Commodity Price Index Naughty & Nice List

Best & Worst Commodity Performers of 2019

Nice — Best Performers (YTD)

1. AECO Natural Gas (+62%)
2. Palladium (+54%)
3. Nickel (+32%)

Naughty — Worst Performers (YTD)

1. Cobalt & Lithium (-38%, -37%)
2. Hard Coking Coal (-37%)
3. Henry hub Natural Gas (-21%)

A YEAR OF REVERSED FORTUNES AND CHALLENGED NARRATIVES

2019 has been a year of reversals and mixed narrative fortunes in commodity markets, with last year's worst performer—AECO natural gas in Western Canada—taking the top spot on the Nice list in 2019 while last year's star performer—the broader Henry Hub North American gas benchmark—has fallen on hard times (chart 1). And while electric vehicles (EVs) are on the rise alongside easing internal combustion engine (ICE) vehicle sales globally, key battery materials like cobalt and lithium are down more than a third this year while palladium, used almost entirely in the emissions control systems of gasoline-fueled vehicles, is up more than 50%. Nickel prices were unexpectedly-strong in 2019 following the surprise acceleration of Indonesia's raw ore export ban, which was original slated take effect in 2022 and is now set to begin in the New Year.

NICE LIST

AECO: WESTERN CANADIAN NATURAL GAS HIGHER ON LOW STOCKS

AECO, the primary natural gas benchmark for Western Canada, rebounded sharply this year despite having been depressed for the past few years as growing supply and bottlenecked export pipelines ran up against surging production in the United States. This year's surge results from intra-provincial pipeline bottlenecks, which prevented gas from reaching storage hubs leading to abnormally low inventory levels for this time of year. AECO's disastrous 2018 performance (-43%, topping last year's Naughty List) also set the natural gas benchmark up well for significant gains this year as a combination of factors left Western Canadian inventories at their lowest seasonal level since 2007 heading into the winter heating season (chart 2). AECO basis has tightened to $0.50/MMBtu under Henry Hub from an exceptionally wide differential of nearly $2.50/MMBtu as recently as September, which combined with Henry Hub's recent weakness still yields an impressive 62% YTD gain for AECO contracts.

Canadian natural gas's traditional and natural export market, the United States, is now the world's fastest-growing source of supply. The horizontal drilling and hydraulic fracking technology that has roiled the oil market first upended the natural gas market and has flipped the United States from an assumed destiny of ever-growing dependence on imported Liquefied Natural Gas (LNG) to that of a dominant future exporter of LNG backed by extremely cheap and plentiful production in the US Northeast and associated gas from oil production in West Texas. This also means that less and less Canadian gas is needed to balance the US market.

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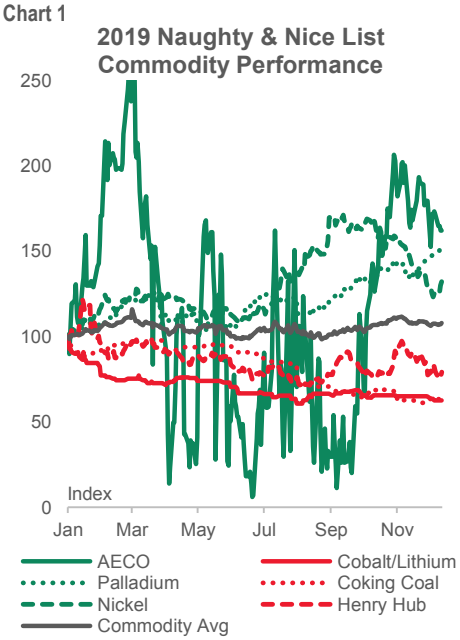
Chart 1



Note: Commodity Avg tracks 24-contract basket.
Source: Scotiabank Economics, Bloomberg.

Scotiabank Commodity Price Index

November 2019	(% change)		
	M/M	Y/Y	YTD
All Commodity*	**1.5**	**10.1**	**-2.4**
Industrials	**1.2**	**12.4**	**-1.9**
Oil & Gas	3.7	56.2	1.9
Metal & Minerals	-1.4	-0.8	2.2
Forest Products	2.1	-8.3	-13.7
Agriculture	**2.5**	**0.8**	**-4.9**

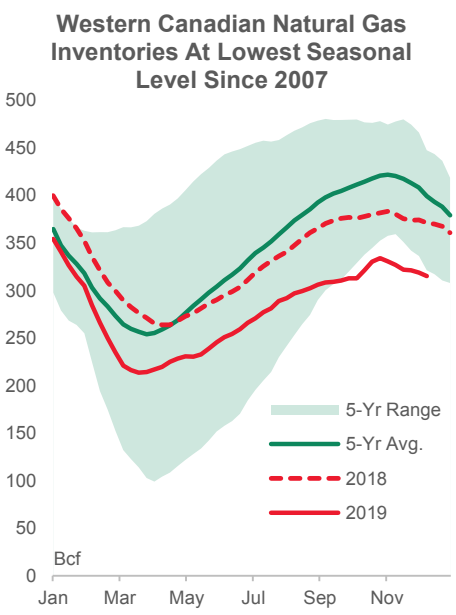
January 2007 = 100	2019		
	Nov	Oct	YTD avg.
All Commodity	**108.9**	**107.3**	**113.5**
Industrials	**105.3**	**104.0**	**111.1**
Oil & Gas	83.1	80.1	89.3
Metal & Minerals	119.7	121.4	125.8
Forest Products	136.0	133.2	139.9
Agriculture	**129.1**	**125.9**	**126.7**

* Weights: Oil & Gas (39.9%), Metal & Minerals (30.1%), Forest Products (14.7%), Agriculture (15.3%); Full technical note on page 9.

Canadian natural gas supply continues to grow, predominately in the Montney and Duvernay formations of Western Alberta and Northeastern BC. This growth comes despite generally weak AECO pricing given a combination of falling costs and a shift toward liquids-rich gas that effectively subsidizes dry gas costs with valuable crude and NGL output. Much of this gas is being used within the region, primarily in Alberta's oil sands industry—where gas is used to create stream for in-situ operations and for facility power generation—as well as within Alberta's power generation sector, which is in the process of phasing out coal in favour of gas and renewables. But domestic demand growth has been insufficient given contracting export markets.

Further, the scale and geographic-concentration of western Canadian gas production growth has bottlenecked intra-provincial pipeline capacity further upstream even before export markets are considered. This capacity crunch is most acute around the Upstream James River (USJR), western portion of the Nova Gas Transmission Ltd (NGTL) Alberta pipeline system, which is preventing much of the incremental production capacity from accessing end-use markets or even storage hubs further downstream away from production fields. This intra-province bottleneck is the primary reason that natural gas inventories haven't built as quickly this year, pushing up prices around the hub, though likely at the expense of gas value further upstream. Planned expansions of the USJR portion are expected to increase capacity by 2 Bcfd by 2021, which will help alleviate this recent intra-provincial tightness. In the longer run, the expected start-up of the Canada LNG export facility in 2024 presents the ultimate light at the end of the tunnel, enabling further growth of Canadian gas production with an eye to gas-thirsty Asia without depending on the US market for export demand.

Chart 2



Source: Scotiabank Economics, Enerdata.

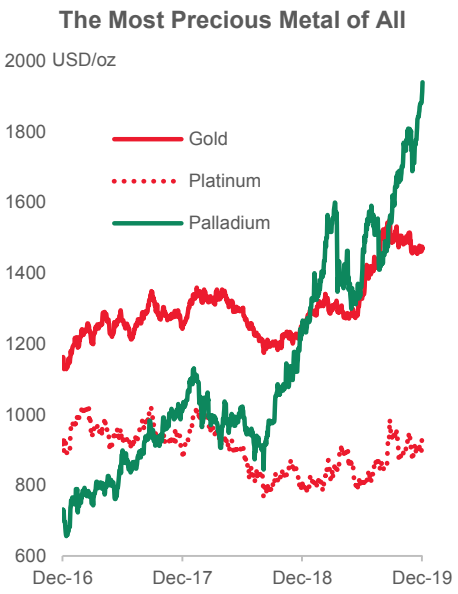
PALLADIUM: THIRD YEAR OF GAINS FOR THE EMISSIONS-CONTROL METAL

Palladium is likely the precious metal that most have heard the least about, though the silvery metal has spent the bulk of 2019 as the most precious metal of them all—breaching above $1,900 per ounce for the first time ever, well-above gold's more modest $1,450/oz (chart 3). Palladium's rally, up 54% in 2019, has also been a multi-year phenomenon and palladium is marking its third consecutive year in the #2 spot of the Nice List. Unlike its sister metals where jewelry and fine circuitry play a starring end-use role, palladium keeps far more practical company with 85% of annual consumption destined for the exhaust systems of gasoline-fueled engines. This years-long rally is a simple case of robust demand running up against inflexible supply, draining inventories and forcing consumers to pay ever-more for the metal.

Palladium is sourced primarily from Russia and South Africa, which together account for more than three-quarters of global mine output. And while it is sourced primarily in those two countries, it is almost never the primary source of production activities, rather being produced as a by-product of typically more lucrative minerals like nickel (Russia) and platinum (South Africa). Palladium's by-product status also explains why the metal is relatively unresponsive to large price changes like we've seen over the past few years—supply is typically driven more by nickel and platinum prices—which can leave markets with multi-year surpluses or, as in this case, a nearly decade-long deficit.

Palladium's demand fortunes face a funny conflict between long-term worries that electricity will displace gasoline as the primary fuel of human mobility, which would negate the need for palladium in emissions control systems, and more immediate near-term driven by tightening environmental standards in many emerging markets, which increases palladium-intensity of current production. Even in Europe, the diesel-gate

Chart 3



Sources: Scotiabank Economics, Bloomberg.

emissions scandal lead to material switching from diesel-fueled cars (which typically use platinum for emissions control) and gasoline-fueled cards (which use palladium).

Given the exceptional tightness of physical markets, stocks of palladium held for ETFs that allow investors to invest in the price of the metal by proxy are being drawn down—more than 65% over the past three years—to satisfy actual industrial demand. Speculative activity has also assisted the metal's rise, though it is notable that prices are hitting all-time highs while the net position of fund managers in palladium contracts remains only half the level of early-2018, which indicates both that industrial consumers are driving the rally and that funds still have further bullish upside. It doesn't look like there are any obvious factors that will slow palladium's price rise, with other more niche metals haven't experienced even larger price blowouts in previous tight cycles.

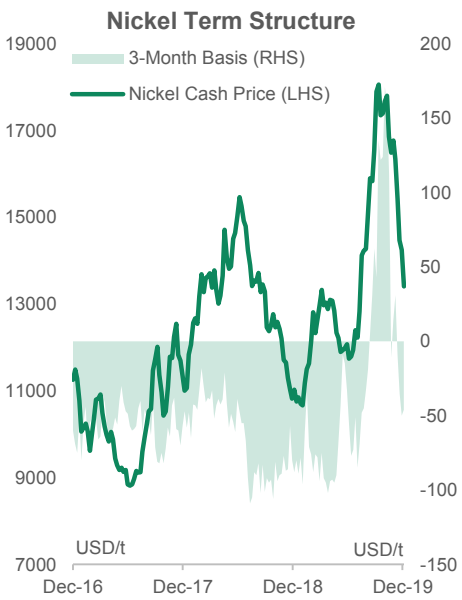
NICKEL: BREAKS FROM WEAK BASE METALS ON INDONESIAN EXPORT BAN

Nickel prices broke away from a moribund base metals complex and surged nearly 60% to a five-year high in the three months leading up to September, primarily on word that a planned ban on Indonesian raw nickel ore exports was being accelerated and would now begin in January 2020, two years ahead of the initial plan for January 2022. Indonesia has spent a good deal of time and money building out its domestic processing industry and the government believes that by accelerating the reinstatement of the raw ore export ban more feedstock will be preserved for that industry's future. The ore ban creates near-term difficulties for China's nickel pig iron (NPI) producers, though we have for a while now expected that Chinese NPI output would fall as more NPI is sourced directly from Indonesia alongside the rapid ramp-up of the country's fledging processing industry. Spot nickel markets tightened materially on the Indonesian ore ban rumour and backwardation reached its highest level since the 2006–7 bull run (chart 4), though as prices continued to rise contracts flipped back to contango and prices collapsed when traders recognized that the initial scramble has likely been overdone. Speculative sentiment toward nickel contracts helped boost the ore-export-ban rally and while positioning has dipped slightly on the fallback in prices, net position remains modestly bullish tilting price risk to the downside. Prices are still up 32% year-to-date despite the recent fallback in prices.

And while supply concerns prompted the recent rally it will likely be the demand side of the ledger that will determine the metal's medium-term fate. Despite the fact that much of Nickel's recent optimism has been wrapped up in the anticipated demand for EV batteries, current end-use remains dominated (>70%) by the stainless steel sector. On that front, things look dourer given contracting stainless production outside of China and rising inventories within China. On top of the near-term headwinds of a tougher stainless steel market, electric vehicle sentiment—which has been a structural tailwind for nickel's prospects for years now—has also dimmed on the back of weaker Chinese sales following the phase-out of especially generous purchase subsidies (more on China's EV slowdown in the Cobalt and Lithium Naughty List entry below).

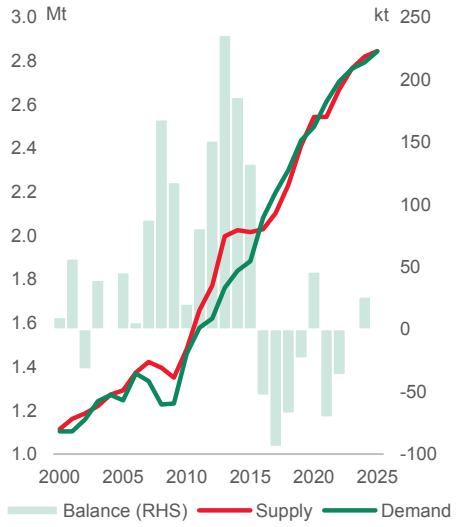
After four years of deficits the nickel market is expected to wobble around over the next half-decade (chart 5) until sources of demand like the anticipated growth of EV production tip the outlook back into deepening structural deficit. Recent market deficits have eroded inventories build up over the prior supply glut, down by two-thirds from the exceptionally high levels reached in 2018 and lifting a weight off nickel prices for the coming years.

Chart 4



Sources: Scotiabank Economics, LME.

Chart 5



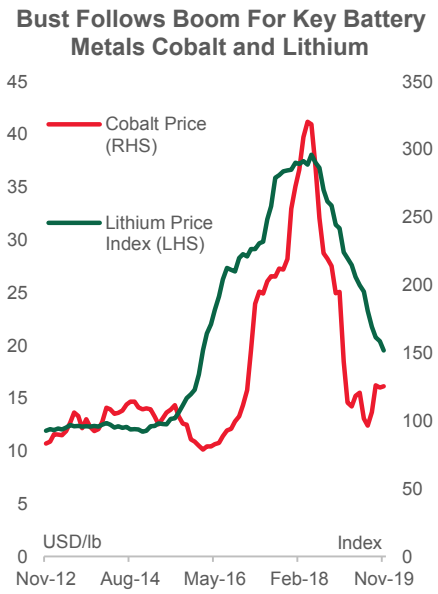
Sources: Scotiabank Economics, WoodMac.

NAUGHTY LIST

PLENTIFUL SUPPLY, WEAK BATTERY DEMAND DISAPPOINT COBALT & LITHIUM EXPECTATIONS

Despite slightly different paths in 2019, key battery materials cobalt and lithium ended 2019 together, down 37–38% year-to-date (chart 6), and for similar reasons. This weak performance is a significant reversal of fortune for the two metals, which both experienced significant gains over the past few years on concerns that supply would fail to keep up with the anticipated growth of EV sales and demand for the materials that go into their batteries. However in a classic tale of overshooting, supply advanced faster than expected given lofty prices and demand from the EV sector disappointed. These slower demand conditions come on the back of a wider downturn in global vehicle sales, particularly in China, but EVs are facing specific hurdles like Beijing's rollback of subsidies to the largest EV market in the world—roughly half of all sales.

Chart 6



Source: Scotiabank Economics, Bloomberg.

Beijing announced that it would be slashing its EV subsidies by 65% over 3 months from June 2019. Prior subsidies could stack up to as much as US$7,100 per vehicle according to media reports and the well-telegraphed end to the subsidies led to a rush for the lower-priced units, boosting sales in the spring but also leaving fewer potential buyers for the latter half of 2019 and into 2020. New Energy Vehicles (NEV)—which include battery electric, hybrid, and hydrogen fuel cell vehicles—saw sales contract steeply in each of the five months following the summer end of the subsidy programme (-44% y/y by November), following exceptional 62% y/y growth in 2018. China's EV contraction comes despite gains of more than 10% globally so far in 2019, propped up by more than one-third gains in Europe. This juxtaposition of fortunes highlights the extreme policy-sensitivity of the fledgling EV market. Chinese NEV sales are expected to stabilize and bounce back next year, though growth like we saw before the wind-down of subsidies is unlikely to be repeated again soon given weakened affordability. In the place of direct EV subsidies the government has increasingly focused its efforts on building out charging infrastructure, which while not immediately supportive for cobalt and lithium demand is a stronger structural booster to future demand growth.

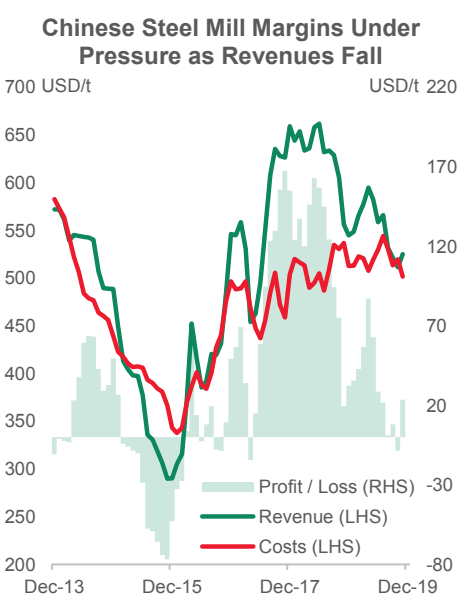
Far from the initial fears of shortages, lithium and cobalt markets appear well-supplied for next few years. Cobalt, in particular, has experienced acute production changes that leave considerable spare capacity in the global system. Glencore announced that it was winding down production at its DRC-based Mutanda project, which alone accounts for roughly one-fifth of the world's cobalt production. Before the announcement, the DRC accounted for more than 70% of the world's cobalt supply. This move managed to arrest the precipitous price declines and effectively put a floor under the market; contracts gained more than 30% in response to the news. However, this development also caps near-term upside potential given the knowledge that supply now has a quarter-market cushion to work through first. The move echoes Glencore's similar move to cut a large portion of zinc mine supply that it controlled to seize a rout in that metal back in 2015. The price decline also weighed heavily on supply from Artisanal miners, which is down by more than two-thirds given much stronger price sensitivity. Cobalt prices had reached highs of more than $40/lb before collapsing back toward $12/lb over the course of 2018 into 2019 until Glencore announced the Mutanda closure. Lithium, too, saw an index tracking prices triple to nearly 300 between mid-2015 and early-2018 before falling back by half to around 150 today.

HARD COKING COAL'S HEADY DAYS OF $200/T LIKELY BEHIND US

After spending a good deal of the past few years trading around $200/t coking coal prices have collapsed through 2019 and are nearly 40% lower than where they began he year. High prices had been supported by a variety of supply disruptions, notably extreme weather and logistical issues that weighed on Australian export capacity, as well as strong steel margins in China that supported robust demand for the fuel.

Prices began to ease as the Australian disruptions were untangled and steel margins in China began to fade, though the rout that began this past summer received additional help from Chinese import restrictions that blocked significant volumes from entering the Chinese market and backed up those supplies into a now-glutted seaborne market. Chinese steel mill margins have vanished in the latter half of the year as domestic steel prices collapsed, after peaking around $600/t as recently as July 2018 (chart 7). At the same time the steel industry outside of China isn't providing much support, leaving coking coal's future very much in the hands of Chinese policymakers. We anticipate that further government stimulus will bolster steel prices and thus mill margins next year, which will support Chinese demand into 2020. Coking coal prices look like they've found a floor around $130/t (the low end of marginal seaborne supply cost estimates) and we expect prices to gradually grind back to around $150/t in 2020 and beyond.

Chart 7



Sources: Scotiabank Economics, Bloomberg.

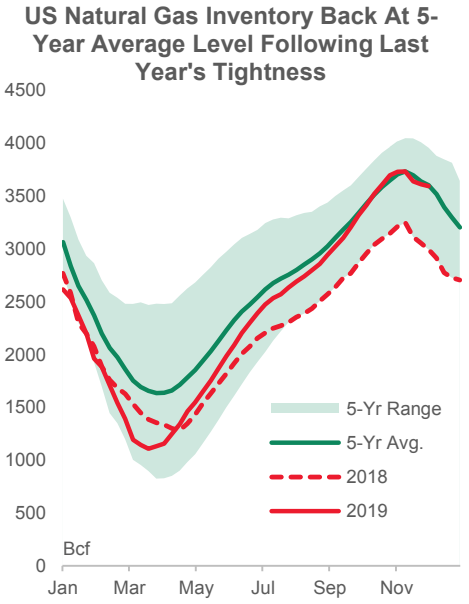
HENRY HUB ROLLER COASTER CONTINUES AS SUPPLY OUTPACES DEMAND

Henry Hub, the primary Louisiana-based natural gas benchmark for the booming North American industry, has continued its roller coaster ride through 2019, rounding out the Naughty List after topping the Nice List in 2018 and a previous Naughty List showing in 2017. Prices for front-month Henry Hub gas contracts have fallen from just shy of $3/MMBtu to $2.34/MMBtu year-to-date as voracious supply growth once again overwhelmed insufficient domestic demand gains and too-sluggish export growth. Prices are heading into January around two-decade lows and surplus gas is rapidly filling US inventories, which are back to typical levels for this time of year from last season's tight conditions (chart 8).

US natural gas production has been growing at an incredible clip over the past few years, recording average y/y gains of more than 8 billion cubic feet per day (Bcfd) over the past twelve months and total production is now flirting with all-time highs of nearly 100 Bcfd in recent months, almost double where output stood only a decade ago. This gaseous bounty is concentrated in the prolific Marcellus/Utica gas fields in the US north-east and as well as from associated gas in West Texas' Permian Basin.

Demand remains firm yet significantly lags this wave of supply, with most domestic consumption gains still concentrated in the power sector where the natural gas-fired power plants continue to ramp up as the cleaner-burning-yet-still-cheap fuel bumps coal from the power mix. Beyond domestic demand, export volumes are also running hot but once again are insufficient to absorb the full volume of gas being brought to the market. LNG export capacity is growing quickly but the much-smaller global LNG market (roughly half the size of the domestic US gas system) is absorbing excess US gas more slowly than initially anticipated, while regulatory delays are slowing the inevitable build-out of pipelines connecting prolific gas fields in the US south to Mexican markets. 2020 is likely going to be a rough year until planned expansions of LNG export capacity and new pipelines south to Mexico help add new sources of demand in 2021. An especially frigid North American winter could materially tighten balances but most forecasts are currently tilted toward mild conditions heading into the holiday season.

Chart 8



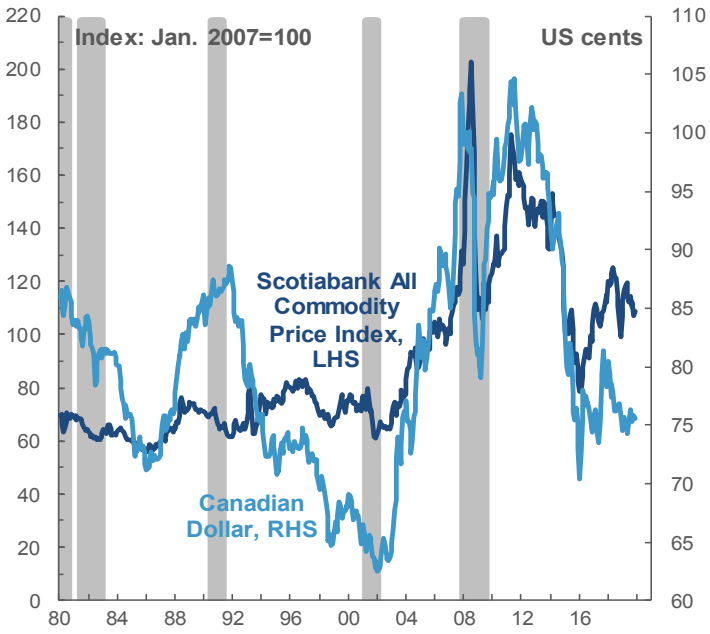
Source: Scotiabank Economics, EIA.

Price Outlook		2000–2018 Period			2019ytd	2019F	2020F	2021F
Oil & Gas		Low	Avg.	High				
Crude Oils								
West Texas Intermediate	USD/bbl	17.45	62.20	145.29	56.89	57	55	62
North Sea Brent Blend	USD/bbl	17.68	65.29	146.08	64.06	64	59	65
WCS - WTI Discount*	USD/bbl	-50.00	-17.35	-5.50	-13.37	-13	-19	-24
Natural Gas								
Nymex Henry Hub	USD/MMBtu	1.64	4.74	15.38	2.54	2.61	2.64	2.75
Metals & Minerals								
Base Metals								
Copper	USD/lb	0.60	2.41	4.60	2.72	2.70	2.75	3.00
Nickel	USD/lb	2.00	7.06	24.58	6.32	6.50	7.50	8.00
Zinc	USD/lb	0.33	0.87	2.10	1.16	1.15	1.08	1.05
Aluminium	USD/lb	0.56	0.87	1.49	0.81	0.90	0.90	0.90
Bulk Commodities								
Iron Ore	USD/t	39	101	194	94	90	72	65
Metallurgical Coal	USD/t	39	135	330	179	184	150	150
Precious Metals								
Gold	USD/toz	256	910	1,895	1,390	1,400	1,550	1,475

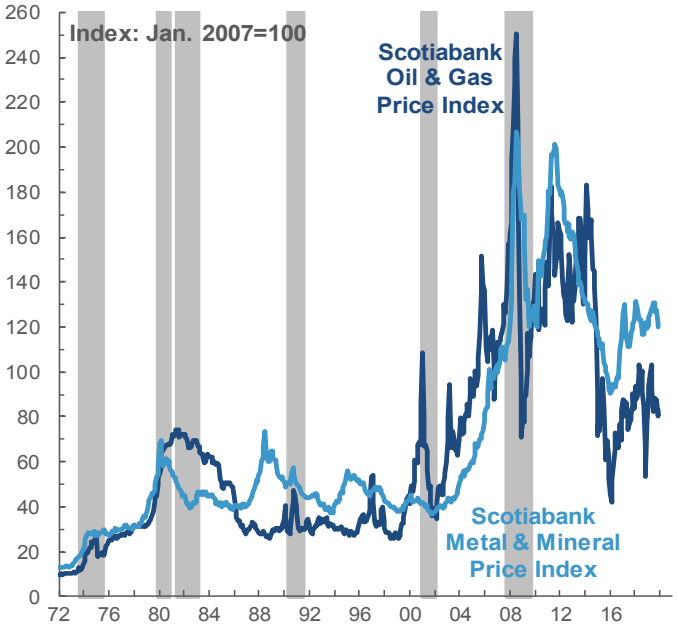
* 2008-17 average.

Scotiabank All Commodity Price Index

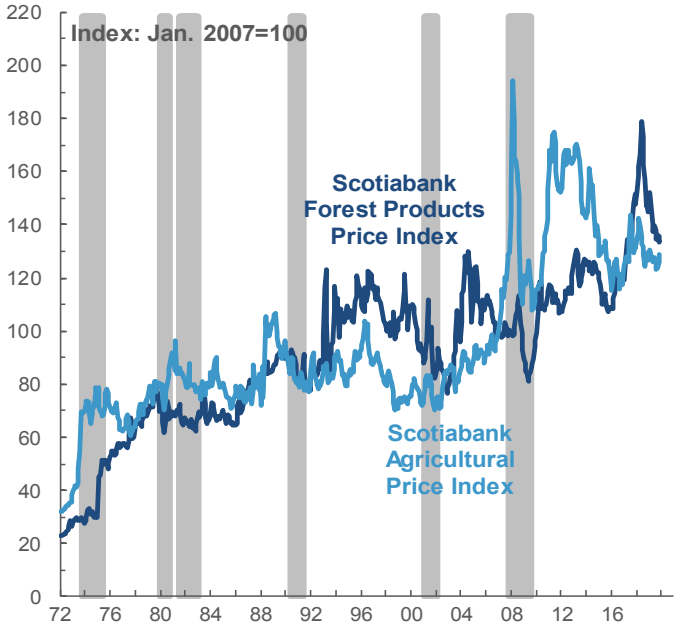
Canadian Dollar vs. Commodity Prices



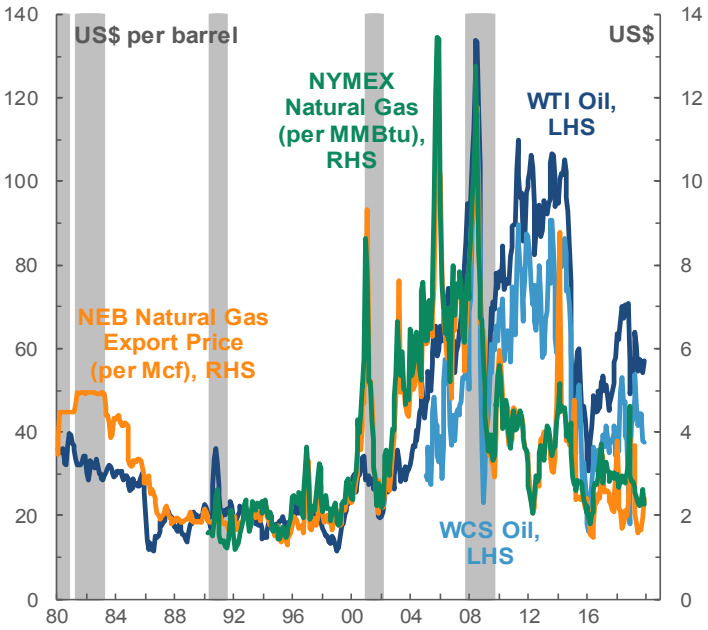
Scotiabank Oil & Gas and Metal & Mineral Indices



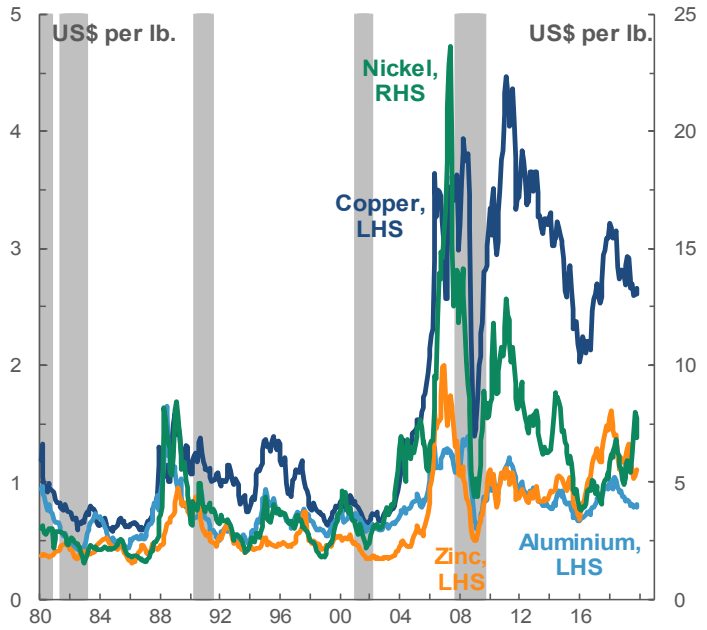
Scotiabank Forest Products & Agricultural Indices



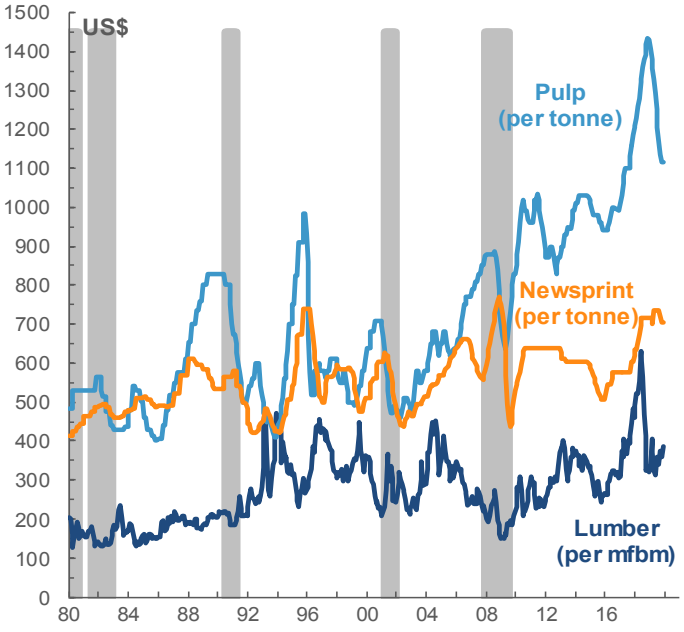
Oil & Gas Prices



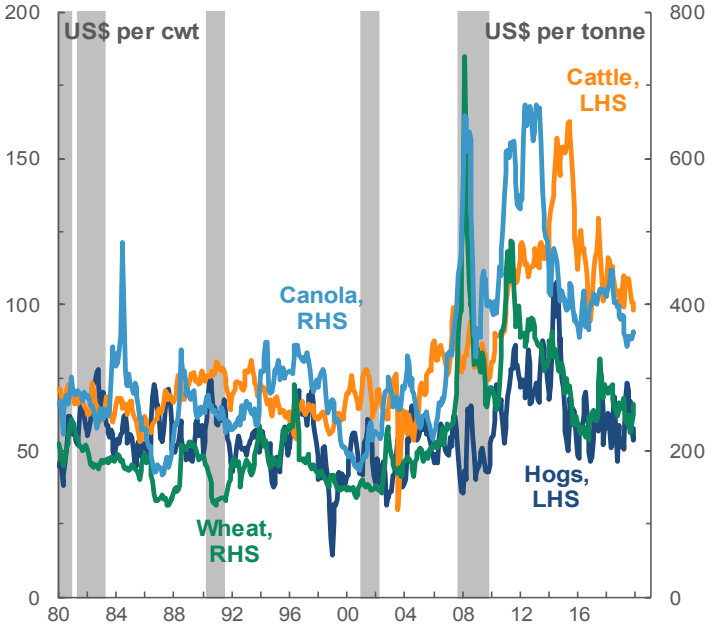
Metals Prices



Forest Products Prices



Agricultural Prices



Technical Note
Scotiabank Commodity Price Index — Principal Canadian Exports
January 2007 = 100

This Index has been designed to track the spot or transactions prices paid in U.S. dollars for key Canadian commodities and resource-based manufactured goods in export markets. The weight of each component is based upon its net export value in 2010. Prior to January 2007, the weight of each component was based on its export value in 1995-97, except for crude oil & refined petroleum products, uncoated freesheet paper and linerboard, where net exports were used. Canada imports a significant quantity of these products, and use of their export value alone would have overstated the importance in Canada's trade performance.

The following prices are included:

OIL & GAS

Crude Oil & Refined Petroleum Products (US$ per bbl) MSW light sweet crude oil at Edmonton (previously Edmonton Par crude) and Western Canadian Select heavy oil at Hardisty, Alberta; price differentials off WTI near-by futures from Bloomberg.

Natural Gas (US$ per mcf) Average export price quoted by the National Energy Board.

Natural Gas Liquids (NGLs – Propane, Butane, Ethane & Pentanes-Plus) (US$ per bbl), Propane at Edmonton & Sarnia.

METALS & MINERALS

Copper & Products (US$ per lb) LME official cash settlement price for grade A copper.

Zinc (US$ per lb) LME SHG cash settlement: prior to Sept 1990, U.S. producers' price for high-grade zinc delivered.

Lead (US$ per lb) LME official cash settlement price; prior to Jan. 1991, U.S. producers' price for common grade delivered.

Aluminium & Products (US$ per lb) since 1979, LME official cash settlement price.

Nickel (US$ per lb) since 1980, LME official cash settlement price.

Gold (US$ per oz) 'LBMA Gold Price PM' as of March 20, 2015.

Potash (US$ per tonne) Standard potassium chloride, spot price, FOB Vancouver.

Sulphur (US$ per tonne) Solid, spot price, FOB Vancouver.

Metallurgical Coal (US$ per tonne) Contract price for premium-grade hard coking coal, FOB Vancouver.

Iron Ore (US cents per dmtu) Spot price fines 62% Fe, CFR Qingdao, China; prior to Jan 2011, term-contract price for concentrates 66% Fe from Labrador/Quebec to Northern Europe (FOB Sept-Iles).

Uranium (US$ per lb) U_3O_8 near-by-futures from Bloomberg.

Molybdenum (US$ per lb) since March 1992, MW dealer oxide.

Cobalt (US$ per lb) MW dealer price.

FOREST PRODUCTS

Lumber & Wood Products, Western Spruce-Pine-Fir 2x4 No.2 & Btr (US$ per mfbm) FOB mill.

Oriented Strandboard (US$ per thousand sq. ft.), U.S. North Central region, 7/16 inch.

Pulp, Bleached Northern Softwood Kraft (US$ per tonne) Transactions price, delivery USA.

Newsprint (US$ per tonne) Average transactions price, 45 grams, delivery Eastern USA.

Groundwood Specialty Papers (US$ per ton) Supercalendered-A paper, 35 lb., delivery USA.

Linerboard (US$ per ton), delivery Eastern USA with zone discounts.

AGRICULTURE

Wheat & Flour (US$ per tonne), DNS No 1 14% protein Duluth, Minn; prior to April 2011 No.1 CWRS, 13.5% protein at St. Lawrence.

Barley (US$ per tonne), Saskatchewan aggregate spot price; historical data No. 1 at Lethbridge, Alberta.

Canola & Oilseeds (US$ per tonne) No.1 Canada, in store Vancouver.

Cattle & Beef (US$ per cwt) Steers over 1,051 pounds at Toronto; from Jan 1993, Ontario average.

Hogs & Pork (US$ per cwt) 100 Index Hogs at Toronto; from Jan 1993, Ontario average.

Fish & Seafood (US$ per lb) West Coast silver coho salmon; Atlantic lobster prices; prior to 1986 cod fillets & blocks.

Scotiabank Commodity Price Index — Components And Weights

Index Components	Net Export Value In 2010 (millions of dollars)	Index Weight (per cent)
OIL & GAS INDEX	**46,537**	**39.90**
Crude Oil & Refined Products	33,231	28.49
Natural Gas & LNG	11,741	10.07
NGLs	1,565	1.34
METAL & MINERAL INDEX	**35,109**	**30.10**
Copper	3,160	2.71
Zinc	1,255	1.08
Lead	579	0.50
Aluminium	6,045	5.18
Nickel	4,246	3.64
Gold	4,678	4.01
Coal	4,757	4.08
Iron Ore	3,346	2.87
Potash	5,161	4.42
Sulphur	457	0.39
Uranium	891	0.76
Cobalt	288	0.25
Molybdenum	246	0.21
FOREST PRODUCTS INDEX	**17,081**	**14.66**
Lumber & Wood Products	4,673	4.01
OSB	812	0.70
Pulp	6,818	5.85
Newsprint	2,734	2.34
Groundwood Spec. Papers	1,971	1.69
Linerboard	87	0.07
AGRICULTURAL INDEX	**17,901**	**15.35**
Wheat & Flour	4,693	4.02
Barley & Feedgrains	1,088	0.93
Canola & Oilseeds	5,398	4.63
Cattle & Beef	1,640	1.41
Hogs & Pork	2,378	2.04
Fish & Seafood	2,704	2.32
TOTAL INDEX	**116,643**	**100.00**