%	2.5%	2.5%	2.6%
Rest of world	13.0%	0.0%	-19.2%	19.0%	12.0%	0.0%	0.0%	-17.9%	10.4%	1.6%	0.9%	0.9%	0.9%
Consumption Mix by Country/Region:													
China	46.9%	51.4%	52.0%	54.1%	55.8%	54.5%	51.3%	55.5%	55.7%	55.5%	55.7%	55.7%	55.5%
Rest of Asia (Ex China)	19.6%	18.1%	18.3%	17.8%	18.1%	19.8%	24.4%	22.6%	22.4%	22.8%	23.0%	23.2%	23.5%
Europe	22.5%	20.3%	19.3%	18.4%	17.8%	17.0%	15.8%	14.1%	14.0%	13.9%	13.6%	13.4%	13.3%
North America	8.1%	7.5%	8.0%	7.3%	6.2%	6.8%	6.5%	6.2%	6.1%	6.1%	6.0%	5.9%	5.9%
Latin America	1.3%	1.2%	1.2%	1.1%	0.8%	0.6%	0.7%	0.7%	0.7%	0.7%	0.7%	0.7%	0.7%
Rest of world	1.6%	1.5%	1.1%	1.3%	1.3%	1.3%	1.2%	0.9%	1.0%	1.0%	1.0%	1.0%	1.0%

Source: Wood Mackenzie; Scotiabank GBM estimates.

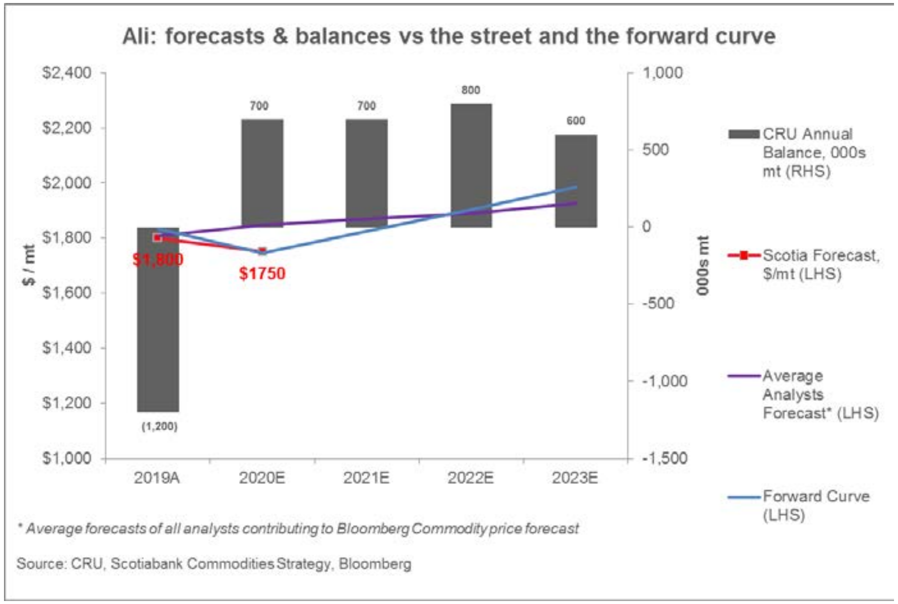
Outlook for Aluminum

Scotiabank™

Ali: Price forecasts & fundamental outlook: the grind lower continues

- Despite some macro & trade risks being removed in Q4’19, falling Chinese costs (on lower Alumina prices and new low-cost smelters), expected rising exports and lower demand expectations in 2020 will drive a surplus of ~700k mt (vs recent deficits of well over 1m mt); that will ensure the slow grind lower continues.

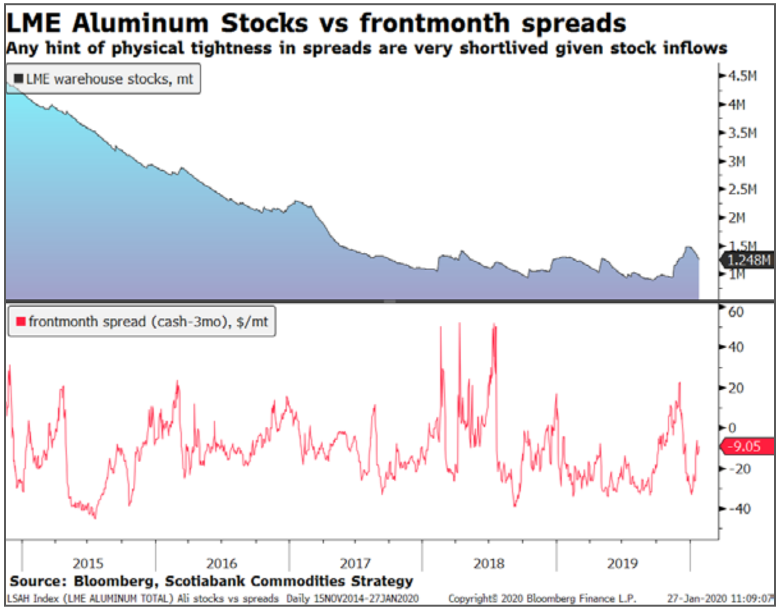
- Prices averaged $1800/mt in 2019; we expect marginally lower prices in 2020, of $1750/mt, as the marginal cost curve will continue to fall , while the demand rebound remains fragile *(see table on pg. 23 for summary on drivers)*

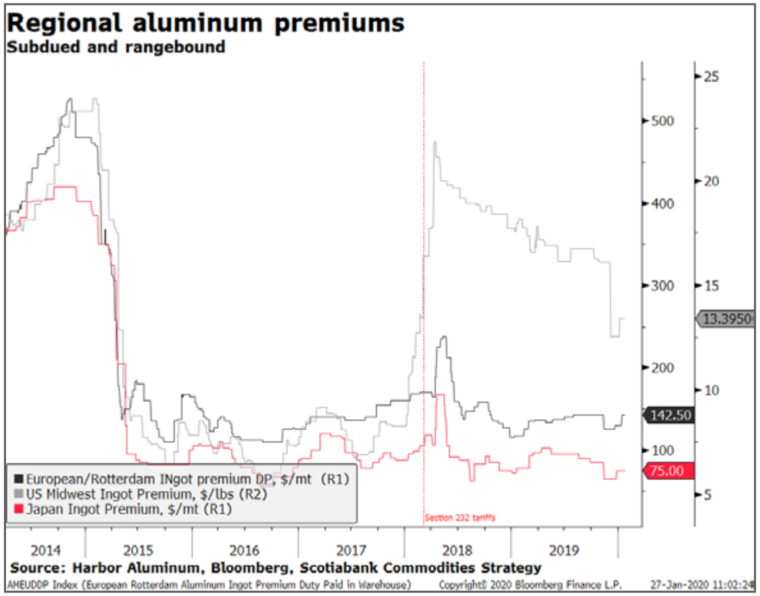


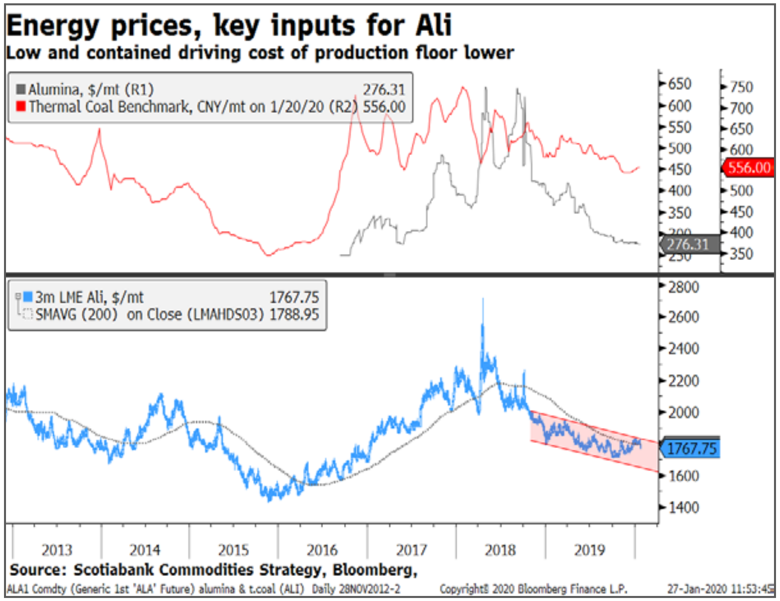
<u>Upside risks (~$1900+)</u>
- Global demand concerns are overblown, and the rebound in sentiment (due to trade) unleashes actual/ pent-up demand
- Recession fears peaked in 2019, with potential further boost from the US economy into presidential elections
- The bottoming out in global manufacturing has momentum and delivers a modest growth pickup
- Emerging market growth improves due to the collective CB easing policies.

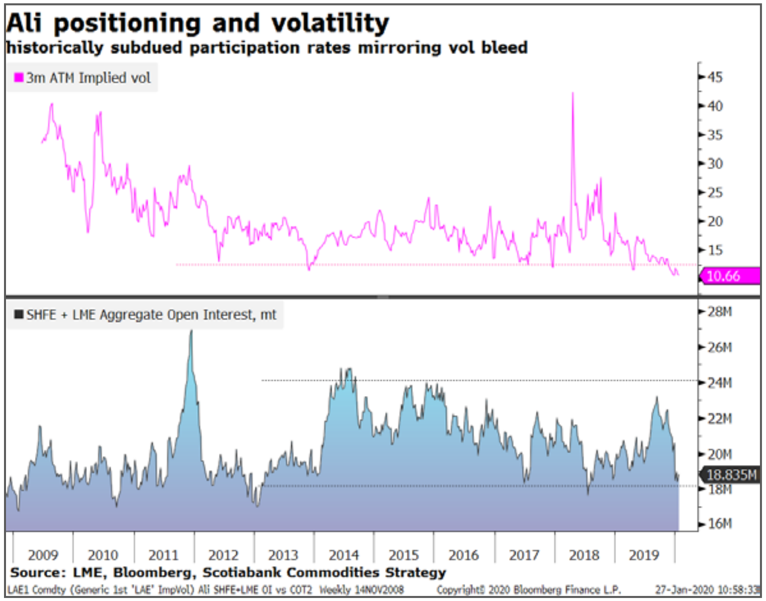
<u>Downside price risks (below $1700)</u>
- Underappreciated US election risk impacts risk and macro outlook
- Protectionist trade policies return → U-turn in US/China trade deal, and/or tariffs on EU goods imposed
- Geopolitical / off-calendar event risks re-emerge
- US growth slows as the fiscal boost fades
- Global auto production continues to fall
- Chinese GDP falls toward to 5.5% (vs 6%)

Ali: chart pack









Aluminums fundamental, macro & technical summary table

ALUMINUM SUMMARY TABLE		
Driver	**General Outlook**	**Comment**
Fundamentals short-term	Bearish	Deficits expanded in 2019, due to lower demand revisions on weakness in auto and the machinery & equipment sectors. Limited supply-side threats/catalysts (despite 2018s volatility & headline exhaustion) has kept prices very contained. Off exchange stocks, despite LME warehouse inventories hovering near 10 year lows (1-1.5m mt), continue to build and provide ample liquidity.
Fundamentals medium-term	Neutral-bearish	Steep deficits in 2018 and 2019 (averaging ~1.5mn mt) due to swing into surpluses in 2020. The Chinese construction sector and auto sector should recover in 2020 (after some recent bottoming in sales) as the lag from past stimulus measure disappears. However, this will be offset by low-cost production restarts and future demand concerns lingering especially the extrusion market
Macro short-term	Neutral	The threat of even further US$ upside is somewhat limited given an expected sustained Fed pause in 2020 and a phase one trade deal that has been a key booster to both sentiment and manufacturing PMIs. The Chinese yuan has stabilized after phase one deal, which is a key underpinning for demand.
Macro medium-term	Neutral	Late cycle fears and the ineffectiveness of monetary policy (with some caution around any significant fiscal response) in boosting growth, creates structural headwinds for a sustained global growth pickup. However, underappreciated inflationary risks due to trade & ESG/climate policy, has boosted the appeal of some commodities
China	Neutral-bearish	Chinese exports expected to end 2019 weak, but rise from 2020 onwards due to Chinese restarts of low-cost smelters (disrupted in 2019) especially in Xinjiang and Shandong, driving Chinese ali production growth that ramps up to 10% YoY by end 2020. In the short-term, Chines exporters will be hit by relatively stronger SHFE price (vs LME) which should discourage some exports.
Production costs	Bearish	Lower alumina prices below $300 have boosted profits prompting producers to expand with new low-cost smelters, leading to cost deflation and ultimately lowering the cost of production. However the Alunorte curtailment is an upside risk for alumina prices in the short-term.
Inventories & spreads	Neutral	Physical ali is currently somewhat comfortably supplied - LME stocks remain structurally very low, but off-exchange stocks, while largely unknown, are arguably resurging as flat prices remain unreactive to past large structural deficits. LME spread tightening in late 2019 was the first sign of physical tightness (although that was short-lived as is usually the case with previous tightening episodes)
Technicals	Neutral-bearish	Prices remain in a contained & compressed $1700-1850 range in the short-term; prices have largely been capped by the 200DMA since the October '18 supply disruptions. Momentum trends point to a slow grind lower. Complacency remains high depicted by implied volatility falling and remaining well below 20% in 2019.
Market positioning & sentiment	Neutral-bullish	LME & SHFE positioning (Aggregate Open Interest) stands at cyclical lows of <19m mt signaling a mix of sidelined long investors outweighed by core CTA shorts. Overall sentiment has thawed on the US/China phase one deal but pessimism around sustained demand growth remains while the lack of price momentum is deterrent as investors prefer other high beta/higher yielding assets.

Source: ScotiaBank Commodity Strategy, Bloomberg, CRU, LME, SHFE

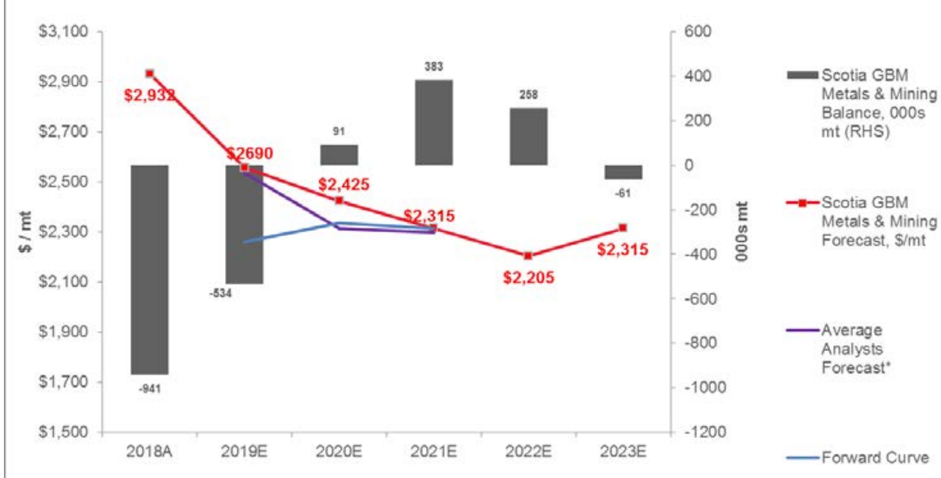
Outlook for Zinc/Lead

Scotiabank™

Zinc: still contending with an upcoming surplus

- Intermittent and chronic tightness with spreads shifting into steep backwardation and stocks at critical levels, has provided key price support in the face of a known concentrate overhang in 2019.
- The market will shift from multi years of structural deficits, posting only a minor deficit in 2019, before significant supply growth ex-China drives a series of surpluses beginning in 2020; fundamentally, zinc is due to average surpluses of ~250k mt over the 2020-2022 period; that's being reflected with soaring TCRCs. That drives Scotia GBMs forecast of $2425/mt ($1.08/lbs) in 2020 and $2315/mt ($1.05/lbs) in 2021.
- The near-term demand outlook remains soft, due to ongoing macro fears and only a fragile recovery in the auto and transportation sectors. Global consumption growth over the 2020-2022 period should range between 0.7%-1.4%, which still is a modest improvement from the negative demand growth in 2018-2019.

Zinc: Scotia forecasts & balances vs the street and the forward curve



* Average forecasts of all analysts contributing to Bloomberg Commodity price forecast

Source: Scotiabank Commodities Strategy, Bloomberg

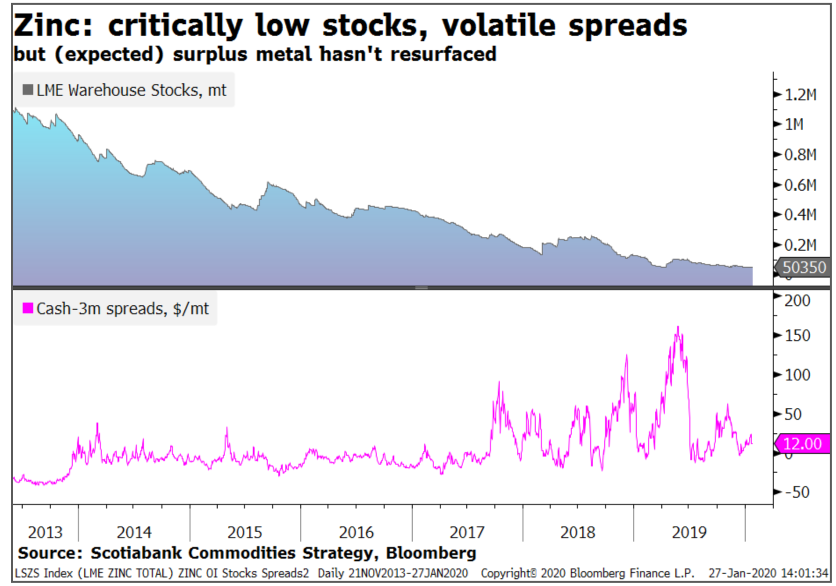
Downside price risks (below $2000)

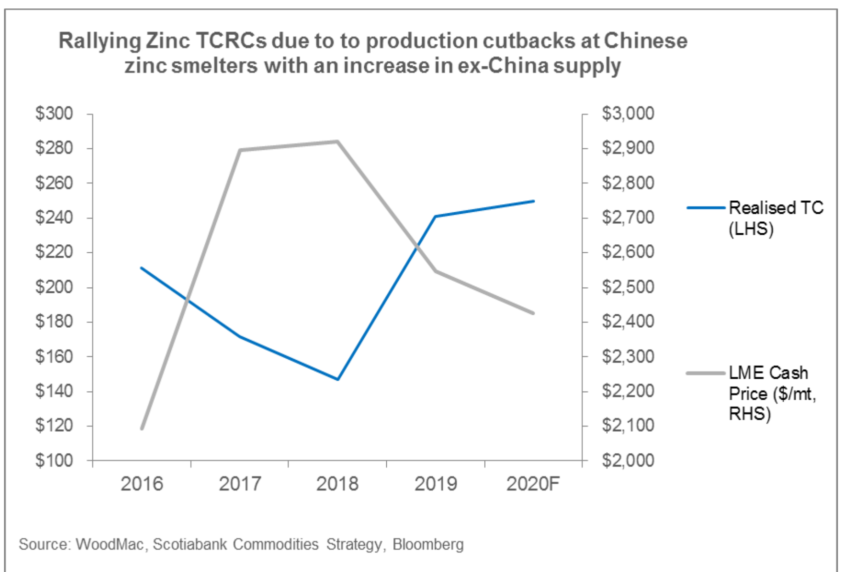
- The global smelter bottleneck (witnessed in 2019) alleviates, putting surplus metal theoretically back onto exchange, confirming bearish convictions.
- Underappreciated US election risk impacts risk and macro outlook
- Protectionist trade policies return → U-turn in US/China trade deal, and/or tariffs on EU goods imposed
- Geopolitical off-calendar event risks re-emerge
- US growth slows as the fiscal boost fades
- Global auto production continues to fall
- Chinese GDP falls closer to 5.5% (vs 6%)

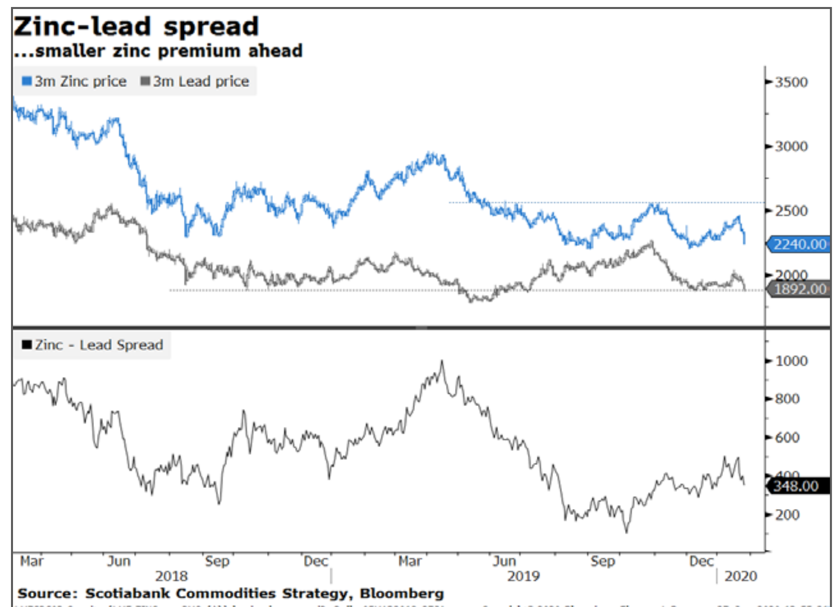
Upside risks (~$3000+)

- The large expected surplus metal doesn't return to the market or isn't visible (in warehouses) with no relief from the volatile spread tightness
- The market (SHFE + LME) remains largely very underinvested
- Global demand concerns are overblown, and the rebound in sentiment (due to trade) unleashes actual/ pent-up demand
- Recession fears peaked in 2019, with potential further boost from the US economy into presidential elections
- Auto demand pickup due to an increase in (Chinese) galvanization rates as consumer preferences shift towards zinc-intensive SUVs
- The bottoming out in global manufacturing has momentum and delivers a modest growth pickup
- Emerging market growth improves due to the recent collective CB easing policies

Zinc & Lead: chart pack







Zinc: contending with upcoming surplus years

Scotiabank GBM Zinc Supply–Demand Model (kt)

	2012	2013	2014	2015	2016	2017	2018	2019E	2020E	2021E	2022E	2023E	2024E
GROSS TOTAL MINE PRODUCTION	12,857	12,907	12,958	13,097	12,119	12,592	12,922	13,328	14,044	14,472	14,505	14,372	14,482
LESS: DISRUPTION ALLOWANCE @ 4.0%								(67)	(562)	(579)	(580)	(575)	(579)
NET TOTAL MINE PRODUCTION	12,857	12,907	12,958	13,097	12,119	12,592	12,922	13,261	13,482	13,893	13,925	13,797	13,903
Mined Zn production growth %	*2.5%*	*0.4%*	*0.4%*	*1.1%*	*-7.5%*	*3.9%*	*2.6%*	*2.6%*	*1.7%*	*3.0%*	*0.2%*	*-0.9%*	*0.8%*
CONCENTRATE SURPLUS/(DEFICIT)	760	418	110	-202	-913	-298	298	400	0	0	0	0	0
REFINED ZINC PRODUCTION	12,453	12,935	13,233	13,720	13,586	13,511	13,237	13,493	14,214	14,678	14,756	14,644	14,732
Refined Zn production growth %	*-4.0%*	*3.9%*	*2.3%*	*3.7%*	*-1.0%*	*-0.6%*	*-2.0%*	*1.9%*	*5.3%*	*3.3%*	*0.5%*	*-0.8%*	*0.6%*
CONSUMPTION	12,649	13,033	13,538	13,674	13,977	14,238	14,178	14,027	14,123	14,295	14,498	14,705	14,899
Global consumption growth %	*2.1%*	*3.0%*	*3.9%*	*1.0%*	*2.2%*	*1.9%*	*-0.4%*	*-1.1%*	*0.7%*	*1.2%*	*1.4%*	*1.4%*	*1.3%*
NET SURPLUS/(DEFICIT)	**(196)**	**(98)**	**(305)**	**46**	**(391)**	**(727)**	**(941)**	**(534)**	**91**	**383**	**258**	**(61)**	**(167)**
Total exchange inventories (LME/SHFE/Bonded)	1,554	1,210	885	747	758	405	191	161	252	634	892	831	664
Days of forward consumption	45	34	24	20	20	10	5	4	7	16	22	21	16
Total inventories (exchange + non-exchange)	4,089	3,991	3,686	3,732	3,341	2,614	1,673	1,139	1,230	1,613	1,871	1,810	1,643
Days of forward consumption	118	112	99	100	87	67	43	30	32	41	47	45	40
LME spot price (USD/lb)	$0.88	$0.87	$0.98	$0.88	$0.95	$1.31	$1.33	$1.16	$1.10	$1.05	$1.00	$1.05	$1.10
Chinese Zn mine production	4,605	4,734	4,864	4,736	4,698	4,669	4,472	4,630	4,722	4,816	4,912	5,009	5,109
Chinese Zn mine production growth %	8.9%	2.8%	2.8%	-2.6%	-0.8%	-0.6%	-4.2%	3.5%	2.0%	2.0%	2.0%	2.0%	2.0%
Chinese Zn mine production as a % total	35.8%	36.7%	37.5%	36.2%	38.8%	37.1%	34.6%	34.7%	33.6%	33.3%	33.9%	34.9%	35.3%
Consumption Growth by Region %													
China	6.5%	6.9%	5.7%	3.1%	3.9%	2.3%	0.7%	1.9%	1.0%	1.5%	1.8%	1.8%	1.6%
Rest of Asia (Ex China)	1.1%	3.5%	3.4%	-2.3%	3.6%	4.0%	-3.6%	-2.7%	0.4%	1.6%	1.9%	1.9%	2.0%
Europe	-6.7%	-1.0%	1.9%	2.3%	-0.3%	2.3%	0.9%	-4.6%	0.3%	0.6%	0.6%	0.6%	0.6%
North America	6.9%	-1.3%	4.7%	-3.5%	3.2%	-4.0%	-0.4%	-3.0%	-0.8%	-0.4%	-0.4%	-0.4%	-0.4%
Latin America	2.8%	-1.5%	-1.4%	-5.9%	0.5%	-1.2%	1.2%	-7.4%	1.3%	1.3%	1.3%	1.4%	1.4%
Rest of world	-6.6%	-5.5%	0.4%	3.9%	-9.1%	0.9%	-6.3%	-2.9%	1.9%	0.9%	0.9%	1.0%	1.0%
Consumption Mix by Country/Region:													
China	43.6%	45.3%	46.1%	47.0%	47.8%	48.0%	48.5%	50.0%	50.1%	50.3%	50.5%	50.7%	50.8%
Rest of Asia (Ex China)	18.7%	18.8%	18.7%	18.1%	18.3%	18.7%	18.1%	17.8%	17.8%	17.8%	17.9%	18.0%	18.1%
Europe	17.6%	16.9%	16.6%	16.8%	16.4%	16.5%	16.7%	16.1%	16.0%	15.9%	15.8%	15.7%	15.6%
North America	9.3%	8.9%	9.0%	8.6%	8.7%	8.2%	8.2%	8.0%	7.9%	7.7%	7.6%	7.5%	7.3%
Latin America	5.0%	4.8%	4.5%	4.2%	4.2%	4.0%	4.1%	3.8%	3.9%	3.9%	3.9%	3.9%	3.9%
Rest of world	5.8%	5.3%	5.1%	5.3%	4.7%	4.7%	4.4%	4.3%	4.3%	4.3%	4.3%	4.3%	4.3%

Source: Wood Mackenzie; Scotiabank GBM estimates.

The macro backdrop & expectations for 2020

A summary of key macroeconomic expectations and assumptions for 2020

… that will thus help frame our outlook and thinking in both base and precious

Growth & recession risk: A tepid and gradual recovery is expected in 2020, and markets should be careful to make the distinction that slow and low global growth is not recessionary; this (fragile) "goldilocks" outlook hinges on supportive central bank policy, stabilizing data with diminished economic and trade risks BUT higher geopolitical & election risk. (Page 12)

Interest rates & liquidity: the coordinated dovish Developed Market CB pivot that drove risk markets in 2H'2019 is behind us.; peak negative yielding debt ($17tn) is also behind us given the pushback and rethink around negative interest rates (ultimately undermining their safe haven appeal). However, liquidity comes in various forms and while the Fed is largely expected to be on a sustained hold throughout 2020 (reinforcing our low for longer US interest rate profile), they have indicated that they're OK with letting the economy run a little hot while the (NY) Fed is likely to continue buying short duration Treasuries in 1H'2020; that should lead to a boost in inflation expectations. (Page 7-8)

Inflation: Inflation risks are underappreciated given the Feds stance, potential expansionary fiscal policies due to social unrest, and the cost push from ESG & protectionist trade policies. There's a growing risk that markets shift from financial/equity inflation into real asset inflation (page 7-8)

Risk Sentiment: Continue to expect volatile shifts in sentiment, driven by trade and (geo)political themes creating large divergences between sentiment beliefs (positioning) and reality (data). (Page 5)

FX trends and the US$: Our core $ house call through 2021 implies the DXY weakening ~8%, from current levels of around ~97 while currency market volatility is overdue an awakening, already witnessed in global bonds, most commodities & equities (page 10).

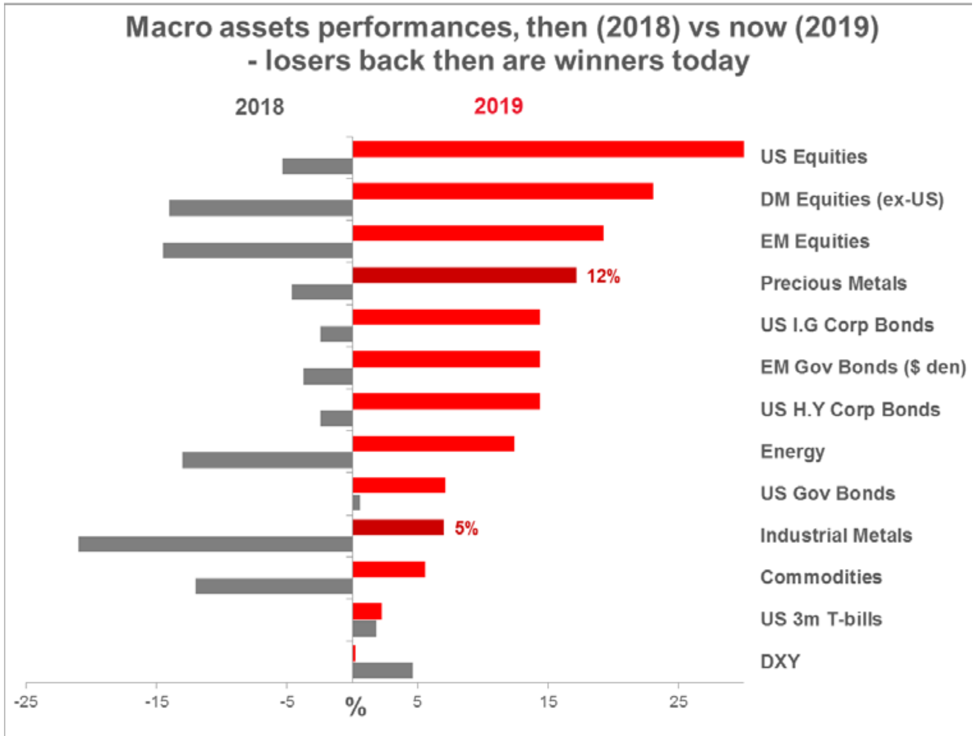
Trade: Expect a series of 'mini-wins' and positive rhetoric within a broader framework of global protectionism; little aggressive trade escalation is expected into the 2020 US elections, but there should be no respite either, given the 'need' to keep US growth and risk assets buoyed. (page 11)

US politics: US election risk remains underpriced with little premium being factored in, on a progressive Democratic nominee; it will become a tradeable theme after Super Tuesday in which the path toward and into November will likely become messy and disorderly keeping election sensitive assets / macro vol bid. (Page 13).

Geopolitics: the frequency of off-calendar geopolitical risks and events are rising, driving the need for more tactical tailrisk hedging. (Page 13-14)

2019: volatile shifts in sentiment; strong performances across risk assets

- **1H 2019 – risks contained**
  - Low volatility, complacent regime
  - Sustained Fed pause after the January FOMC
  - **Risk assets trend**
- **Summer 2019 – peak Geopolitical uncertainty, trade & recession fears**
  - Trade, geopolitics & Fed change course
  - Outsized repricing in global bonds; $17tn of global debt demand negative yields
  - Global manufacturing collectively really rolls over
- **4Q 2019 -- trade hopes & liquidity injections**
  - Shift from trade escalation to de-escalation
  - Low volatility, complacent regime
  - Macro fear trumped by liquidity, led by the Fed
  - Reflation trades re-emerge
  - **Reduced need for recession hedges/havens**

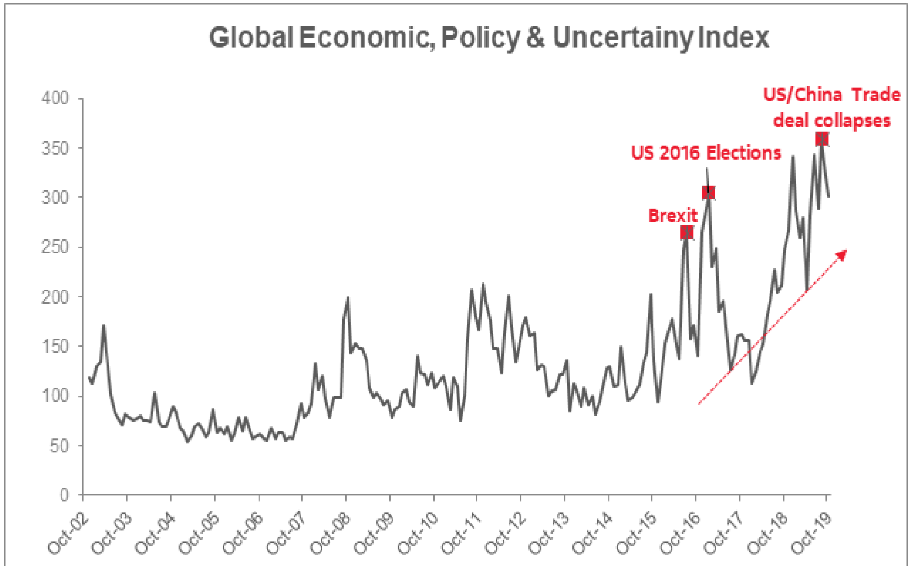


Source: Scotiabank Commodities Strategy, Bloomberg, ICE BofA ML

It going to be very tough to repeat the above-average, double digit returns of 2019 seen in most sectors except Commodities and EM FX. Historically, sharp risk-asset are followed by more modest growth

Geopolitical, trade & Fed risk peaked in 2019; remain vigilant in 2020

- **2019 will be known as the year of relentless cheap money (unleashed by the Feds U-turn from hikes to cuts and re-expansion of their Balance Sheet), US/China trade policy U-turns and a major global manufacturing growth slowdown, that altogether drove negative yields through the financial system and led to peak recession fears**
- **The hot summer of 2019 marked several major turning points in trade, geopolitics/politics & monetary policy injecting broad-based macro fear and volatility. But in Q4'19, trade de-escalation & CB easing led to a dramatic shift in narrative; markets debated between "no recession vs cyclical upturn" instead of "recession vs no recession"**
- **Current volatility is relatively low, the macroeconomic regime is ultra complacent and theres a *reduced* need for recession hedges or havens. However, volatility flare-ups are underpriced into 2020 with political and geopolitical developments still a large 'unknown' creating a key risk for overly optimistic sentiment.**



*quantifies the GDP_weighted average of national Economic, Policy & Uncertainty (EPU) Indices for 20 countries. Each EPU reflects reflects the relative frequency of own-country newspaper articles that contain a trio of terms pertaining to the economy (E), policy (P) and uncertainty (U)

Source: Scotiabank Commodities Strategy, Bloomberg, Economic Policy Uncertainty

The largest macro moments of 2019:

- Flash crash in the Yen (January)
- The January to July U-turn in Fed policy and switch from autopilot QT to Balance Sheet increases (QE)
- Reemergence of currency wars (summer 2019) and the renminbi 'cracked 7'
- US repo markets stress (September)
- US/China Trade - tariffs or deals - delivered by tweet (all year)
- Brexit shenanigans (all year)
- High profile IPOs or attempts to IPO (WeWork, BeyondMeat, Uber, Lyft) mostly disappointed
- Geopolitical and Middle East tensions became more frequent and underpinned oil markets and other havens
- Anarchism returned with large and violent protests in Chile, Lebanon, Spain, Iraq, Hong Kong, India, France and Russia (all year)

Interest Rates & The Fed: liquidity in various forms

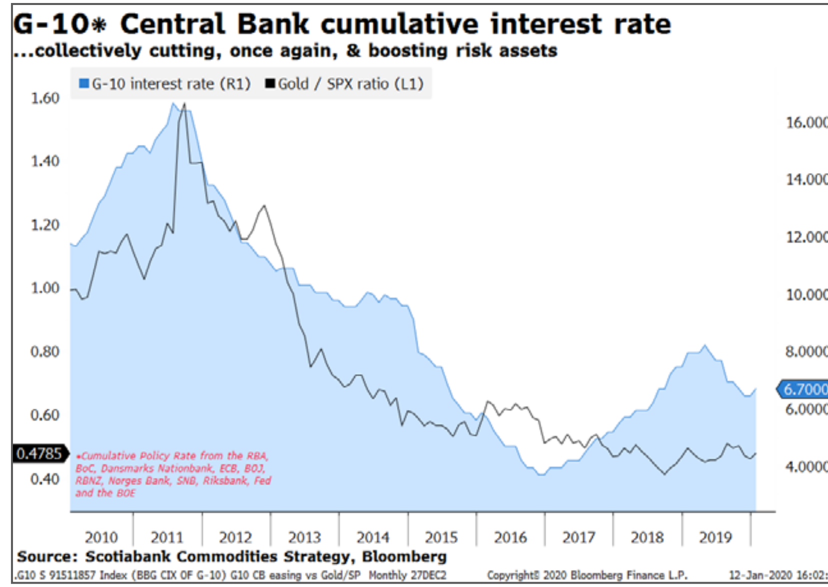
- Macro fear was trumped by liquidity, led by the Feds 3 "midcycle" rate cuts in 2H'19. Global G-10 Central Banks have cumulatively cuts rates by 175bps while the Fed has pumped over $400bn worth of liquidity since the repo markets seized up in September.

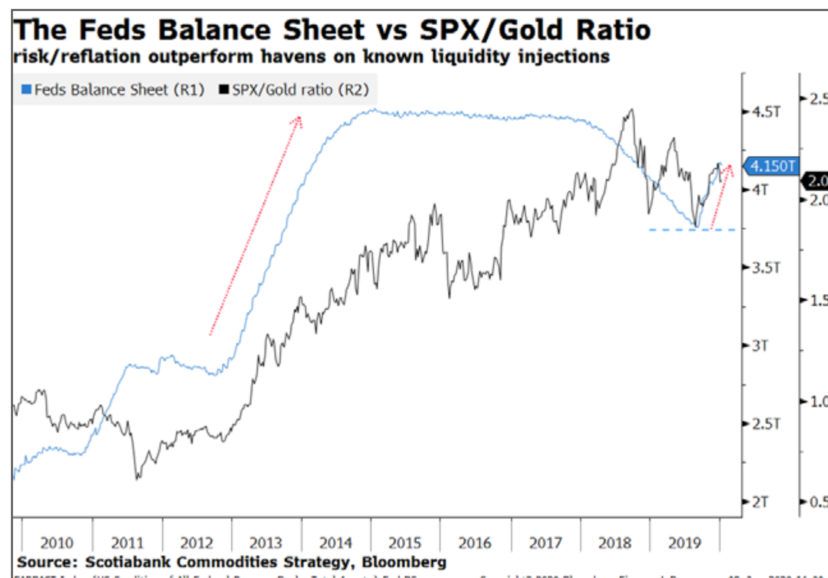
- The Fed is largely expected to be on a sustained hold throughout 2020, with the NY Fed likely to continue buying short duration Treasuries in 1H'2020; the Fed has hinted that they're OK with letting the economy run a little hot which should lead to a further boost in inflation expectations. That supports "all-boats rise" in which Gold and havens can perform, but Golds unlikely to <u>out</u>perform risk assets (IF geopolitical / trade risks remain contained). Overall, the coordinated dovish DM CB pivot that drove risk markets in 2H'2019 is behind us.

- The consensual outlook from 'the street' is for US Treasuries (10years) to remain below 2%, which isn't wrong in light of relative pricing vs other G-10 countries and expectations for growth, inflation and monetary policy. Havens such as US Government bonds and Gold still have a role to play as insurance (despite low yields and recent gains).

- Inflation risks are underappreciated given:
  - The Feds past action and stance - U-turn on both rates (from hikes to cuts) and Balance Sheet trends (from Quantitative Tightening to 'QE') with "sustained inflation" required before they act
  - Expansionary fiscal policies (eg: higher wages) to appease large scale social unrest globally
  - The cost push from ESG, decarbonization policies and protectionist policies/tariffs.

  → There is a growing risk that markets shift from financial/equity inflation into real asset inflation



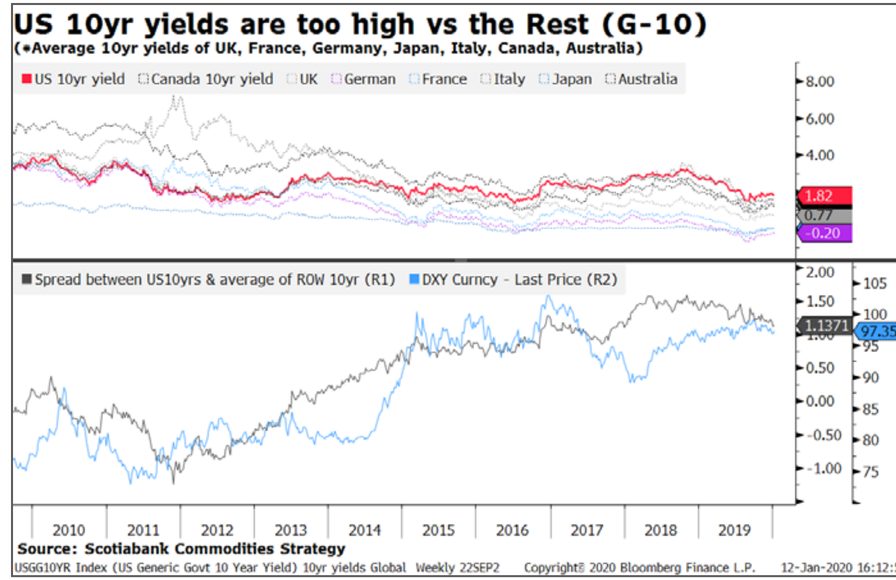


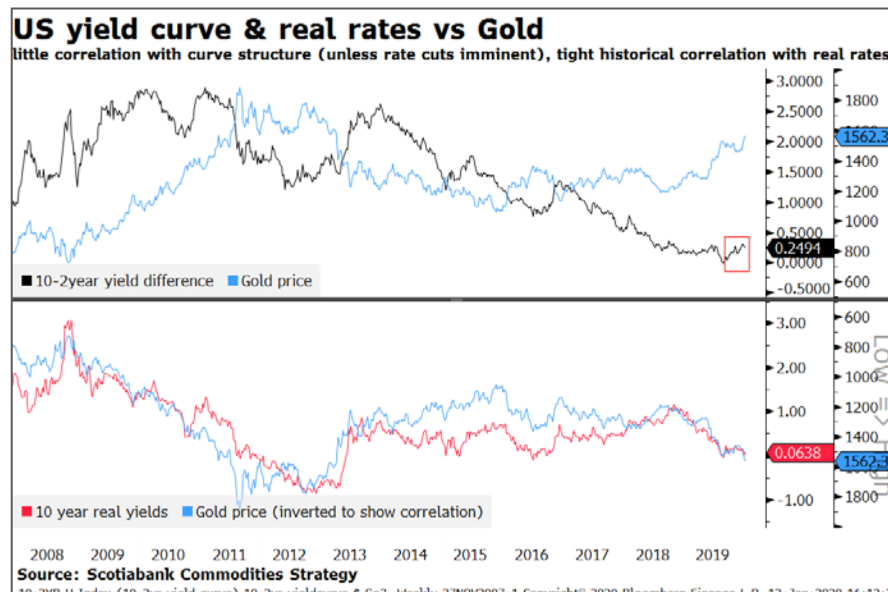
Interest Rates & The Fed: liquidity in various forms

- Negative interest rates remain despite the the pile of negative yielding debt falling from a peak of $17tn in Q3'19 to ~$12tn currently. That pile is likely to have peaked in 2019 (given the pushback and rethink around negatively yielding European debt ultimately undermining their safe haven appeal) but the amount of negative yielding debt should still remain sizeable. That's because weak inflation, structural long-term demand for government debt and expectations for ECB rates to stay below 0%, remain in place.

- However, the full (and perverse) implications from negative debt has yet to be felt (or known) thereore its highly unlikely the Fed targets a negative range into the next recession (upheaval in money markets, essentially a tax on banks lending to the Fed which only Congress can technically do). That implies the Fed will be forced to get creative given that its room to maneuver on interest rates remains very limited.

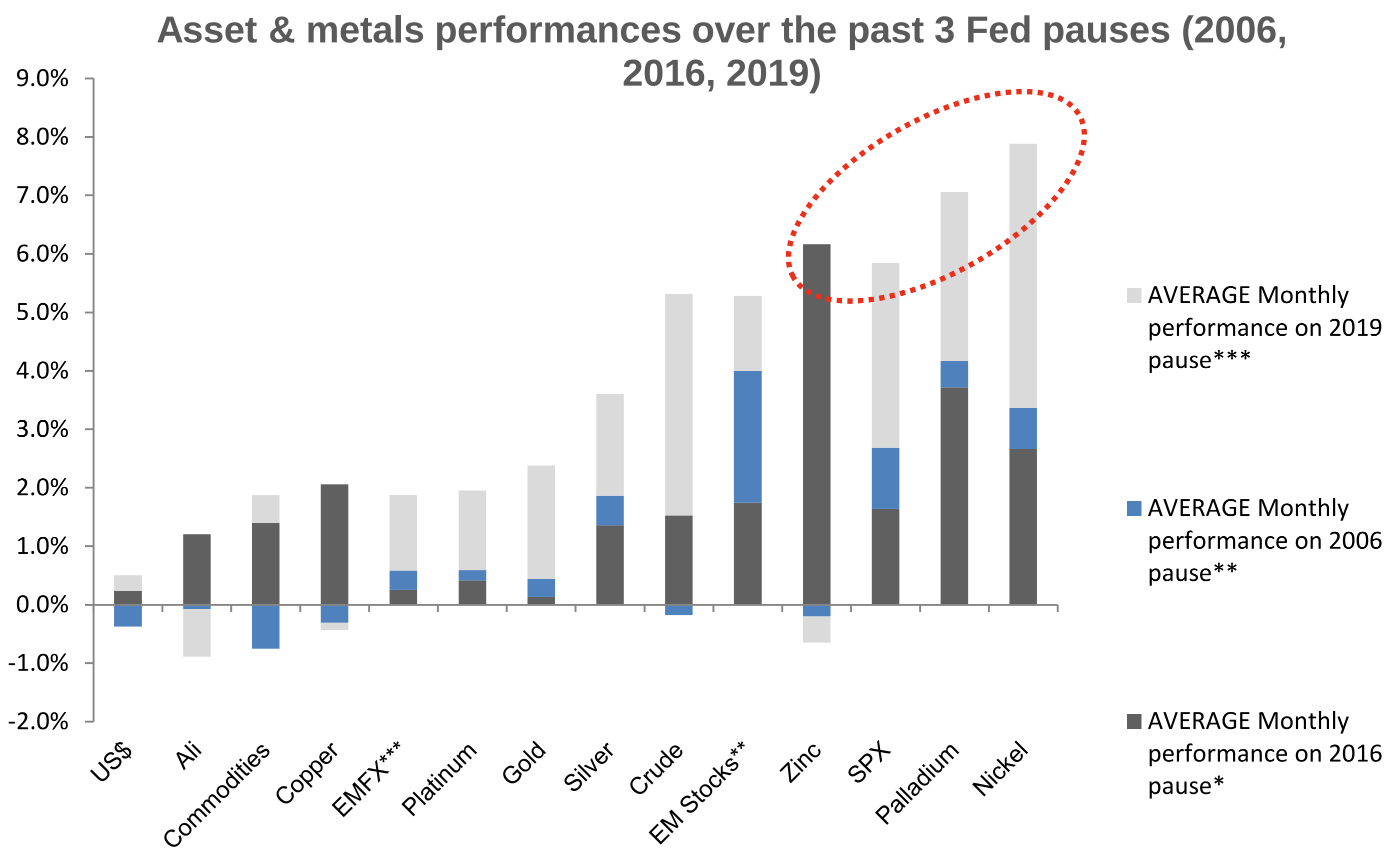
- For now, and into 1H'2020, further US yield curve steepening (away from the recessionary "inverted levels") is possible if global growth and inflation expectations continue to run. There is little correlation between a steeper yield curve and Gold prices (unless rate cuts are imminent and real rates remain flat or negative).





A Fed pause: what happened during past pauses

A Fed rate pause which is usually associated with "Goldilocks" growth (or a recovery that's rather fragile), is most favourable to both US and EM equities, AND high beta illiquid metals like Nickel, Palladium & Zinc



** 2016 Fed pause: Dec '15 hike - Dec '16 hike*

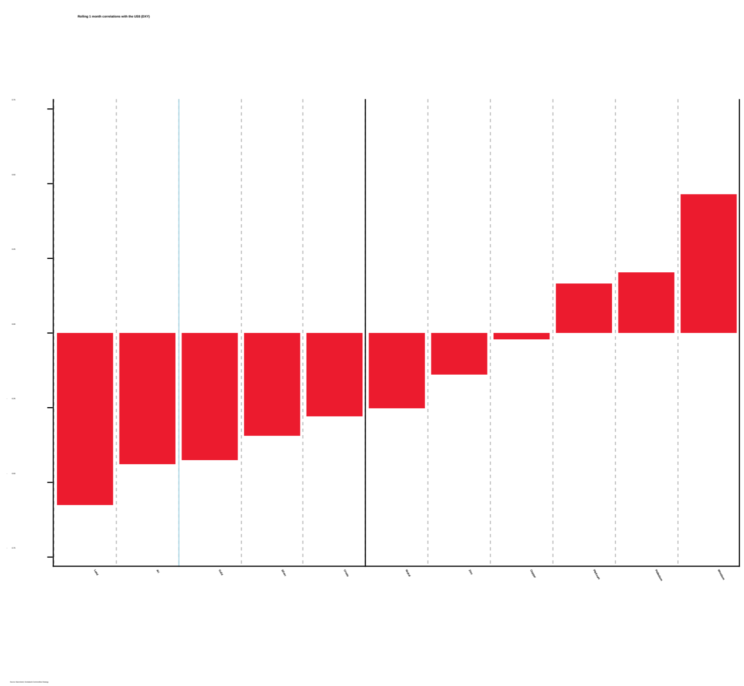
**** 2019 Fed pause: Dec '18 hike to July '19 cut*

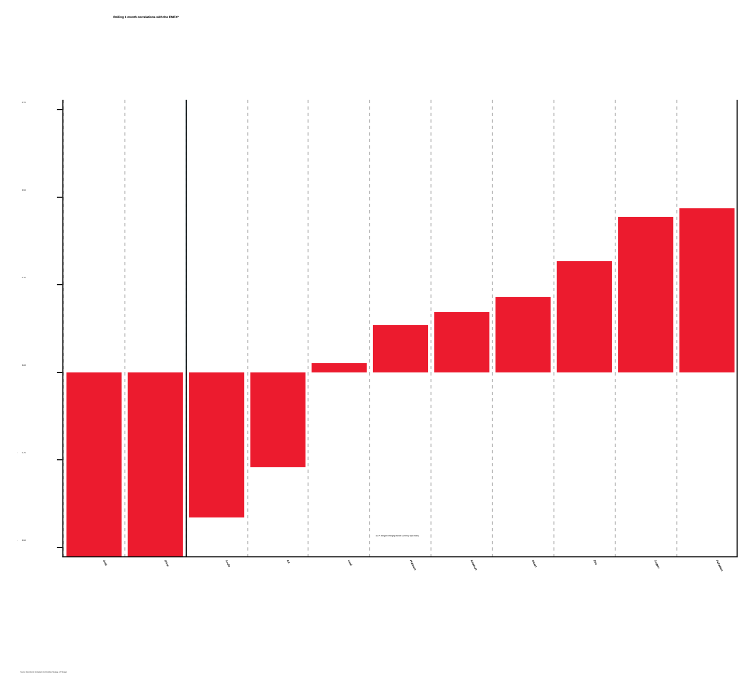
*** 2006 Fed pause: June '06 hike to Sept '07 cut*

Source: Scotiabank Commodities Strategy, Bloomberg

The US$ Outlook: Tirelessly resilient but 2020 looking increasingly different

- Our core $ house call through 2021 implies DXY weakening ~8%, from current levels of around ~97. Persistent USD$ strength is probably peaking as interest rate differentials are generally tilted against it while the China-US de-escalation will induce an unwind of typical haven currencies specifically the US$.
- Additional US$ headwinds also stem from, 1) further stalling of US growth or "US exceptionalism" as fiscal stimulus (2018) and monetary policy (2019) fade, 2) renewed pressure as markets refocus on the unsustainable US fiscal path/debt levels, and 3) added uncertainty around the US presidential election
- Currency market volatility is also overdue an awakening (already witnessed in global bonds, most commodities & equities)
- Metals most likely to benefit from broad-based USD strength (vs DM currencies) are Gold, Silver, & Platinum. On the contrary, Nickel, Rhodium and Zinc are the historical benefactors on any EMFX strength





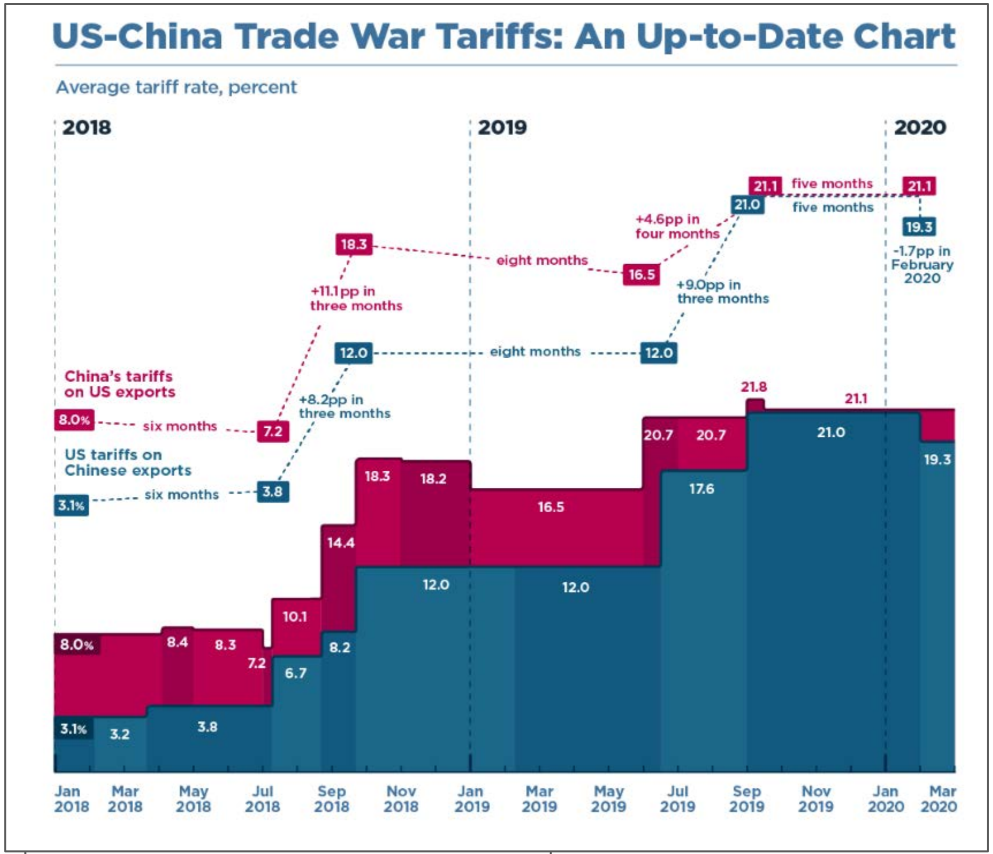
US/China Trade: Expect a series of 'mini-wins' within protectionism

- Expect a series of 'mini-wins' and positive rhetoric within a broader framework of global protectionism; little aggressive trade escalation is expected into the 2020 US elections, but there should be no respite either, given the 'need' to keep US growth and risk assets buoyed.

- 2019s trade wars have been somewhat of a distraction to the major rift in the US / China relationship over technological competition. The likelihood over any <u>comprehensive</u> trade agreement including national security, IP/tech and human rights issues, in 2020 is very small.

- The Phase One trade deal (note documents remain sealed) agreed upon in mid December in reality does little for manufacturers by keeping the 25% tariffs on most imported Chinese goods; it has a relatively larger impact on sentiment (which has drastically improved) vs actual activity

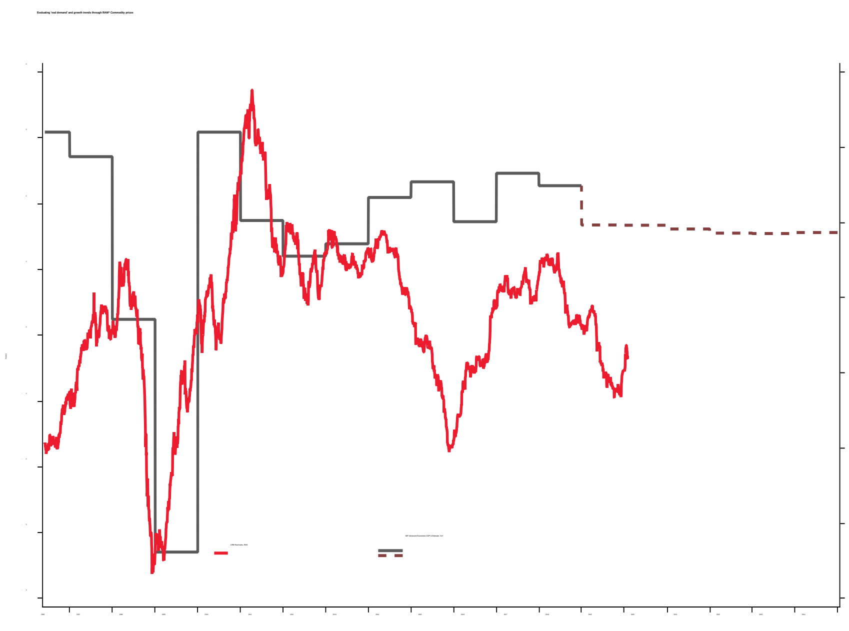
- "Phase one" seems to lock in a new normal of higher tariffs (vs a year ago). And while Phase Two may provide further improvement, that is 1) only expected after the November US elections, and 2) depends on who is in the White House where Democratic rivals are likely to be as protectionist as Trump

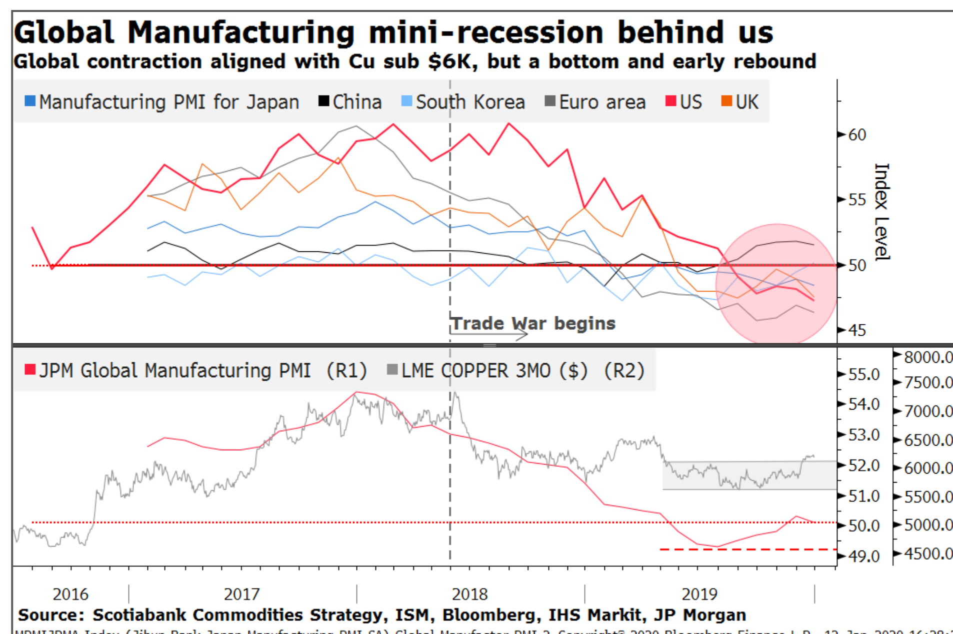


Source: The Peterson Institute

2020: Slowest global growth since 2016 but the bottom is in

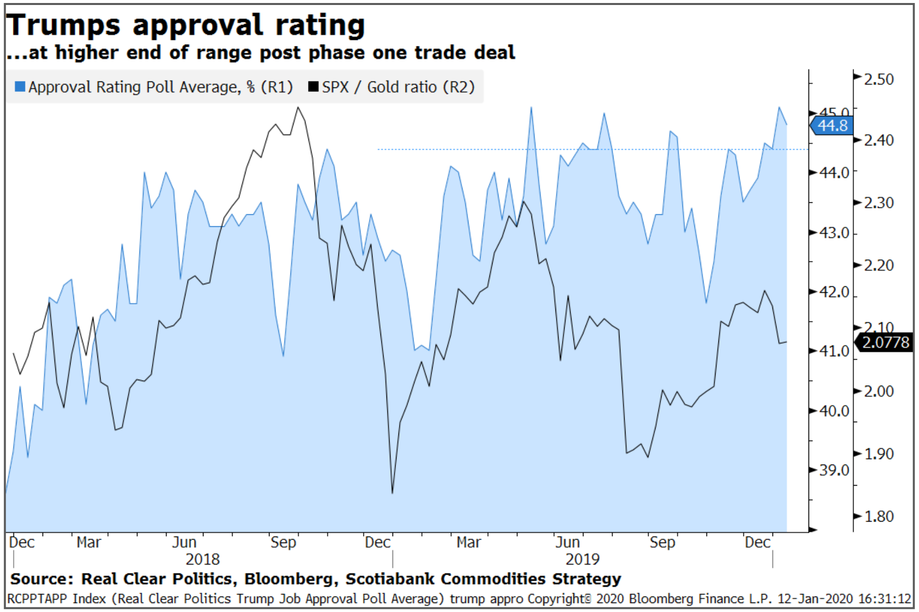
- Recession risk has receded dramatically due to the de-escalation of two key event risks for the global markets (US China trade war and a no-deal Brexit) and coordinated CB easing.
- A tepid and gradual recovery is expected in 2020, and markets should be careful to make the distinction that slow and low global growth is not recessionary; this (fragile) “goldilocks” outlook hinges on supportive central bank policy, stabilizing data with diminished economic and trade risks BUT higher geopolitical and US election risk.
- Raw commodities can be a leading indicator in recoveries with the following lessons from the CRB Rind Index evident:
    - Commodities were not at recessionary levels in 2019, despite sentiment calls and other recessionary indicators (inverted yield curve).
    - Dips in raw commodities are historically shallower (vs the 2008 and 2016 commodities nadir) and upturns are historically sharp.
    - There is a bottom in raw commodity prices and early signs of a reflationary rebound in Q4’19. However, its tough to expect this upcoming 3rd manufacturing bounce (since the GFC) into 2020 to mimic the reflationary bounce in commodities in 2016, due to limited Chinese growth with little appetite for a repeat of their large-scale stimulus of the past.





2020 Politics: Modern Politics makes surprises the norm

- With currently 13 major candidates, the Democratic 2020 presidential field is one of the largest, competitive, and arguably unpredictable in modern history.
- Markets usually struggle to fairly price in election risks (due to innate binary outcomes) after analyzing the two competing agendas relating to trade & tax policy, regulation & fiscal spending. This is further complicated given the unpredictability of Trump - will he campaign as Trump 1.0 (the market-friendly, deregulating, tax cutting person seen in the 2 years post 2016 election) or Trump 2.0 (the protectionist tariff man the market feared in 2016 but who only 'emerged' in 2018)?
- There's plenty of historical analysis outlining how risk markets react to a Democratic or Republican White House win, whether one party controls Congress or not, or whether stock markets have any predictive powers (strong equity returns in the lead up to elections have an uncanny ability to ensure the incumbent party wins). That could be a useful exercise after the Democratic nominee is known (after Q1'20). However it's the path toward and into November that will likely become messy and disorderly, characterized by polarized and angry rhetoric and one in which markets will need to price in the fact that political surprises have become the norm; that should keep election sensitive assets / macro vol bid
- Overall, the US election will be a highly tradeable theme in 2020 especially after Super Tuesday (March 3rd) in which we'll likely know the Democratic candidate. The most likely outcome is a Trump re-election, given current financial and economic conditions; that's the best case for risk assets as it extends the status quo and especially if Republican also control Congress, which could usher in a 2nd round of tax cuts driving equities higher but also deficits (positive Gold). The best case for Gold (worst case for equities) is if either progressive (Elizabeth Warren or Bernie Sanders) is elected, especially if the Democrats also gain full control of Congress – the market friendly Trump policies are then likely to be unwound.



US election risk remains underpriced with little premium being factored in on a progressive Democratic nominee.

A list of macro uncertainties to monitor in 2020

Potential catalysts for renewed recession fears and/or the end of decade long bull market in US risk

3 known core macro uncertainties:

- Shaky Banks in Europe
- Debt mountain in China
- Corporate Leverage in the U.S

Potential lesser known macro uncertainties:

- Global growth falters further **(✓)**
- A Central Bank policy mistake
- Escalating geopolitical or trade tensions **(✓)**
- Official currency intervention
- Major selloff in credit markets and/or interest rates
- A dollar-yuan break through 7-handle **(✓)**
- 2020 U.S. election: an elected progressive Democrat
- Impeachment risk
- Inflation gradually, then suddenly accelerates
- A global (not Chinese) 'carmageddon'
- Threat of a US debt default
- Problems sourcing market liquidity **(✓)**
- European or other recession risk

(✓) Achieved. (-) Undecided; TBD. (x) Not achieved in 2019

Macro Investment themes to consider for 2020

"Investment idea"	*Thinking*	*Metals Trade Expression*
Short $ *(tactical)*	• De-escalating US/China trade war • Swelling twin deficits • US growth "exceptionalism" behind us • Trump & modern politics: 2020 US election campaign	• **Tactically long higher beta Gold proxies / $ hedges (Platinum, Silver, Copper)**
Long Volatility *(structural)*	• Trade policy remains highly unpredictable • (Fake) new cycles driving whippy intraday price action & unpredictability • Skepticism growing around power of CBs to pump up asset prices • Inherent & unexplained lack of market/screen liquidity • Growing number of late cycle macro wobbles	• **Long low volatility, safe-haven currencies (e.g.: Gold, CHF, JPY)**
Short Politics & Geopolitics *(structural)*	• Trade policy remains highly unpredictable & complicated by climate change policies ("carbon tariffs") • Increasing frequency of "off-calendar" geopolitical events/risks • Rise of protectionism globally - "Globalism" vs "nationalism" • Partisan polarization and 2020 US election campaign • Low/slow growth, income inequality fueling further political uprisings and protests	• **Long Gold as a political hedge**
Long inflation *(structural)*	• Fed U-turn on both rates (from hikes to cuts) and Balance Sheet expansion (QT to 'QE'): "sustained inflation" required before they act • Expansionary fiscal policies (higher wages) to appease large scale social unrest • ESG: cost inflationary supply constraints, tighter future commodity supply. • Political pressure due to climate change unlikely to dissipate • Protectionist trade policies / tariffs	• **Long Commodities**

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