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metal&ROCK | Europe

What's Driving Gold?

Gold prices are being buffeted around by diverging rates and inflation/stagflation concerns. We look at what's priced in and where it could go from here.

Is gold over or undervalued? It depends if you are looking at real or nominal rates. Both can be used as inputs into gold price analysis, but right now, they tell very different stories. [Exhibit 1](#) illustrates this - using a regression back to 2004, the US 10y real rate at -1.06% implies gold should be pricing ~\$1870/oz. However, based on the 10Y US nominal yield at 1.57%, the price should be ~\$1540/oz. The spread between these two scenarios, at \$330/oz, is at a record high in dollar terms, and close to it as a % of the current spot gold price. This uncertainty goes some way to explain the recent gold price action and relatively muted movements in ETF holdings.

Why the disconnect between real and nominal yields? Our [strategists](#) estimate the market is pricing nearly 3 US rate hikes in 2022, driving nominal yields higher. However, real yields have disconnected, pushing inflation breakevens to the widest in nearly a decade. They attribute this to investors searching for inflation protection and **acknowledge that the stagflation narrative continues to capture attention**. In particular, they point to flattening yield curves - implying markets believe inflation is supply-side driven (leading to stagflation), rather than demand driven. On top, they note that lower real yields in the 5y sector and below "suggest that markets do not see a strong enough response from the Fed to offset the rise in inflation breakevens".

So where next? Our strategists expect the Fed to announce the start of tapering from November 15, and to acknowledge that high inflation readings could last longer at [next week's FOMC meeting](#). Price action will depend on commentary around inflation, the pace of hikes and demand. They see room for disappointment versus market expectations if the Fed emphasises that tapering is not tightening. However, with the disconnect between real and nominal yields, they think real yields still look very low on all of the valuation metrics they look at. Thus, "a mention of the rising demand impulse, or improving growth, could spark a move higher in real yields". They also call for continued strengthening of the USD, and in particular, would see higher real yields and tighter breakevens as the most USD-positive regime. Both of these could take some of the shine off gold's recent price action, in line with our forecasts outlined in [The Price Deck](#).

The bull case for gold: Although not our strategists' base case (see [Stagflation? No. Inflation? Yes](#)), we consider a stagflation scenario, with inflation persisting and some signs of demand growth slowing (US Q3 GDP up just 2% YoY and our [China team](#) cutting their 4Q GDP forecast by 70bps to 3.3% YoY). Looking at the 1970s and also 2004-2005, gold has typically performed well during stagflation ([Exhibit 5](#)). Our equities teams note that stocks are pricing in almost nothing of this bull scenario (see [here](#) and [here](#)).

MORGAN STANLEY & CO. INTERNATIONAL PLC+

Amy Sergeant, CFA

EQUITY ANALYST AND COMMODITIES STRATEGIST

Amy.Sergeant@morganstanley.com +44 20 7677-6937

Dan Shaw

EQUITY ANALYST

Dan.Shaw@morganstanley.com +44 20 7425 5853

RMB MORGAN STANLEY PROPRIETARY LIMITED+

Jared Hoover

EQUITY ANALYST

Jared.Hoover@rmbmorganstanley.com +27 11 282-1082

MORGAN STANLEY & CO. INTERNATIONAL PLC+

Marius van Straaten

COMMODITY STRATEGIST

Marius.Van.Straaten@morganstanley.com +44 20 7677-5632

Martijn Rats, CFA

EQUITY ANALYST AND COMMODITIES STRATEGIST

Martijn.Rats@morganstanley.com +44 20 7425-6618

Exhibit 1: Real and nominal yields tell different narratives about the gold price

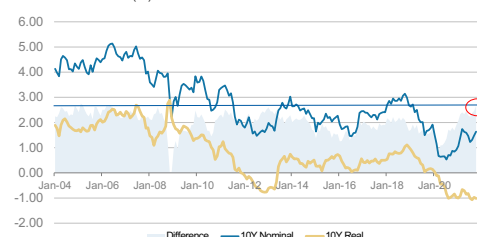
Gold and Implied Gold Price (\$/oz)



Source: Bloomberg, Morgan Stanley Research

Exhibit 2: Real yields have disconnected from nominal yields

10Y and Real Rates (%)



Source: Bloomberg, Morgan Stanley Research

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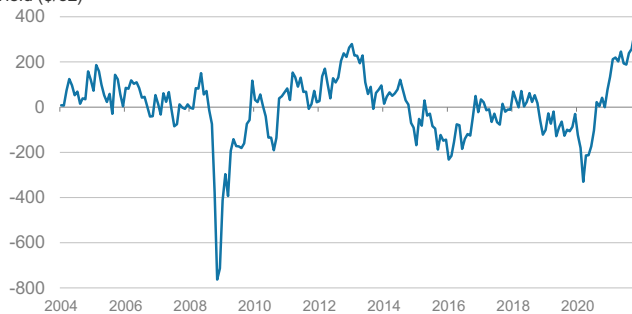
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Additional Charts

Exhibit 3: The disconnect between real and nominal implied gold price is at a record level in \$ terms

Difference between implied Gold price on 10Y Real vs Nominal Yield (\$/oz)



Source: Bloomberg, Morgan Stanley Research

Exhibit 4: Inflation breakevens are also at decade highs

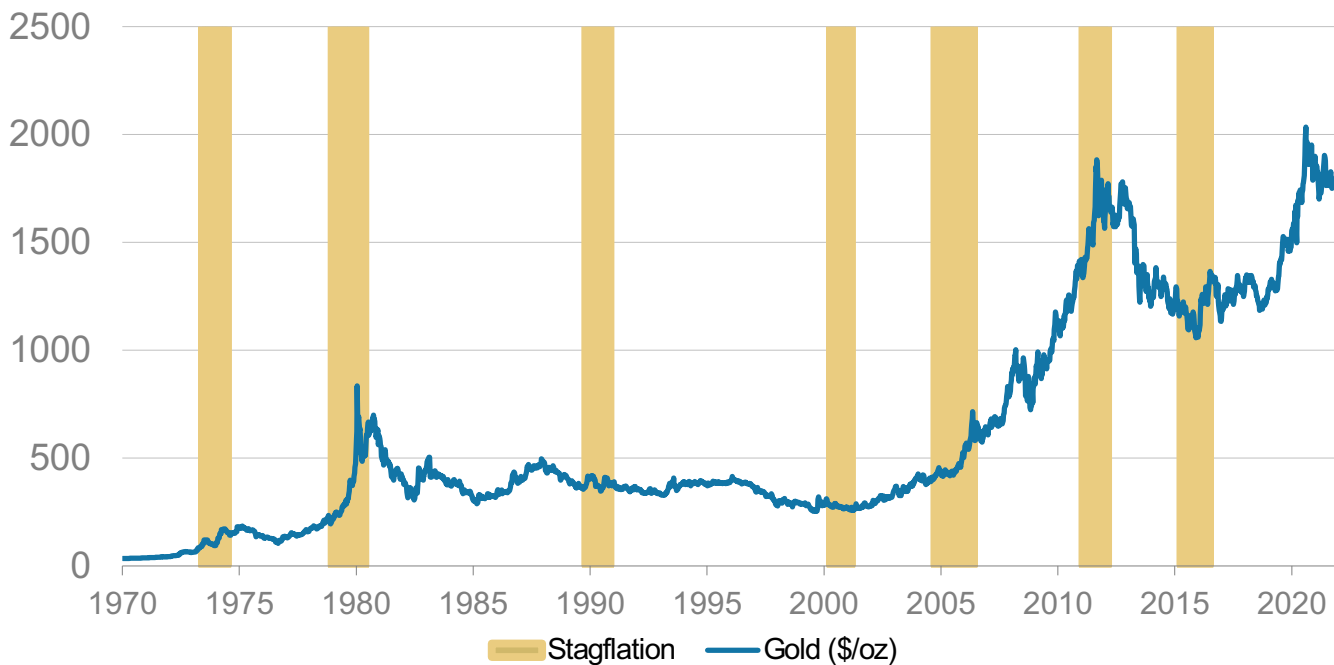
Difference between 10y Nominal and Real Rate (%)



Source: Bloomberg, Morgan Stanley Research

Exhibit 5: Stagflationary periods have typically been supportive for gold prices

Gold Price (\$/oz) and Stagflation



Source: Note: Stagflation periods based loosely on periods highlighted by WGC data from <https://www.gold.org/goldhub/research/investment-update-stagflation-rears-its-ugly-head>

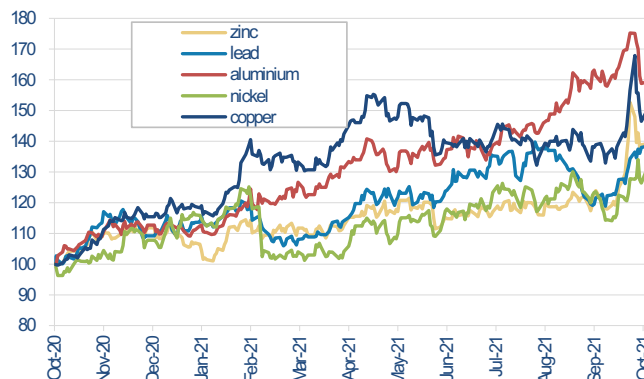
Week in Review

Base Metals: Base metal prices continued to come under pressure, led by aluminium and zinc as China proposed price controls on coal prices and pushed for higher supply. Copper held up on a relative basis as LME available inventories remain low. Our economists have revised their Q4 China GDP growth forecast down by 70bps to 3.3%.

Precious Metals: Gold hovered around \$1,800/oz as real rates weakened. Both platinum and palladium moved lower as uncertainty remains around the chip shortage recovery (see [Weekly Widget](#)).

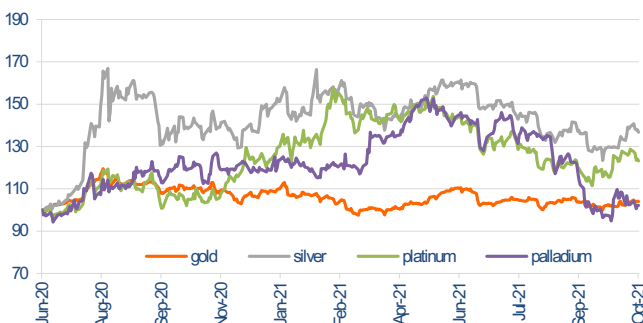
Bulks : The iron ore price continued to trade lower, ending the week at \$107/t, as further blast furnace restrictions were enforced in Tangshan and China's iron ore port stocks expanded by almost 5Mt (+3%) on the week. Seaborne thermal coal prices came under further pressure, as the domestic sell-off on the back of China's proposed price cap spilled over in the seaborne market. Despite the sliding thermal coal price, met-coal held up well, as the market remains tight.

Exhibit 6: Base metals price indices (12-mth rolling)



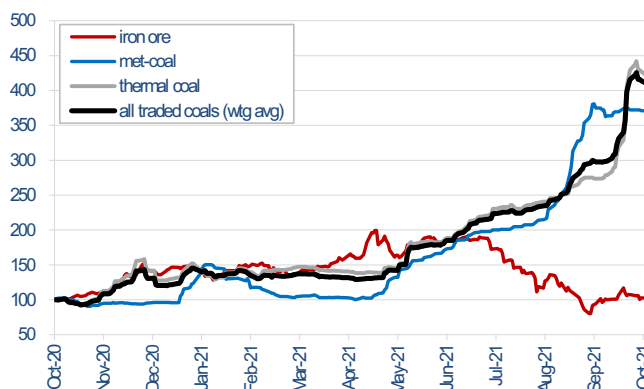
Source: Bloomberg, Morgan Stanley Research

Exhibit 7: Precious metals indices



Source: Bloomberg, Morgan Stanley Research

Exhibit 8: Bulk commodity price indices (12-mth rolling)



Source: Platts, Bloomberg, Morgan Stanley Research

Morgan Stanley Price Forecasts




Exhibit 9: Summary of Morgan Stanley's commodity price forecasts (as at 28 Sep 2021)

commodity group	unit	1Q 21	2Q 21	3Q 21e	4Q 21e	1Q 22e	2Q 22e	3Q 22e	4Q 22e	2020	2021e	2022e	2023e	2024e	2025e	LT real	LT nom.
Base Metals																	
Aluminium	US\$/lb	0.95	1.09	1.20	1.36	1.30	1.28	1.18	1.13	0.77	1.15	1.22	1.05	1.10	1.15	0.93	1.05
	US\$/t	2,094	2,396	2,638	2,998	2,866	2,822	2,601	2,491	1,704	2,532	2,695	2,315	2,425	2,535	2,050	2,323
Copper	US\$/lb	3.85	4.39	4.26	4.15	4.00	3.85	3.60	3.20	2.80	4.16	3.66	3.05	3.11	3.19	2.82	3.20
	US\$/t	8,490	9,679	9,394	9,149	8,818	8,488	7,937	7,055	6,178	9,178	8,074	6,724	6,862	7,022	6,217	7,045
Nickel	US\$/lb	7.96	7.87	8.68	9.00	8.75	8.50	8.00	7.50	6.26	8.38	8.19	6.81	7.54	7.80	6.90	7.82
	US\$/t	17,545	17,354	19,147	19,842	19,290	18,739	17,637	16,535	13,794	18,472	18,050	15,019	16,617	17,196	15,212	17,238
Zinc	US\$/lb	1.25	1.32	1.36	1.35	1.25	1.15	1.10	1.08	1.03	1.32	1.15	1.05	1.08	1.10	1.05	1.19
	US\$/t	2,749	2,913	2,990	2,976	2,756	2,535	2,425	2,381	2,267	2,907	2,524	2,320	2,370	2,414	2,315	2,623
Lead	US\$/lb	0.91	0.96	1.06	1.03	1.00	0.95	0.90	0.85	0.83	0.99	0.93	0.80	0.80	0.84	0.80	0.91
	US\$/t	2,011	2,125	2,340	2,271	2,205	2,094	1,984	1,874	1,825	2,186	2,039	1,764	1,764	1,852	1,764	1,999
Precious Metals																	
Gold	US\$/oz	1,795	1,814	1,792	1,725	1,675	1,650	1,600	1,560	1,769	1,782	1,621	1,550	1,475	1,390	1,155	1,309
Silver	US\$/oz	26.2	26.7	24.4	23.0	22.9	23.6	22.9	22.3	20.5	25.1	22.9	22.2	21.1	22.0	20.0	22.6
Platinum	US\$/oz	1,165	1,187	1,031	950	1,000	1,040	1,080	1,120	888	1,083	1,060	1,245	1,375	1,375	1,100	1,247
Palladium	US\$/oz	2,419	2,798	2,490	2,000	2,150	2,300	2,150	2,000	2,208	2,427	2,150	1,538	1,219	1,233	1,100	1,247
Bulks																	
Iron Ore (fines 62% Fe, cfr N.China)	US\$/t	167	200	155	85	90	110	95	85	108	152	95	81	61	63	56	63
Hard Coking Coal (spot, fob Aus)	US\$/t	128	138	270	340	270	220	170	180	125	219	210	151	144	145	134	152
Thermal coal (spot, fob Newc)	US\$/t	87	107	165	190	170	150	130	120	60	137	143	95	75	76	69	78
Other																	
Manganese ore (44%)	US\$/mtu	5.1	5.0	5.2	5.2	5.0	5.0	5.0	5.0	4.6	5.1	5.0	4.9	4.7	4.5	4.1	4.6
Alumina (spot, fob Aus)	US\$/t	299	277	322	380	340	290	285	285	271	319	300	288	304	320	321	364
Lithium carbonate (contract, fob Chile)	US\$/t	7,505	9,167	11,500	13,000	14,000	15,000	13,000	11,000	6,859	10,293	13,250	8,563	7,000	7,050	6,590	7,468
Cobalt	US\$/lb	21.9	20.8	23.5	23.0	20.0	19.0	18.0	18.0	16.2	22.3	18.8	17.3	15.0	16.0	15.0	17.0
Uranium - spot	US\$/lb	28.9	30.6	35.0	55.0	45.0	40.0	37.0	37.0	29.7	37.4	39.8	41.0	48.5	45.8	35.0	39.7
Exchange Rates																	
1 AUD = USD		0.77	0.77	0.74	0.75	0.75	0.75	0.75	0.75	0.69	0.76	0.75	0.75	0.74	0.73	0.71	0.72
1 USD = BRL		5.47	5.29	5.22	5.11	5.08	5.15	5.15	5.11	5.14	5.27	5.12	5.15	5.21	5.28	5.39	5.39
1 USD = CAD		1.27	1.23	1.26	1.25	1.26	1.27	1.29	1.30	1.34	1.25	1.28	1.29	1.27	1.25	1.26	1.23
1 USD = ZAR		14.96	14.12	14.61	14.50	14.91	15.33	15.74	16.15	16.42	14.55	15.53	17.19	18.47	19.12	15.60	20.10
1 EUR = USD		1.21	1.21	1.18	1.18	1.19	1.19	1.19	1.19	1.14	1.19	1.19	1.20	1.21	1.22	1.31	1.23
1 USD = CNY		6.48	6.46	6.47	6.25	6.24	6.23	6.22	6.20	6.90	6.42	6.22	6.25	6.33	6.41	6.48	6.52

Source: LME, Bloomberg, Platts, Morgan Stanley Research estimates (e). Exchange rate forecasts are the assumptions that are compiled and used by Global Resources Equity Team; all prices are nominal, unless otherwise indicated.

Commodity Thermometer

Exhibit 10: Metals & Mining Commodity Thermometer

Rating	Commodity	Bearish	Neutral	Bullish	Thesis
6	Lithium Carbonate				Surging EV demand leaves supply to play catch-up, significantly tightening the market. We see this as transitory, with price gradually normalising from 2Q22.
5	Uranium				Physical investor buying is likely to extend the current price rally, but we see the recent rate of inflows as unsustainable, and expect a price correction through 2022.
4	Platinum				Rebalancing ahead, driven by platinum for palladium substitution, further heavy duty/diesel emission tightening and industrial demand strength, while recycled supply capacity stays constrained.
4	Aluminum				China's power challenges keep aluminium supplies tight and prices supported over winter, but pressure should ease into 2022 as power and logistical constraints ease.
4	Palladium				Some upside on 2022/23 deficit and inflection in global auto production, but longer-term structural challenges.
4	Nickel				Price impact of slowing demand from China's stainless steel production cuts is offset by the looming risk of an Indonesian export ban, providing price support into 1H22.
3	Silver				Some room to outperform versus gold on industrial demand as autos production rates improve, but overhang from higher rates and stronger USD.
3	Lead				Ex-China balance remains tight, and high freight rates prevent surplus volumes flowing from China. Expect price to ease in 2022 as mine supply recovers.
3	Manganese Ore				We see a further loosening of a market that is already weighed down by higher inventories, and expect limited price upside.
3	Thermal Coal				China's continued coal shortage and seaborne supply disruptions should keep the market tight and price relatively resilient.
2	Copper				Underpinned by China restocking demand and sentiment drivers around COP26 and infrastructure stimulus, but supply growth drives surplus in 2022-23. Long-term structural demand story remains intact.
2	Gold				Higher rates partly priced in but our economists call for further increases as asset purchase tapering starts, driving a stronger USD and weighing on the gold price.
2	Alumina				Supply disruptions should ease in 2022 as Jamalco and Alumar return to full production. Keep an eye on China refinery versus smelter cuts for future balance.
1	Zinc				We see price supported in Q4 as China power shortages keep production constrained but zinc's exposure to steel end markets means demand headwinds are building, weighing on price into 2022.
1	Cobalt				Accelerating mine supply growth, as the rate of demand growth eases, should tip the market back into surplus.
1	Hard Coking Coal				Looking overpriced vs iron ore now, but the supply recovery and easing of elevated price is likely to take time.
1	Iron Ore				We believe iron ore can dip further into 4Q/1Q, but expect a bounce by 2Q22, as China's steel production curbs are lifted and infrastructure stimulus filters through.

Source: Morgan Stanley Research. Note order of preference based on MSe 1Q22e vs 3Q21e average prices

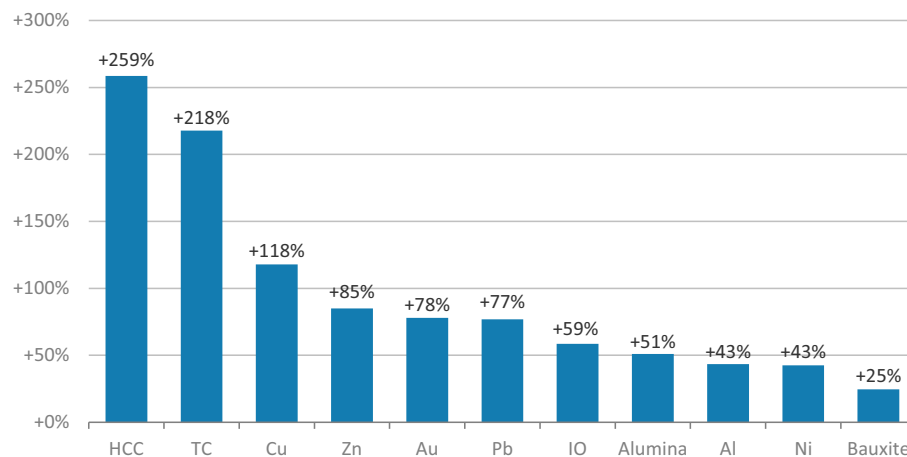
Recent Reports + Upcoming Events

Recent Research	Date
Commodity Matters: 10 Takeaways from Magnesium Expert Call	25-Oct-21
metal&ROCK: Defiant nickel	25-Oct-21
Commodity Matters: Magnesium Madness	20-Oct-21
Commodity Matters: Lessons from the iron ore majors	20-Oct-21
Commodity Matters: China coal supply uplift?	19-Oct-21
metal&ROCK: P + P = P	18-Oct-21
Commodity Matters: Iron ore – lifting the floor	13-Oct-21
Commodity Matters: Zinc - A tightening European market	13-Oct-21
China Materials: Sep Trade Data – Material Rebound in Coal Imports	13-Oct-21
metal&ROCK: Iron ore – more downside	11-Oct-21
metal&ROCK: Aluminium: Staying Tight	04-Oct-21
metal&ROCK: The Price Deck – 4Q 2021	28-Sep-21
metal&ROCK: Nickel's next supply shock	20-Sep-21
metal&ROCK: Uranium rediscovered	13-Sep-21
Rust Review: A rapidly loosening market	07-Sep-21
Commodity Matters: Alumina awakes	07-Sep-21
metal&ROCK: Met-coal rebuffs iron ore	31-Aug-21
metal&ROCK: Commodities – Seeking entry	23-Aug-21
Commodity Matters: Iron ore – washout	19-Aug-21
metal&ROCK: Thermal coal's relentless rally	16-Aug-21
metal&ROCK: Iron ore's bear market lessons	09-Aug-21
China Materials: Jul Trade Data – Softened Steel Exports	08-Aug-21
Metal & Rock: Copper – Triple Supply Threat	02-Aug-21

Exhibit 11: Upcoming China economic data relevant to Commodities

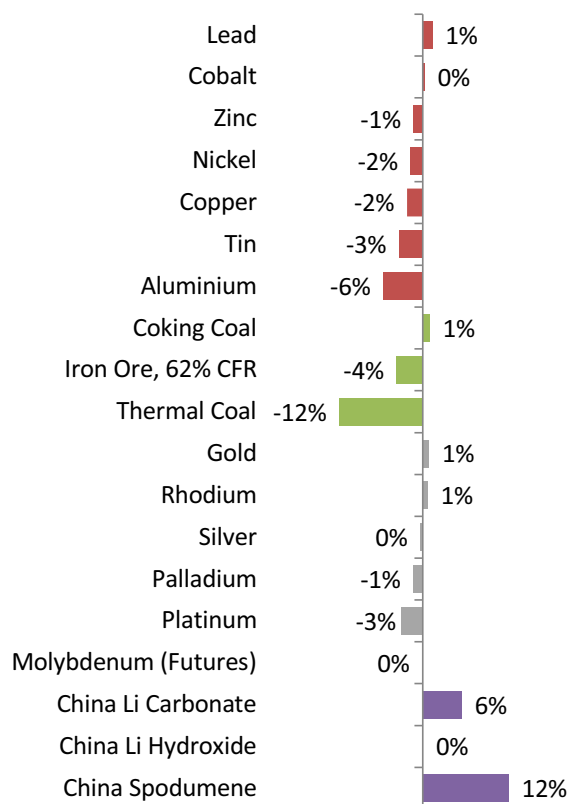
Date	Event
7-Nov	Exports YoY CNY
7-Nov	Imports YoY CNY
7-Nov	Trade Balance CNY
10-Nov	CPI YoY

Source: Bloomberg, Morgan Stanley Research

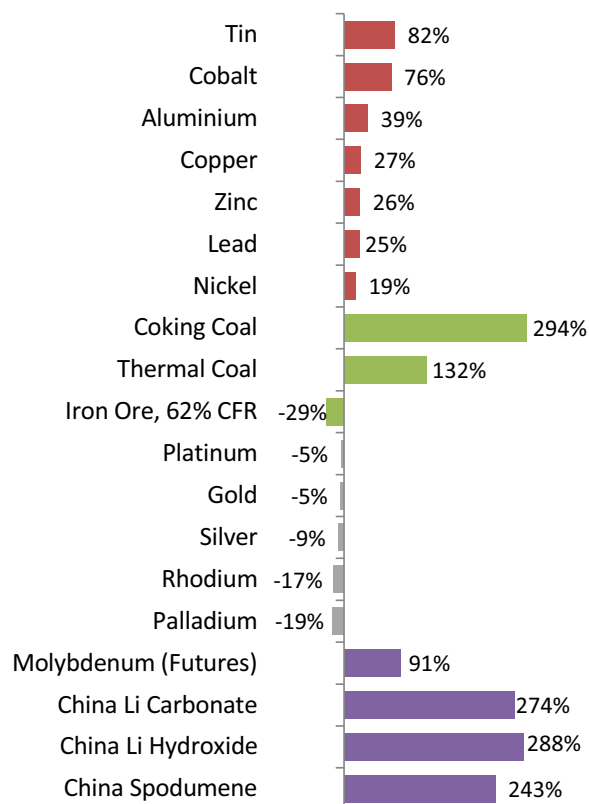
Exhibit 12: Spot commodity prices vs. the marginal cost of production

Source: Wood Mackenzie, Bloomberg, Morgan Stanley Research. Note: Marginal cost (year 2021); dataset Q3 2021; C1 cash costs. Coal dataset is 3Q 2021.

Commodity Price Snapshot

Exhibit 13: Key metals: one-week absolute performance, 21-Oct-21 to 28-Oct-21

Source: Bloomberg, Morgan Stanley Research

Exhibit 14: Key metals: YTD absolute performance, through 28-Oct-21

Source: Bloomberg, Morgan Stanley Research

Exhibit 15: Base Metals: price snapshot

Base Metals	28-Oct-21	21-Oct-21	WoW Change (%)
Copper	4.47	4.57	-2.2%
Aluminium	1.24	1.31	-5.6%
Zinc	1.56	1.58	-1.3%
Nickel	8.93	9.08	-1.7%
Lead	1.12	1.10	1.3%
Tin	16.95	17.53	-3.3%
Cobalt	25.52	25.45	0.3%

Source: Bloomberg, Morgan Stanley Research; WoW = Week on week

Exhibit 16: Bults: price snapshot

Bults	28-Oct-21	21-Oct-21	WoW Change (%)
Iron Ore, 62% CFR	113.2	117.5	-3.7%
Thermal Coal	132.5	150.1	-11.8%
Coking Coal	404.0	400.0	1.0%

Source: Bloomberg, Morgan Stanley Research; WoW = Week on week

Exhibit 17: Precious Metals & PGMs: price snapshot

Precious Metals and PGMs	28-Oct-21	21-Oct-21	WoW Change (%)
Gold	1,799	1,783	0.9%
Silver	24.08	24.16	-0.3%
Platinum	1,021	1,053	-3.0%
Palladium	1,991	2,018	-1.3%
Rhodium	14,100	14,000	0.7%

Source: Bloomberg, Morgan Stanley Research; WoW = Week on week

Exhibit 18: Other Metals: price snapshot

Other	28-Oct-21	21-Oct-21	WoW Change (%)
Molybdenum, LME Cash (US\$/lb)	19.1	19.2	-0.1%
Uranium UxC-Ux U3O8 Spot (US\$/lb)	43.1	43.1	0.0%
China Lithium Carbonate 99.5% Ex-VAT (US\$/t)	25,962.7	24,608.6	5.5%
China Lithium Hydroxide 56.5% Ex-VAT (US\$/t)	24,614.0	24,608.6	0.0%
China Spodumene 5% min CIF Ex-VAT (US\$/t)	1,198.3	1,069.0	12.1%

Source: Bloomberg, Morgan Stanley Research; WoW = Week on week

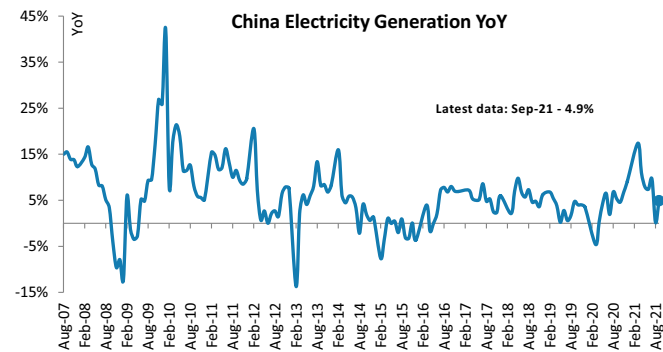
Exhibit 19: Exchange rate snapshot of major metal-producing countries

FX Rates of Key Commodity Countries	28-Oct-21	21-Oct-21	WoW Change (%)
1 AUD = USD (Australian \$)	0.75	0.75	1.0%
1 EUR = USD (Euro)	1.17	1.16	0.5%
1 USD = BRL (Brazilian Real)	5.65	5.66	-0.3%
1 USD = CAD (Canadian \$)	1.23	1.24	-0.2%
1 USD = CLP (Chilean Peso)	806	818	-1.4%
1 USD = CNY (Chinese Renmimbi)	6.39	6.39	0.0%
1 USD = KZT (Kazakh Tenge)	428	426	0.4%
1 USD = MXN (Mexican Peso)	20.37	20.30	0.3%
1 USD = NOK (Norwegian Krone)	8.33	8.36	-0.4%
1 USD = PEN (Peruvian New Sol)	3.98	3.95	0.8%
1 USD = SEK (Swedish Krona)	8.52	8.60	-1.0%
1 USD = ZAR (S. African Rand)	15.13	14.69	3.0%
1 USD = ZMW (Zambian Kwacha)	17.24	17.10	0.8%

Source: Bloomberg, Morgan Stanley Research; WoW = Week on week

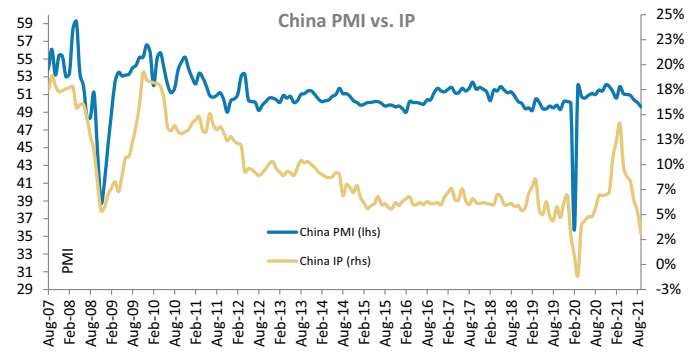
China's Macro Indicators

Exhibit 20: China's electricity generation



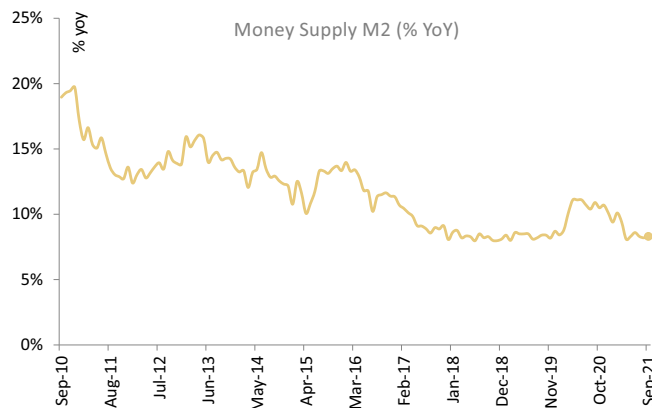
Source: CEIC, Morgan Stanley Research

Exhibit 21: China's Purchasing Managers Index and Industrial Production (IP)



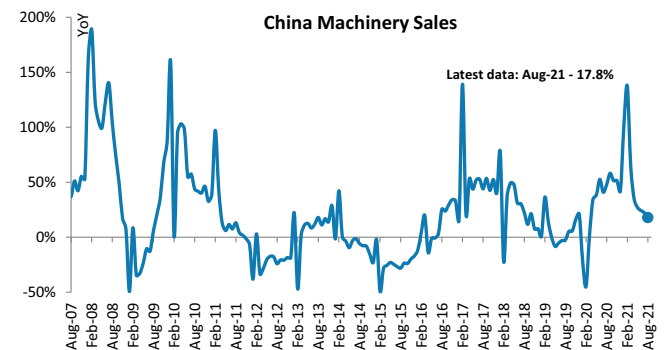
Source: CEIC, Morgan Stanley Research

Exhibit 22: China's M2 money supply



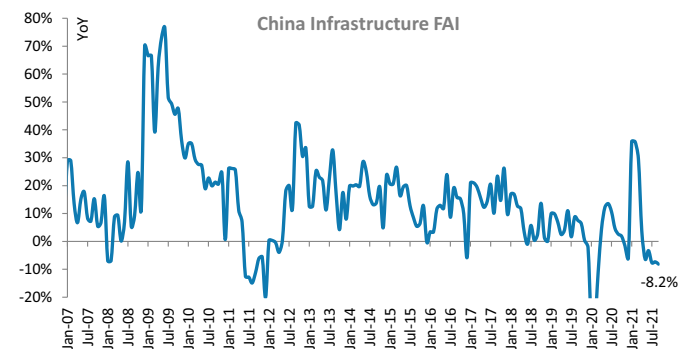
Source: CEIC, Morgan Stanley Research

Exhibit 23: China's machinery sales



Source: CEIC, Morgan Stanley Research

Exhibit 24: China's Infrastructure Fixed Asset Investments (FAI)



Source: CEIC, Morgan Stanley Research

Exhibit 25: China's land sales



Source: CEIC, Morgan Stanley Research

Exhibit 26: China's floor space started and sold vs floor space completed

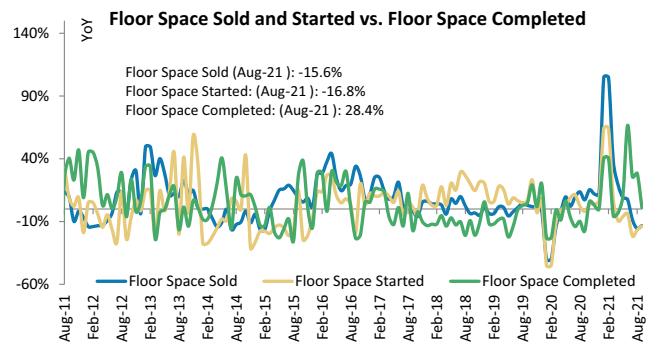


Exhibit 27: Floor space completed by type of establishment

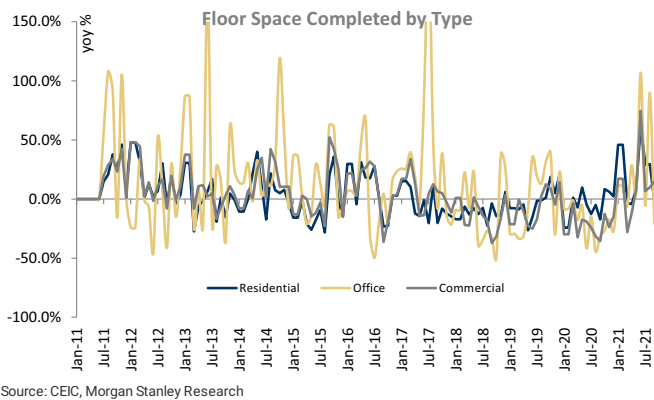


Exhibit 28: China's national average property sales

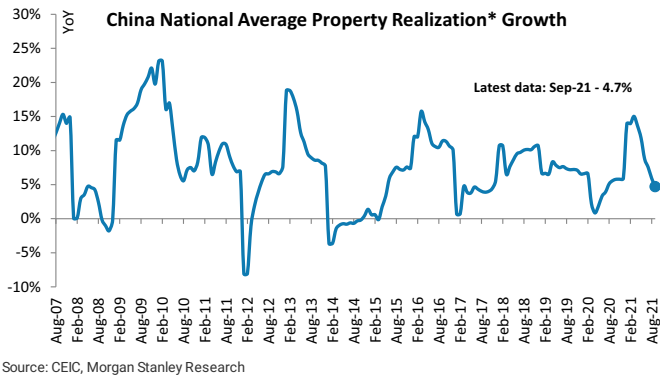
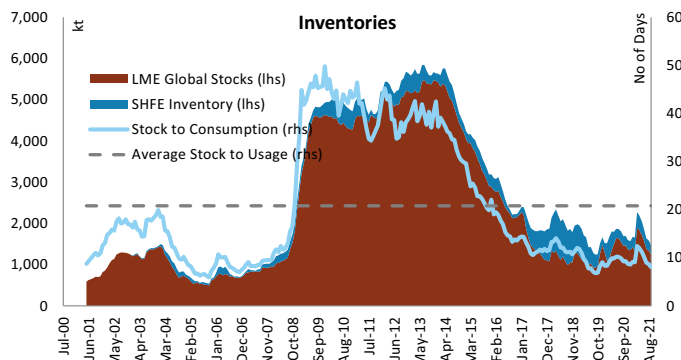


Exhibit 29: MS China Economic Index vs. China IP



Aluminium

Exhibit 30: Aluminium exchange inventories and days of consumption



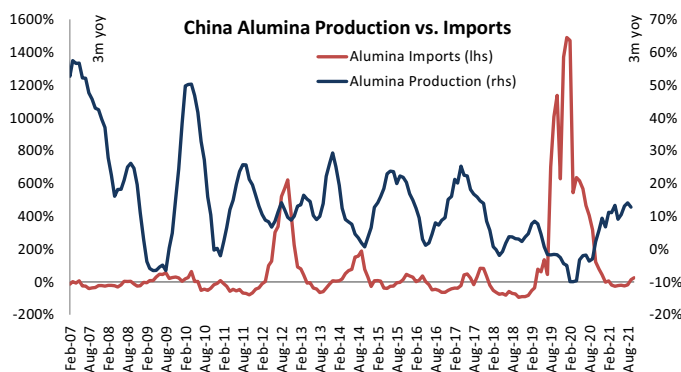
Source: Bloomberg, WBMS, Morgan Stanley Research

Exhibit 31: China's apparent consumption vs. price



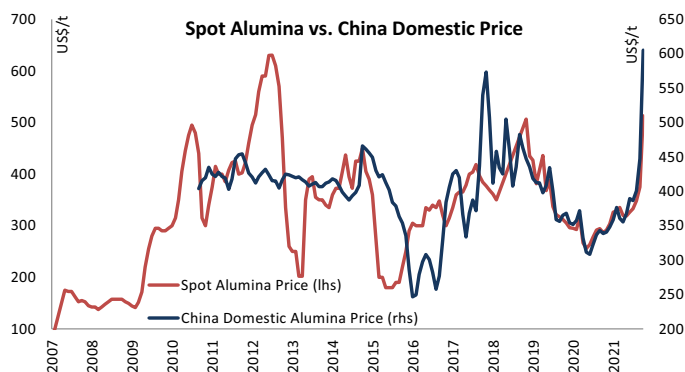
Source: Bloomberg, Morgan Stanley Research

Exhibit 32: Raw materials: China's alumina production vs. imports



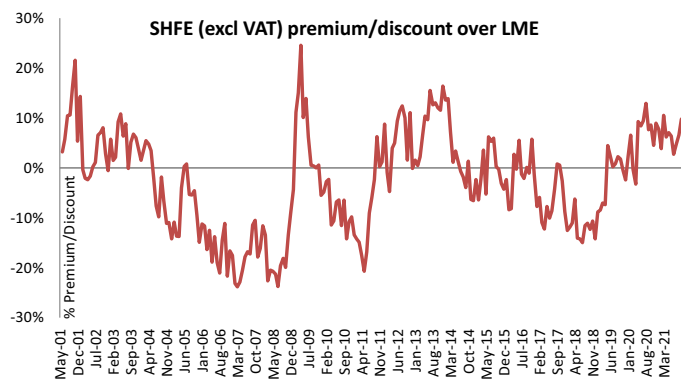
Source: Bloomberg, Morgan Stanley Research

Exhibit 33: Raw materials: spot alumina vs. China's domestic price



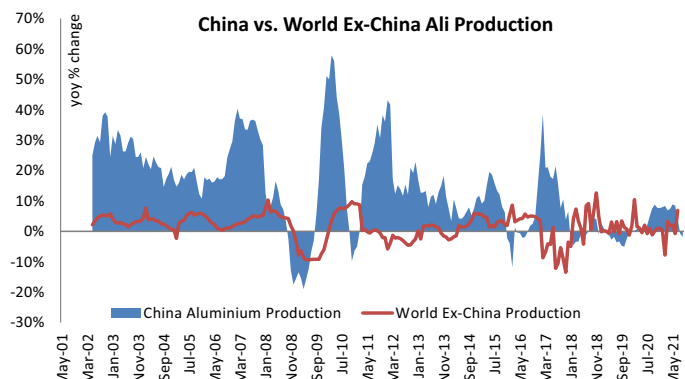
Source: Bloomberg, Morgan Stanley Research

Exhibit 34: Price differentials: SHFE vs. LME

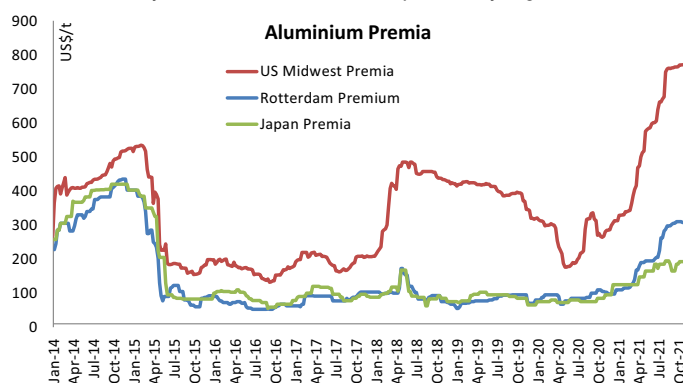


Source: Bloomberg, Morgan Stanley Research

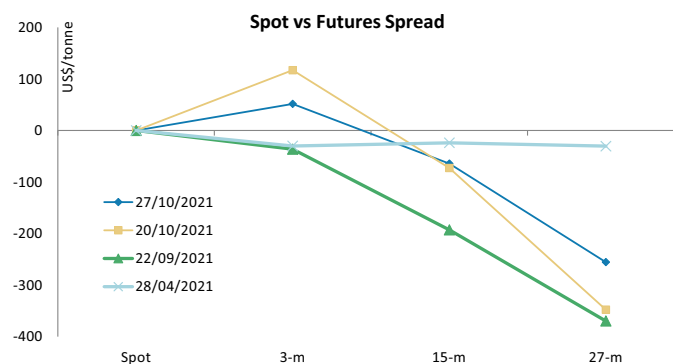
Exhibit 35: Aluminium world production ex-China



Source: Bloomberg, Morgan Stanley Research

Exhibit 36: Physical demand: aluminium premia, by region


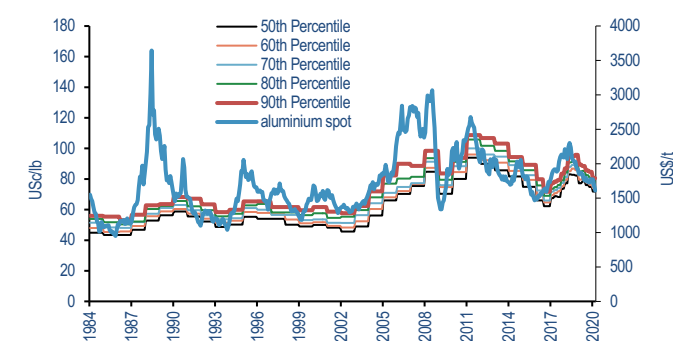
Source: Bloomberg, Morgan Stanley Research

Exhibit 37: Contango vs. Backwardation: aluminium futures curve movement


Source: Bloomberg, Morgan Stanley Research

Exhibit 38: China's aluminium exports, by product type

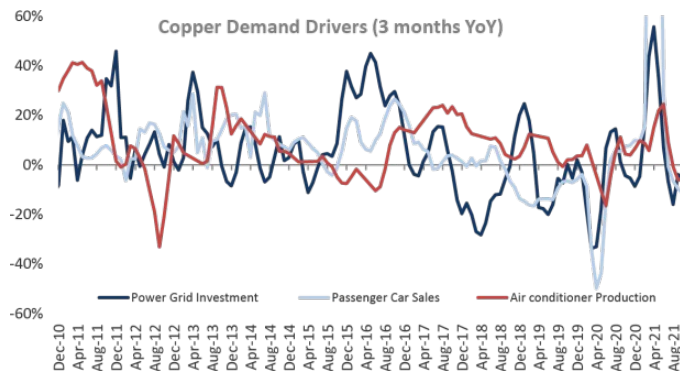

Source: Bloomberg, Morgan Stanley Research

Exhibit 39: Aluminium cost curve evolution


Source: Wood Mackenzie, Morgan Stanley Research

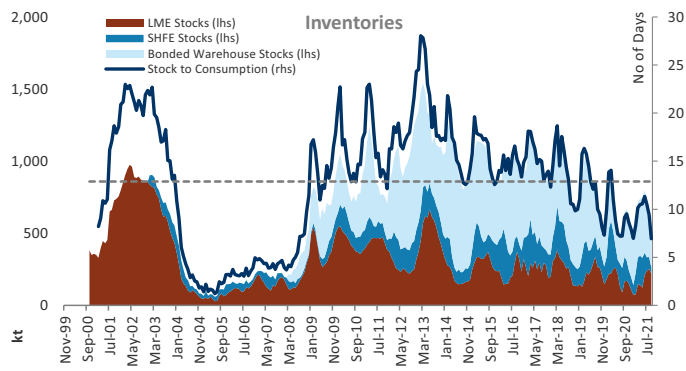
Copper

Exhibit 40: China demand – grid investments, car sales, and air conditioner sales



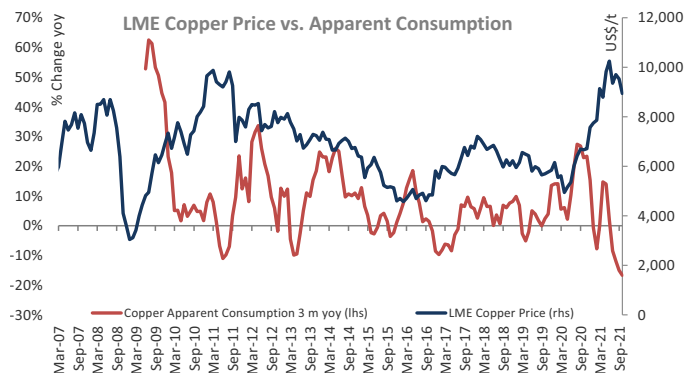
Source: Bloomberg, Morgan Stanley Research

Exhibit 41: Copper exchange and bonded warehouse inventories vs. days of consumption



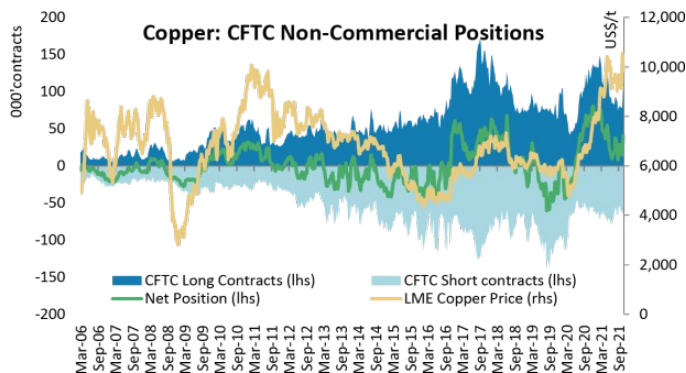
Source: Bloomberg, Morgan Stanley Research

Exhibit 42: China's copper price vs. apparent consumption



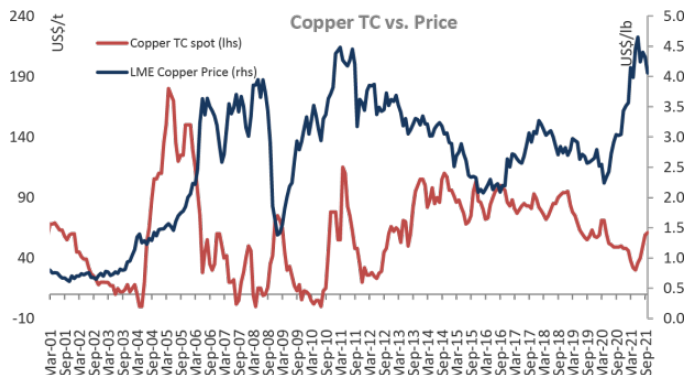
Source: Bloomberg, Morgan Stanley Research, * Apparent Consumption is calculated as refined production less net exports and change in SHFE stocks.

Exhibit 43: CFTC speculative net length



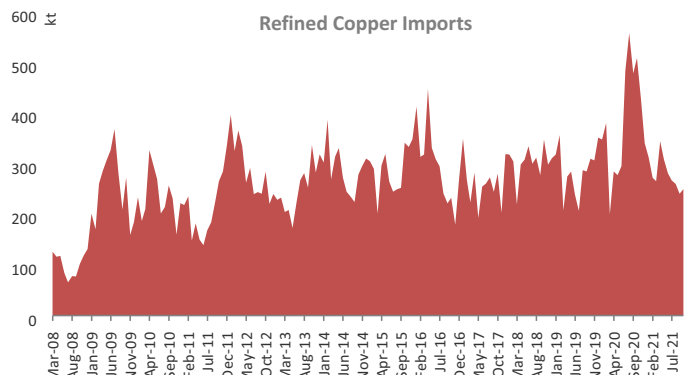
Source: Bloomberg, CFTC, Morgan Stanley Research

Exhibit 44: Copper treatment charges (TCs) vs. price



Source: Bloomberg, Wood Mackenzie, Morgan Stanley Research

Exhibit 45: China's refined copper imports



Source: Bloomberg, Wood Mackenzie, Morgan Stanley Research

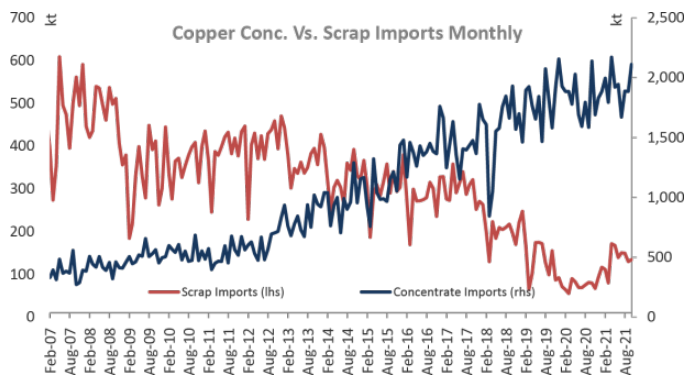
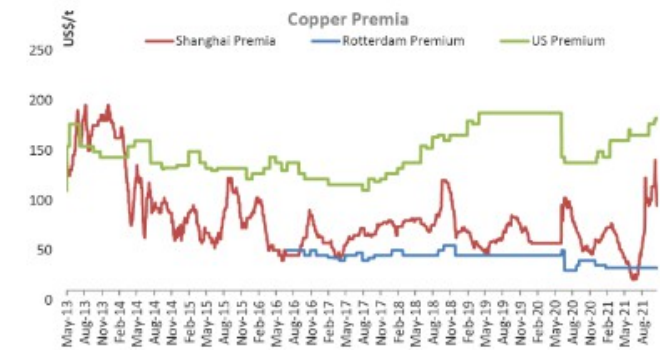
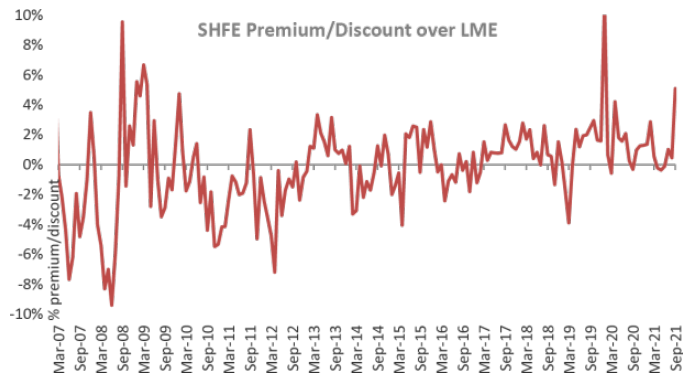
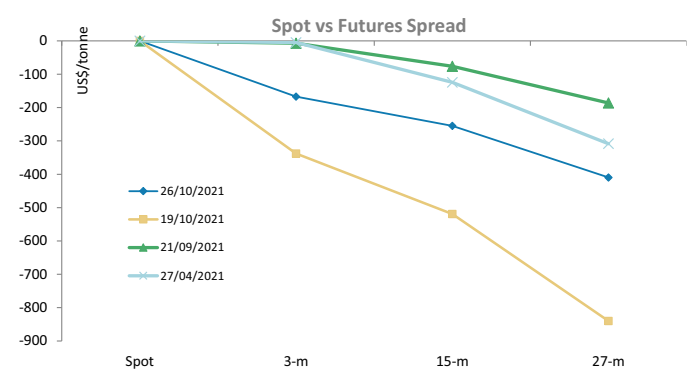
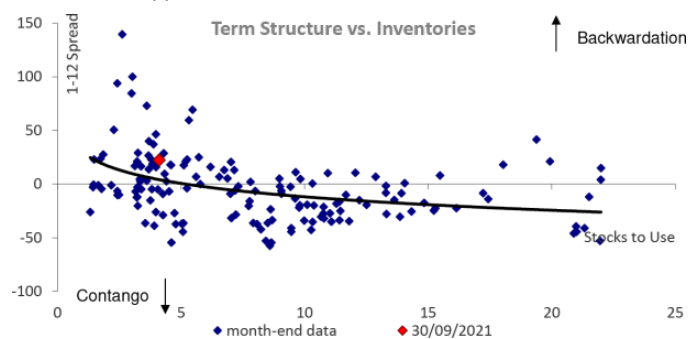
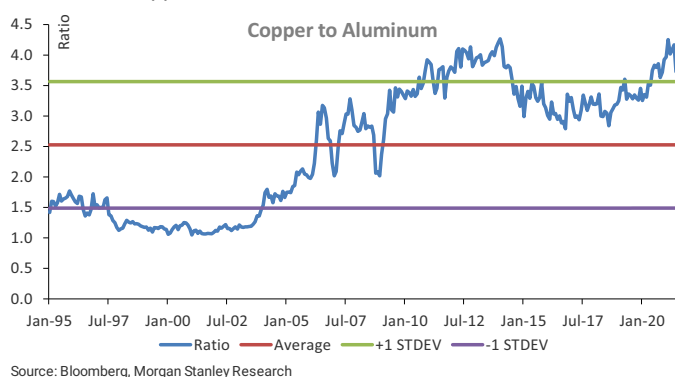
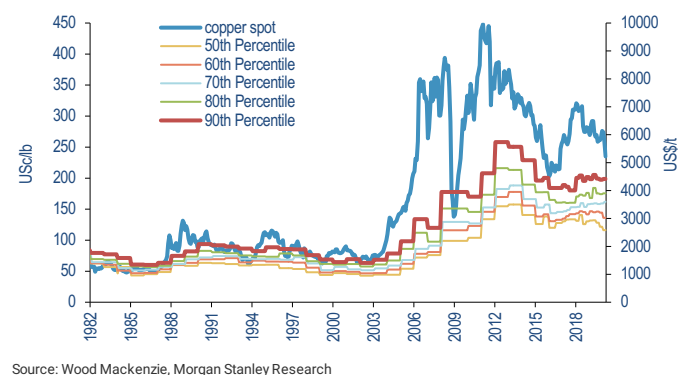
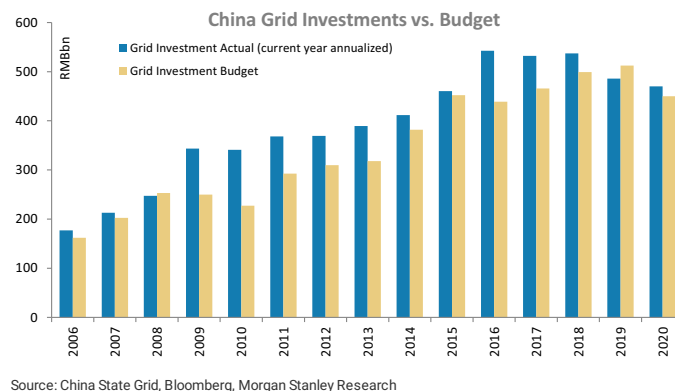
Exhibit 46: Raw materials: China's copper concentrate and scrap monthly imports

Exhibit 47: Physical demand: copper premia by region

Exhibit 48: Price differentials: SHFE vs. LME

Exhibit 49: Contango vs. Backwardation: copper forward curve


Exhibit 50: Copper term structure vs. inventories

Exhibit 51: Copper to aluminium ratio

Exhibit 52: Copper cost curve evolution

Exhibit 53: China grid investments (annualised) vs. government spending budget


Nickel

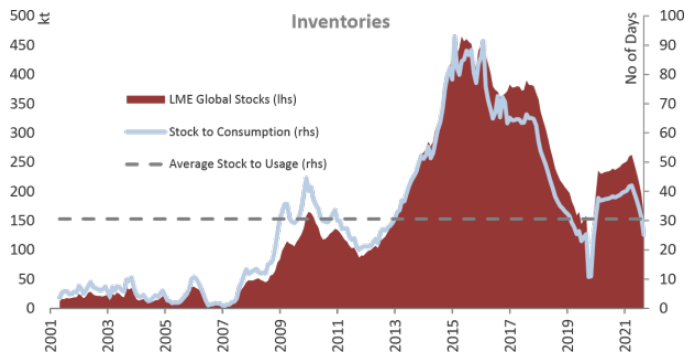
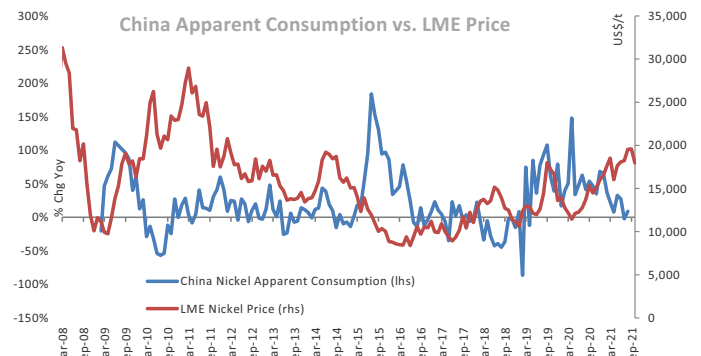
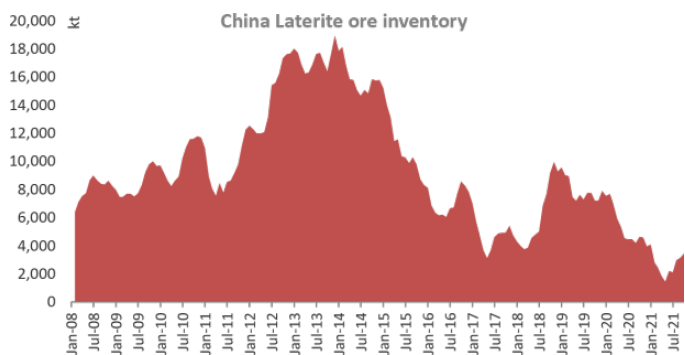
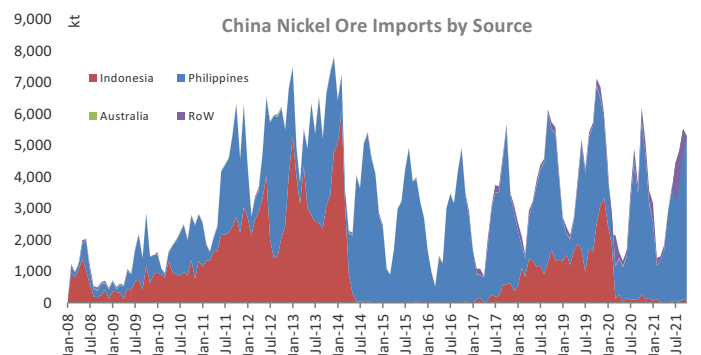
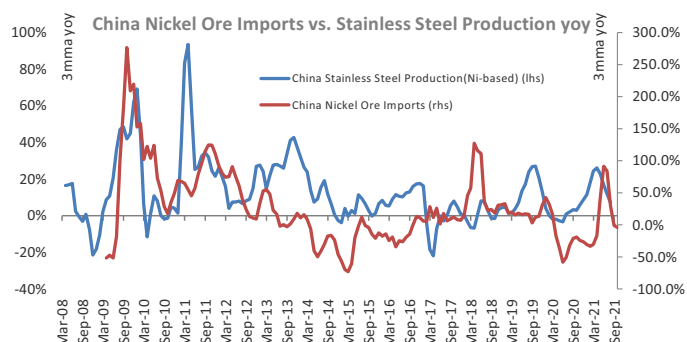
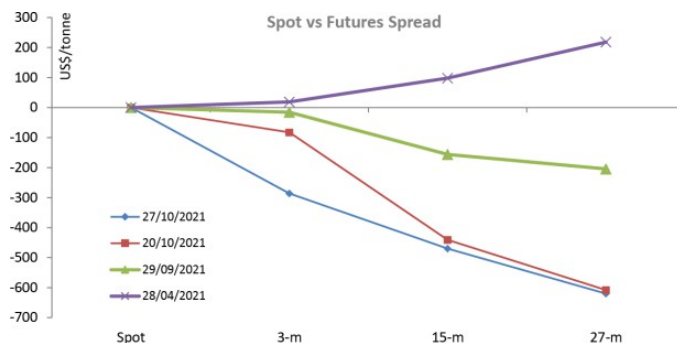
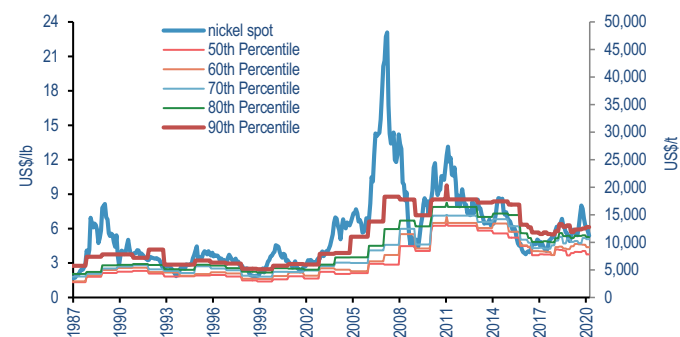
Exhibit 54: Nickel exchange inventories and days of consumption

Exhibit 55: China's apparent nickel consumption vs. LME price

Exhibit 56: Raw materials: nickel laterite ore inventories

Exhibit 57: Raw materials: China's ore imports by source


Exhibit 58: China's nickel ore imports vs. stainless steel production


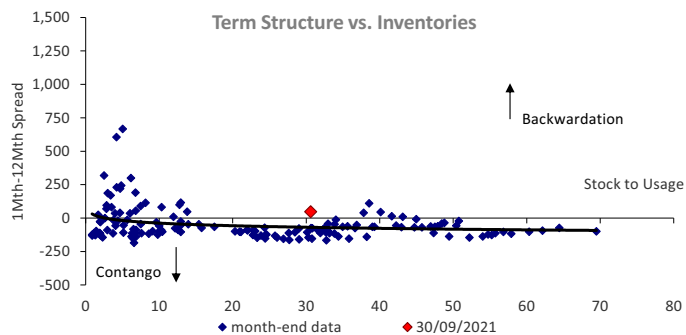
Source: Bloomberg, Morgan Stanley Research

Exhibit 59: Contango vs. Backwardation: nickel futures curve movement


Source: Bloomberg, Morgan Stanley Research

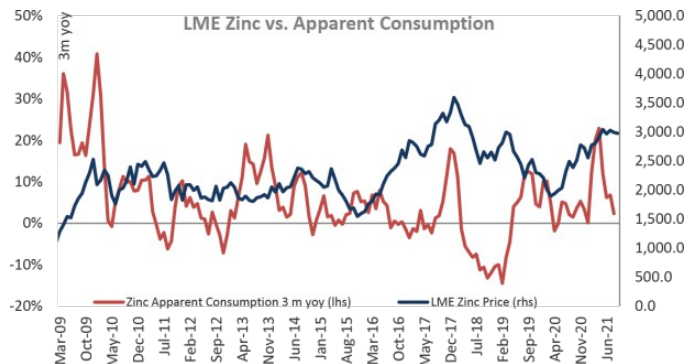
Exhibit 60: Nickel cost curve evolution


Source: Wood Mackenzie, Morgan Stanley Research

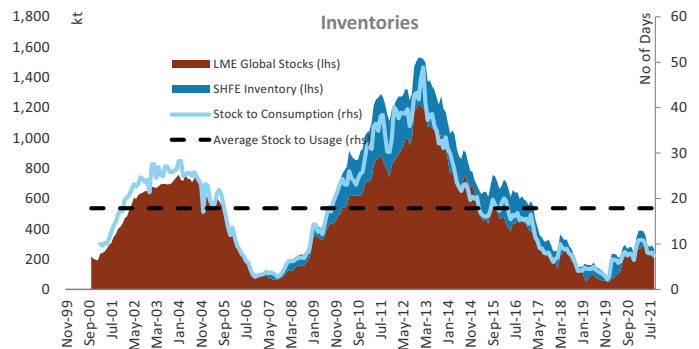
Exhibit 61: Nickel term structure vs. inventories


Source: Bloomberg, Morgan Stanley Research

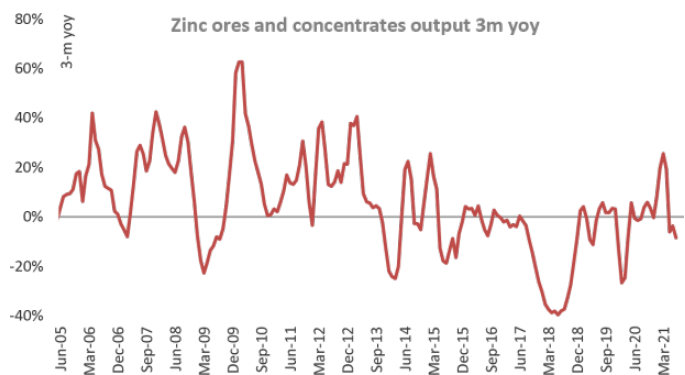
Zinc

Exhibit 62: China's apparent zinc consumption vs. LME price


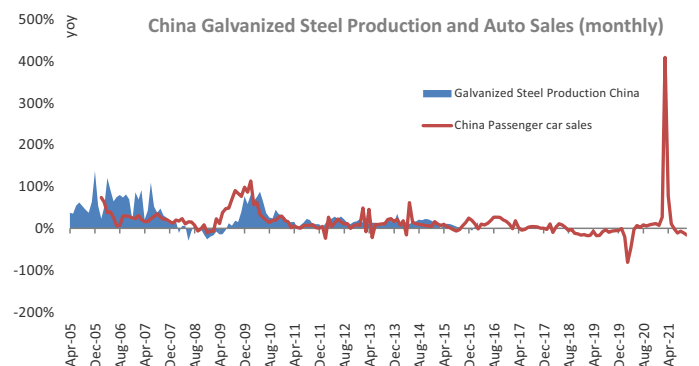
Source: Bloomberg, Morgan Stanley Research

Exhibit 63: Zinc exchange inventories and days of consumption


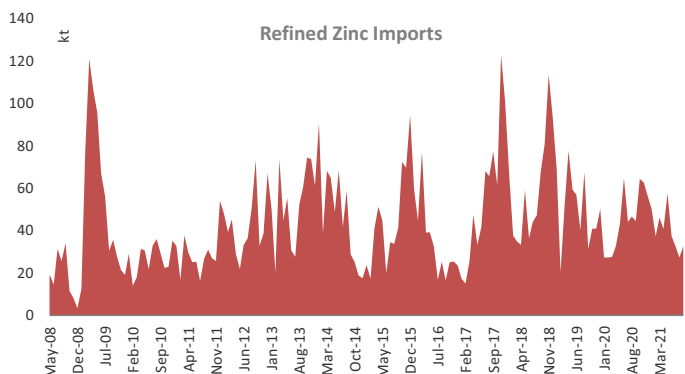
Source: Bloomberg, Morgan Stanley Research

Exhibit 64: Supply drivers: China's zinc ore and concentrate output


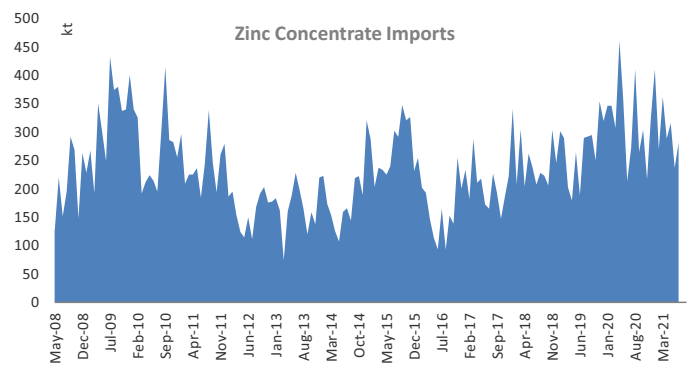
Source: Bloomberg, Morgan Stanley Research

Exhibit 65: Demand drivers: China's galvanised steel production and auto sales


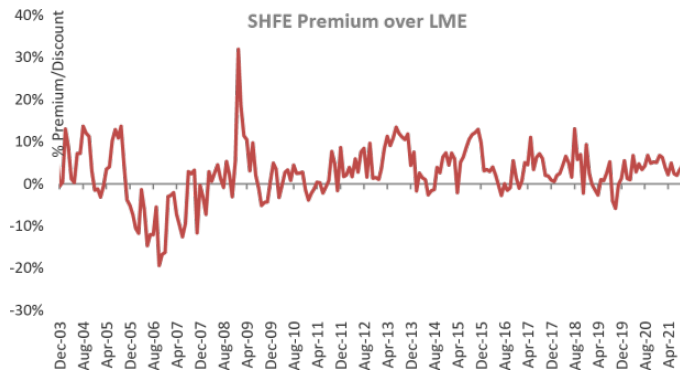
Source: Bloomberg, Morgan Stanley Research

Exhibit 66: Finished metal: China's refined zinc imports


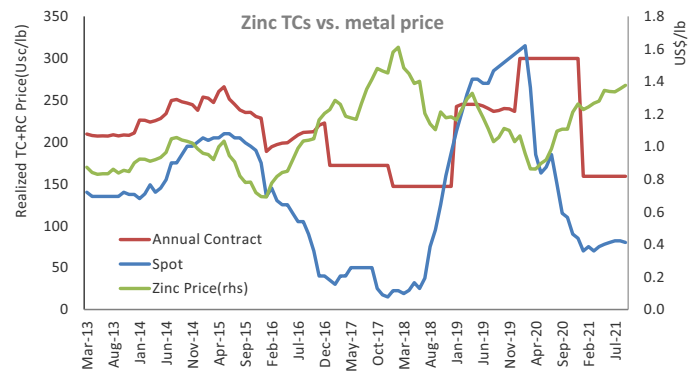
Source: Bloomberg, Morgan Stanley Research

Exhibit 67: Raw materials: China's zinc concentrate imports


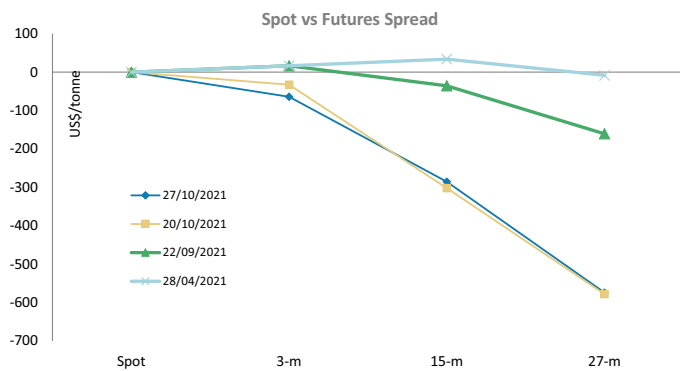
Source: Bloomberg, Morgan Stanley Research

Exhibit 68: Zinc price differentials: SHFE vs. LME


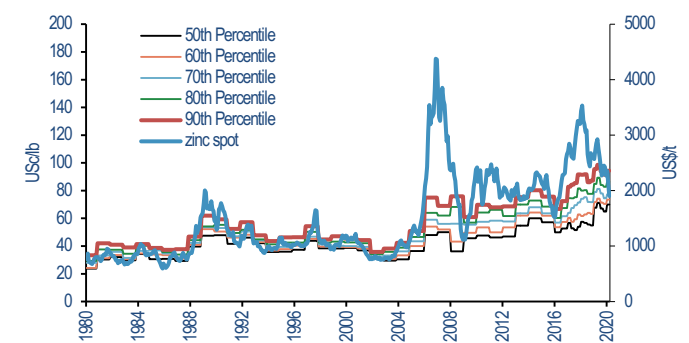
Source: Bloomberg, Morgan Stanley Research

Exhibit 69: Zinc TCs vs. metal price


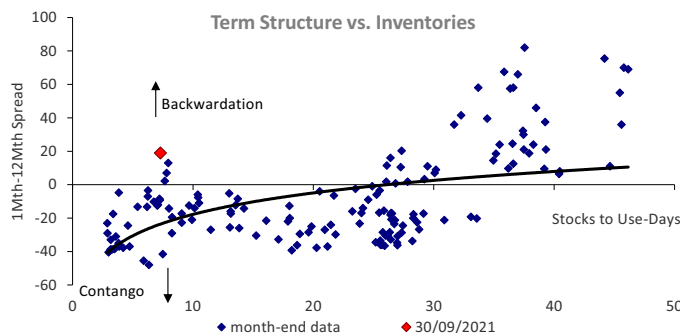
Source: Wood Mackenzie, Morgan Stanley Research

Exhibit 70: Contango vs. Backwardation: zinc futures curve movement


Source: Bloomberg, Morgan Stanley Research

Exhibit 71: Zinc cost curve evolution


Source: Wood Mackenzie, Morgan Stanley Research

Exhibit 72: Zinc term structure vs. inventories


Source: Bloomberg, Morgan Stanley Research

Gold + other precious metals

Exhibit 73: ETF gold holdings vs. gold price

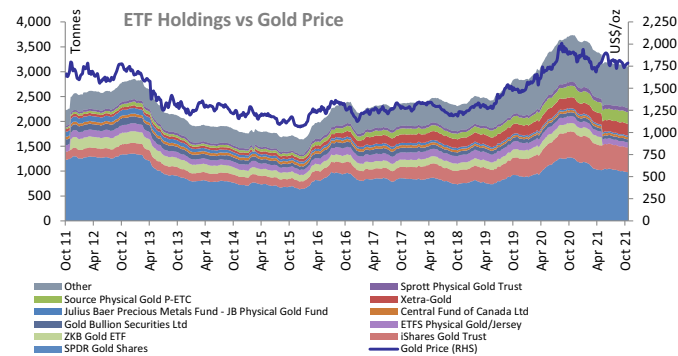


Exhibit 74: Gold price vs. real interest rates

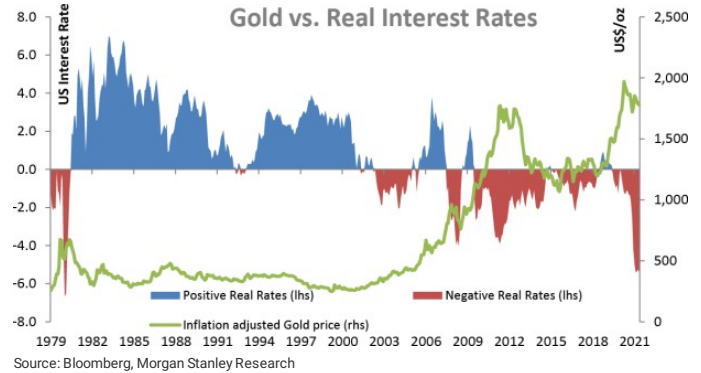


Exhibit 75: Gold performance vs. volatility index vs. dollar index



Exhibit 76: Gold to Silver Ratio

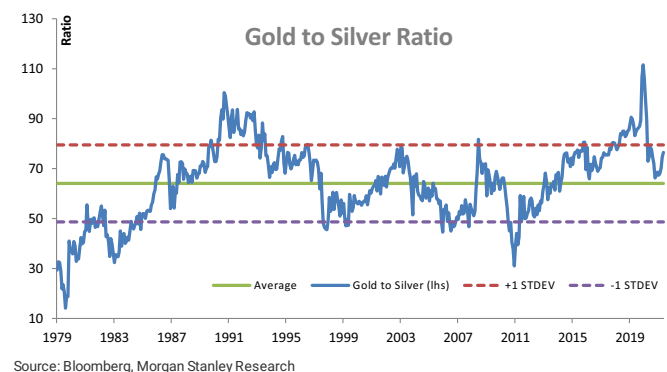
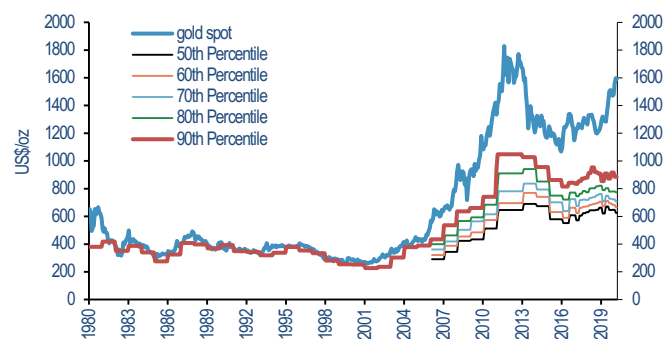
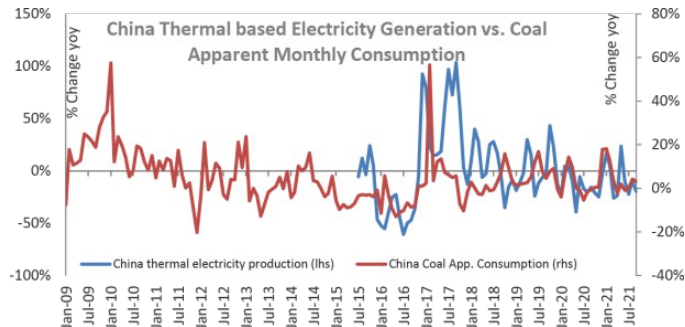


Exhibit 77: Gold cost curve (C1) evolution



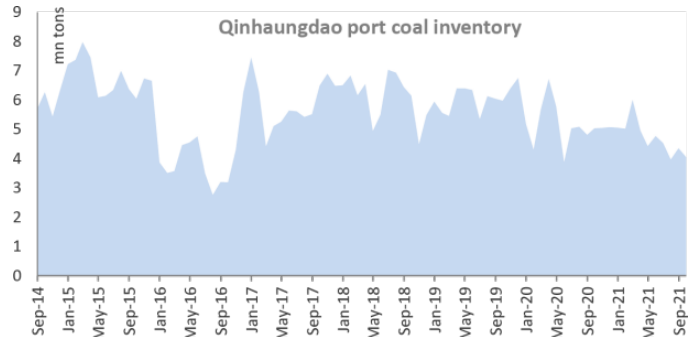
Coal

Exhibit 78: China's thermal based power generation vs. coal apparent monthly consumption



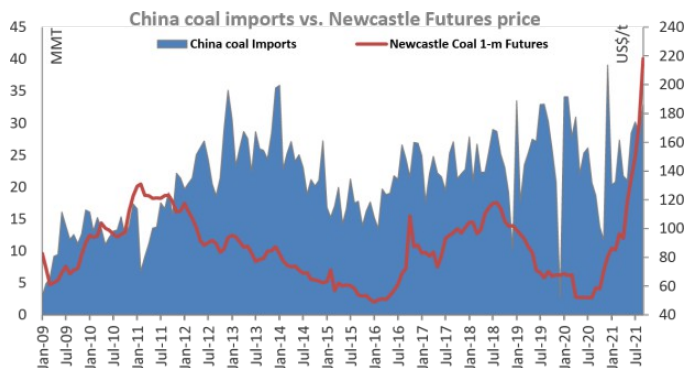
Source: NBS, Bloomberg, Morgan Stanley Research. Apparent Consumption is calculated as Domestic raw coal output less net coal exports

Exhibit 79: Coal inventories: Qinhuangdao port



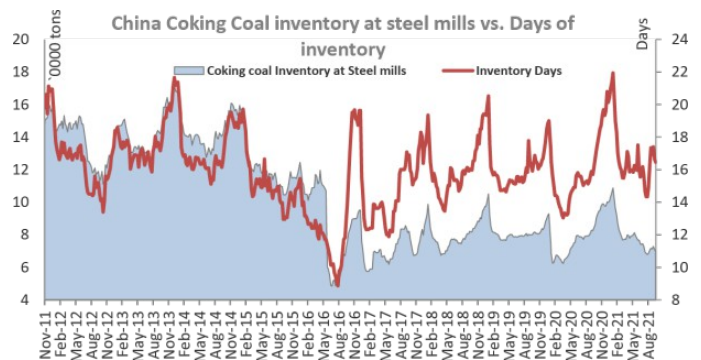
Source: Bloomberg, Morgan Stanley Research

Exhibit 80: China's coal imports vs. prices



Source: Bloomberg, Morgan Stanley Research

Exhibit 81: Inventories: China's coking coal inventories at steel mills vs. days of consumption



Source: Mysteel, Bloomberg, Morgan Stanley Research

Iron Ore

Exhibit 82: Iron ore inventories at China's sea ports and inventory days of consumption

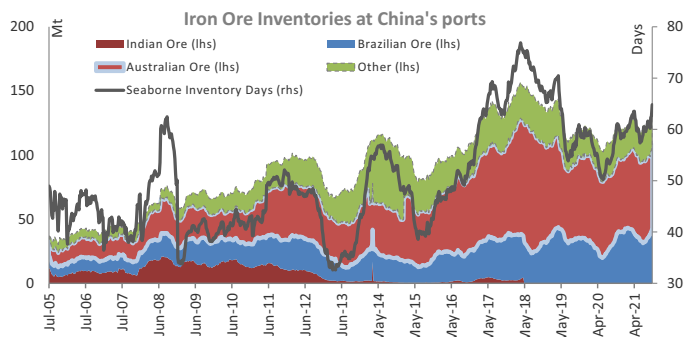


Exhibit 83: China's crude steel production, absolute and YoY change

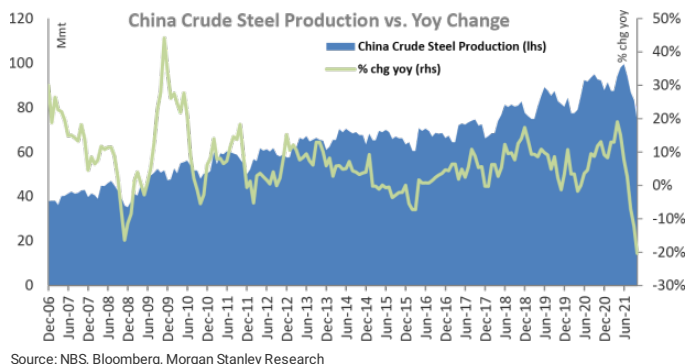


Exhibit 84: China's iron ore prices vs. steel prices



Exhibit 85: Freight rates from key shipping regions to China



Exhibit 86: China's iron ore inventories at small and mid-sized steel mills

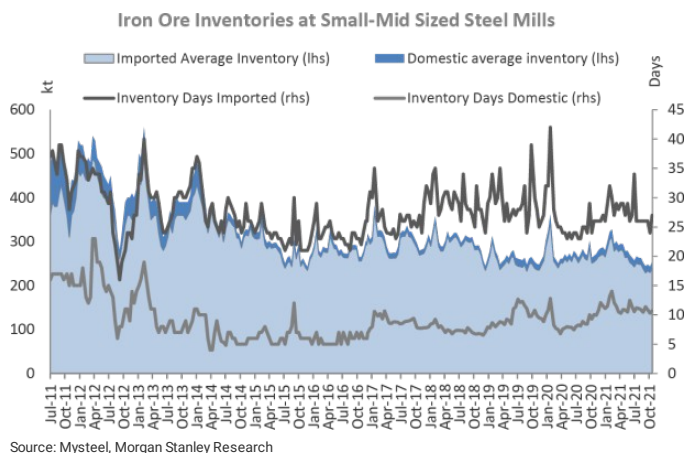


Exhibit 87: China's steel product inventories at distributor level

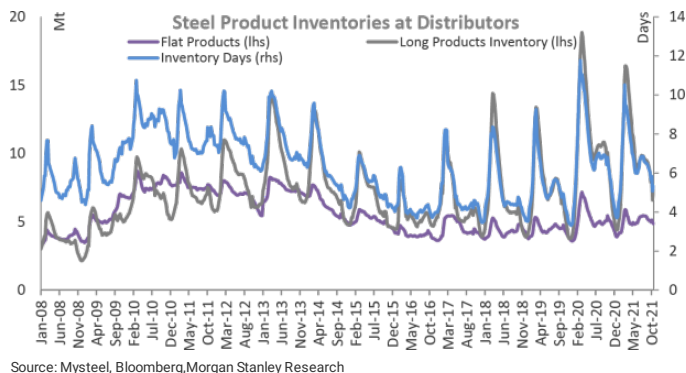
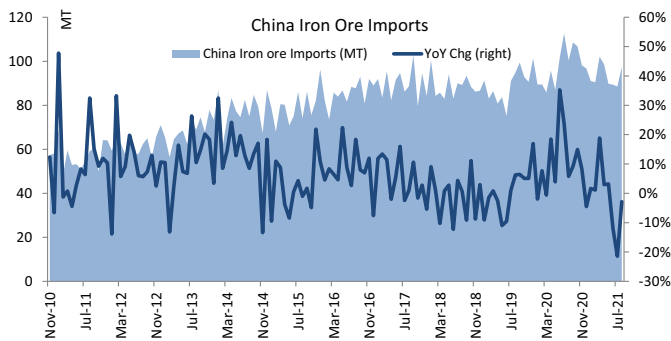
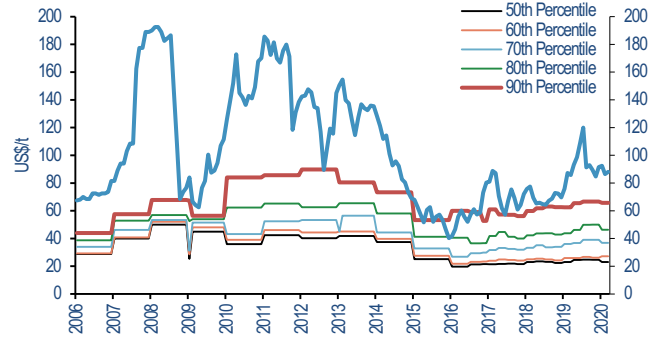


Exhibit 88: China's iron ore imports



Source: Bloomberg, Morgan Stanley Research

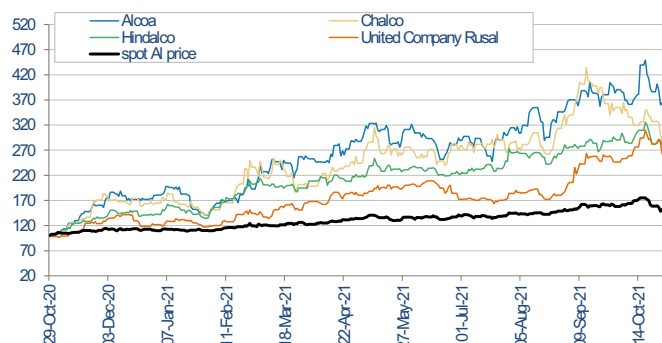
Exhibit 89: Iron ore cost curve evolution



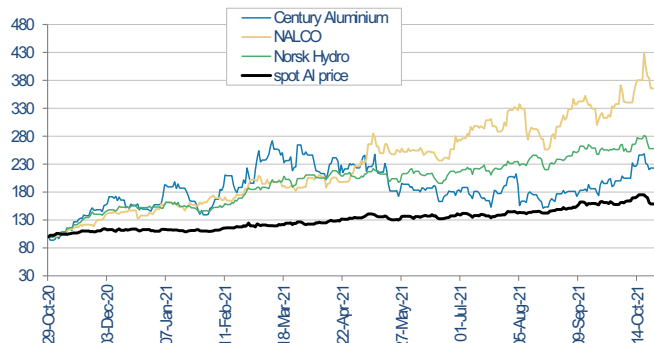
Source: Wood Mackenzie, Bloomberg, Morgan Stanley Research

Equity vs. Commodity – Relative One-Year Performance

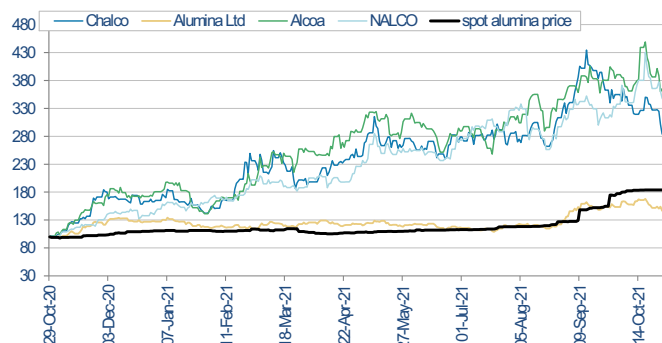
Aluminium, Alumina

Exhibit 90: Aluminium (large cap)

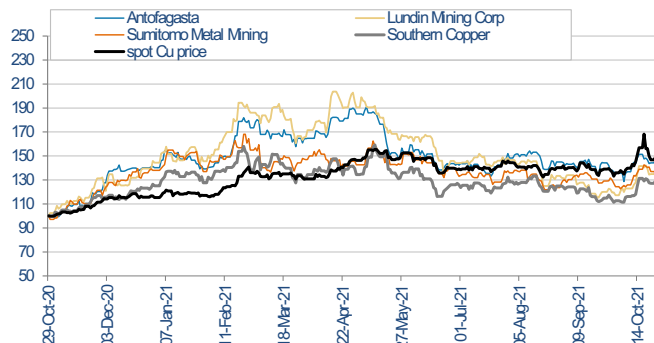
Source: Bloomberg, Morgan Stanley Research

Exhibit 91: Aluminium (small-medium cap)

Source: Bloomberg, Morgan Stanley Research

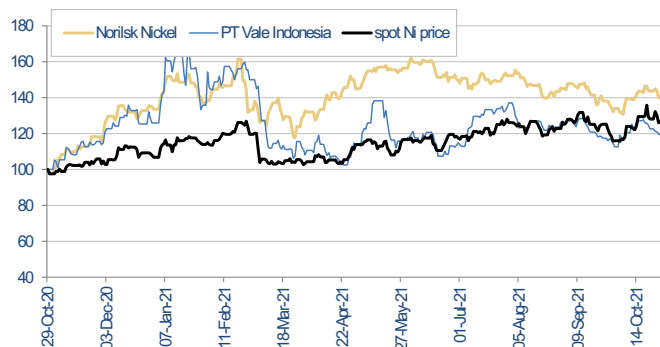
Exhibit 92: Alumina

Source: Bloomberg, Morgan Stanley Research

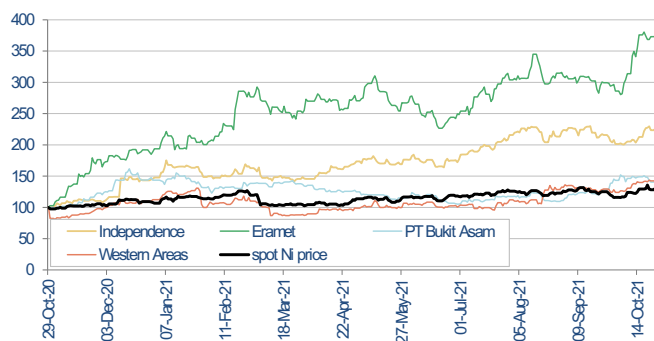
Exhibit 93: Copper

Source: Bloomberg, Morgan Stanley Research

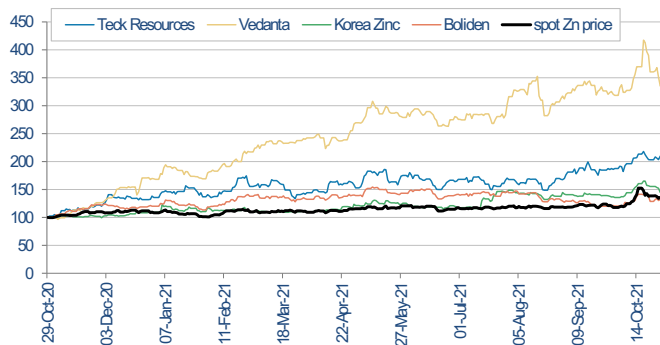
Nickel

Exhibit 94: Nickel (large cap)


Source: Bloomberg, Morgan Stanley Research

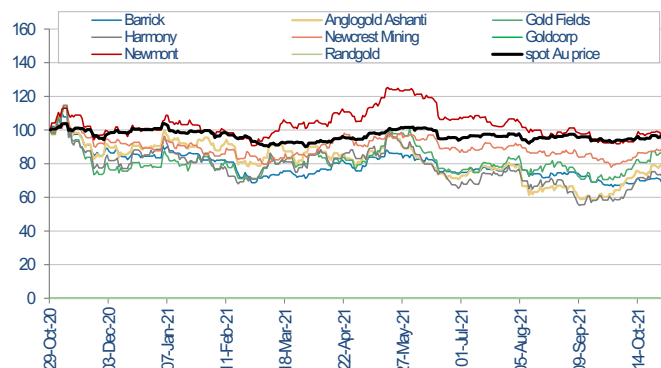
Exhibit 95: Nickel (small-medium cap)


Source: Bloomberg, Morgan Stanley Research

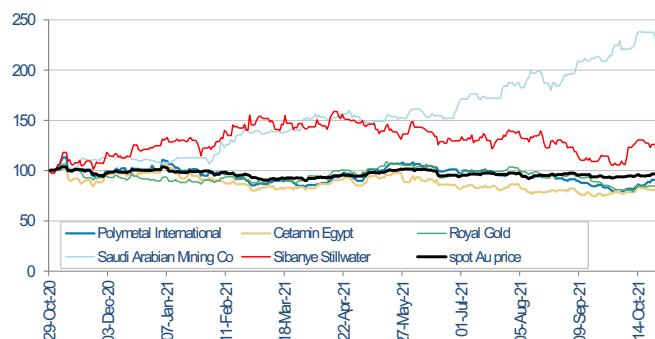
Exhibit 96: Zinc


Source: Bloomberg, Morgan Stanley Research

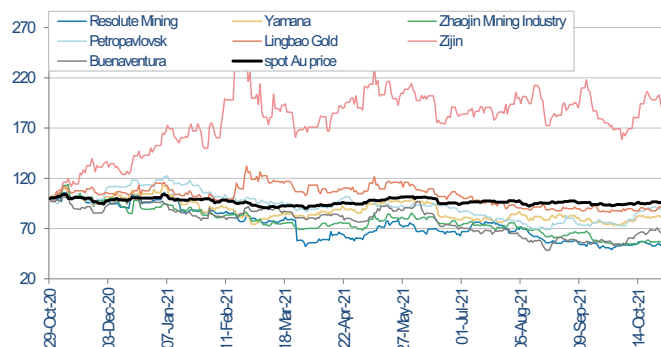
Precious Metals

Exhibit 97: Gold (large cap)


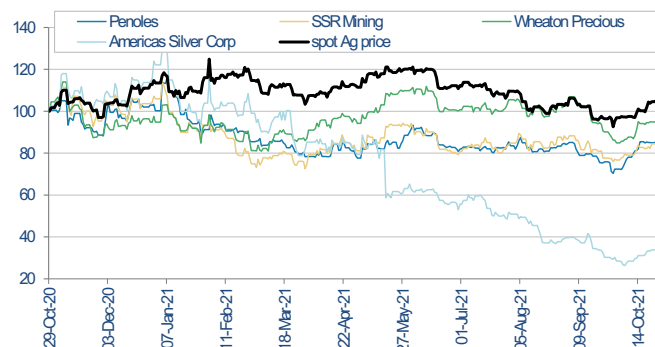
Source: Bloomberg, Morgan Stanley Research

Exhibit 98: Gold (small cap)


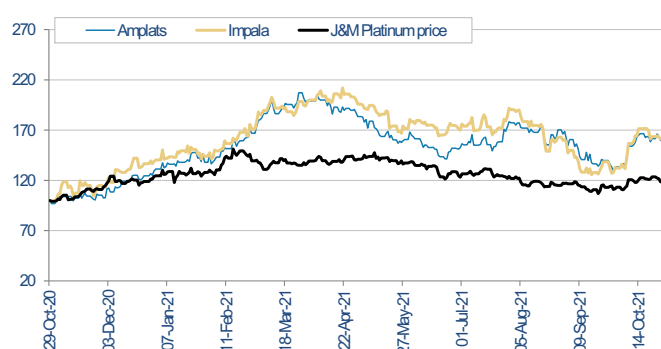
Source: Bloomberg, Morgan Stanley Research

Exhibit 99: Gold (small cap)


Source: Bloomberg, Morgan Stanley Research

Exhibit 100: Silver


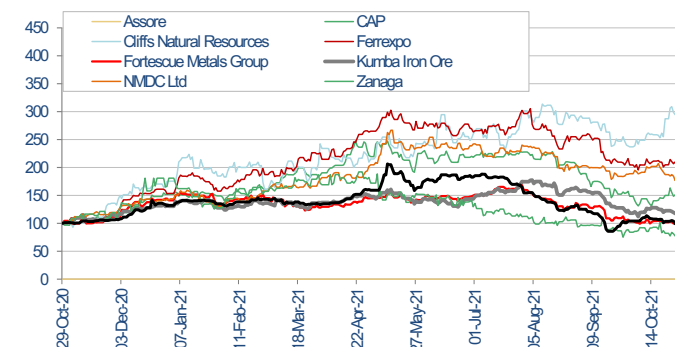
Source: Bloomberg, Morgan Stanley Research

Exhibit 101: PGMs


Source: Bloomberg, Morgan Stanley Research

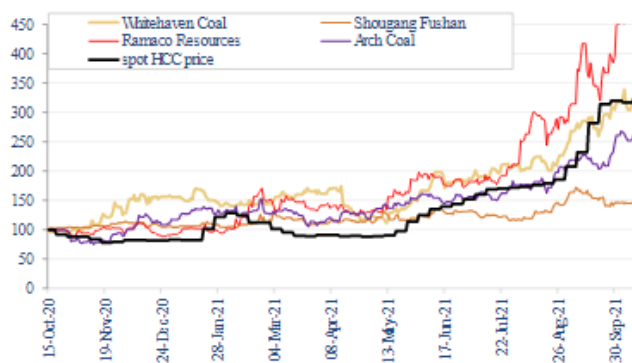
Bulks – Iron Ore, Metallurgical Coal

Exhibit 102: Iron ore



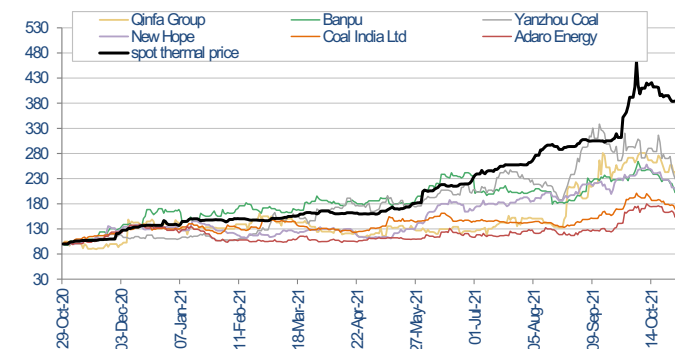
Source: Bloomberg, Morgan Stanley Research

Exhibit 103: Metallurgical coal

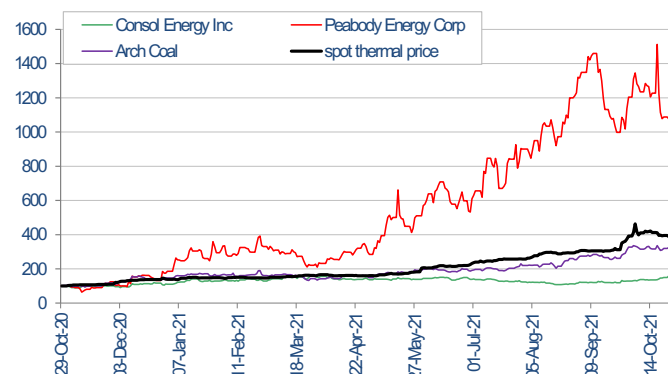


Source: Bloomberg, Morgan Stanley Research

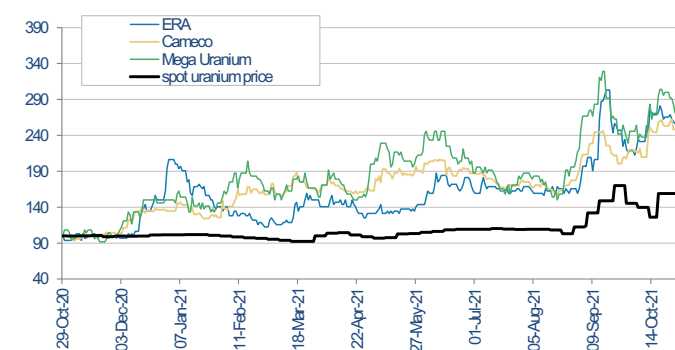
Energy – Thermal Coal, Uranium, Oil

Exhibit 104: Thermal coal – Asia


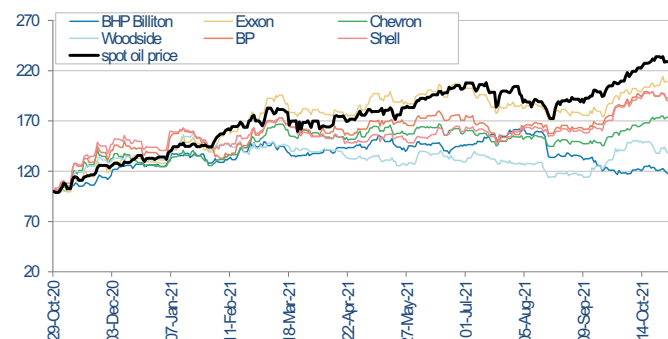
Source: Bloomberg, Morgan Stanley Research

Exhibit 105: Thermal coal – North America


Source: Bloomberg, Morgan Stanley Research

Exhibit 106: Uranium


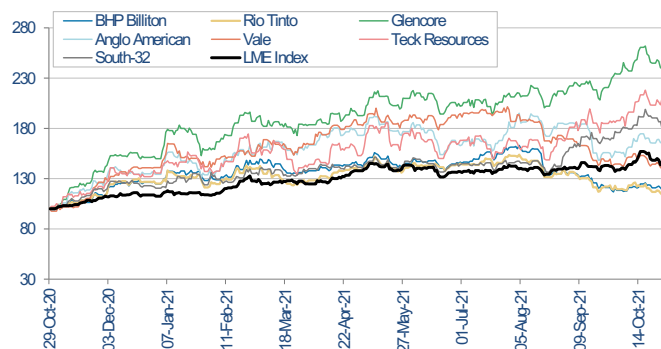
Source: Bloomberg, Morgan Stanley Research

Exhibit 107: Oil


Source: Bloomberg, Morgan Stanley Research

Diversified

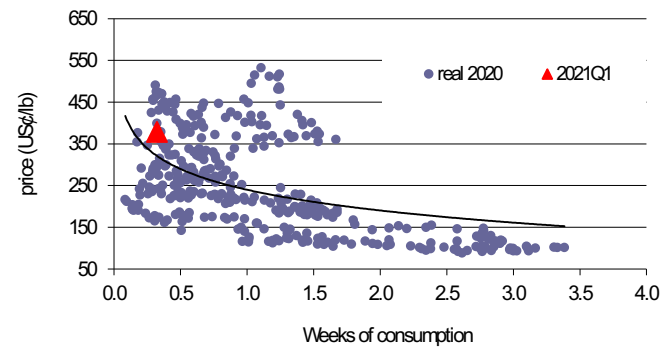
Exhibit 108: Diversified



Source: Bloomberg, Morgan Stanley Research

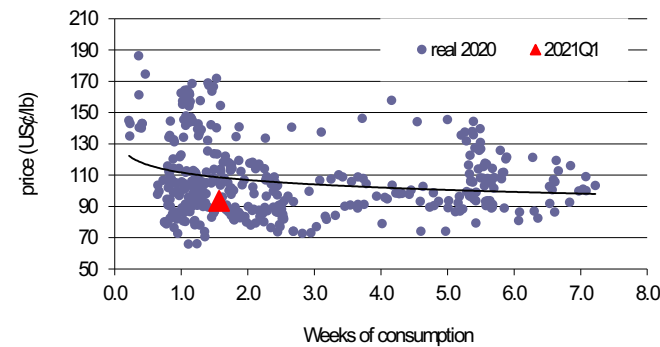
Pinch diagrams

Exhibit 109: Copper



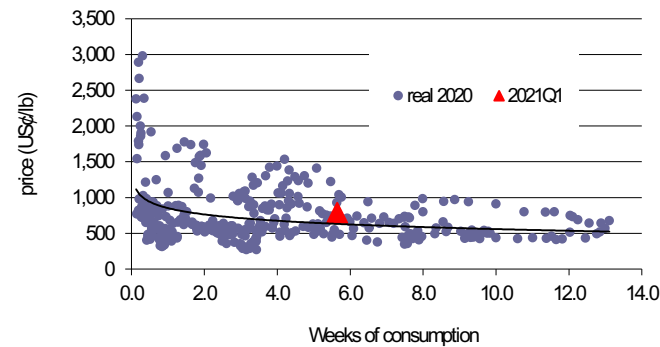
Source: LME, Bloomberg, WBMS, Morgan Stanley Research

Exhibit 110: Aluminium



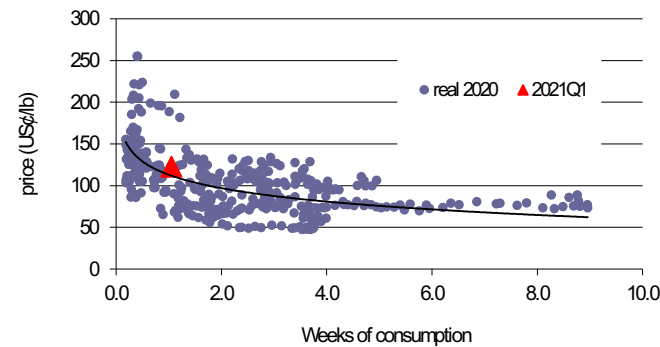
Source: LME, Bloomberg, WBMS, Morgan Stanley Research

Exhibit 111: Nickel



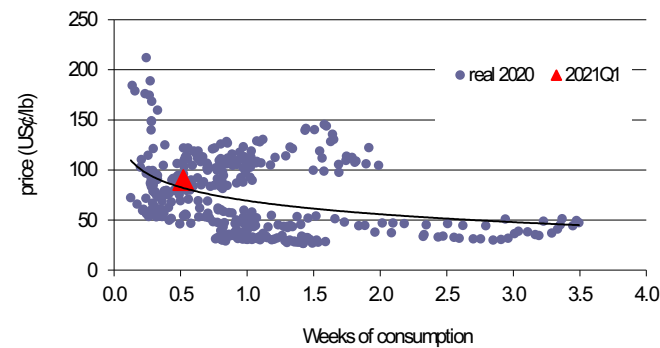
Source: LME, Bloomberg, WBMS, Morgan Stanley Research

Exhibit 112: Zinc



Source: LME, Bloomberg, WBMS, Morgan Stanley Research

Exhibit 113: Lead



Source: LME, Bloomberg, WBMS, Morgan Stanley Research

Key Morgan Stanley Forecasts

Exhibit 114: Base metal price forecasts

Period	Aluminium			Copper			Nickel			Zinc		
	Bull	Base US\$/lb	Bear	Bull	Base US\$/lb	Bear	Bull	Base US\$/lb	Bear	Bull	Base US\$/lb	Bear
2021e	1.18	1.15	1.11	4.27	4.16	4.06	9.05	8.38	7.93	1.39	1.32	1.27
2022e	1.41	1.22	1.04	4.76	3.66	3.30	12.28	8.19	6.55	1.43	1.15	1.03
2023e	1.28	1.05	0.84	3.97	3.05	2.75	10.22	6.81	5.45	1.37	1.05	0.95
2024e	1.32	1.10	0.88	4.20	3.11	2.80	10.55	7.54	5.28	1.40	1.08	0.97
2025e	1.36	1.15	0.92	4.46	3.19	2.87	10.14	7.80	5.46	1.37	1.10	0.99
2026e	1.20	1.05	0.84	4.19	3.22	2.90	9.48	7.90	5.53	1.40	1.17	0.99
LT nom	1.15	1.05	0.89	4.14	3.18	2.70	9.34	7.78	5.45	1.30	1.18	0.95

Source: Morgan Stanley Commodities Research estimates (e)

Exhibit 115: Precious metals price forecasts

Period	Gold			Silver			Platinum			Palladium		
	Bull	Base US\$/oz	Bear	Bull	Base US\$/oz	Bear	Bull	Base US\$/oz	Bear	Bull	Base US\$/oz	Bear
2021e	1,868	1,782	1,747	26.52	25.08	23.64	1,131	1,083	1,036	2,527	2,427	2,277
2022e	1,946	1,621	1,459	27.50	22.91	18.33	1,272	1,060	848	2,795	2,150	1,505
2023e	1,938	1,550	1,395	31.08	22.20	18.87	1,619	1,245	1,121	1,845	1,538	1,076
2024e	1,918	1,475	1,372	31.69	21.13	19.01	1,788	1,375	1,238	1,463	1,219	853
2025e	1,946	1,390	1,321	31.90	22.00	19.80	1,788	1,375	1,238	1,479	1,233	863
2026e	1,890	1,350	1,283	32.63	22.50	20.25	1,706	1,313	1,181	1,500	1,250	1,000
LT nom	1,824	1,303	1,173	29.30	22.54	19.15	1,613	1,241	1,117	1,489	1,241	993

Source: Morgan Stanley Commodities Research estimates (e)

Exhibit 116: Bulks price forecasts

Period	Iron Ore (spot)			Hard Coking Coal (spot)			Thermal Coal			Manganese ore (44%)			Lithium (job Lot/mt)			Uranium (spot)		
	Bull	Base US\$/t	Bear	Bull	Base US\$/t	Bear	Bull	Base US\$/t	Bear	Bull	Base US\$/lb	Bear	Bull	Base US\$/lb	Bear	Bull	Base US\$/lb	Bear
2021e	162	152	145	253	219	194	206	137	128	7.6	5.1	3.6	13,381	10,293	9,264	46	37	32
2022e	152	95	57	420	210	188	242	143	107	6.0	5.0	4.0	19,675	13,290	10,600	60	40	30
2023e	163	81	57	272	151	121	152	95	71	5.9	4.9	4.0	13,700	8,563	7,706	62	41	31
2024e	135	61	49	230	144	115	105	75	56	5.7	4.7	3.8	10,500	7,000	6,300	68	49	39
2025e	125	63	56	203	145	116	106	76	57	5.4	4.5	3.6	9,870	7,050	5,640	64	46	37
2026e	117	65	55	189	145	116	101	78	59	5.4	4.5	3.6	9,490	7,300	5,840	55	39	32
LT nom	109	63	49	197	151	121	101	78	58	5.5	4.6	3.7	8,922	7,435	5,948	59	39	32

Source: Morgan Stanley Commodities Research estimates (e)

Global Metals & Mining Team

GLOBAL METALS & MINING TEAM

Global Metals & Mining – Commodity Strategists

Amy Sergeant ³, COMMODITY STRATEGIST Amy.Sergeant@morganstanley.com +44 20 7677 6637
Marius van Straaten ³, COMMODITY STRATEGIST Marius.VanStraaten@morganstanley.com +44 20 7677 5632

EMEA Metals & Mining, Steel (London)

Alain Gabriel ³, EQUITY ANALYST Alain.Gabriel@morganstanley.com +44 20 7425 6959
Ioannis Masvoulas ³, EQUITY ANALYST Ioannis.Masvoulas@morganstanley.com +44 20 7425 0427
Dan Shaw ³, EQUITY ANALYST Dan.Shaw@morganstanley.com +44 20 7425 5863
Sandeep Peety ³, EQUITY ANALYST Sandeep.Peety@morganstanley.com +44 20 7677 6242

South Africa Metals & Mining, Steel (Johannesburg)

Christopher Nicholson ¹⁰, EQUITY ANALYST Christopher.Nicholson@mtbmorganstanley.com +27 11 252 1154
Brian Morgan ¹⁰, EQUITY ANALYST Brian.Morgan@mtbmorganstanley.com +27 11 252 8969
Jared Hoover ¹⁰, EQUITY ANALYST Jared.Hoover@mtbmorganstanley.com +27 11 252 1092

Americas Steel, Metals & Mining, Pulp & Paper (New York/São Paulo/Mexico)

Carlos de Alba ¹, EQUITY ANALYST Carlos.deAlba@morganstanley.com +1 212 761 4927
Serena Rocha Calejon ¹, RESEARCH ASSOCIATE Serena.Rocha.Calejon@morganstanley.com +1 212 761 0144
Jens Spiess ², EQUITY ANALYST Jens.Spiess@morganstanley.com +52 55 5282 6614

Japan Metals & Mining, Steel (Tokyo)

Takato Watabe ⁷, EQUITY ANALYST Takato.Watabe@morganstanley.com +81 3 6836 5436
Yu Shirakawa ⁷, EQUITY ANALYST Yu.Shirakawa@morganstanley.com +81 3 6836 5432

Australia Metals & Mining, Steel (Sydney)

Rahul Anand ⁶, EQUITY ANALYST Rahul.Anand@morganstanley.com +61 2 9770 1136
Shannon Sinha ⁶, RESEARCH ASSOCIATE Shannon.Sinha@morganstanley.com +61 2 9770 1334

China Metals & Mining, Steel (Hong Kong)

Rachel Zhang ⁵, EQUITY ANALYST Rachel.Zhang@mtbmorganstanley.com +852 2239 1520
Sara Chen ⁵, EQUITY ANALYST Sara.Chen@morganstanley.com +852 2848 5292
Hannah Yang ⁵, EQUITY ANALYST Hannah.Yang@morganstanley.com +852 2239 7079
Yujie Wang ⁵, RESEARCH ASSOCIATE Yujie.Wang@morganstanley.com +852 2239 1502

Korea Metals & Mining, Steel (Seoul)

Young Suk Shin ¹¹, EQUITY ANALYST Young.Shin@morganstanley.com +82 2 399 4994

Asia Oil & Gas & Coal (Hong Kong/Jakarta)

Andy Meng ⁵, EQUITY ANALYST Andy.Meng@morganstanley.com +852 2239 7699
Jack Lu ⁵, EQUITY ANALYST Jack.Lu@morganstanley.com +852 2848 5044

Global Energy

Martijn Rats ³, EQUITY ANALYST and COMMODITIES STRATEGIST Martijn.Rats@morganstanley.com +44 20 7425 6618

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