

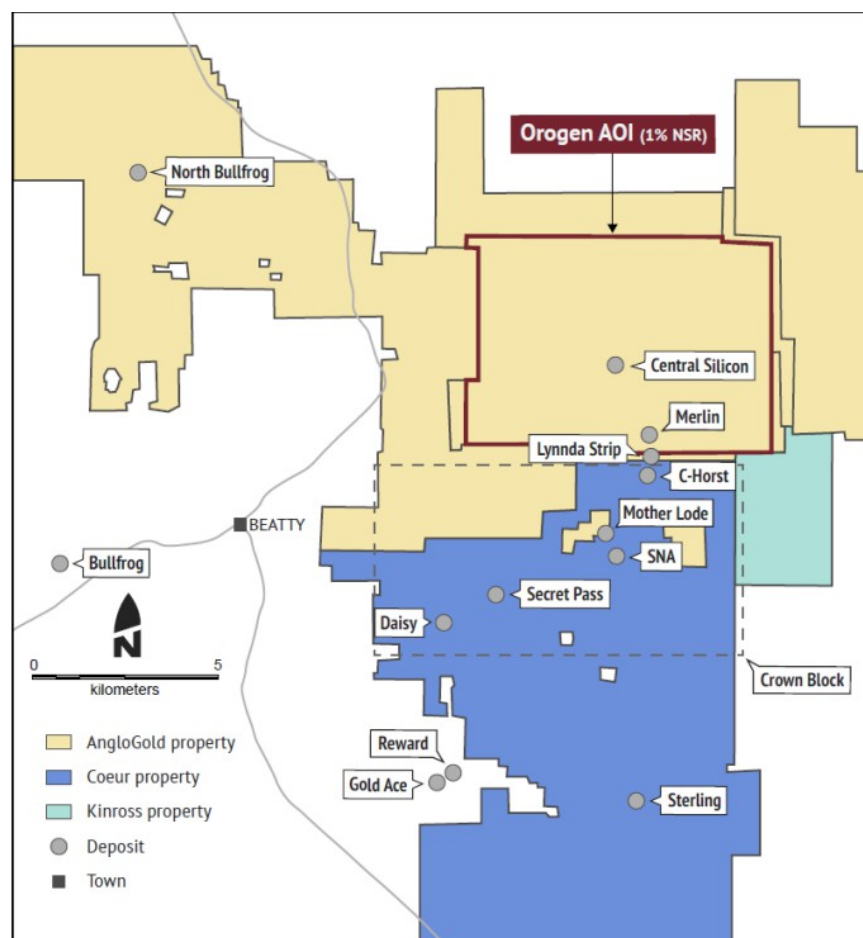
January 14, 2022 06:58 AM GMT

SA Rocks | Europe

SA Golds' interest in juniors

With shareholder approval for the Corvus acquisition obtained, we provide updated economics for additional disclosure included in the circular. We also provide thoughts on ANG's and GFI's material interest in juniors/explorers in the context of reserve replacement.

Exhibit 1: AngloGold's Silicon and Merlin deposits are adjacent to Corvus Gold's North Bullfrog, Mother Lode and Lynnda Strip, as well as multiple deposits on Coeur Mining's contiguous tenements, potentially allowing for district-level synergies



Source: Orogen Royalties

AngloGold receives shareholder approval for Corvus Gold acquisition - updated transaction estimates accretive; synergies with adjacent deposits and peers by Feb22; growth or replacement? The remaining CP involves approval from a Canadian court expected on 18 January. **Following additional disclosure in the shareholder circular**, and applying [our base case gold price forecasts](#) (LT real

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EEMEA - Metals & Mining

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Carbon Steel

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Gold and Precious Metals

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Stainless Steel

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[SA Diversified Mining: 1Q22 price deck update \(8 Dec 2021\)](#)

[Exxaro Resources Limited: Recycling returns don't appear well priced \(8 Dec 2021\)](#)

[SA Gold: 1Q22 price deck update \(8 Dec 2021\)](#)

[metal&ROCK: Long-term incentive prices – all in the money \(8 Dec 2021\)](#)

[metal&ROCK: The Price Deck – 1Q 2022 \(9 Dec 2021\)](#)

[Glencore PLC: More to play for. Next catalyst – Investor Day \(23 Nov 2021\)](#)

[SA Platinum Group Metals: Lofty heights \(17 Nov 2021\)](#)

[Sappi Ltd: Buy the dip \(11 Nov 2021\)](#)

[Implats Limited: 101 \(19 Oct 2021\)](#)

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For analyst certification and other important disclosures, refer to the Disclosure Section, located at the end of this report.

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gold of \$1,172 vs. \$1,396 for consensus) to both the North Bull Frog and Mother Lode projects within Corvus Gold, we estimate the acquisition is NPV neutral. Assuming consensus LT gold prices, we estimate a NPV/s, IRR, payback period, and acquisition-implied gold price of \$1.2/s, 30%, 4 years (LoM: 15 year), and \$1,455 respectively. **Both these estimates exclude synergies** with ANGs adjacent Silicon and Merlin deposits, for which we expect an outlook in Feb22. Given a layback agreement is required with adjacent gold mining peer Coeur Mining, to fully access the Mother Lode deposit, synergies with them could also exist - we understand Coeur are likely to publish an economic assessment to mine deposits within their crown block (see chart) by mid-2022. Lastly, while **Corvus Gold appears to be reflect growth ounces, it isn't clear** whether ANGs North American footprint (c.300-350k oz pa) could in fact be replacement for under-earning areas of the portfolio (e.g Sunrise Dam and Serra Grande), which we understand are being reviewed for their full potential/fit within the portfolio.

AngloGold's c.14% interest in Pure Gold: Although a material holding given the investee's geological potential and preferable jurisdiction in Canada, execution risk is elevated following operational disruptions and Management changes in 2021. In addition, with a number of items on ANG's own agenda (improving underlying operational performance, Obuasi ramp-up, greenfields, brownfields, Corvus Gold acquisition), we see limited scope for further corporate activity here.

Gold Fields stake in Asanko Gold (45%), Chakana copper (19.9%), Western Lefroy Project (up to 70%), Consolidated Woodjam Copper Corporation (c.16.3%), Magmatic Resources (c.10.9%), Orsu Metals (c.6.1%): We understand the latter three interests are legacy investments, similar to the Cardinal Resources stake (which was sold in FY20). Near term, we think Management will likely seek a better understanding of challenges inhibiting operational improvements at **Asanko** (higher-for-longer cost outlook vs. Group) ahead of an optimization decision, potentially by mid-year. [A maiden mineral resource](#) has recently been declared at **Chakana Copper's Cu-Au-Ag silver deposit in Peru**, and is a longer-term option to replace declining Group production from FY25. GFI recently opted to earn [up to a 70% stake in the Western Lefroy Project](#), which has tenements adjacent to its St Ives mine - this could aid in filling the mill/replacing production post FY24, as the mine transitions to campaign milling.

Spot-based comparative

Exhibit 2: Spot comps for SA Resource stocks

Spot commodity prices and FX							Upside / (downside) to consensus at spot	
	P/E		EV/EBITDA		FCF Yield			
	2021	2022	2021	2022	2021	2022		
Anglo American	6.4x	5.9x	4.1x	3.9x	10.3%	10.3%	-1%	52%
ARM	3.7x	4.9x	2.1x	2.4x	14.0%	15.2%	0%	-16%
BHP	8.7x	7.9x	4.9x	4.9x	12.1%	9.6%	0%	13%
Exxaro	3.8x	4.0x	2.8x	2.2x	21.7%	21.8%	-12%	19%
Glencore	6.6x	3.7x	5.0x	3.0x	16.2%	26.4%	0%	73%
Kumba	5.1x	6.1x	3.4x	3.8x	24.8%	17.9%	-11%	59%
South 32	22.1x	5.2x	6.6x	3.0x	7.9%	21.0%	0%	46%
Thungela	3.5x	1.1x	2.0x	0.7x	21.6%	79.8%	-34%	97%
Mondi	15.4x	13.6x	8.8x	7.6x	2.7%	5.9%	-2%	-6%
Sappi	17.8x	5.5x	6.2x	3.6x	-2.4%	20.8%	0%	45%
Sasol	7.0x	5.2x	4.0x	3.2x	15%	19%	NM	2%
Anglo Platinum	6.3x	9.6x	4.5x	6.3x	15.6%	8.9%	14%	-11%
Implats	5.1x	5.4x	3.0x	3.2x	17.8%	17.1%	NM	-6%
Northam	8.1x	5.3x	6.5x	4.5x	9.2%	16.3%	NM	1%
RBPlat	6.0x	7.9x	4.3x	4.6x	15.1%	11.1%	1%	-10%
Sibanye	3.7x	5.0x	2.3x	2.5x	22.7%	17.9%	6%	10%
AngloGold Ashanti	12.6x	10.7x	5.4x	4.6x	0.9%	3.1%	2%	-20%
GoldFields	10.1x	11.2x	4.8x	5.1x	6.2%	4.6%	3%	-8%
Harmony	13.2x	5.8x	4.6x	3.0x	3.3%	7.2%	NM	28%

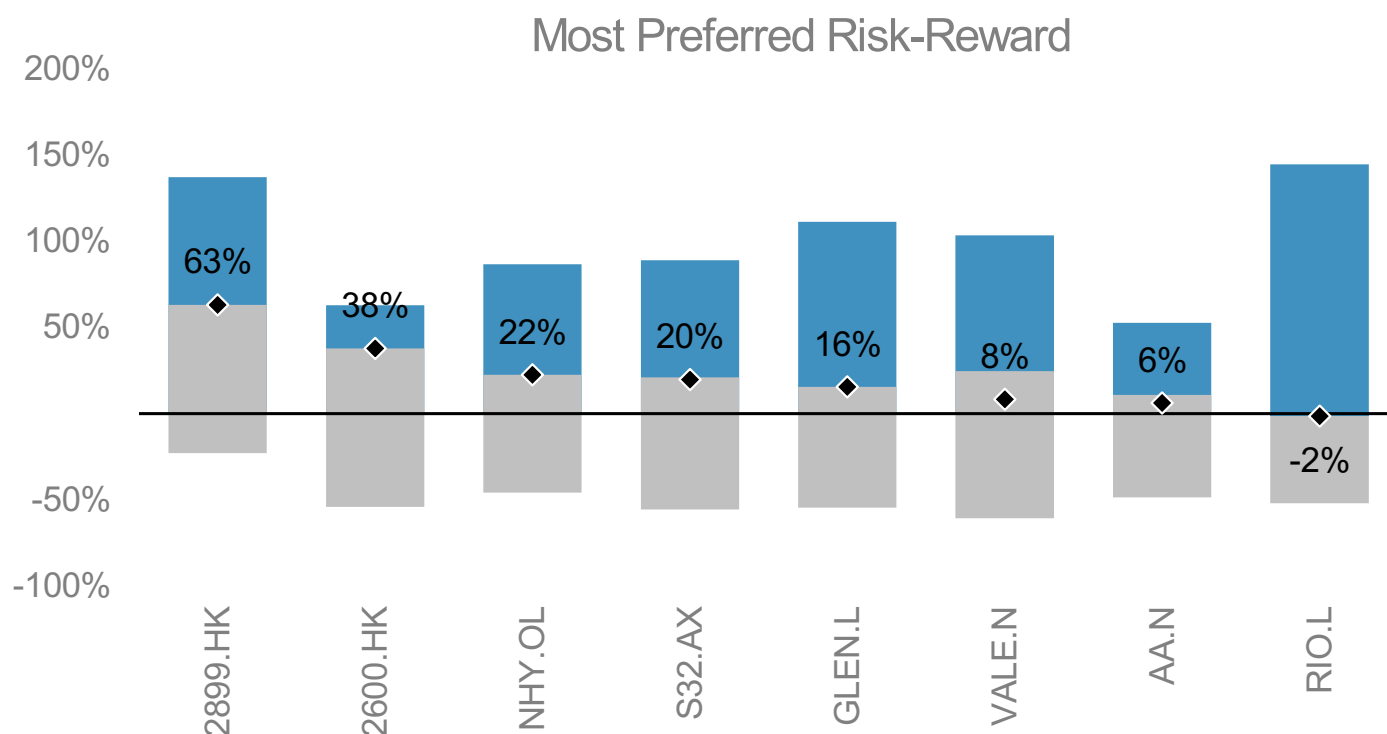
Source: Morgan Stanley Research estimates. Note: Priced at close on 13 January 2021.

Global Picks

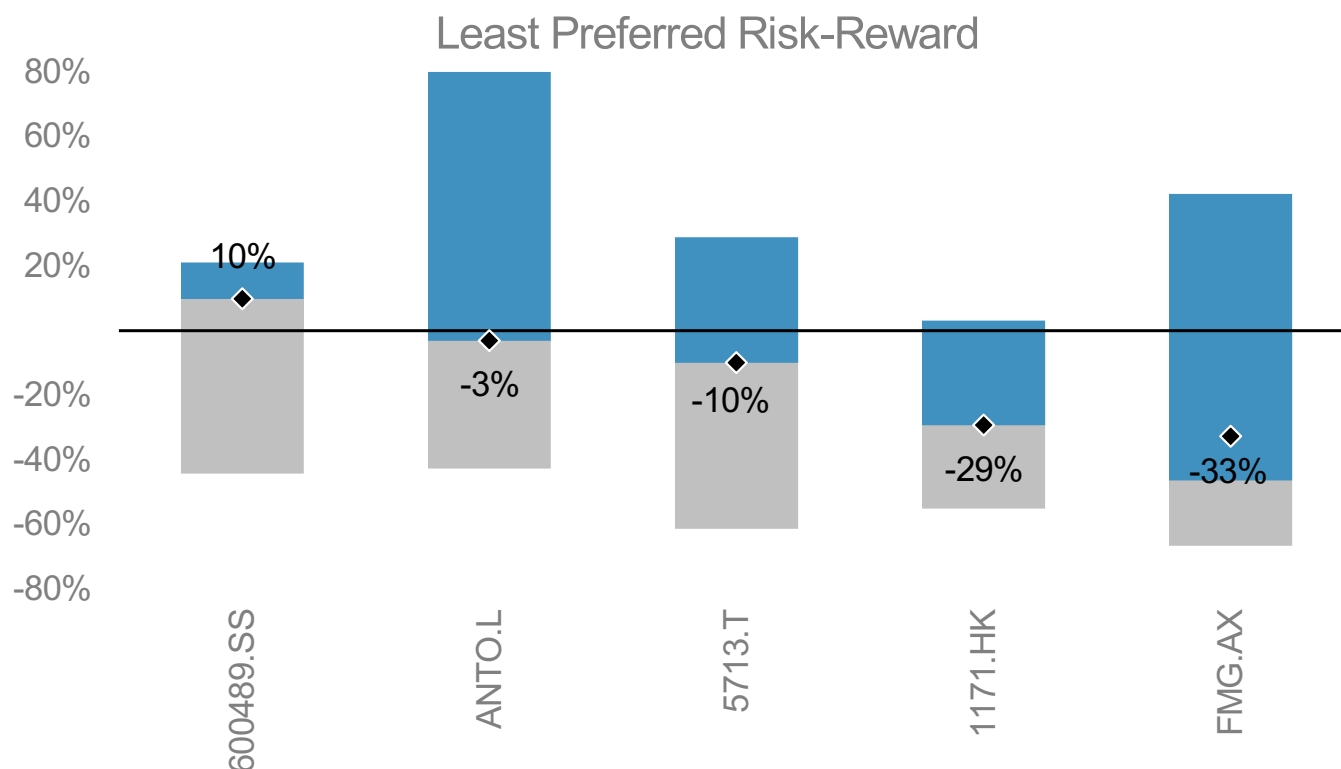
Exhibit 3: Global Mining Equities: Most Preferred and Least Preferred Stocks

		Rating	Rating	CCY	Current Price	Price Target	% to PT	Analyst
Most Preferred								
Alcoa Corp	AA.N	Overweight	OW	USD	62.2	66.0	6%	Carlos De Alba
Aluminum Corp. of China Ltd.	2600.HK	Overweight	OW	HKD	4.8	6.6	38%	Rachel Zhang
Norsk Hydro ASA	NHY.OL	Overweight	OW	NOK	70.2	86.0	22%	Ioannis Masvoulas
Zijin Mining Group	2899.HK	Overweight	OW	HKD	9	15	63%	Sara Chan
South32 Ltd	S32.AX	Overweight	OW	AUD	4.1	4.9	20%	Rahul Anand
Rio Tinto Plc	RIO.L	Overweight	OW	GBP	5,301.00	5,220.00	-2%	Alain Gabriel
Glencore PLC	GLEN.L	Overweight	OW	GBP	387.80	448.00	16%	Alain Gabriel
Vale	VALE.N	Overweight	OW	USD	15.24	16.50	8%	Carlos De Alba
Least Preferred								
Yanzhou Coal	1171.HK	Underweight	UW	HKD	16	11	-29%	Sara Chan
Zhongjin Gold Corp. Ltd.	600489.SS	Underweight	UW	CNY	8.3	9.2	10%	Sara Chan
Fortescue Metals Group Ltd.	FMG.AX	Underweight	UW	AUD	20.88	14.05	-33%	Rahul Anand
Sumitomo Metal Mining	5713.T	Underweight	UW	JPY	4,773.00	4,300.00	-10%	Yu Shirakawa
Antofagasta	ANTO.L	Underweight	UW	GBP	1,342.00	1,300.00	-3%	Ioannis Masvoulas

Source: Morgan Stanley Research. Note: Priced at close on 11 January 2022.

Exhibit 4: Most Preferred Mining Stocks

Source: Morgan Stanley Research estimates. Note: Shown in descending order of upside to price target. Priced at close on 11 January 2022.

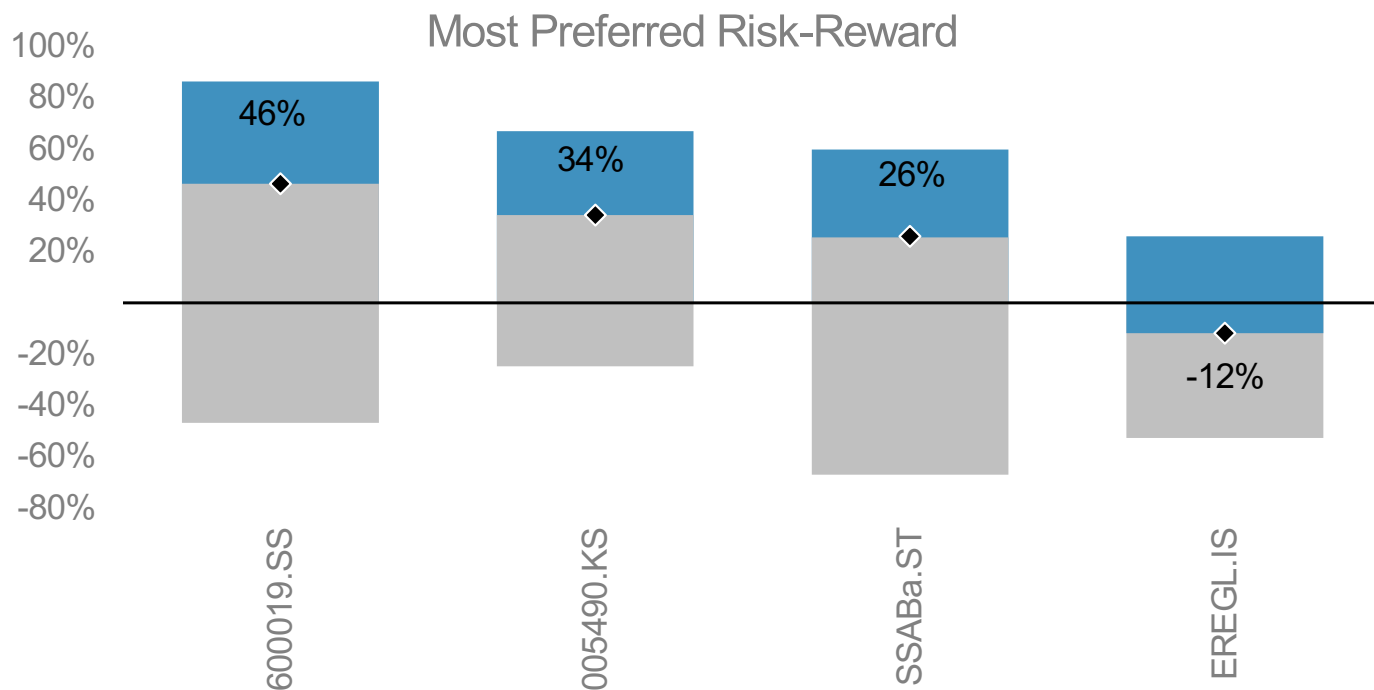
Exhibit 5: Least Preferred Mining Stocks

Source: Morgan Stanley Research estimates. Note: Shown in descending order of upside to price target. Priced at close on 11 January 2022.

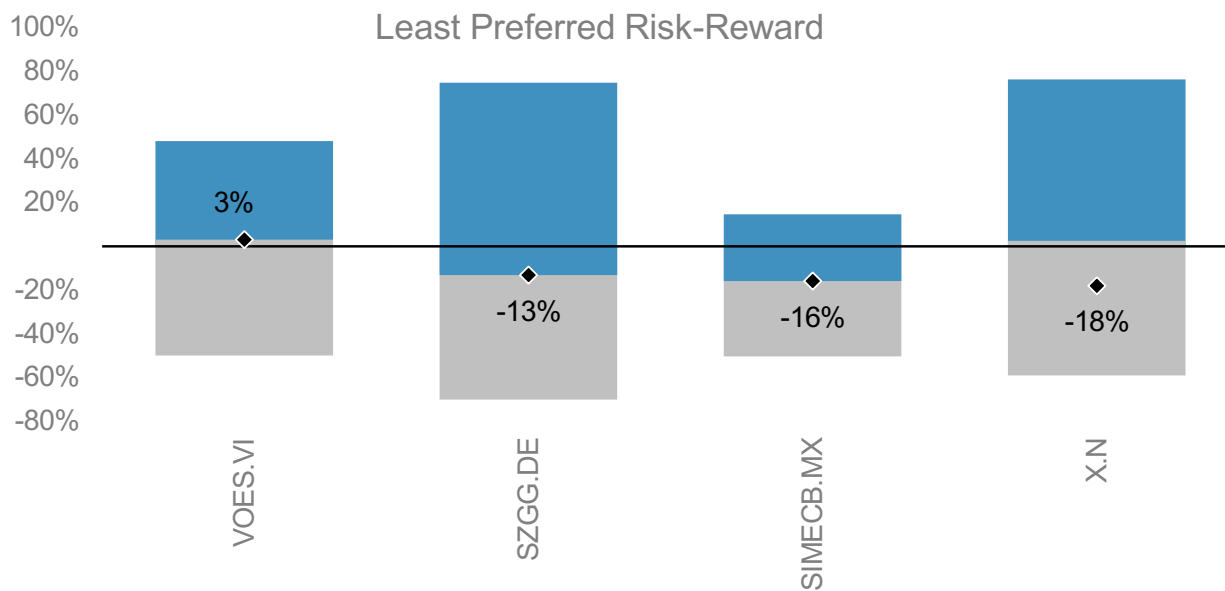
Exhibit 6: Global Steel Equities: Most Preferred and Least Preferred Stock

		Rating	Rating	CCY	Current Price	Price Target	% to PT	Analyst
Most Preferred								
SSAB AB	SSABa.ST	Overweight	OW	SEK	56	70	26%	Alain Gabriel
Erdemir	EREGL.IS	Overweight	OW	TRY	31.76	28.00	-12%	Dan Shaw
Baoshan Iron & Steel	600019.SS	Overweight	OW	CNY	7.5	11.0	46%	Rachel Zhang
POSCO	005490.KS	Overweight	OW	KRW	305,500.0	410,000.0	34%	Young Suk Shin
Least Preferred								
voestalpine AG	VOES.VI	Underweight	UW	EUR	34.0	35.0	3%	Alain Gabriel
Grupo Simec S.A.B. de C.V.	SIMECB.MX	Underweight	UW	MXN	177.0	149.0	-16%	Carlos De Alba
US Steel	X.N	Underweight	UW	USD	24.4	20.0	-18%	Carlos De Alba
Salzgitter AG	SZGG.DE	Underweight	UW	EUR	35.4	30.7	-13%	Alain Gabriel

Source: Morgan Stanley Research. Note: Priced at close on 11 January 2022.

Exhibit 7: Most Preferred Steel Stocks


Source: Morgan Stanley Research estimates. Note: Shown in descending order of upside to price target. Priced at close on 11 January 2022.

Exhibit 8: Least Preferred Steel Stocks


Source: Morgan Stanley Research estimates. Note: Shown in descending order of upside to price target. Priced at close on 11 January 2022.

For further details on our top picks, please refer to our report [Global Metals & Mining: Global Preference List - 1Q22 \(23 Dec 2021\)](#)

Mining – Relative performance & valuation

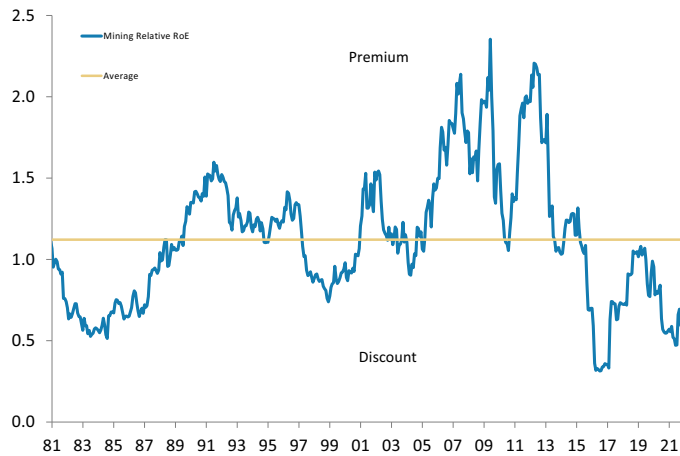
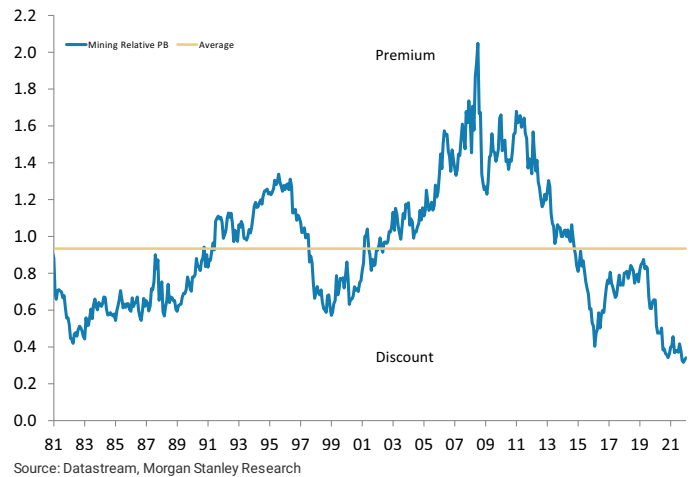
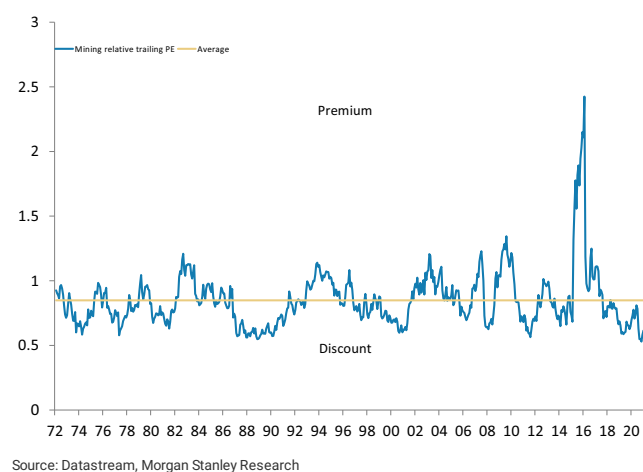
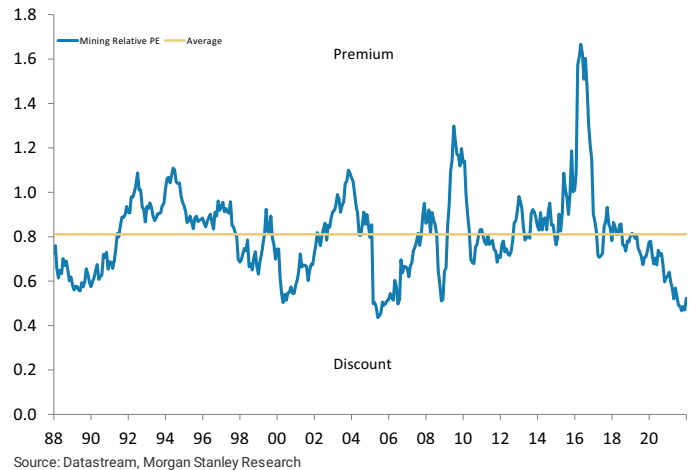
Exhibit 9: World Datastream Mining index RoE relative to the Datastream World Index**Exhibit 10:** World Datastream Mining index P/B relative to the Datastream World Index**Exhibit 11:** World Datastream Mining index trailing P/E relative to the Datastream World Index**Exhibit 12:** World Datastream Mining index 12m forward P/E relative to the Datastream World Index

Exhibit 13: World Datastream Mining index 12m forward DY relative to the Datastream World Index

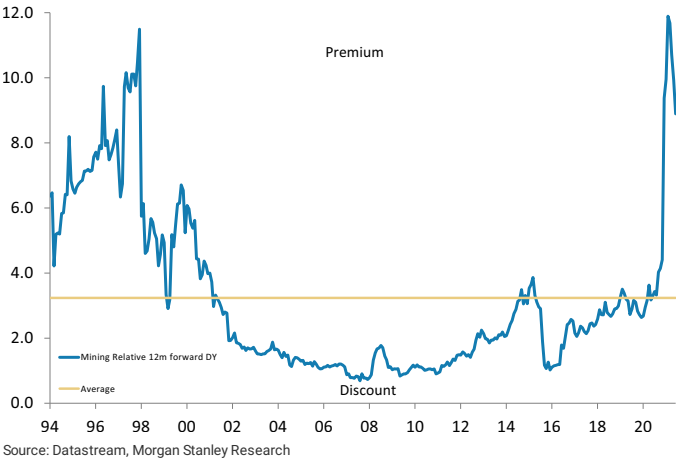
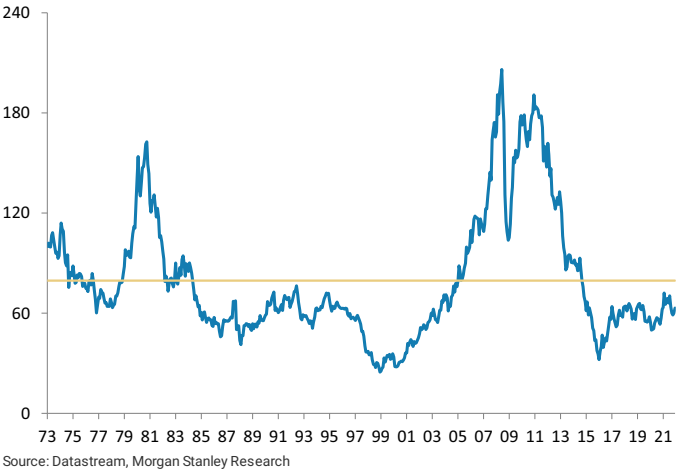


Exhibit 14: World Datastream Mining index share price relative to the Datastream World Index



Valuation Tables – Base Case

Exhibit 15: Base case valuation multiples and key metrics: diversified miners

Diversified Companies	Rating	FX	Price Target	Share Price	Market cap (US\$m)	EV*** (USD)	P/E	EV/EBITDA	FCF Yield	Dividend Yield	P/B	ROE	ND/(ND+E+M)	Net Debt/EBITDA																
						2022CY	2023CY	2024CY	2022CY	2023CY	2024CY	2022e	2023e	2024e	2022e	2023e	2024e													
African Rainbow Minerals^	OW	ZAc	27,000	24,096	3,452	2,697	4.5x	6.2x	NA	2.4x	2.8x	NA	5.7%	6.2%	NA	10.0%	7.4%	NA	1.1x	1.0x	NA	24.3%	15.8%	NA	Cash	Cash	NA	NA	NA	
Anglo American Plc	EW	Gbp	2,870	3,239	53,816	78,874	8.8x	13.4x	16.1x	5.2x	6.8x	5.6x	4.0%	1.4%	1.6%	4.6%	3.0%	2.5%	4.4x	3.8x	1.5x	20.9%	12.2%	9.5%	0.1x	0.2x	0.2x	0.4x	0.7x	0.8x
BHP Group Ltd***	++	AUD	++	44.65	162,077	225,935	11.2x	16.2x	21.5x	7.5x	9.9x	12.1x	7.0%	5.6%	4.2%	6.5%	4.4%	3.4%	3.8x	3.7x	3.7x	31.0%	23.7%	17.3%	0.2x	0.2x	0.2x	0.4x	0.4x	0.5x
BHP Group Plc***	++	Gbp	++	2,274	156,528	218,135	10.8x	15.6x	20.7x	7.2x	9.5x	11.7x	7.3%	5.8%	4.3%	6.8%	4.5%	3.5%	3.7x	3.6x	3.5x	31.0%	23.7%	17.3%	0.2x	0.2x	0.2x	0.4x	0.4x	0.5x
Exaro Resources Limited	OW	ZAc	13,000	16,592	3,843	3,758	3.9x	4.4x	NA	2.9x	2.9x	NA	21.0%	15.3%	NA	11.9%	11.1%	NA	1.2x	1.1x	NM	25.3%	19.6%	NA	Cash	Cash	NA	Cash	Cash	NA
Glencore	OW	Gbp	448	388	68,934	97,885	7.5x	13.3x	17.6x	5.0x	7.5x	8.8x	13.7%	9.6%	6.6%	14.6%	8.8%	7.5%	1.9x	2.2x	2.4x	23.5%	11.7%	9.9%	0.3x	0.4x	0.4x	1.2x	2.0x	2.4x
MMG Ltd.	EW	HKD	3.50	2.54	2,625	9,868	4.8x	8.4x	7.1x	3.6x	4.2x	3.8x	44.5%	38.9%	36.0%	0.0%	0.0%	0.0%	1.1x	1.0x	0.9x	29.9%	13.3%	13.9%	0.6x	0.5x	0.4x	1.6x	1.6x	1.1x
Norilsk Nickel	EW	USD	31.0	32.1	50,714	61,787	6.2x	7.8x	9.9x	5.0x	6.2x	7.4x	10.7%	7.6%	5.2%	10.6%	7.5%	5.0%	6.9x	6.0x	5.2x	NM	88.2%	60.7%	0.5x	0.5x	0.5x	0.8x	1.1x	1.4x
Rio Tinto Limited**	OW	AUD	109.00	106.37	124,347	150,219	8.9x	12.0x	16.5x	5.9x	7.8x	9.9x	8.1%	4.5%	3.1%	6.9%	5.0%	3.7%	2.2x	2.1x	2.1x	26.9%	18.7%	13.0%	0.0x	0.1x	0.1x	0.2x	0.4x	0.6x
Rio Tinto Plc***	OW	Gbp	5,220	5,301	117,282	143,153	8.3x	11.3x	15.5x	5.7x	7.5x	9.4x	8.6%	4.8%	3.3%	7.3%	5.3%	3.9%	2.1x	2.0x	1.9x	26.9%	18.7%	13.0%	0.0x	0.1x	0.1x	0.2x	0.4x	0.6x
South32^	OW	AUD	4.85	4.05	13,714	13,013	6.9x	10.8x	NA	3.8x	5.2x	NA	9.7%	2.4%	NA	5.8%	3.7%	NA	1.3x	1.2x	NA	20.5%	11.8%	NA	Cash	Cash	NA	NA	NA	NA
Teck Resources Limited	OW	USD	33.0	32.4	17,527	22,925	6.3x	13.9x	13.1x	3.8x	5.3x	4.2x	8.0%	9.9%	9.2%	0.5%	0.5%	0.5%	0.9x	0.8x	0.8x	15.8%	6.2%	6.2%	0.2x	0.2x	0.1x	0.9x	1.0x	0.5x
Vale S.A.	OW	USD	16.5	15.2	74,553	83,149	7.4x	9.1x	12.0x	4.3x	5.2x	6.1x	8.0%	7.2%	5.7%	11.8%	11.4%	4.3%	2.1x	2.2x	2.1x	28.0%	23.4%	18.4%	0.2x	0.2x	0.2x	0.4x	0.6x	0.7x
Vedanta Ltd***	NA	INR	NA	331	16,572	23,742	6.3x	6.3x	NA	4.0x	4.1x	NA	26.8%	26.5%	NA	7.0%	6.5%	NA	1.6x	1.4x	NA	25.4%	22.7%	NA	0.3x	NA	NA	0.3x	0.3x	NA
Weighted Average					579,562	758,989	7.6x	11.0x	14.6x	5.1x	6.7x	8.2x	9.0%	6.7%	4.5%	8.1%	5.9%	3.9%	2.7x	2.6x	2.5x	24.6%	23.8%	17.5%	0.2x	0.2x	0.2x	0.5x	0.7x	0.8x

Source: Morgan Stanley Research estimates (e), Thomson Reuters for non-covered companies (* Not covered by Morgan Stanley, ** Market cap based on total no. of group shares, *** provisions and pensions included in EV, ^ Fiscal year ending in June, ^^ Fiscal year ending in March, *** Fiscal year ending in September, **** Fiscal year ending in August, ***** Fiscal year ending in July). Weighted Average for P/E, FCF Yield, Dividend Yield, P/B, ROE based on Market Cap. Weighted Average for EV/EBITDA, Net Debt/EBITDA based on EV. Share prices as of January 11, 2021. NA = Not applicable, NM = Not meaningful. ++ Stock Rating, Price Target, or Estimates for this company have been removed from consideration in this report because, under applicable law and/or Morgan Stanley policy, Morgan Stanley may be precluded from issuing such information with respect to this company at this time.

Exhibit 16: Base case valuation multiples and key metrics: copper producers

Copper Companies	Rating	FX	Price Target	Share Price	Market cap (US\$m)	EV (US\$ mn)	P/E	EV/EBITDA	FCF Yield	Dividend Yield	P/B	ROE	ND/(ND+E+M)	Net Debt/EBITDA																
					2022CY	2023CY	2024CY	2022CY	2023CY	2024CY	2022CY	2023CY	2024CY	2022e	2023e	2024e	2022e	2023e	2024e											
Antofagasta Plc	UW	Gbp	1,300	1,342	17,973	27,841	18.5x	27.3x	24.5x	7.6x	9.1x	9.1x	1.5%	-1.1%	0.0%	3.5%	2.4%	2.7%	2.1x	2.1x	2.0x	11.6%	7.7%	8.5%	Cash	0.1x	0.1x	Cash	0.2x	0.4x
Aurubis AG**	UW	EUR	76	91.1	4,520	4,787	15.9x	17.0x	16.2x	7.7x	8.3x	8.0x	-3.3%	-4.2%	0.4%	1.7%	2.0%	2.2%	1.1x	1.0x	1.0x	7.2%	6.4%	8.5%	Cash	0.0x	0.1x	Cash	0.7x	0.8x
Boliden AB	EW	SEK	325	366	11,089	11,832	11.4x	14.5x	15.9x	6.2x	7.1x	7.6x	4.0%	4.1%	3.5%	4.9%	3.8%	3.5%	1.8x	1.8x	1.7x	17.3%	12.6%	11.1%	Cash	0.0x	0.0x	Cash	0.1x	0.1x
Copper Mountain Mining Corporation*	NA	CAD	NA	3.56	596	NA	8.1x	10.5x	3.7x	NA	NA	NA	6.4%	-11.4%	27.5%	0.0%	0.0%	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.0x	3.0x	NA
First Quantum Minerals Ltd.	OW	CAD	37.0	33.0	18,136	28,083	10.2x	15.5x	13.8x	6.1x	7.2x	6.2x	11.5%	8.4%	8.6%	0.9%	0.6%	0.6%	1.5x	1.4x	1.3x	17.7%	9.9%	10.2%	0.2x	0.1x	0.0x	0.8x	0.6x	0.2x
Freeport-McMoran	EW	USD	34.0	43.0	63,797	72,440	11.0x	19.3x	17.6x	5.8x	7.1x	6.4x	6.5%	6.6%	7.5%	0.7%	0.7%	0.7%	3.1x	2.7x	2.4x	37.5%	15.9%	15.4%	Cash	Cash	Cash	Cash	Cash	Cash
Grupo Mexico	EW	MXN	104	90	34,376	37,884	9.8x	11.0x	9.4x	4.9x	5.0x	4.2x	11.9%	11.1%	12.3%	6.9%	5.4%	6.0%	2.1x	2.0x	1.8x	23.6%	19.5%	21.3%	0.0x	Cash	Cash	0.1x	Cash	Cash
Ivanhoe Mines Ltd*	NA	CAD	NA	11.27	10,842	NA	25.1x	21.6x	17.2x	NA	NA	NA	1.5%	-2.2%	NA	0.0%	0.0%	NA	NA	NA	NA	13.7%	15.9%	NA	NA	NA	NA	Cash	0.1x	NA
Jiangxi Copper Company Limited	EW	CNY	24.0	22.6	9,555	10,776	12.9x	14.6x	12.0x	5.3x	5.3x	4.4x	13.3%	13.3%	11.1%	1.2%	1.3%	1.2%	1.1x	1.0x	1.0x	9.3%	7.6%	8.7%	0.2x	0.2x	0.1x	1.7x	1.4x	1.0x
KGHM Polska	EW	PLN	140	143.1	7,175	8,706	7.4x	9.5x	7.4x	4.6x	5.2x	4.0x	11.0%	10.1%	11.1%	2.7%	3.5%	4.5%	1.0x	0.9x	0.8x	14.8%	10.0%	12.0%	Cash	Cash	Cash	Cash	Cash	Cash
Lundin Mining Corporation	++	SEK	++	71.0	5,847	6,897	7.6x	12.3x	11.4x	4.1x	5.1x	4.5x	9.4%	8.4%	7.2%	3.8%	3.4%	2.9%	1.2x	1.1x	1.0x	16.8%	9.4%	9.7%	Cash	Cash	Cash	Cash	Cash	Cash
MMG Ltd.	EW	HKD	3.50	2.54	2,625	9,868	4.8x	8.4x	7.1x	3.6x	4.2x	3.8x	44.5%	38.9%	36.0%	0.0%	0.0%	0.0%	1.1x	1.0x	0.9x	29.9%	13.3%	13.9%	0.6x	0.5x	0.4x	1.6x	1.6x	1.1x
Mitsubishi Materials Corporation**	EW	JPY	2,150	2,052	2,326	3,972	6.1x	NA	NA	4.2x	NA	NA	20.6%	NA	NA	3.5%	NA	NA	0.4x	NA	NA	7.5%	NA	NA	0.4x	NA	NA	1.2x	NA	NA
Oz Minerals Limited	EW	AUD	27.30	26.52	6,796	6,967	12.4x	18.4x	NA	6.5x	8.8x	NA	3.9%	-0.8%	NA	1.5%	1.3%	NA	2.2x	2.0x	NM	20.7%	11.9%	NA	0.1x	0.1x	NA	0.2x	0.4x	NA
Sandfire Resources*	OW	AUD	7.35	6.94	888	2,006	9.9x	13.9x	NA	3.8x	3.5x	NA	-75.7%	24.4%	NA	3.6%	2.5%	NA	1.2x	1.1x	NA	21.3%	8.4%	NA	0.1x	0.0x	NA	0.4x	NA	NA
Southern Copper Corporation	EW	USD	55.0	66.0	51,032	53,631	19.6x	22.4x	18.6x	9.4x	10.2x	8.5x	5.6%	5.2%	5.9%	5.4%	3.6%	3.5%	6.3x	6.0x	5.4x	31.4%	28.1%	32.1%	0.3x	0.2x	0.1x	0.6x	0.5x	0.2x
Sumitomo Metal Mining**	UW	JPY	4,300	4,716	11,283	5,882	10.0x	NA	NA	4.1x	NA	NA	9.4%	NA	NA	3.6%	NA	NA	0.9x	NA	NA	9.5%	NA	NA	0.1x	NA	NA	0.9x	NA	NA
Weighted Average					258,888	291,571	13.5x	18.1x	15.9x	6.4x	7.4x	6.6x	7.3%	6.4%	7.7%	3.3%	2.5%	2.7%	3.0x	2.9x	2.6x	24.6%	16.8%	18.1%	0.2x	0.2x	0.1x	0.7x	0.6x	0.4x

Source: Morgan Stanley Research estimates (e), Thomson Reuters for non covered companies (*not covered by Morgan Stanley, ** Market cap based on total no. of group shares, *** provisions and pensions included in EV, ^ Fiscal year ending in June, ^^ Fiscal year ending in March, *** Fiscal year ending in September, **** Fiscal year ending in August, ***** Fiscal year ending in July). Weighted Average for P/E, FCF Yield, Dividend Yield, P/B, ROE based on Market Cap. Weighted Average for EV/EBITDA, Net Debt/EBITDA based on EV. Share prices as of January 11, 2021. NA = Not applicable, NM = Not meaningful

Exhibit 17: Base case valuation multiples and key metrics: iron ore producers

Iron Ore Companies	Rating	FX	Price Target	Share Price	Market cap (US\$m)	EV (US\$ mn)	P/E	EV/EBITDA	FCF Yield	Dividend Yield	P/B	ROE	ND/(ND+E+M)	Net Debt/EBITDA																
					2022CY	2023CY	2024CY	2022CY	2023CY	2024CY	2022CY	2023CY	2024CY	2022e	2023e	2024e	2022e	2023e	2024e											
Anglo American Plc	EW	Gbp	2,870	3,239	53,816	78,874	8.8x	13.4x	16.1x	5.2x	6.8x	5.6x	3.6%	1.3%	1.4%	4.6%	3.0%	2.5%	4.4x	3.8x	1.5x	20.9%	12.2%	9.5%	0.1x	0.2x	0.2x	0.4x	0.7x	0.8x
Rio Tinto Plc	OW	Gbp	5,220	5,301	117,282	143,153	8.3x	11.3x	15.5x	5.7x	7.5x	9.4x	11.2%	6.3%	4.3%	7.3%	5.3%	3.9%	2.1x	2.0x	1.9x	26.9%	18.7%	13.0%	0.0x	0.1x	0.1x	0.2x	0.4x	0.6x
BHP Group Plc*	++	Gbp	++	2,274	156,528	218,135	10.8x	15.6x	20.7x	7.2x	9.5x	11.7x	17.4%	13.9%	10.3%	6.8%	4.5%	3.5%	3.7x	3.6x	3.5x	31.0%	23.7%	17.3%	0.2x	0.2x	0.2x	0.4x	0.4x	0.5x
Vale	OW	USD	16.5	15.2	74,553	83,149	7.4x	9.1x	12.0x	4.3x	5.2x	6.1x	7.6%	6.9%	5.4%	11.8%	11.4%	4.3%	2.1x	2.2x	2.1x	28.0%	23.4%	18.4%	0.2x	0.2x	0.2x	0.4x	0.6x	0.7x
CAP	OW	CLP	11,216	8,500	1,535	2,882	4.0x	7.6x	21.0x	2.8x	3.9x	5.7x	37.7%	27.4%	16.4%	13.2%	9.5%	4.1%	0.6x	0.6x	0.6x	16.8%	8.1%	2.9%	Cash	Cash	Cash	Cash	Cash	Cash
CSN	EW	BRL	29	25	6,161	7,619	4.5x	6.7x	11.0x	2.3x	3.2x	4.4x	13.0%	-0.2%	-0.7%	5.1%	4.6%	2.9%	1.3x	1.1x	1.1x	33.9%	19.4%	10.4%	0.3x	0.3x	0.3x	0.8x	1.2x	1.7x
CSN Mineraçao	OW	BRL	8	7	6,953	6,202	9.8x	21.8x	29.4x	4.5x	7.2x	8.9x	2.5%	-4.9%	-3.3%	7.5%	4.6%	2.6%	2.4x	2.4x	2.3x	25.6%	10.9%	8.1%	Cash	Cash	0.1x	Cash	Cash	0.5x
Cleveland-Cliffs Inc	EW	USD	24	22.20	11,102	NA	3.8x	9.3x	NA	NA	NA	NA	40.0%	18.4%	NA	1.4x	1.8x	NA	1.4x	1.	1.	47.8%	14.8%	NA	0.2x	NA	NA	0.2x	NA	NA
Ferroport Plc*	NA	USD	NA	302.80	2,430	1,965	5.0x	5.5x	6.6x	3.1x	3.0x	3.3x	13.3%	13.9%	13.3%	7.8%	9.0%	14.3%	1.1x	1.0x	NA	22.3%	18.3%	15.0%	NA	NA	NA	Cash	Cash	Cash
Fortescue Metals Group*	UW	AUD	14.05	21.12	46,677	48,448	11.7x	17.6x	30.2x	6.5x	8.8x	13.2x	6.0%	5.1%	3.4%	6.6%	4.3%	2.5%	3.0x	3.0x	3.0x	24.2%	17.4%	10.0%	0.1x	0.1x	0.1x	0.2x	0.4x	0.5x
Kumba Iron Ore	UW	Zac	39,000	49,793	10,289	10,366	10.7x	11.2x	16.7x	5.2x	5.3x	7.2x	5.2%	5.3%	4.4%	6.9%	6.9%	5.4%	3.6x	3.4x	3.4x	36.9%	32.0%	20.0%	Cash	Cash	Cash	Cash	Cash	Cash
NMDC Ltd***	NA	INR	NA	136	5,402	NA	9.4x	5.8x	NA	NA	NA	NA	7.8%	14.4%	NA	7.8%	6.6%	NA	1.0x	1.0x	NA	20.7%	17.1%	NA	NA	NA	NA	Cash	Cash	NA
Weighted Average					492,728	600,784	5.2x	13.1x	18.3x	5.9x	7.8x	9.6x	11.9%	8.3%	6.0%	7.4%	5.7%	3.6%	2.9x	2.8x	2.6x	28.1%	20.2%	14.6%	0.1x	0.1x	0.1x	0.3x	0.5x	0.6x

Exhibit 18: Base case valuation multiples and key metrics: aluminium producers

Aluminium Companies	Rating	FX	Price Target	Share Price	Market cap (US\$m)	EV (US\$ m)	P/E	EV/EBITDA	FCF Yield	Dividend Yield	P/B	ROE	ND/(ND+E+M)	Net Debt/EBITDA																	
					2022CY	2023CY	2024CY	2022CY	2023CY	2024CY	2022CY	2023CY	2024CY	2022e	2023e	2024e	2022e	2023e	2024e												
Alcoa Inc.	OW	USD	66.0	62.2	11,876	12,248	15.2x	12.8x	13.5x	5.0x	4.5x	4.0x	9.6%	11.8%	10.1%	0.6%	0.6%	0.6%	2.1x	1.7x	1.4x	17.7%	16.1%	12.3%	Cash	Cash	Cash	Cash	Cash		
Alumina Limited	OW	AUD	2.15	2.01	4,153	4,124	12.9x	37.6x	29.6x	NA	NA	NA	14.5%	4.6%	4.8%	7.7%	2.3%	1.7%	2.2x	2.4x	2.3x	17.4%	6.0%	8.0%	Cash	0.0x	0.0x	Cash	NM	NM	
Aluminium Bahrain*	NA	BHD	NA	0.81	3,051	NA	3.4x	3.3x	NA	NA	NA	NA	37.8%	38.4%	NA	12.0%	17.9%	NA	NA	NA	NA	20.6%	17.7%	NA	NA	NA	NA	NA	NA	NA	
Aluminium Corporation Of China	OW	HKD	6.60	4.79	14,794	24,324	7.1x	6.4x	6.7x	6.7x	6.0x	5.8x	22.4%	23.1%	21.8%	0.0%	0.0%	0.0%	0.9x	0.8x	0.7x	15.4%	14.9%	12.4%	0.4x	0.3x	0.1x	2.0x	1.2x	0.5x	
Century Aluminum Company*	NA	USD	NA	17.40	1,568	NA	4.6x	5.5x	NA	NA	NA	NA	29.1%	22.2%	NA	0.0%	0.0%	NA	NA	NA	NA	16.2%	5.8%	NA	NA	NA	NA	0.1x	Cash	NA	
China Hongqiao Group*	NA	HKD	NA	9.05	10,589	NA	3.2x	2.9x	NA	NA	NA	NA	49.0%	53.3%	NA	14.9%	16.1%	0.0%	0.7x	0.6x	NA	21.9%	20.1%	NA	NA	NA	NA	0.2x	Cash	NA	
Constellation NV*	NA	USD	NA	18.8	2,668	5,259	13.1x	9.5x	NA	7.6x	6.6x	NA	10.2%	19.6%	NA	0.0%	0.0%	NA	5.3x	3.4x	NA	49.4%	40.1%	NA	NA	NA	NA	2.8x	2.0x	NA	
Hindalco Industries Limited***	NA	INR	NA	486	14,722	23,217	8.8x	8.8x	NA	6.4x	6.3x	NA	17.2%	NA	NA	1.0%	0.9%	NA	1.3x	1.1x	NA	15.5%	13.6%	NA	NA	NA	NA	1.4x	1.0x	NA	
Kaiser Aluminum Corp*	NA	USD	NA	100	1,589	NA	18.8x	13.0x	NA	NA	NA	NA	4.5%	7.5%	NA	3.0%	3.1%	NA	2.1x	2.0x	NA	11.4%	14.7%	NA	NA	NA	NA	3.0x	2.7x	NA	
National Aluminium Co Ltd*	NA	INR	NA	108.45	2,691	NA	9.3x	10.8x	NA	NA	NA	NA	10.6%	7.1%	NA	3.3%	3.4%	NA	1.6x	1.4x	NA	17.0%	13.7%	NA	NA	NA	NA	Cash	Cash	NA	
Nippon Light Metals Holding Company**	EW	JPY	1,800	1,817	975	1,966	5.9x	NA	NA	4.6x	NA	NA	11.8%	NA	NA	6.1%	NA	NA	0.5x	NA	NA	9.1%	NA	NA	NA	0.2x	NA	NA	1.4x	NA	NA
Norsk Hydro ASA	OW	NOK	86.00	70.22	16,396	18,973	7.1x	9.0x	9.0x	4.4x	5.1x	4.9x	10.7%	10.6%	10.0%	7.0%	5.6%	5.5%	1.6x	1.5x	1.4x	24.6%	17.4%	16.2%	Cash	Cash	Cash	Cash	Cash	Cash	
Shandong Nanshan Aluminium Corp	OW	CNY	6.50	4.85	9,094	7,467	12.5x	11.0x	8.2x	6.1x	4.9x	3.3x	7.3%	9.5%	13.2%	0.8%	0.9%	1.2%	1.2x	1.1x	1.0x	10.6%	11.1%	13.5%	Cash	Cash	Cash	Cash	Cash	Cash	
South32*	OW	AUD	4.85	4.05	13,714	13,013	6.9x	10.8x	NA	3.8x	5.2x	NA	9.7%	2.4%	NA	5.8%	3.7%	NA	1.3x	1.2x	NA	20.5%	11.8%	NA	Cash	Cash	NA	NA	NA	NA	
UACU Corp**	OW	JPY	3,500	2,809	1,175	3,288	9.5x	NA	NA	5.5x	NA	NA	15.2%	NA	NA	3.4%	NA	NA	0.6x	NA	NA	6.7%	NA	NA	0.5x	NA	NA	3.1x	NA	NA	
United Company Rusal Plc*	NA	HKD	NA	7.88	15,687	NA	3.6x	3.6x	5.4x	NA	NA	NA	15.7%	15.3%	6.2%	4.6%	3.9%	4.2%	8.2x	6.8x	NA	30.6%	23.9%	17.5%	NA	NA	NA	0.4x	Cash	Cash	
Yunnan Aluminium Co*	NA	CNY	NA	12.72	6,919	NA	9.3x	8.6x	NA	NA	NA	NA	16.7%	18.5%	NA	NA	9.6%	NA	2.1x	1.8x	NA	25.1%	22.7%	NA	NA	NA	NA	0.2x	Cash	NA	
Weighted Average					131,663	113,879	8.2x	9.0x	9.6x	5.6x	5.6x	4.9x	17.3%	17.1%	11.7%	5.2%	5.0%	3.2%	2.3x	2.0x	1.2x	20.6%	16.7%	14.2%	0.4x	0.2x	0.1x	1.9x	1.2x	0.5x	

Source: Morgan Stanley Research estimates (e), Thomson Reuters for non covered companies (*not covered by Morgan Stanley, ** Market cap based on total no. of group shares, *** provisions and pensions included in EV, * Fiscal year ending in June, ** Fiscal year ending in March, *** Fiscal year ending in September, **** Fiscal year ending in August, ***** Fiscal year ending in July). Weighted Average for P/E, FCF Yield, Dividend Yield, P/B, ROE based on Market Cap. Weighted Average for EV/EBITDA, Net Debt/EBITDA based on EV. Share prices as of January 11, 2021. NA = Not applicable, NM = Not meaningful

Exhibit 19: Base case valuation multiples and key metrics: coal producers

Coal Companies	Rating	FX	Price Target	Share Price	Market cap (US\$m)	EV (USD) 2022CY	P/E 2023CY	2024CY	2022CY	EV/EBITDA 2023CY	2024CY	2022CY	FCF Yield 2023CY	2024CY	Dividend Yield 2022CY	2023CY	2024CY	P/B 2022CY	2023CY	2024CY	2022e	ROE 2023e	2024e	2022e	ND/(ND+E+M) 2023e	2024e	2022e	Net Debt/EBITDA 2023e	2024e		
THERMAL COAL																															
Adaro Energy	UW	IDR	1,428	2,340	5,234	4,402	12.0x	14.9x	12.7x	3.7x	3.9x	3.4x	5.5%	10.3%	11.1%	4.2%	3.4%	3.9%	1.2x	1.2x	1.1x	11.0%	8.4%	9.4%	Cash	Cash	Cash	Cash	Cash		
Arch Coal, Inc.*	NA	USD	NA	98.15	1,503	NA	2.6x	6.3x	31.6x	NA	NA	NA	53.0%	27.0%	NA	1.0%	1.0%	1.0%	NA	NA	NA	61.2%	21.5%	NA	NA	NA	NA	NA	Cash	NA	
China Coal Energy Co.	UW	CNY	5.11	6.57	12,005	21,231	5.4x	6.9x	NA	2.7x	3.0x	NA	66.0%	51.1%	NA	4.7%	3.6%	NA	0.7x	0.7x	NM	14.4%	10.2%	NA	0.1x	0.0x	NA	0.4x	0.2x	NA	
China Shenhua Energy Company Limited	OW	HKD	23.3	18.8	66,923	52,737	6.7x	7.0x	NA	3.7x	3.7x	NA	NM	NM	NA	5.7%	5.4%	NA	0.7x	0.7x	NM	11.6%	10.2%	NA	Cash	Cash	NA	Cash	Cash	NA	
Coal India Limited****	NA	INR	NA	159	13,200	10,416	5.7x	5.5x	NA	3.1x	3.0x	NA	11.5%	13.7%	NA	10.9%	11.3%	NA	2.2x	1.9x	NA	39.4%	36.7%	NA	NA	NA	NA	Cash	Cash	NA	
Consol Energy Inc.*	NA	USD	NA	24.6	849	NA	4.8x	4.1x	NA	NA	NA	NA	41.6%	37.0%	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Exaro Resources Limited	UW	ZAR	13,000	16,592	3,843	3,758	3.9x	4.4x	NA	2.9x	2.9x	NA	21.8%	15.9%	NA	11.9%	11.1%	NA	1.2x	1.1x	NM	25.3%	19.6%	NA	Cash	Cash	NA	Cash	Cash	NA	
Harum Energy*	NA	IDR	NA	10,900	2,061	NA	14.5x	9.8x	NA	NA	NA	NA	7.9%	11.5%	NA	0.9%	1.8%	NA	3.8x	3.3x	NA	22.0%	29.4%	NA	NA	NA	NA	Cash	Cash	NA	
Indo Tambora Energy Megah*	NA	IDR	NA	20,175	1,594	1,143	5.2x	7.9x	NA	2.3x	3.4x	NA	29.1%	19.0%	NA	17.1%	13.3%	NA	1.4x	1.4x	NA	26.0%	18.0%	NA	NA	NA	NA	Cash	Cash	NA	
New Hope Corporation Limited*****	NA	AUD	NA	2.30	1,372	NA	4.3x	7.8x	NA	NA	NA	NA	34.8%	21.4%	NA	10.8%	7.3%	4.1%	0.9x	0.8x	NA	22.8%	11.7%	NA	NA	NA	NA	Cash	Cash	NA	
Peabody Energy Corporation*	NA	USD	NA	11.98	1,526	NA	2.9x	34.1x	28.9x	NA	NA	NA	65.7%	36.1%	29.9%	0.0%	0.0%	0.0%	NA	NA	NA	33.6%	NM	NA	NA	NA	NA	0.8x	NA	NA	
Shaanxi Coal Industry	UW	CNY	13.12	12.36	19,393	1,509	7.4x	8.0x	NA	0.3x	0.7x	NA	72.3%	6.7%	NA	4.1%	3.7%	NA	1.3x	1.1x	NM	19.6%	15.8%	NA	Cash	Cash	NA	Cash	Cash	NA	
Whitehaven Coal Limited*	OW	AUD	3.80	2.87	2,114	1,804	3.5x	6.0x	NA	1.7x	2.5x	NA	32.1%	15.1%	NA	6.7%	4.7%	NA	0.8x	0.7x	NA	28.1%	13.1%	NA	Cash	Cash	NA	NA	NA	NA	
Yancoal Australia Ltd	EW	HKD	17.66	17.40	2,949	3,336	4.7x	4.8x	NA	2.7x	2.3x	NA	27.9%	30.9%	NA	10.7%	10.3%	NA	0.7x	0.6x	NM	15.8%	14.1%	NA	0.3x	0.2x	NA	1.2x	0.8x	NA	
Yangquan Coal Industry Group Co Ltd*	NA	CNY	NA	12.20	4,602	NA	10.6x	10.3x	NA	NA	NA	NA	-2.1%	18.5%	NA	0.0%	0.0%	NA	1.2x	1.0x	NA	9.8%	9.3%	NA	NA	NA	NA	0.0x	0.0x	NA	
Thungela Resources Ltd	OW	ZAR	12,000	8,727.00	760	NA	2.1x	3.2x	5.2x	NA	NA	NA	NA	NA	NA	12.5%	7.5%	9.6%	NA	NA	NA	39.3%	15.2%	25.0%	NA	NA	NA	Cash	Cash	Cash	
Yanzhou Coal Mining Company Limited	UW	HKD	11.23	15.88	14,938	27,338	3.2x	4.5x	5.6x	3.9x	5.7x	7.2x	22.7%	-38.1%	-15.4%	13.6%	15.6%	11.2%	0.8x	0.8x	NA	28.1%	17.4%	13.2%	0.4x	0.5x	0.5x	1.4x	2.5x	3.4x	
Weighted Average					154,867	127,675	6.4x	7.3x	10.3x	3.4x	3.9x	6.8x	37.5%	10.2%	-5.8%	7.0%	6.8%	8.5%	1.0x	0.9x	1.1x	18.6%	14.7%	12.7%	0.1x	0.1x	0.5x	1.0x	1.5x	3.4x	
COKING COAL																															
(Persero) Pt Aneka Tambang Tbk*	NA	IDR	NA	2,080	3,494	3,556	17.7x	15.1x	NA	9.6x	8.3x	NA	6.4%	8.6%	NA	1.4%	2.1%	NA	2.1x	2.0x	NA	12.9%	14.0%	NA	NA	NA	NA	0.7x	Cash	NA	
Arch Coal, Inc.*	NA	USD	NA	98.15	1,503	2,252	2.6x	6.3x	31.6x	2.4x	4.3x	10.0x	53.0%	27.0%	NA	1.0%	1.0%	1.0%	NA	NA	NA	61.2%	21.5%	NA	NA	NA	NA	NA	Cash	NA	
Banpu Public Company Limited*	NA	THB	NA	11.2	2,276	7,812	5.7x	6.9x	8.5x	6.1x	6.4x	NA	30.4%	33.2%	NA	6.6%	5.8%	NA	0.9x	0.9x	NA	16.7%	12.1%	NA	NA	NA	NA	2.2x	1.8x	NA	
Open Joint Stock Company "Raspaskaya**	NA	RUB	NA	4.75	4,372	4,799	6.0x	6.9x	NA	4.4x	4.8x	NA	18.0%	16.1%	NA	13.7%	12.2%	NA	NA	NA	NA	45.6%	38.3%	NA	NA	NA	NA	0.1x	0.2x	NA	
Suncoke Energy*	NA	USD	NA	7.16	595	NA	12.5x	12.7x	NA	NA	NA	NA	26.1%	25.7%	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Warrior Met Coal.*	NA	USD	NA	27.41	1,409	1,555	5.0x	9.5x	11.7x	3.1x	4.6x	4.2x	28.3%	16.6%	NA	0.6%	0.6%	0.7%	1.3x	1.2x	NA	31.6%	13.1%	NA	NA	NA	NA	Cash	Cash	NA	
Weighted Average					13,650	19,975	8.8x	9.5x	16.0x	5.7x	6.0x	7.6x	22.4%	18.7%	NA	6.3%	5.6%	0.9%	1.6x	1.5x	NA	32.1%	22.6%	NA	NA	NA	NA	1.3x	1.2x	NA	

Source: Morgan Stanley Research estimates (e), Thomson Reuters for non covered companies (*not covered by Morgan Stanley, ** Market cap based on total no. of group shares, *** provisions and pensions included in EV, * Fiscal year ending in June, ** Fiscal year ending in March, *** Fiscal year ending in September, **** Fiscal year ending in August, ***** Fiscal year ending in July). Weighted Average for P/E, FCF Yield, Dividend Yield, P/B, ROE based on Market Cap. Weighted Average for EV/EBITDA, Net Debt/EBITDA based on EV. Share prices as of January 11, 2021. NA = Not applicable, NM = Not meaningful

Exhibit 20: Base case valuation multiples and key metrics: gold producers

Gold Companies	Rating	FX	Price Target	Share Price	Market cap (US\$m)	EV (USD)	P/E	EV/EBITDA	FCF Yield	Dividend Yield	P/B	ROE	ND/(ND+E+M)	Net Debt/EBITDA																	
					2022CY	2023CY	2023CY	2023CY	2024CY	2022CY	2023CY	2023CY	2024CY	2022e	2023e	2024e															
Agnico Eagle Mines Ltd*	NA	CAD	NA	65.2	12,691	NA	16.6x	16.8x	16.1x	NA	NA	NA	12.6%	13.7%	16.4%	2.7%	2.7%	NA	2.9x	NA	NA	16.4%	12.3%	14.7%	NA	NA	NA	0.2x	Cash	Cash	
Alamos Gold Inc*	NA	CAD	NA	9.26	2,887	NA	16.7x	17.9x	16.9x	NA	NA	NA	3.4%	3.3%	2.9%	1.1%	0.9%	NA	1.0x	NA	NA	4.6%	4.9%	2.8%	NA	NA	NA	Cash	Cash	Cash	
AngloGold Ashanti Limited	EW	ZAR	31,500	30,940	8,317	6,890	13.4x	20.6x	NA	4.7x	5.4x	NA	4.3%	3.9%	NA	1.2%	1.1%	NA	1.8x	1.7x	NM	15.1%	8.7%	NA	0.2x	0.1x	NA	0.2x	NM	NA	
Barrick Gold Corp*	NA	CAD	NA	23.7	33,562	46,281	16.8x	15.8x	15.5x	7.1x	6.9x	7.1x	13.8%	14.8%	14.8%	2.0%	2.2%	2.3%	1.4x	NA	NA	7.0%	7.1%	5.8%	NA	NA	NA	Cash	Cash	Cash	
Centamin PLC	EW	GBP	100	91	1,431	1,251	13.0x	16.4x	15.2x	3.5x	4.0x	3.7x	3.9%	3.9%	7.3%	4.0%	3.2%	5.7%	1.1x	1.0x	1.0x	8.3%	6.5%	6.8%	Cash	Cash	Cash	Cash	Cash	Cash	
Centerra*	NA	CAD	NA	10.4	2,459	NA	7.9x	11.3x	30.7x	NA	NA	NA	14.6%	11.5%	2.9%	2.6%	2.8%	2.8%	1.2x	1.1x	1.2x	12.2%	7.0%	1.0%	NA	NA	NA	Cash	Cash	Cash	
Compania De Minas Buenaventura	UW	USD	7.0	8.0	2,034	1,275	9.4x	NM	16.6x	4.9x	8.4x	6.2x	0.7%	-12.0%	-2.1%	2.1%	0.5%	1.5%	0.7x	0.7x	0.7x	8.1%	1.7%	4.3%	0.2x	0.2x	0.2x	2.4x	4.7x	3.9x	
Dowa Holdings Co. Ltd.**	EW	JPY	5,100	4,915	2,537	2,453	7.2x	NA	NA	3.8x	NA	NA	7.9%	NA	NA	2.6%	NA	NA	0.8x	NA	NA	12.2%	NA	NA	0.2x	NA	NA	1.1x	NA	NA	
Eldorado Gold Corp*	NA	CAD	NA	12.0	1,740	NA	14.3x	11.8x	10.0x	NA	NA	NA	5.9%	0.5%	1.6%	0.0%	0.0%	NA	0.5x	NA	NA	3.0%	3.6%	2.3%	NA	NA	NA	Cash	Cash	1.1x	
Endeavour Mining	EW	GBP	1,830	1,575	5,172	5,817	14.2x	19.6x	18.3x	4.7x	5.6x	5.3x	10.8%	7.1%	8.9%	7.8%	5.2%	8.7%	1.2x	1.3x	1.3x	9.1%	6.3%	7.0%	Cash	Cash	Cash	Cash	Cash	Cash	
Evolution Mining**	EW	AUD	4.25	3.86	4,690	5,615	15.6x	16.0x	NA	7.5x	7.2x	NA	2.9%	4.4%	NA	2.0%	1.9%	NA	2.1x	1.9x	NA	15.6%	13.2%	NA	0.3x	0.3x	NA	1.2x	1.2x	NA	
Fresnillo Plc	EW	GBP	900	825	8,255	8,341	15.4x	17.1x	22.5x	5.5x	5.5x	5.9x	8.6%	8.8%	8.2%	3.1%	2.9%	2.4%	2.1x	2.0x	1.9x	14.8%	12.3%	8.8%	Cash	Cash	Cash	Cash	Cash	Cash	
Gold Fields Limited	EW	ZAR	15,200	16,399	9,244	9,469	13.0x	18.3x	NA	4.9x	5.4x	NA	3.7%	5.9%	NA	2.3%	1.6%	NA	2.0x	1.8x	NM	16.8%	10.7%	NA	0.2x	0.1x	NA	0.1x	NM	NA	
Harmony Gold Mining Co. Ltd.*	UW	ZAR	5,000	5,790	2,244	1,983	10.3x	NM	NA	3.5x	5.5x	NA	0.0%	-3.3%	NA	0.5%	0.1%	NA	0.9x	0.9x	NA	10.4%	2.4%	NA	0.0x	0.0x	NA	NA	NA	NA	
Ilamgold*	NA	CAD	NA	3.72	1,411	NA	38.4x	15.2x	8.1x	NA	NA	NA	-36.5%	-0.9%	26.1%	0.0%	0.0%	0.0%	0.6x	NA	NA	0.4%	1.0%	NA	NA	NA	NA	0.7x	1.7x	1.6x	
Independence Group NL*	UW	AUD	9.70	11.69	6,354	5,846	15.4x	19.4x	NA	7.8x	9.5x	NA	5.9%	4.4%	NA	1.8%	1.4%	NA	2.5x	2.6x	NA	17.0%	13.0%	NA	Cash	Cash	NA	1.7x	NA	NA	
Kinross Gold Corporation*	NA	CAD	NA	7.13	7,107	NA	7.8x	7.1x	7.4x	NA	NA	NA	22.2%	25.4%	20.0%	2.1%	2.1%	2.1%	1.0x	NA	NA	11.4%	10.1%	8.2%	NA	NA	NA	0.0x	Cash	Cash	
Minera Frisco*	UW	MXN	3.30	3.56	1,056	2,021	13.9x	23.7x	17.7x	4.2x	4.8x	4.1x	23.0%	18.9%	19.2%	0.0%	1.3%	1.7%	1.7x	1.6x	1.5x	14.5%	7.2%	9.1%	0.6x	0.5x	0.5x	1.9x	1.9x	1.4x	
NEW GOLD INC*	NA	CAD	NA	2.01	1,088	NA	6.5x	6.4x	6.4x	NA	NA	NA	19.7%	22.7%	37.1%	0.0%	0.0%	0.0%	1.0x	0.7x	0.6x	14.7%	12.2%	10.5%	NA	NA	NA	0.6x	Cash	Cash	
Newcrest Mining Limited*	OW	AUD	29.40	24.19	13,309	16,164	20.6x	27.6x	NA	7.9x	8.4x	NA	1.0%	3.1%	NA	1.4%	1.6%	NA	1.3x	1.2x	NA	6.7%	4.7%	NA	0.1x	0.1x	NA	0.7x	0.6x	NA	
Newmont Mining Corporation*	NA	USD	NA	60.9	48,572	57,051	19.6x	21.4x	18.8x	9.0x	9.4x	8.6x	8.6%	8.1%	9.9%	3.6%	3.4%	3.5%	2.1x	2.1x	2.0x	9.0%	7.9%	9.2%	NA	NA	NA	Cash	Cash	Cash	
Northern Star Resources*	AUD	AUD	9.95	9.08	7,611	7,330	36.6x	NM	NA	6.6x	7.1x	NA	5.6%	5.6%	NA	5.5%	5.8%	NA	1.3x	1.3x	NA	3.6%	1.2%	NA	Cash	Cash	NA	NA	NA	NA	
Pan African Resources Ltd**	NA	GBP	NA	17.5	461	NA	8.3x	5.5x	8.8x	NA	NA	NA	20.1%	23.1%	NA	5.3%	NA	NA	NA	NA	NA	15.7%	16.2%	NA	NA	NA	NA	0.0x	Cash	NA	
Perseus Mining Ltd**	NA	AUD	NA	1.54	1,357	NA	8.3x	7.9x	NA	NA	NA	NA	25.3%	26.0%	NA	2.1%	2.3%	NA	1.4x	1.2x	NA	19.4%	17.3%	NA	NA	NA	NA	Cash	Cash	NA	
Petropavlovsk*	NA	GBP	NA	18.1	978	NA	8.3x	8.4x	8.8x	NA	NA	NA	24.7%	22.0%	23.3%	0.0%	3.0%	40.5%	1.1x	0.9x	NA	11.4%	10.5%	7.0%	NA	NA	NA	1.0x	0.9x	0.3x	
Polymetal International Plc	OW	GBP	1,650	1,213	7,921	9,156	6.9x	8.4x	9.2x	5.2x	6.1x	6.4x	9.9%	7.2%	7.5%	6.9%	8.1%	7.5%	2.6x	2.4x	2.2x	47.9%	31.3%	25.9%	0.3x	0.3x	0.3x	0.7x	0.9x	0.9x	
Polysius Gold	EW	USD	100	82.3	22,208	24,204	9.5x	10.9x	12.2x	7.4x	8.1x	8.8x	5.4%	4.9%	6.0%	4.4%	4.0%	3.6%	2.3x	1.9x	1.6x	67.0%	42.6%	30.8%	0.2x	0.2x	0.1x	0.5x	0.5x	0.3x	
Regis Resources Ltd*	OW	AUD	2.35	1.90	1,026	1,175	7.3x	8.4x	NA	3.1x	2.9x	NA	2.0%	15.2%	NA	5.5%	4.9%	NA	1.7x	1.6x	NA	11.8%	9.7%	NA	0.1x	0.1x	NA	0.4x	NA	NA	
Resolute Mining**	NA	AUD	NA	0.35	279	436	6.8x	10.3x	NA	2.0x	2.3x	1.3x	56.1%	24.6%	NA	2.9%	5.3%	NA	0.4x	0.3x	NA	8.0%	4.5%	NA	NA	NA	NA	0.3x	Cash	NA	
Royal Gold Inc*	NA	USD	NA	102	6,716	NA	26.8x	27.4x	31.4x	NA	NA	NA	5.6%	NA	NA	1.3%	1.3%	NA	NA	NA	NA	10.1%	NA	NA	NA	NA	NA	Cash	Cash	NA	
Saudi Arabian Mining Company (Ma'aden)*	NA	SAR	NA	85.90	28,162	46,992	15.9x	16.9x	27.4x	12.7x	13.1x	NA	10.5%	9.7%	NA	0.0%	0.0%	NA	2.6x	2.4x	2.4x	16.5%	13.3%	9.1%	NA	NA	NA	2.1x	1.6x	NA	
Sibanye-Stillwater	EW	ZAR	6,000	5,555	7,728	7,485	4.6x	5.8x	NA	2.0x	2.0x	NA	18.4%	24.6%	NA	7.6%	6.1%	NA	1.5x	1.3x	NM	41.2%	25.8%	NA	Cash	Cash	NA	Cash	Cash	NA	
Sumitomo Metal Mining**	UW	JPY	4,300	4,716	11,283	5,882	10.0x	NA	NA	4.1x	NA	NA	9.4%	NA	NA	3.6%	NA	NA	0.9x	NA	NA	9.5%	NA	NA	NA	0.1x	NA	NA	0.9x	NA	NA
Tanama Gold Inc*	NA	CAD	NA	5.07	3,879	NA	13.9x	16.4x	24.8x	NA	NA	NA	16.1%	16.4%	30.8%	2.9%	2.6%	3.0%	0.9x	NA	NA	4.9%	3.8%	3.2%	NA	NA	NA	0.2x	Cash	Cash	
Zhaohing Mining Industry	EW	HKD	7.12	5.99	2,512	4,618	13.8x	11.1x	11.9x	9.7x	8.5x	8.4x	13.3%	11.5%	11.4%	1.1%	1.4%	1.3%	1.1x	1.0x	0.9x	8.3%	9.6%	8.3%	0.5x	0.4x	0.4x	4.7x	3.9x	3.6x	
Zhongjin Gold Corp. Ltd.	UW	CNY	9.16	8.34	6,343	6,877	32.1x	NM	NA	11.3x	12.5x	NA	9.1%	8.1%	NA	1.1%	0.8%	NA	1.6x	1.6x	NM	5.1%	3.8%	NA	0.1x	0.0x	NA	0.4x	NM	NA	
Zijin Mining Group	EW	CNY	12.06	9.43	35,756	46,069	14.3x	14.8x	NA	8.8x	8.2x	NA	4.5%	7.2%	NA	2.9%	3.2%	NA	3.0x	2.7x	NM	24.4%	20.5%	NA	0.3x	0.2x	NA	1.3x	1.1x	NA	
Weighted Average					320,388	330,671	15.8x	17.0x	18.1x	8.1x	8.5x	7.7x	8.6%	9.2%	11.2%	3.0%	2.9%	3.7%	2.0x	2.0x	1.9x	17.8%	13.6%	11.5%	0.2x	0.2x	0.2x	1.0x	1.2x	0.9x	

Source: Morgan Stanley Research estimates (e), Thomson Reuters for non covered companies (*not covered by Morgan Stanley, ** Market cap based on total no. of group shares, *** provisions and pensions included in EV, * Fiscal year ending in June, ** Fiscal year ending in March, *** Fiscal year ending in September, **** Fiscal year ending in August, ***** Fiscal year ending in July). Weighted Average for P/E, FCF Yield, Dividend Yield, P/B, ROE based on Market Cap. Weighted Average for EV/EBITDA, Net Debt/EBITDA based on EV. Share prices as of January 11, 2021. NA = Not applicable, NM = Not meaningful

Exhibit 21: Base case valuation multiples and key metrics: silver producers

Silver Companies	Rating	FX	Price Target	Share Price	Market cap (US\$m)	EV (USD)	P/E			EV/EBITDA			FCF Yield			Dividend Yield			P/B			ROE			ND/(ND+E+M)			Net Debt/EBITDA			
							2022.0	2023.0	2024.0	2022.0	2023.0	2024.0	2022.0	2023.0	2024.0	2022.0	2023.0	2024.0	2022.0	2023.0	2024.0	2021e	2022e	2023e	2021e	2022e	2023e	2021e	2022e	2023e	
Coeur Mining*	NA	USD	NA	5.16	1,326	NA	18.2x	13.1x	5.9x	NA	NA	NA	-6.0%	12.2%	27.5%	0.0%	0.0%	NA	NA	NA	NA	4.3%	7.6%	NA	NA	NA	NA	2.5x	1.8x	0.6x	
Endeavour Silver*	NA	CAD	NA	5.35	726	NA	NM	21.3x	10.1x	NA	NA	NA	-3.1%	6.5%	NA	0.0%	0.0%	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	Cash	NA	NA	
First Majestic Silver Corp.*	NA	CAD	NA	13.6	2,852	NA	23.3x	18.0x	1.8x	NA	NA	NA	0.8%	0.8%	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	Cash	NA	NA
Fortuna Silver Mines*	NA	CAD	NA	4.73	1,097	NA	6.1x	6.5x	10.0x	NA	NA	NA	22.6%	23.2%	22.7%	0.0%	0.0%	NA	NA	NA	NA	6.0%	2.0%	NA	NA	NA	NA	NA	Cash	Cash	Cash
Fresnillo Plc	EW	GBP	900	825	8,255	8,341	15.4x	17.1x	22.5x	5.5x	5.5x	5.9x	8.6%	8.8%	8.2x	3.1%	2.9%	2.4%	2.1x	2.0x	1.9x	14.8%	12.3%	8.8%	Cash	Cash	Cash	Cash	Cash	Cash	
Hochschild Mining Plc*	NA	GBP	NA	120	840	NA	9.7x	12.2x	11.7x	NA	NA	NA	23.1%	22.6%	NA	3.0%	3.3%	NA	1.0x	1.0x	NA	9.4%	9.8%	NA	NA	NA	NA	NA	Cash	Cash	Cash
Penoles	EW	MXN	254	231	4,505	6,855	12.0x	14.7x	22.9x	3.7x	3.8x	4.2x	14.3%	13.1%	12.2%	5.2%	4.2%	3.4%	1.1x	1.1x	1.1x	9.7%	7.6%	4.8%	0.2x	0.1x	0.0x	0.5x	0.3x	0.1x	
SSR Mining Inc*	NA	CAD	NA	214	3,606	4,017	11.1x	12.4x	11.4x	5.5x	5.9x	5.7x	14.7%	15.0%	16.3%	1.3%	1.2%	NA	1.0x	0.9x	NA	7.7%	7.0%	NA	NA	NA	NA	Cash	Cash	Cash	
US Silver and Gold*	NA	CAD	NA	1.03	135	189	12.8x	13x	6.3x	4.7x	2.9x	2.8x	8.5%	26.1%	30.9%	1.9%	2.1%	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.2x	0.2x	NA	
Weighted Average					23,270	19,403	14.6x	15.2x	17.7x	4.9x	4.9x	5.2x	10.5%	12.4%	13.1%	2.3%	2.5%	2.7%	1.6x	1.5x	1.6x	10.9%	9.3%	7.4%	0.2x	0.1x	0.0x	1.0x	0.7x	0.2x	

Valuation Tables – Base Case (cont'd)

Exhibit 24: Base case valuation multiples and key metrics: other miners

Other Companies	Rating	FX	Price Target	Share Price	Market cap (US\$mn)	EV (USD) 2022CY	2022CY	P/E 2023CY	2024CY	2022CY	EV/EBITDA 2023CY	2024CY	2022CY	FCF Yield 2023CY	2024CY	2022CY	Dividend Yield 2023CY	2024CY	2022CY	P/B 2023CY	2024CY	2022e	ROE 2023e	2024e	2022e	ND(ND+E+M) 2023e	2024e	2022e	Net Debt/EBITDA 2023e	2024e
PLATINUM																														
Anglo Platinum Limited	UW	ZAc	140,000	181.880	30,734	28,788	8.7x	13.6x	NA	8.0x	8.6x	NA	9.1%	3.3%	NA	10.4%	7.4%	NA	5.1x	5.5x	NM	46.1%	37.5%	NA	Cash	Cash	NA	Cash	Cash	NA
Impats Platinum Holdings Limited*	OW	ZAc	24,000	23,276	12,282	11,198	5.9x	6.7x	NA	3.3x	3.6x	NA	11.8%	10.6%	NA	15.5%	15.1%	NA	1.9x	1.9x	NA	35.0%	28.6%	NA	Cash	Cash	NA	NA	NA	NA
Royal Bafokeng Platinum Ltd	EW	ZAc	13,000	16,201	3,034	2,996	8.7x	10.3x	NA	5.2x	6.0x	NA	10.1%	11.7%	NA	10.5%	10.9%	NA	2.0x	2.0x	NM	21.2%	19.0%	NA	Cash	Cash	NA	Cash	Cash	NA
Weighted Average					46,050	42,982	8.6x	11.5x	NA	5.3x	7.2x	NA	9.9%	5.8%	NA	11.7%	9.7%	NA	4.0x	4.3x	NA	43.5%	33.9%	NA	NA	NA	NA	NA	NA	NA
DIAMONDS																														
Atrisa	UW	RUB	110	120.8	11,740	13,733	12.8x	11.6x	16.0x	9.3x	8.7x	11.0x	8.0%	8.9%	5.5%	7.5%	8.5%	4.7%	5.6x	5.7x	5.2x	41.5%	48.4%	35.9%	0.5x	0.5x	0.4x	1.3x	1.2x	1.4x
Gem Diamonds Limited*	NA	GBp	NA	49.1	94	NA	4.1x	4.4x	NA	NA	NA	NA	-11.6%	-13.1%	NA	4.9%	4.9%	NA	NA	NA	NA	12.0%	8.7%	NA	NA	NA	NA	Cash	Cash	NA
Lucara Diamond Corp.*	NA	CAD	NA	0.60	216	279	10.6x	8.4x	NA	2.7x	3.3x	NA	-7.1%	0.4%	NA	0.0%	0.0%	NA	0.5x	NA	NA	26.5%	NA	NA	NA	NA	NA	0.3x	1.3x	NA
Petra Diamonds Limited**	NA	GBp	NA	72.0	191	NA	5.4x	4.0x	9.3x	NA	NA	NA	37.1%	36.3%	24.0%	0.0%	0.0%	0.0%	NA	NA	NA	6.9%	9.0%	NA	NA	NA	NA	1.5x	1.0x	NA
Weighted Average					12,241	14,011	12.6x	11.4x	15.9x	9.2x	8.6x	11.0x	8.8%	9.0%	5.8%	7.5%	8.5%	4.7%	5.5x	5.7x	5.2x	40.4%	47.5%	35.9%	0.5x	0.5x	0.4x	1.2x	1.2x	1.4x
RARE EARTHS																														
China Molybdenum Co., Ltd.	OW	HKD	6.20	3.96	17,449	21,358	9.8x	13.1x	11.9x	7.8x	9.2x	8.0x	2.0%	0.5%	6.5%	4.3%	4.8%	3.9%	1.4x	1.3x	1.2x	16.1%	10.7%	11.2%	0.2x	0.3x	0.2x	1.6x	2.0x	1.5x
Luka Resources Limited	EW	AUD	8.80	10.82	3,284	2,733	10.9x	9.2x	NA	4.8x	3.8x	NA	7.2%	8.6%	NA	3.2%	3.8%	NA	2.4x	2.1x	NM	27.1%	26.6%	NA	Cash	Cash	NA	Cash	Cash	NA
Lynas Corporation Limited**	NA	AUD	NA	10.99	7,109	6,857	24.7x	20.1x	16.4x	16.5x	13.8x	11.6x	3.0%	5.0%	6.9%	0.0%	0.0%	0.7%	6.0x	4.6x	4.1x	28.2%	23.7%	20.2%	NA	NA	NA	Cash	Cash	Cash
Tronox	EW	USD	26.00	24.6	3,525	5,802	8.1x	6.8x	NA	5.5x	4.6x	NA	11.9%	17.0%	NA	2.0%	0.0%	NA	1.6x	1.3x	NM	22.7%	22.8%	NA	0.4x	0.4x	NA	2.1x	1.5x	NA
Weighted Average					31,367	36,746	13.1x	13.6x	13.2x	8.8x	8.0x	8.9x	3.9%	4.2%	6.6%	3.5%	4.7%	3.0%	2.6x	2.2x	2.1x	20.8%	16.7%	13.6%	0.3x	0.3x	0.2x	1.7x	1.9x	1.5x
Manganese																														
African Rainbow Minerals*	OW	ZAc	27,000	24,086	3,452	2,897	4.5x	6.2x	NA	2.4x	2.8x	NA	5.7%	6.2%	NA	10.0%	7.4%	NA	1.1x	1.0x	NA	24.3%	15.8%	NA	Cash	Cash	NA	NA	NA	NA
Erasmé S.A.	NA	EUR	NA	77	2,320	5,024	3.9x	5.7x	3.6x	4.3x	4.9x	4.9x	31.4%	26.3%	24.9%	0.0%	1.6%	2.3%	1.5x	1.3x	0.9x	32.0%	19.8%	28.6%	NA	NA	NA	0.8x	0.9x	0.4x
South32*	OW	AUD	4.85	4.05	13,714	13,013	6.9x	10.8x	NA	3.8x	5.2x	NA	9.7%	2.4%	NA	5.8%	3.7%	NA	1.3x	1.2x	NA	20.5%	11.8%	NA	Cash	Cash	NA	NA	NA	NA
Vale S.A.	OW	USD	16.5	15.2	74,553	83,149	7.4x	9.1x	12.0x	4.3x	5.2x	6.1x	8.0%	7.2%	5.7%	11.8%	11.4%	4.3%	2.1x	2.2x	2.1x	28.0%	23.4%	18.4%	0.2x	0.2x	0.2x	0.4x	0.6x	0.7x
Weighted Average					94,039	103,883	7.1x	9.2x	11.7x	4.2x	5.1x	6.1x	8.7%	6.9%	6.3%	10.9%	9.9%	4.3%	2.0x	2.0x	2.0x	26.8%	21.3%	18.7%	0.2x	0.2x	0.2x	0.4x	0.6x	0.7x
PROCESSING																														
Aurubis AG***	UW	EUR	76	91.1	4,520	4,787	15.9x	17.0x	16.2x	7.7x	8.3x	8.0x	-3.3%	-4.2%	0.4%	1.7%	2.1%	2.2%	1.1x	1.0x	1.0x	7.2%	6.4%	6.5%	Cash	0.0x	0.1x	Cash	0.7x	0.8x
Boliden AB	EW	SEK	325	366	11,089	11,832	11.4x	14.5x	15.9x	6.2x	7.1x	7.8x	4.0%	4.1%	3.5%	4.9%	3.8%	3.5%	1.8x	1.8x	1.7x	17.3%	12.6%	11.1%	Cash	0.0x	0.0x	Cash	0.1x	0.1x
Dow Chemicals Co.,Ltd. **	EW	JPY	5,100	4,915	2,537	2,453	7.2x	NA	NA	3.8x	NA	NA	7.9%	NA	NA	2.6%	NA	NA	0.8x	NA	NA	12.2%	NA	NA	0.2x	NA	NA	1.1x	NA	NA
Kangri Copper Company Limited	EW	CNY	24	22.6	9,555	10,776	12.9x	14.6x	12.0x	5.3x	5.3x	4.4x	13.3%	13.3%	11.1%	1.2%	1.3%	1.2%	1.1x	1.0x	1.0x	9.3%	7.6%	8.7%	0.2x	0.2x	0.1x	1.7x	1.4x	1.0x
KGHM Polska Miedz Spolka Akcyjna	EW	PLN	140	143.1	7,175	8,706	7.4x	9.5x	7.4x	4.6x	5.2x	4.0x	11.0%	10.1%	11.0%	2.7%	3.5%	4.5%	1.0x	0.9x	0.8x	14.8%	10.0%	12.0%	Cash	Cash	Cash	Cash	Cash	Cash
Mitsubishi Materials Corporation**	EW	JPY	2,150	2,052	2,326	3,972	6.1x	NA	NA	4.2x	NA	NA	20.6%	NA	NA	3.5%	NA	NA	0.4x	NA	NA	7.5%	NA	NA	0.4x	NA	NA	1.2x	NA	NA
Mitsui Mining And Smelting Company**	OW	JPY	4,150	3,190	1,580	2,730	5.5x	NA	NA	3.7x	NA	NA	0.0%	NA	NA	3.7%	NA	NA	0.7x	NA	NA	13.3%	NA	NA	0.4x	NA	NA	1.3x	NA	NA
Weighted Average					38,783	45,256	10.7x	13.6x	12.9x	5.4x	6.3x	6.8x	7.8%	7.0%	6.9%	2.5%	2.7%	2.8%	1.2x	1.3x	1.2x	12.6%	9.7%	9.9%	0.3x	0.1x	0.1x	1.5x	0.7x	0.6x
TECHNICAL GRADE METALS																														
Mineral Resources Limited	EW	AUD	44.70	60.73	8,144	9,334	24.0x	NM	NA	12.7x	16.1x	NA	-7.7%	-4.0%	NA	2.1%	1.2%	NA	3.2x	3.2x	NA	14.2%	6.7%	NA	0.3x	0.4x	NA	1.5x	3.2x	NA
Syrah Resources	EW	AUD	1.35	2.03	695	796	NM	NM	NA	NM	NM	NA	-8.2%	-8.5%	NA	0.0%	0.0%	NA	2.4x	2.3x	NM	0.0%	2.0%	NA	0.2x	0.3x	NA	6.3x	4.9x	NA
Orocobre Ltd.*	EW	AUD	9.80	10.88	4,973	4,778	27.9x	NM	NA	18.2x	NM	NA	2.1%	2.1%	NA	0.0%	0.0%	NA	1.3x	1.3x	NA	18.1%	1.6%	NA	Cash	Cash	NA	NA	NA	NA
Weighted Average					13,812	14,908	25.5x	NA	NA	14.5x	16.1x	NA	-11.7%	-8.6%	NA	2.1%	1.2%	NA	2.5x	2.5x	NA	14.9%	4.6%	NA	0.3x	0.4x	NA	1.9x	3.4x	NA

Source: Morgan Stanley Research estimates (e), Thomson Reuters for non covered companies (*not covered by Morgan Stanley, ** Market cap based on total no. of group shares, *** provisions and pensions included in EV, * Fiscal year ending in June, ** Fiscal year ending in March, *** Fiscal year ending in September, **** Fiscal year ending in August, ***** Fiscal year ending in July). Weighted Average for P/E, FCF Yield, Dividend Yield, P/B, ROE based on Market Cap. Weighted Average for EV/EBITDA, Net Debt/EBITDA based on EV. Share prices as of January 11, 2021. NA = Not applicable, NM = Not meaningful.

Exhibit 25: Base case valuation multiples and key metrics: Lithium miners

Lithium Companies	Rating	FX	Price Target	Share Price	Market cap (US\$mn)	EV (US\$ mn)	P/E	EV/EBITDA	FCF Yield	Dividend Yield	P/B	ROE	ND(ND+E+M)	Net Debt/EBITDA																
						2022CY	2023CY	2024CY	2022CY	2023CY	2024CY	2022e	2023e	2024e																
Albemarle Corporation	UW	USD	80	240.2	25,758	29,937	NM	NM	NM	-1.8%	-1.1%	-0.5%	0.7%	0.7%	0.7%	4.8x	4.6x	4.4x	10.7%	8.5%	8.1%	0.3x	0.3x	0.3x	2.2x	2.8x	3.3x			
Sociedad Quimica y Minera de Chile S.A.	UW	USD	51	51.9	13,652	16,751	19.5x	21.3x	NA	10.8x	11.4x	NA	0.6%	4.4%	NA	5.1%	4.7%	NA	4.6x	4.6x	NM	23.4%	21.4%	NA	0.4x	0.4x	NA	1.2x	1.5x	NA
Livent*	NA	USD	NA	24.7	3,996	NA	NM	38.1x	NM	NA	NA	NA	0.3%	1.3%	3.6%	0.0%	0.0%	0.0%	5.6x	4.9x	NA	11.9%	13.2%	NA	NA	NA	NA	1.4x	1.6x	1.2x
Orocobre*	EW	AUD	9.80	10.88	4,973	4,778	27.9x	NM	NA	18.2x	NM	NA	2.1%	2.1%	NA	0.0%	0.0%	NA	1.3x	1.3x	NA	18.1%	1.6%	NA	Cash	Cash	NA	NA	NA	NA
Mineral Resources*	EW	AUD	44.7	60.73	8,144	9,334	24.0x	NM	NA	12.7x	16.1x	NA	-7.7%	-4.0%	NA	2.1%	1.2%	NA	3.2x	3.2x	NA	14.2%	6.7%	NA	0.3x	0.4x	NA	1.5x	3.2x	NA
Ganfeng	EW	CNY	196	127.15	25,735	26,714	30.7x	23.4x	26.9x	NM	15.8x	17.4x	0.4%	3.1%	3.9%	0.7%	0.9%	0.7%	9.5x	7.2x	5.9x	41.0%	40.5%	26.6%	0.2x	0.0x	Cash	0.4x	NM	Cash
Weighting Average					82,258	87,514	26.5x	24.1x	26.9x	12.5x	14.4x	17.4x	-1.9%	1.2%	1.9%	1.6%	1.5%	0.7%	5.9x	5.1x	5.1x	23.1%	20.4%	17.3%	0.3x	0.2x	0.3x	1.3x	2.5x	3.3x

Source: Morgan Stanley Research estimates (e), Thomson Reuters for non covered companies (*not covered by Morgan Stanley, ** Market cap based on total

Exhibit 27: Base case valuation multiples and key metrics: Steel companies

Steel Companies	Rating	FX	Price Target	Share Price	Market cap (US\$m)	EV*** (USD) 2022CY	2022CY	P/E 2023CY	2024CY	2022CY	EV/EBITDA 2023CY	2024CY	2022CY	FCF Yield 2023CY	2024CY	2022CY	Dividend Yield 2023CY	2024CY	2022CY	P/B 2023CY	2024CY	2022e	ROE 2023e	2024e	2022e	ND/(ND+E+M) 2023e	2024e	2022e	Net Debt/EBITDA 2023e	2024e	
AUSTRALIA																															
BlueScope Steel*	EW	AUD	23.5	21.3	7,773	5,160	4.4x	7.3x	8.1x	2.0x	2.5x	2.3x	20.8%	14.3%	11.5%	2.3%	2.3%	2.3%	1.0x	0.9x	0.8x	27.8%	12.9%	10.5%	Cash	Cash	Cash	NA	NA	NA	
Sims Metal Management*	EW	AUD	16.5	15.5	2,298	1,671	9.1x	14.8x	15.8x	3.5x	4.4x	4.2x	12.5%	10.0%	7.9%	3.2%	3.2%	3.2%	1.3x	1.2x	1.2x	15.2%	8.6%	7.7%	Cash	Cash	Cash	NA	NA	NA	
Weighted Average					10,071	6,831	5.5x	9.0x	9.9x	2.3x	3.0x	2.9x	16.9%	13.3%	10.7%	2.5%	2.5%	2.5%	1.0x	1.0x	0.9x	24.9%	11.9%	9.9%	NA	NA	NA	NA	NA	NA	
China (A-Shares)																															
Angang Steel Company Limited	OW	CNY	5.60	4.07	5,705	5,934	3.9x	3.5x	3.2x	2.3x	1.9x	1.6x	14.5%	18.1%	21.9%	8.3%	10.3%	11.4%	0.6x	0.5x	0.5x	16.4%	16.3%	15.9%	0.1x	0.0x	Cash	0.3x	0.1x	Cash	
Baoshan Iron & Steel	OW	CNY	11.00	7.85	26,506	28,989	5.7x	5.3x	5.0x	3.3x	2.9x	2.6x	16.3%	19.2%	18.5%	9.1%	9.8%	10.5%	0.8x	0.7x	0.7x	15.0%	15.1%	15.0%	0.0x	Cash	Cash	0.1x	Cash	Cash	
China Steel Corp.	OW	TWD	52.0	34.9	19,417	22,679	7.4x	9.2x	9.0x	4.4x	5.0x	4.7x	8.7%	12.7%	14.4%	8.2%	9.5%	7.6%	1.4x	1.4x	1.3x	20.7%	15.3%	15.4%	0.2x	0.2x	0.1x	0.7x	0.6x	0.3x	
Habeli Iron and Steel Co Ltd*	NA	CNY	NA	2.55	4,247	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	9.7%	NA	NA	0.5x	NA	NA	4.3%	NA	NA	NA	NA	NA	NA	NA	NA	
Maanshan Iron & Steel	EW	CNY	4.20	4.25	4,570	6,244	5.6x	5.3x	5.0x	3.6x	2.7x	2.1x	23.1%	33.3%	21.7%	5.5%	5.9%	6.1%	0.9x	0.8x	0.7x	16.9%	16.3%	15.3%	0.2x	0.1x	Cash	1.1x	0.3x	Cash	
Weighted Average					59,445	53,145	6.1x	6.2x	6.2x	3.6x	3.3x	3.3x	14.0%	18.0%	17.7%	8.5%	9.4%	9.2%	1.0x	0.9x	0.9x	16.3%	15.4%	15.2%	0.1x	0.1x	0.1x	0.4x	0.5x	0.3x	
China (H-Shares)																															
Angang Steel Company Limited	OW	HKD	5.50	3.90	5,705	5,934	3.0x	2.7x	2.5x	2.3x	1.9x	1.6x	14.5%	18.1%	21.9%	10.7%	13.2%	14.6%	0.4x	0.4x	0.4x	16.4%	16.3%	15.9%	0.1x	0.0x	Cash	0.3x	0.1x	Cash	
Maanshan Iron & Steel	EW	HKD	3.40	3.23	4,570	6,244	3.5x	3.3x	3.1x	3.6x	2.7x	2.1x	23.1%	33.3%	21.7%	8.9%	9.5%	9.9%	0.5x	0.5x	0.4x	16.9%	16.3%	15.3%	0.2x	0.1x	Cash	1.1x	0.3x	Cash	
Weighted Average					10,275	12,178	3.2x	3.0x	2.8x	3.0x	2.3x	1.9x	18.3%	24.9%	21.9%	9.9%	11.5%	12.5%	0.5x	0.4x	0.4x	16.5%	16.3%	15.6%	0.2x	0.1x	Cash	0.7x	0.2x	NA	
India																															
Jindal Steel & Power**	NA	INR	NA	384	5,291	7,804	5.6x	5.9x	NA	NA	4.2x	4.4x	NA	22.9%	20.1%	NA	0.0%	0.0%	NA	0.9x	0.8x	NA	17.5%	13.9%	NA	NA	NA	NA	0.8x	0.8x	NA
JSW Steel Ltd.**	NA	INR	NA	646	21,008	28,610	7.9x	7.9x	NA	NA	5.7x	5.7x	NA	12.3%	14.7%	NA	1.3%	1.4%	NA	2.0x	1.6x	NA	27.6%	21.6%	NA	NA	NA	NA	1.4x	1.3x	NA
Steel Authority Of India***	NA	INR	NA	104	5,826	8,979	4.0x	4.5x	NA	NA	3.3x	3.4x	NA	31.3%	28.7%	NA	4.6%	3.5%	NA	0.7x	0.6x	NA	18.4%	15.0%	NA	NA	NA	NA	1.1x	1.1x	NA
Weighted Average					31,835	44,419	5.3x	6.3x	NA	NA	4.7x	5.3x	NA	26.5%	22.6%	NA	1.7%	1.6%	NA	1.1x	0.9x	NA	23.5%	16.0%	NA	NA	NA	NA	0.8x	0.7x	NA
Japan																															
JFE Holdings**	OW	JPY	2,700	1,631	8,151	20,464	4.3x	NA	NA	3.9x	NA	NA	5.4%	NA	NA	7.7%	NA	NA	0.4x	NA	NA	12.5%	NA	NA	0.4x	NA	NA	2.7x	NA	NA	
Kobe Steel**	EW	JPY	800	608	1,913	8,412	3.8x	NA	NA	4.5x	NA	NA	1.0%	NA	NA	3.9%	NA	NA	0.3x	NA	NA	7.1%	NA	NA	0.6x	NA	NA	4.3x	NA	NA	
Nippon Steel & Sumitomo Metal**	OW	JPY	2,600	2,049	16,362	28,457	5.3x	NA	NA	5.8x	NA	NA	9.5%	NA	NA	5.6%	NA	NA	0.5x	NA	NA	11.2%	NA	NA	0.4x	NA	NA	2.2x	NA	NA	
Tokyo Steel**	OW	JPY	1,650	1,435	1,490	904	6.8x	NA	NA	2.8x	NA	NA	9.9%	NA	NA	1.9%	NA	NA	0.9x	NA	NA	15.1%	NA	NA	Cash	NA	NA	NA	NA	NA	NA
Weighted Average					27,916	58,237	4.8x	NA	NA	3.8x	NA	NA	7.8%	NA	NA	5.9%	NA	NA	0.5x	NA	NA	11.5%	NA	NA	0.4x	NA	NA	2.7x	NA	NA	
Korea																															
Poongsang Steel Mill*	NA	KRW	NA	17,650	1,406	3,259	3.8x	3.8x	2.7x	4.1x	4.2x	3.0x	48.4%	47.2%	NA	2.4%	2.5%	1.2%	0.6x	0.5x	0.4x	15.9%	13.4%	15.5%	NA	NA	NA	1.0x	0.5x	NA	
Hyundai Steel*	NA	KRW	NA	44,250	4,929	14,996	4.6x	4.8x	5.8x	5.0x	5.2x	4.6x	40.9%	38.6%	NA	1.9%	2.0%	1.8%	0.3x	0.3x	0.3x	6.9%	6.2%	4.7%	NA	NA	NA	2.6x	2.4x	2.6x	
POSCO	OW	KRW	410,000	300,000	20,068	17,923	3.8x	3.7x	NA	1.7x	1.3x	NA	20.0%	26.4%	NA	5.4%	5.3%	NA	0.4x	0.4x	NM	12.6%	11.8%	NA	0.0x	Cash	NA	0.0x	Cash	NA	
Weighted Average					26,403	36,179	3.9x	3.8x	5.1x	3.3x	3.4x	4.3x	25.4%	29.8%	NA	4.6%	4.5%	1.7%	0.4x	0.4x	0.3x	11.7%	10.8%	7.1%	0.0x	NA	NA	1.2x	2.0x	2.6x	
Latin America																															
CSN	EW	BRL	29.0	24.9	6,161	7,619	4.5x	6.7x	11.0x	2.3x	3.2x	4.4x	13.1%	-0.2%	-0.7%	5.1%	4.6%	2.9%	1.3x	1.1x	1.1x	33.9%	19.4%	10.4%	0.3x	0.3x	0.3x	0.8x	1.2x	1.8x	
Gerdau S.A.	EW	BRL	34.0	28.2	8,082	7,991	4.7x	7.5x	9.3x	2.5x	3.2x	3.5x	24.7%	13.6%	10.7%	7.7%	4.3%	3.4%	1.0x	0.9x	0.9x	24.7%	13.6%	10.0%	0.0x	Cash	Cash	0.1x	Cash	Cash	
Grupo Simec S.A.B. de C.V.	OW	MXN	149	177	4,324	3,276	14.0x	14.4x	14.0x	6.7x	6.1x	5.4x	7.1%	7.6%	6.7%	0.0%	0.0%	0.0%	1.8x	1.6x	1.4x	14.6%	12.5%	11.4%	Cash	Cash	Cash	Cash	Cash	Cash	
Industrias CH. S.A.B. de C.V.	EW	MXN	173	191	4,091	3,408	14.5x	14.6x	14.2x	6.2x	5.6x	5.0x	7.0%	7.7%	6.4%	0.0%	0.0%	0.0%	1.7x	1.6x	1.4x	13.7%	11.9%	11.0%	Cash	Cash	Cash	Cash	Cash	Cash	
Ternium S.A.	EW	USD	47.0	46.2	9,067	6,447	3.8x	5.6x	6.9x	1.5x	1.6x	1.5x	35.7%	22.7%	18.0%	6.6%	4.5%	4.5%	0.7x	0.7x	0.6x	22.6%	13.2%	9.7%	Cash	Cash	Cash	Cash	Cash	Cash	
Usiminas	EW	BRL	18.0	16.3	3,408	2,861	3.9x	6.0x	7.1x	1.8x	2.4x	2.6x	20.4%	18.5%	14.9%	6.9%	4.7%	3.4%	0.8x	0.7x	0.7x	25.2%	13.6%	10.4%	Cash	Cash	Cash	Cash	Cash	Cash	
Weighted Average					35,132	31,599	6.8x	8.4x	9.9x	3.0x	3.4x	3.8x	20.9%	12.6%	10.9%	6.5%	4.5%	3.7%	1.2x	1.0x	1.0x	23.3%	14.2%	10.3%	0.2x	0.3x	0.3x	0.4x	1.2x	1.8x	
North America																															
Commercial Metals Company****	NA	USD	NA	36.0	4,367	NA	8.5x	11.1x	NA	NA	NA	NA	11.9%	11.9%	NA	1.5%	1.5%	NA	1.5x	1.3x	NA	18.3%	12.3%	NA	NA	NA	NA	-0.1x	Cash	NA	
Nucor Corporation	EW	USD	107	110.8	31,748	28,609	5.8x	12.7x	13.8x	3.6x	6.2x	6.0x	20.2%	5.3%	8.5%	1.5%	1.5%	1.5%	1.6x	1.5x	1.3x	36.9%	12.7%	10.6%	Cash	Cash	Cash	Cash	Cash	Cash	
Schneider Steel Industries*****	NA	USD	NA	45.5	1,267	NA	7.7x	6.9x	NA	NA	NA	NA	1.6%	1.6%	NA	NA	NA	NA	NA	NA	NA	13.8%	NA	NA	NA	NA	NA	0.3x	Cash	NA	
Steel Dynamics	EW	USD	67	61.0	12,284	10,093	4.5x	9.7x	9.9x	2.5x	3.8x	3.3x	27.3%	14.0%	11.6%	1.8%	1.8%	1.9%	1.3x	1.2x	1.1x	41.3%	13.9%	12.1%	Cash	Cash	Cash	Cash	Cash	Cash	
US Steel Corporation	OW	USD	20	24.4	7,011	7,761	4.2x	14.4x	38.4x	2.5x	4.4x	4.6x	6.3%	-6.8%	5.8%	0.8%	0.8%	0.8%	0.6x	0.6x	0.6x	17.7%	4.4%	1.5%	0.1x	0.1x	0.1x	0.4x	0.9x	0.8x	
Weighted Average					56,677	46,463	5.6x	12.0x	16.2x	1.3x	5.4x	5.2x	19.4%	6.2%	8.9%	1.5%	1.5%	1.5%	1.4x	1.3x	1.2x	33.5%	11.9%	9.7%	0.1x	0.1x	0.1x	0.4x	0.9x	0.8x	
Russia																															
EVRAZ	OW	GBP	650	597.6	11,842	16,471	5.1x	7.8x	9.1x	4.4x	6.2x	7.0x	20.9%	13.4%	11.1%	20.9%	13.4%	11.1%	6.7x	8.9x	9.4x	NM	85.4%	98.6%	0.6x	0.7x	0.7x	0.8x	1.2x	1.4x	
Novolipetsk Steel	EW	USD	30	29.3	17,572	20,718	6.0x	10.8x	10.3x	4.5x	6.9x	6.7x	18.3%	9.8%	8.9%	18.7%	8.3%	9.2%	3.2x	3.2x	3.3x	45.7%	29.1%	31.1%	0.4x	0.3x	0.4x	0.7x	1.0x	1.0x	
Severstal PAO	EW	USD	21.5	21.1	17,901	20,083	6.9x	11.8x	11.4x	5.1x	7.5x	7.3x	14.1%	8.7%	8.6%	19.3%	9.5%	8.5%	5.2x	5.5x	5.4x	50.8%	44.0%	47.8%	0.4x	0.4x	0.4x	0.6x	0.9x	0.9x	
Weighted Average					47,315	57,272	6.1x	10.4x	10.4x	4.7x	6.9x	7.0x	17																		

Paper and Packaging Comps

Exhibit 29: Base case valuation multiples and key metrics: Paper, pulp and packaging companies

Companies	Rating	FX	Price Target	Share Price	Market cap (US\$mn)	EV*** (USD) 2022CY	P/E 2022CY 2023CY	EV/EBITDA 2022CY 2023CY	FCF Yield 2022CY 2023CY	Dividend Yield 2022CY 2023CY	P/B 2022CY 2023CY	Cash conversion 2022CY	Capex/sales 2022CY	ROE 2022e	Net Debt/EBITDA 2022e 2023e
SIG Combibloc	EW	CHF	23.5	24.0	8,315	9,826	29.4x 26.3x	14.5x 13.1x	3.4% 3.9%	1.9% 2.1%	3.4x 3.4x	69.0%	8.2%	11.8%	2.2x 1.8x
Weighted Average					8,315	9,826	29.4x 26.3x	14.5x 13.1x	3.4% 3.9%	1.9% 2.1%	3.4x 3.4x	69.0%	8.2%	11.8%	2.2x 1.8x
Non-system Suppliers															
Greatview aseptic ^c	NA	HKD	NA	2.8	485	408	8.1x 7.5x	3.9x 3.8x	15.5% 8.8%	10.3% 12.5%	1.2x 1.2x	88.0%	2.0%	15.2%	Cash Cash
Weighted Average					485	408	8.1x 7.5x	3.9x 3.8x	15.5% 8.8%	10.3% 12.5%	1.2x 1.2x	88.0%	2.0%	15.2%	NA NA
Diversified packaging															
Amcor Ltd ^a	OW	AUD	19.0	17.0	18,567	23,853	14.8x 14.2x	10.9x 10.4x	6.1% 6.1%	4.0% 4.2%	3.7x 3.5x	75.1%	4.0%	25.7%	2.4x 2.2x
Ardagh	NA	USD	NA	8.7	5,249	8,041	16.9x 13.0x	10.0x 8.4x	-1.2% 6.2%	0.0% 0.7%	4.3x 2.4x	7.5%	16.3%	49.3%	3.5x 3.0x
Bell Corp	OW	USD	110.0	89.9	29,613	38,211	20.2x 17.1x	13.7x 12.8x	1.7% 2.9%	0.9% 1.0%	NM NM	46.2%	9.9%	45.3%	3.4x 3.4x
Berry Global Group Inc ^{aaa}	EW	USD	71.0	72.4	10,085	17,512	11.9x 10.8x	7.6x 7.0x	10.0% 10.5%	0.0% 0.0%	2.5x 2.1x	65.4%	5.5%	25.2%	3.2x 2.7x
Crown Holdings	OW	USD	129.0	109.4	14,103	20,816	14.2x 12.4x	9.6x 9.3x	2.1% 3.6%	0.7% 0.7%	7.3x 6.7x	53.7%	8.4%	NM	3.5x 3.5x
Huhtamaki OYJ ^a	NA	EUR	NA	37.9	4,629	6,042	16.3x 14.9x	9.7x 9.0x	5.0% 5.2%	2.8% 3.0%	2.6x 2.4x	54.4%	6.5%	16.2%	2.3x 2.0x
Pact Group Holdings Limited ^{aa}	UW	AUD	3	2.48	612	1,076	10.1x 9.2x	4.9x 4.6x	18.6% 19.2%	4.7% 5.1%	1.7x 1.6x	69.1%	5.3%	17.9%	2.1x 1.9x
Sealed Air Corporation	EW	USD	61.0	66.0	9,878	12,962	16.0x 14.7x	10.8x 10.2x	6.0% 6.5%	1.2% 1.2%	NM NM	82.6%	3.6%	NM	2.5x 2.3x
Silgan Holdings Inc ^a	NA	USD	NA	42.2	4,662	7,400	11.3x 10.7x	7.9x 7.3x	9.5% 10.4%	1.4% 1.4%	2.5x 2.1x	73.6%	4.0%	24.4%	2.9x 2.5x
Orora Limited ^a	EW	AUD	3.5	3.5	2,243	2,720	19.1x 18.0x	9.8x 9.2x	5.5% 7.2%	4.1% 4.4%	3.8x 3.6x	72.4%	2.9%	20.9%	1.7x 1.4x
Weighted Average					99,638	138,632	16.2x 14.4x	10.7x 10.1x	4.4% 5.5%	1.8% 1.8%	4.2x 3.7x	58.5%	7.3%	34.1%	3.0x 2.9x
Glass packaging															
Owens-Illinois Inc ^c	NA	USD	NA	13.0	2,045	6,490	6.7x 6.0x	5.6x 5.4x	2.1% 2.8%	0.0% 0.5%	3.5x 2.3x	43.2%	10.3%	47.0%	3.9x 3.7x
Vidrala SA ^a	NA	EUR	NA	85.3	2,882	2,954	15.5x 14.5x	8.6x 7.8x	5.5% 6.8%	1.7% 1.9%	2.4x 2.1x	61.0%	10.5%	16.2%	0.2x Cash
Vetropack Holding SA ^a	NA	CHF	NA	56.8	844	906	14.8x 13.9x	4.6x 4.3x	-6.8% 9.0%	2.4% 2.5%	1.4x 1.3x	NM	24.9%	9.3%	0.3x 0.2x
Zignago Vetro SpA ^a	NA	EUR	NA	16.1	1,600	1,889	20.9x 19.7x	11.4x 10.6x	3.8% 6.0%	3.2% 3.4%	5.3x 4.8x	56.8%	11.8%	25.0%	1.7x 1.4x
Weighted Average					7,372	12,239	14.2x 13.2x	7.2x 6.7x	2.8% 5.8%	2.3% 1.9%	3.2x 2.7x	54.4%	11.6%	25.9%	2.4x 2.9x
Paper packaging															
BillerudKorsnas AB ^a	NA	SEK	NA	166	3,793	4,360	16.8x 16.1x	8.6x 8.1x	3.6% 4.2%	3.1% 3.5%	1.6x 1.6x	46.6%	8.6%	9.8%	1.1x 0.8x
International Paper	NA	USD	NA	49	18,790	22,419	10.4x 10.0x	6.7x 6.2x	9.3% 9.7%	4.2% 4.0%	1.9x 1.8x	73.8%	4.3%	18.0%	1.1x 0.7x
Lee & Man Paper Manufacturing	EW	HKD	6.70	5.67	3,175	4,706	6.4x 6.2x	5.9x 5.6x	5.7% 6.4%	5.6% 5.8%	0.7x 0.7x	51.7%	10.4%	12.6%	1.9x 1.7x
Louisiana-Pacific Corp ^a	NA	USD	NA	74	6,541	6,027	8.6x 12.0x	5.3x NA	7.7% 6.4%	1.0% 1.1%	4.2x 2.7x	75.5%	7.3%	38.5%	Cash NA
Mondi PLC	OW	GBP	2,100	1,880	10,784	13,051	14.0x 13.2x	7.8x 7.3x	5.7% 7.4%	2.7% 2.9%	2.2x 2.0x	62.3%	7.8%	17.5%	1.1x 0.8x
DS Smith plc ^{aaaa}	OW	GBP	450	394	5,437	7,140	12.8x 11.1x	7.5x 6.6x	7.0% 8.5%	3.9% 4.5%	1.5x 1.5x	54.4%	6.4%	12.0%	1.5x 1.2x
Nine Dragons Paper	EW	HKD	11.0	9.0	5,385	11,713	5.1x 4.3x	5.2x 5.1x	-24.0% -25.4%	5.6% 6.6%	0.7x 0.6x	NM	28.1%	14.0%	2.8x 3.0x
Sappi Ltd	OW	ZAc	6,000	4,580	1,616	3,794	6.3x 6.4x	4.5x 4.3x	14.6% 18.6%	5.3% 5.2%	0.8x 0.7x	55.1%	6.4%	13.4%	2.3x 2.0x
Svenska Cellulosa SCA AB ^a	NA	SEK	NA	161.6	12,475	13,441	27.7x 35.7x	17.8x NM	1.5% 1.8%	1.6% 1.8%	1.4x 1.4x	43.8%	21.4%	5.2%	1.3x 1.6x
Smurfit Kappa Group PLC ^a	EW	GBP	4,200.0	4,072.0	12,716	15,926	15.9x 16.0x	8.3x 8.1x	1.8% 3.2%	2.0% 2.2%	2.7x 2.5x	53.1%	8.2%	18.9%	1.6x 1.4x
Stora Enso Oyj ^a	UW	EUR	12.5	16.7	13,140	16,117	12.3x 18.4x	7.2x 9.0x	8.1% 5.1%	4.1% 2.7%	1.3x 1.3x	69.1%	6.5%	11.1%	1.0x 1.2x
UPM-Kymmene Oyj ^a	EW	EUR	36.0	34.1	18,171	17,188	16.3x 16.2x	9.3x 8.7x	3.7% 6.4%	3.8% 3.6%	1.8x 1.7x	54.4%	8.8%	11.3%	1.1x 0.8x
Weighted Average					112,023	135,882	14.3x 15.8x	8.3x 7.3x	4.1% 4.7%	3.3% 3.3%	1.9x 1.7x	60.0%	10.3%	15.0%	1.4x 1.3x
Pulp															
Suzano Papel e Celulose	OW	BRL	65.0	59.5	14,424	25,141	15.2x 10.1x	5.3x 5.7x	7.2% 7.0%	1.6% 2.4%	5.1x 3.7x	45.0%	32.5%	44.5%	2.3x 2.4x
Kraft SA	OW	BRL	31.0	25.0	4,931	9,227	8.5x 8.2x	6.6x 6.1x	-0.2% 6.4%	5.7% 6.2%	5.1x 4.1x	44.3%	22.6%	NM	3.1x 2.8x
Empresas CMPC SA	OW	CLP	1,963	1,405	4,244	7,290	9.3x 11.9x	4.5x 4.8x	7.2% 16.6%	4.3% 3.4%	0.5x 0.5x	51.7%	12.7%	5.9%	1.9x 1.8x
Weighted Average					23,599	41,657	12.7x 10.1x	5.5x 5.7x	5.7% 8.6%	3.0% 3.4%	4.2x 3.2x	46.1%	26.9%	35.7%	2.4x 2.4x

Source: Morgan Stanley Research estimates (e), Thomson Reuters for non covered companies (*not covered by Morgan Stanley, ** Market cap based on total no. of group shares, *** provisions and pensions included in EV. ^a Fiscal year ending in June, ^{aa} Fiscal year ending in March, ^{aaa} Fiscal year ending in September, ^{aaaa} Fiscal year ending in August, ^{aaaaa} Fiscal year ending in April). Weighted Average for P/E, FCF Yield, Dividend Yield, P/B, ROE based on Market Cap. Weighted Average for EV/EBITDA, Net Debt/EBITDA based on EV. Share prices as of January 11, 2021. NA = Not applicable, NM = Not meaningful.

Valuation Tables – Mark to Market

Exhibit 30: Mark-to-market valuation multiples and metrics for key mining companies

Global Stocks	Rating	FX	Price Target	Market cap (US\$m)	EV** (US\$m)	2022CY	P/E 2023CY	EV/EBITDA 2022CY	EV/EBITDA 2023CY	FCF Yield 2022CY	FCF Yield 2023CY	Dividend Yield 2022CY	Dividend Yield 2023CY	P/B 2022CY	P/B 2023CY	ROE 2022e**	2022e Net Debt/EBITDA
North America																	
Alcoa Corp	OW	USD	66.0	11,876	15,588	7.1x	4.8x	3.3x	1.9x	13.8%	23.6%	13.8%	23.6%	1.8x	1.3x	29.8%	-0.28x
Freeport-McMoran	EW	USD	34.00	63,797	78,480	8.9x	11.6x	4.8x	4.7x	8.4%	11.9%	0.7%	0.7%	2.9x	2.4x	38.4%	-0.2x
Teck Resources	OW	USD	33.0	17,527	22,333	3.4x	3.8x	2.2x	1.8x	16.7%	31.4%	0.5%	0.5%	0.7x	0.6x	24.2%	0.5x
South America																	
Grupo Mexico	EW	USD	104.0	34,376	39,383	9.6x	10.9x	4.8x	5.0x	12.1%	11.2%	7.0%	5.5%	2.1x	2.0x	23.6%	0.1x
Southern Copper Corp.	EW	USD	55.0	51,032	53,915	16.8x	15.6x	8.3x	7.7x	6.0%	8.0%	5.9%	5.4%	6.0x	5.6x	35.7%	0.6x
Vale	OW	USD	16.5	74,553	77,769	4.6x	4.3x	2.9x	2.9x	15.4%	20.6%	13.8%	16.9%	1.7x	1.7x	40.2%	0.1x
CSN Mineracao	OW	BRL	8	6,953	6,976	9.0x	8.7x	4.3x	3.9x	-3.6%	3.2%	8.4%	11.1%	2.3x	2.3x	25.3%	-0.2x
China																	
Chalco	OW	HKD	6.60	14,794	27,621	8.5x	5.0x	6.5x	4.0x	25.6%	33.2%	0.0%	0.0%	1.2x	1.0x	14.4%	1.4x
Jiangxi Copper	OW	HKD	17.30	9,555	10,776	8.3x	7.0x	5.1x	4.2x	18.5%	17.9%	1.7%	2.0%	0.8x	0.7x	9.5%	1.7x
Zhagjin	EW	HKD	7.12	2,617	4,937	9.9x	7.3x	8.4x	6.7x	15.4%	15.2%	1.6%	2.1%	1.0x	0.9x	4.6%	3.9x
Zijin	OW	HKD	15.12	35,879	48,893	10.2x	8.8x	6.6x	5.4x	5.3%	10.5%	4.4%	5.1%	2.6x	2.2x	25.9%	1.0x
Russia																	
AK Arosa	UW	RUB	110.0	11,740	12,931	11.2x	9.8x	7.9x	7.1x	9.0%	10.5%	8.5%	10.0%	5.4x	5.4x	47.9%	0.6x
Norilsk Nickel	EW	USD	31.0	50,714	56,457	5.9x	5.5x	4.9x	4.5x	11.3%	12.8%	11.3%	12.8%	6.6x	4.5x	111.9%	0.7x
Polymetal	OW	GBP	1,650	7,921	9,123	6.1x	5.7x	4.8x	4.4x	11.6%	12.8%	11.6%	12.8%	2.5x	2.2x	40.9%	0.6x
Polyus Gold	EW	USD	100.0	22,208	13,634	8.3x	7.6x	6.5x	5.8x	6.8%	8.5%	4.9%	5.4%	4.3x	3.2x	51.5%	0.4x
Europe																	
Anglo American	EW	GBP	2,870	53,816	59,770	6.0x	5.0x	3.9x	3.3x	9.9%	15.0%	6.8%	8.0%	1.5x	1.2x	25.2%	0.2x
Antofagasta	UW	GBP	1,300	17,973	27,499	13.5x	10.6x	5.3x	4.3x	2.9%	4.0%	4.8%	6.1%	2.0x	1.9x	15.2%	Cash
BHP Billiton*	++	GBP		156,528	181,939	6.7x	6.1x	4.3x	3.7x	13.2%	16.7%	9.1%	9.6%	3.2x	2.6x	47.0%	0.1x
Centamin	EW	GBP	100	1,431	1,182	10.9x	8.9x	3.1x	2.7x	5.1%	8.7%	4.9%	8.2%	1.0x	1.0x	9.4%	Cash
Glencore	OW	GBP	448	68,934	103,137	4.6x	4.0x	3.5x	3.2x	21.6%	26.5%	23.4%	26.7%	1.3x	1.3x	28.4%	0.7x
Lundin Mining	++	SEK		5,847	6,951	5.5x	4.8x	3.2x	2.4x	11.7%	19.2%	4.7%	7.7%	1.1x	1.0x	20.2%	Cash
Norsk Hydro	OW	NOK	86	16,396	19,496	6.5x	6.1x	3.8x	3.4x	9.4%	14.4%	7.7%	8.2%	1.5x	1.4x	23.7%	Cash
Rio Tinto	OW	GBP	5,220.0	117,282	142,772	5.5x	4.9x	3.9x	3.5x	14.9%	16.4%	16.5%	17.1%	2.0x	1.8x	35.6%	Cash

Source : Morgan Stanley Research estimates. ++ Stock Rating, Price Target, or Estimates for this company have been removed from consideration in this report because, under applicable law and/or Morgan Stanley policy, Morgan Stanley may be precluded from issuing such information with respect to this company at this time. ** Provisions and pensions included in Enterprise Value calculation. * Fiscal year ending in June. ** RoE calculated using year end book value. NM = Not meaningful. Companies valuation multiples and metrics are as of 11 January 2022.

Raw materials, electric vehicles, and electrification

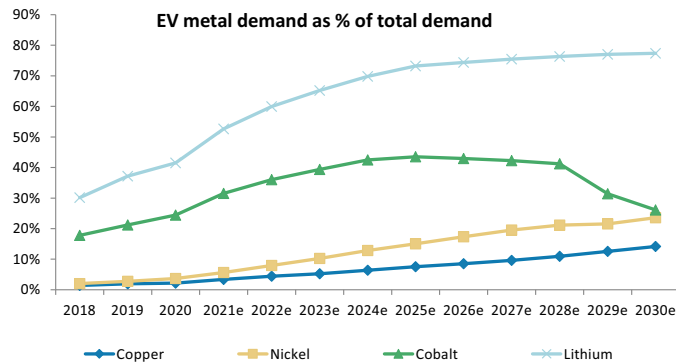
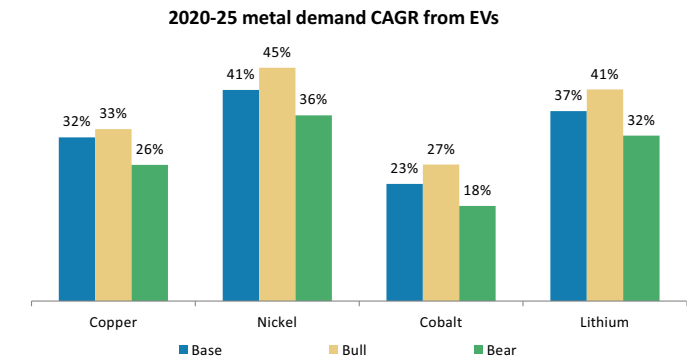
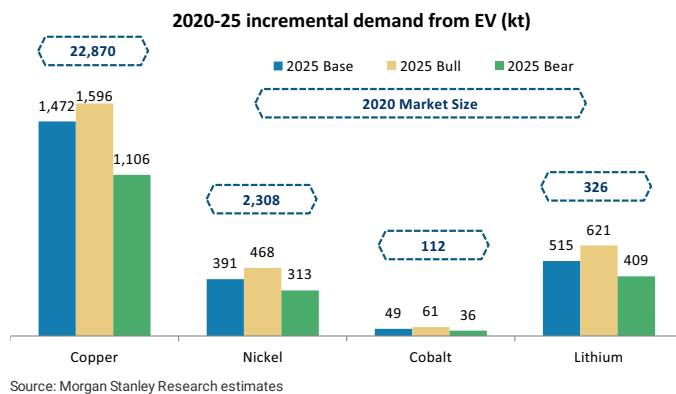
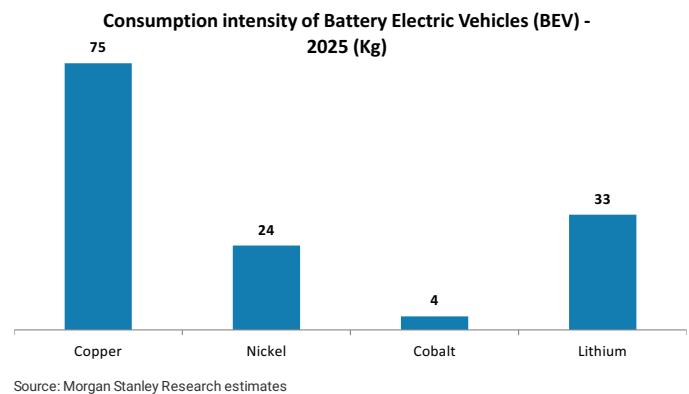
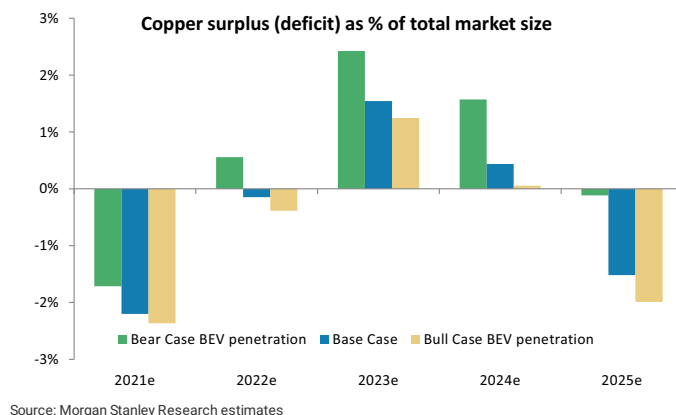
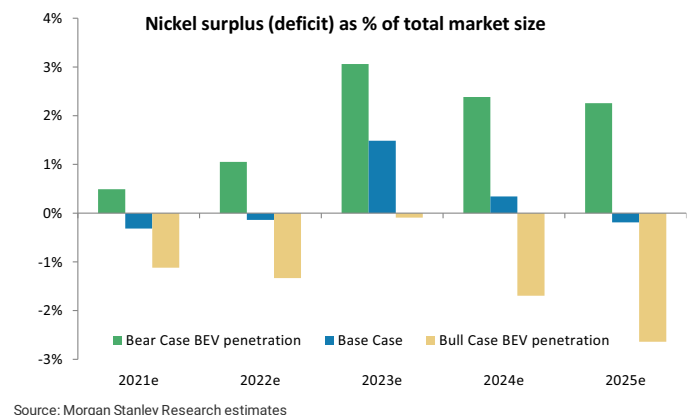
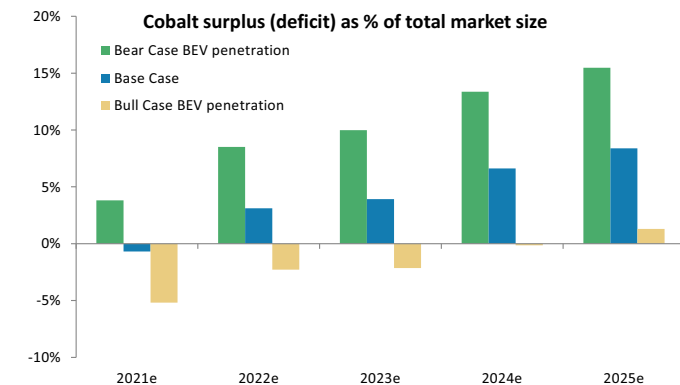
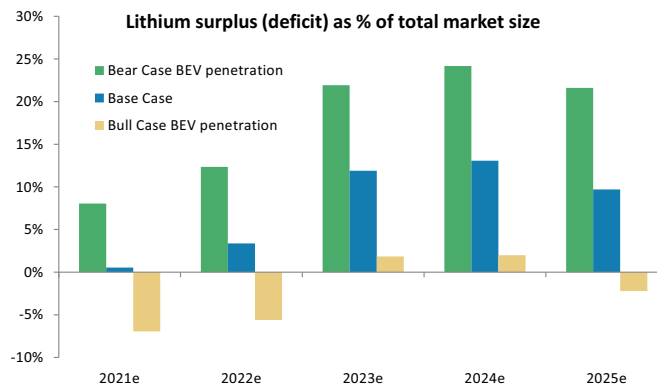
Exhibit 31: EV raw material demand as percentage of total global demand**Exhibit 32:** Metal demand growth rates under different scenarios**Exhibit 33:** Absolute EV raw material demand increase relative to total market size**Exhibit 34:** Metal consumption intensity for battery electric vehicles (BEVs)**Exhibit 35:** Copper market deficit scenarios based on different EV penetration rates**Exhibit 36:** Nickel market deficit scenarios based on different EV penetration rates

Exhibit 37: Cobalt market deficit scenarios based on different EV penetration rates

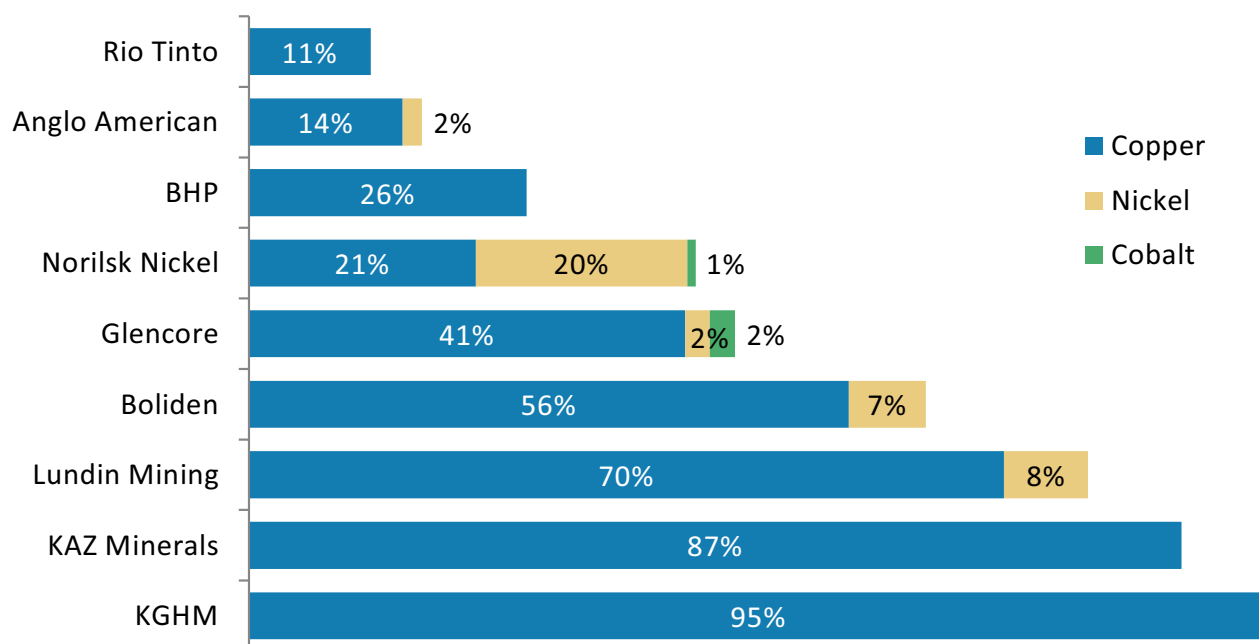
Source: Morgan Stanley Research estimates

Exhibit 38: Lithium market deficit scenarios based on different EV penetration rates

Source: Morgan Stanley Research estimates

Exhibit 39: Revenue exposure to electric vehicle/electrification raw materials

2021e Revenue exposure to "EV metals"



Source: Morgan Stanley Research estimates

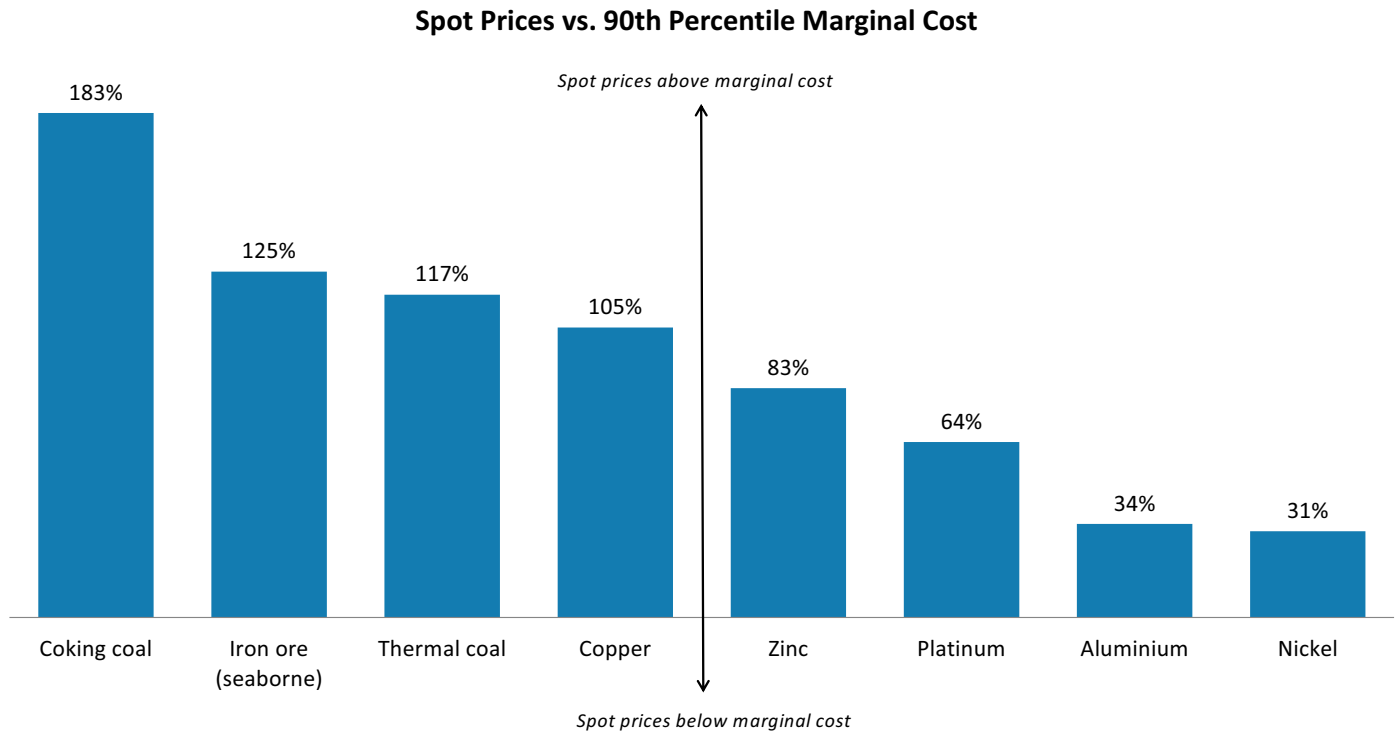
Exhibit 40: Impact of "electrification" on metal demand

	2020	2025				
kt	Global demand	Generation & grid infrastructure*	Grid storage*	Charging infrastructure*	e-vehicles**	Total demand from electrification
Copper	22,870	170	86	115	1,968	2,339
Nickel	2,308		71		476	547
Cobalt	112		26		76	102

Source: Copper Development Association, Glencore, Morgan Stanley Research

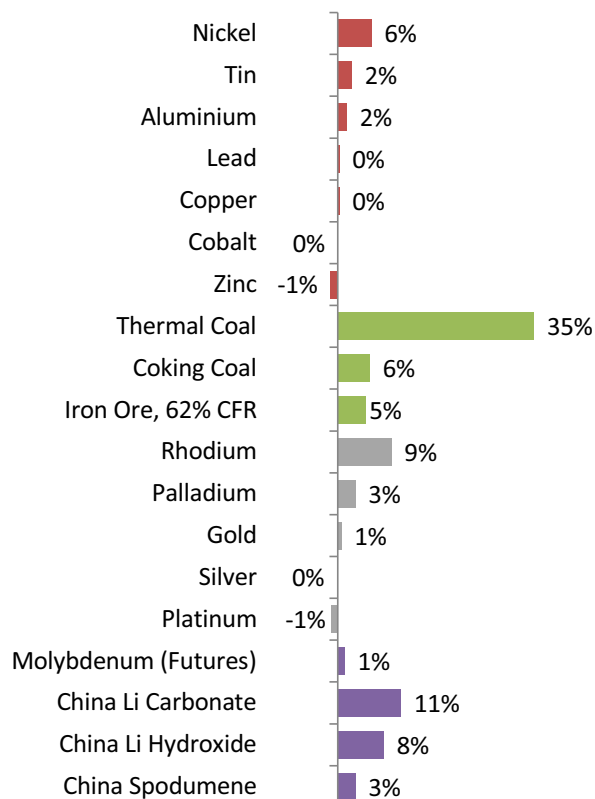
Spot Commodity Prices vs. Marginal Costs

Exhibit 41: Spot commodity prices vs. the marginal cost of production

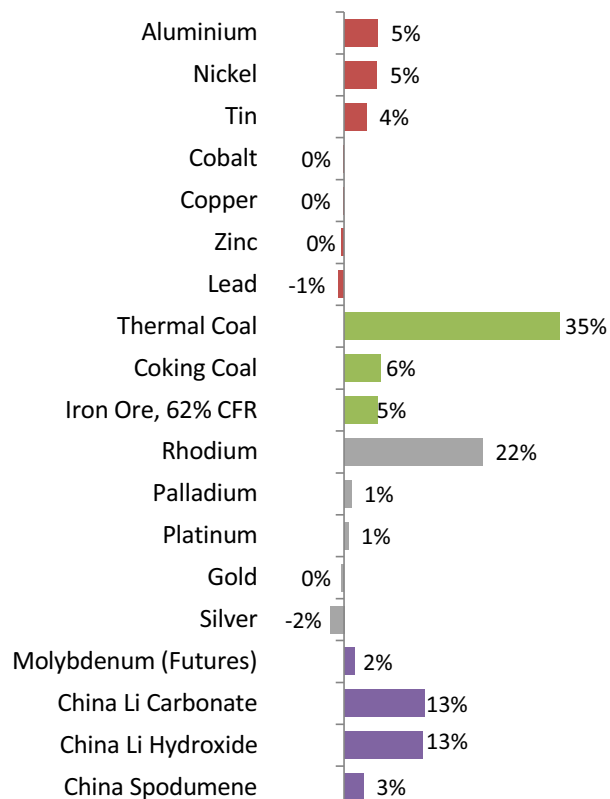


Source: Wood Mackenzie, Bloomberg, Morgan Stanley Research. Note: Marginal cost – year 2021; dataset Q4 2021; for coal, the dataset is as of Nov 2021; C1 cash costs for zinc, copper and aluminium. Total cash cost for iron ore, coking and thermal coal

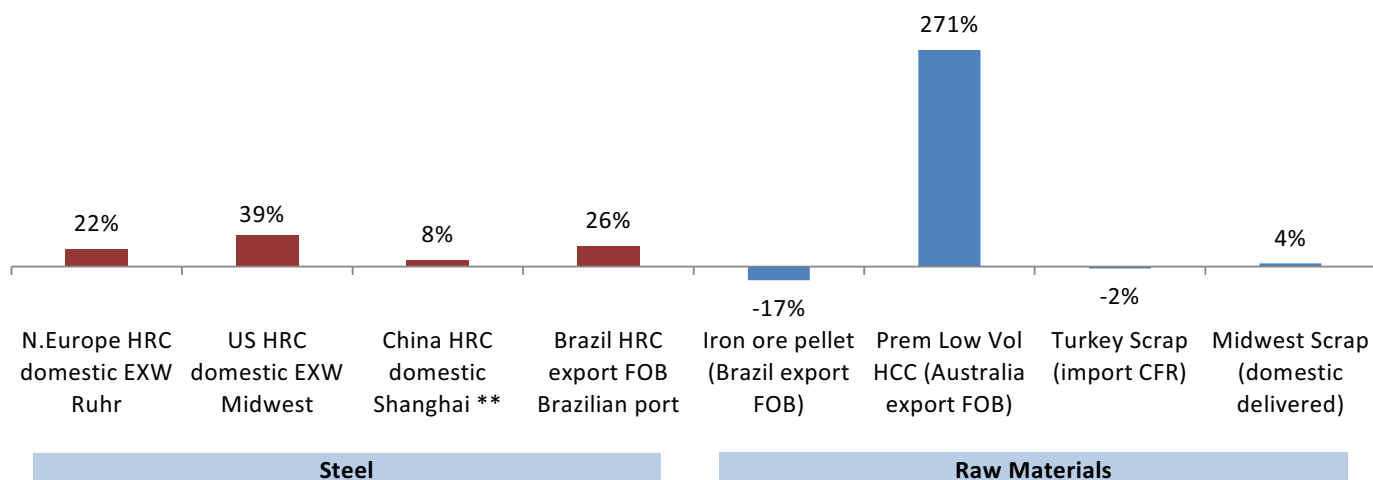
Commodity Price Snapshot

Exhibit 42: Key metals: 1-week absolute performance

Source: Bloomberg, Morgan Stanley Research. Price as on 11 Jan 2022

Exhibit 43: Key metals: year-to-date absolute performance

Source: Bloomberg, Morgan Stanley Research. Price as on 11 Jan 2022

Exhibit 44: Key steel indicators: LTM absolute performance

Source: Morgan Stanley Research. Price as on 10 Jan 2022. ** VAT inclusive

Exhibit 45: Base metals: price snapshot

Base Metals	11-Jan-22	05-Jan-22	WoW Change (%)
Copper	4.42	4.40	0.3%
Aluminium	1.34	1.32	1.6%
Zinc	1.62	1.64	-1.3%
Nickel	9.97	9.41	5.9%
Lead	1.05	1.05	0.3%
Tin	18.51	18.06	2.5%
Cobalt	31.83	31.83	0.0%

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

Exhibit 46: Bulks: price snapshot

Bulks	11-Jan-22	05-Jan-22	WoW Change (%)
Iron Ore, 62% CFR	125.5	119.5	5.0%
Thermal Coal	125.8	93.5	34.6%
Coking Coal	379.0	358.8	5.6%

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

Exhibit 47: Precious metals & PGMs: price snapshot

Precious Metals and PGMs	11-Jan-22	05-Jan-22	WoW Change (%)
Gold	1,822	1,810	0.6%
Silver	22.78	22.81	-0.1%
Platinum	975	986	-1.1%
Palladium	1,927	1,869	3.1%
Rhodium	17,300	15,800	9.5%

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

Exhibit 48: Other metals: price snapshot

Other	11-Jan-22	05-Jan-22	WoW Change (%)
Molybdenum, LME Cash (US\$/lb)	19.0	18.8	1.2%
Uranium UxC-Ux U3O8 Spot (US\$/lb)	43.1	43.1	0.0%
China Lithium Carbonate 99.5% Ex-VAT (US\$/t)	42,535.4	38,268.1	11.2%
China Lithium Hydroxide 56.5% Ex-VAT (US\$/t)	31,850.8	29,463.1	8.1%
China Spodumene 5% min CIF Ex-VAT (US\$/t)	2,275.9	2,206.9	3.1%

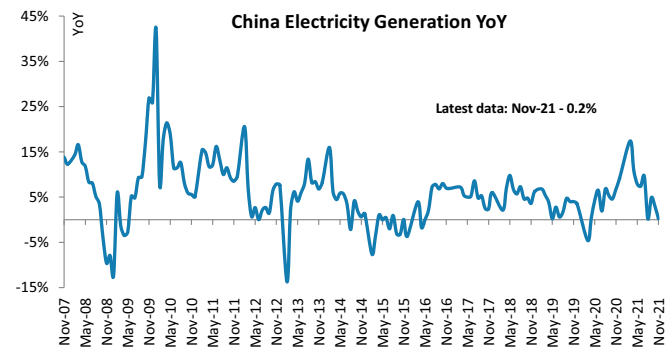
Source: Bloomberg, Morgan Stanley Research. WoW = Week on week

Exhibit 49: Exchange rate snapshot of major metal producing countries

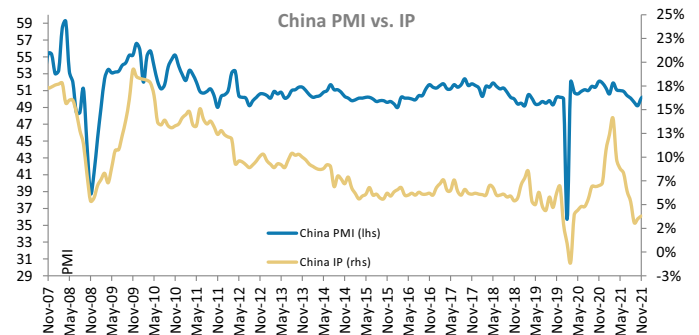
FX Rates of Key Commodity Countries	11-Jan-22	05-Jan-22	WoW Change (%)
1 AUD = USD (Australian \$)	0.72	0.72	-0.2%
1 EUR = USD (Euro)	1.14	1.13	0.5%
1 USD = BRL (Brazilian Real)	5.57	5.72	-2.5%
1 USD = CAD (Canadian \$)	1.26	1.28	-1.4%
1 USD = CLP (Chilean Peso)	829	838	-1.0%
1 USD = CNY (Chinese Renminbi)	6.37	6.36	0.2%
1 USD = KZT (Kazakh Tenge)	435	436	-0.2%
1 USD = MXN (Mexican Peso)	20.38	20.57	-0.9%
1 USD = NOK (Norwegian Krone)	8.80	8.85	-0.6%
1 USD = PEN (Peruvian New Sol)	3.91	3.96	-1.4%
1 USD = SEK (Swedish Krona)	9.04	9.11	-0.8%
1 USD = ZAR (S. African Rand)	15.53	15.90	-2.4%
1 USD = ZMW (Zambian Kwacha)	16.97	16.78	1.1%

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

China Macro Indicators

Exhibit 50: China electricity generation

Source: CEIC, Morgan Stanley Research

Exhibit 51: China Purchasing Managers Index and Industrial Production (IP)

Source: CEIC, Morgan Stanley Research

Exhibit 52: China M1 and M2 money supply

Source: CEIC, Morgan Stanley Research

Exhibit 53: China machinery sales

Source: CEIC, Morgan Stanley Research

Exhibit 54: China fixed asset investments (FAI)

Source: CEIC, Morgan Stanley Research

Exhibit 55: China land sales

Source: CEIC, Morgan Stanley Research

Exhibit 56: China floor space sold and started vs floor space completed (monthly YoY)

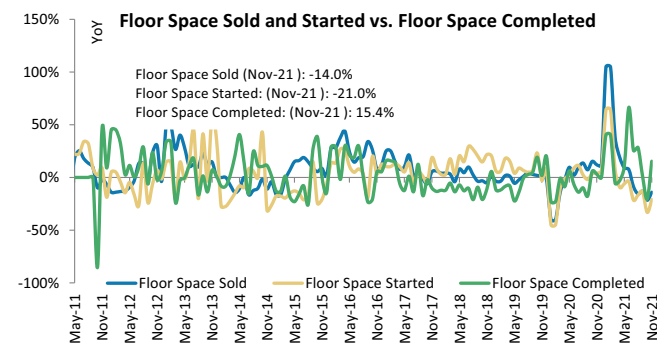


Exhibit 57: China floor space sold vs floor space started (monthly)

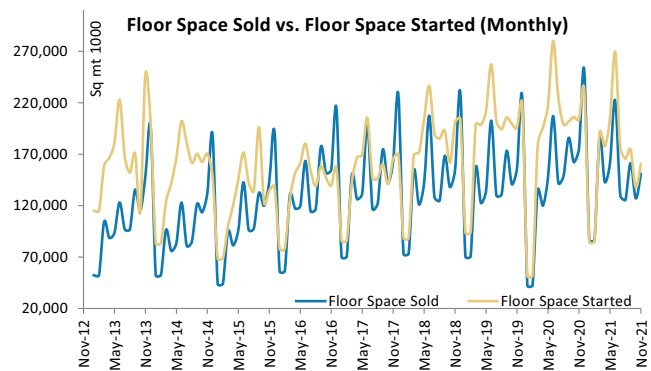
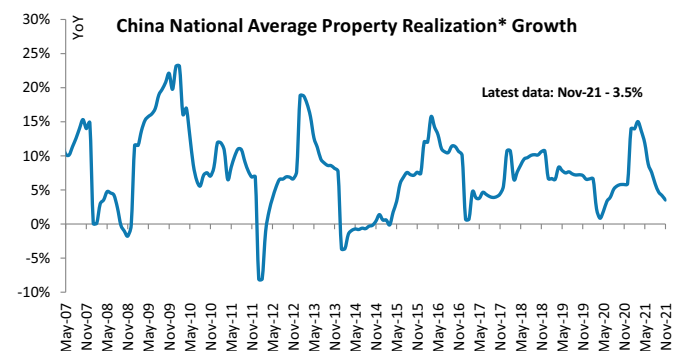
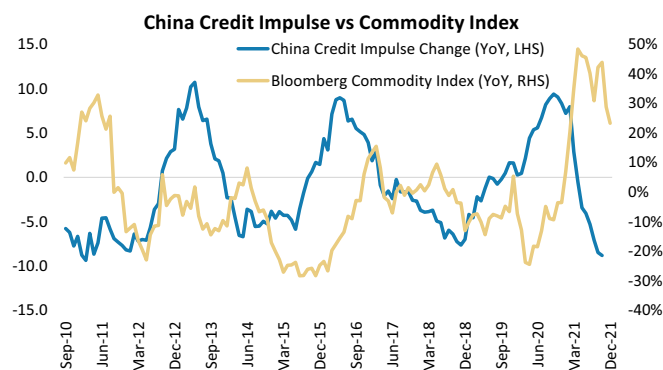
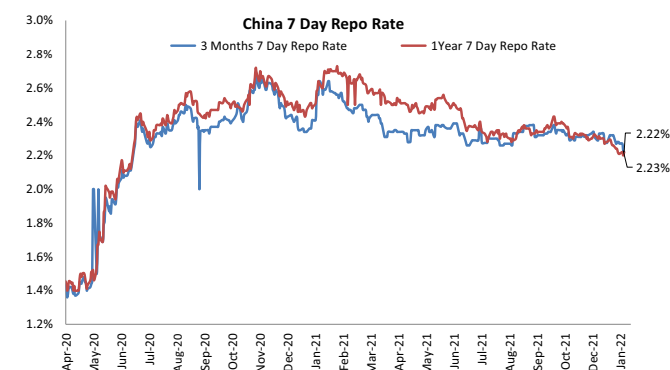


Exhibit 58: China national average property realization growth


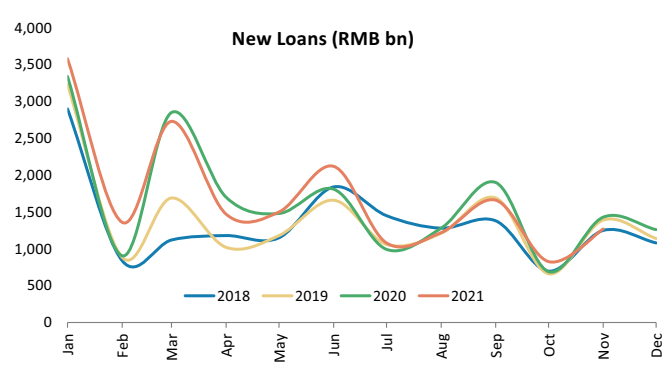
* Building sold value/Floor space volume sold (RMB/sq mt)
Source: CEIC, Morgan Stanley Research

Exhibit 59: China Credit Impulse vs Commodity Index


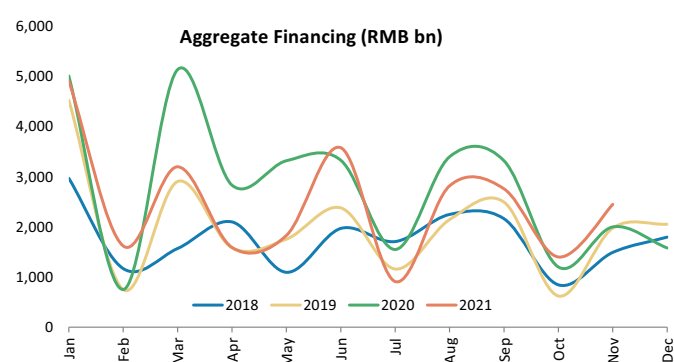
Source: Bloomberg

Exhibit 60: China 7-day repo rate


Source: Datastream

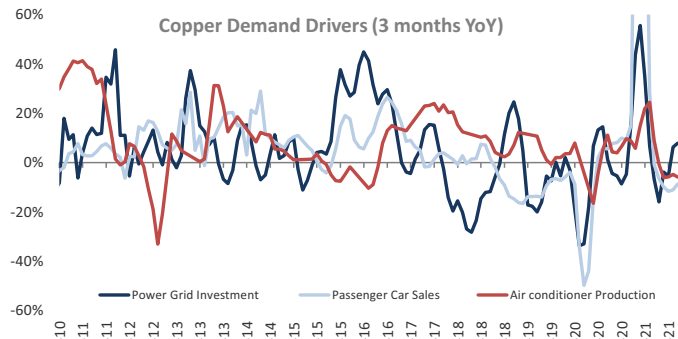
Exhibit 61: New loans (RMB bn)


Source: CEIC

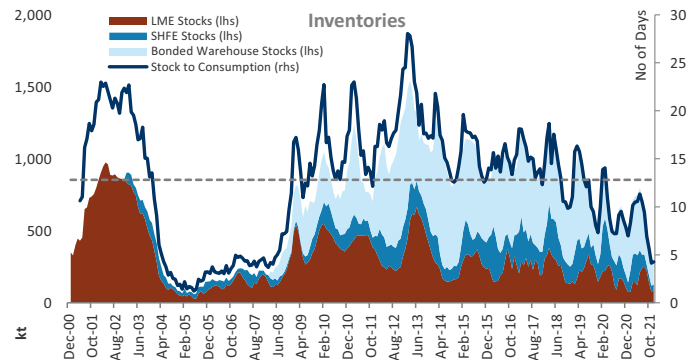
Exhibit 62: Aggregate financing (RMB bn)


Source: CEIC

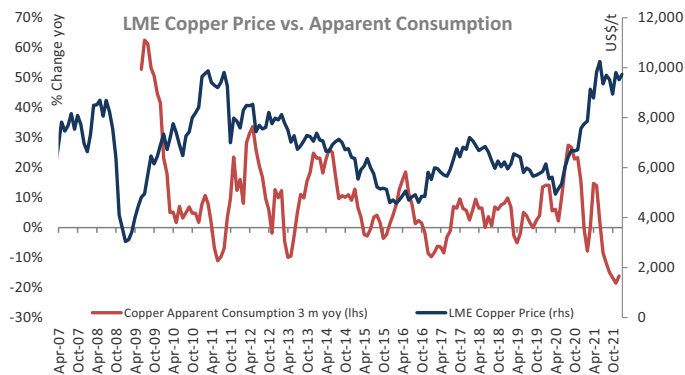
Copper

Exhibit 63: Grid investments, car sales, and air conditioner sales

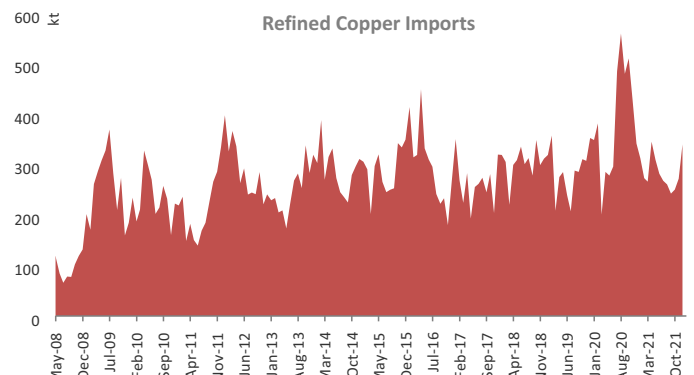
Source: Bloomberg, Morgan Stanley Research

Exhibit 64: Exchange and bonded warehouse stocks vs. days of consumption

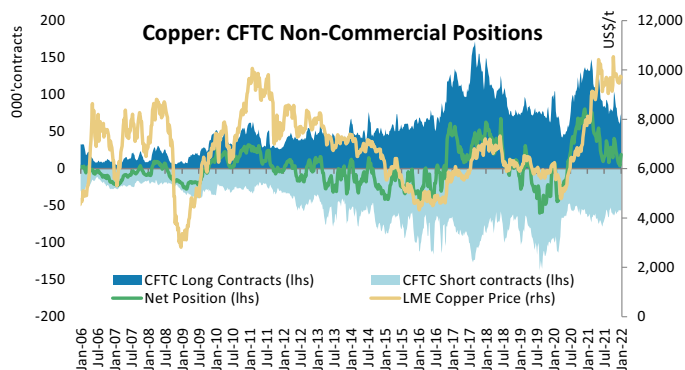
Source: Bloomberg, ICSG, Morgan Stanley Research

Exhibit 65: China's copper price vs. apparent consumption

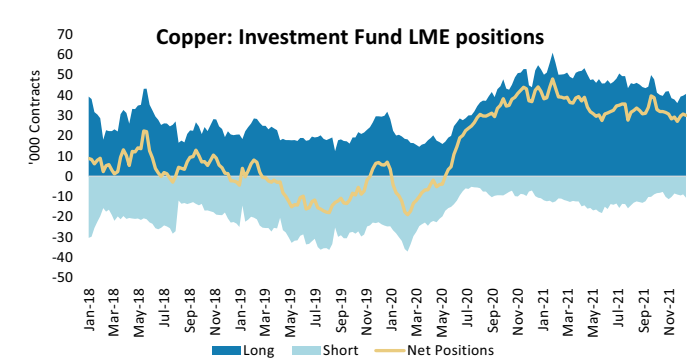
Source: Bloomberg, Morgan Stanley Research, *Apparent Consumption is calculated as refined production less net exports and change in SHFE stocks.

Exhibit 66: China refined copper imports

Source: Bloomberg, Morgan Stanley Research

Exhibit 67: CFTC speculative net length

Source: Bloomberg, CFTC, Morgan Stanley Research

Exhibit 68: LME speculative net length

Source: LME, Morgan Stanley Research

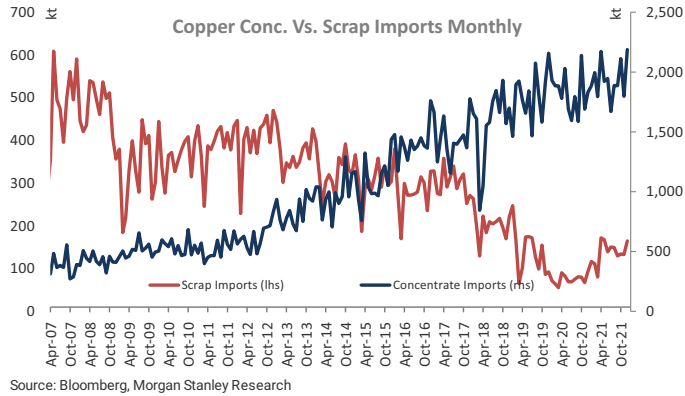
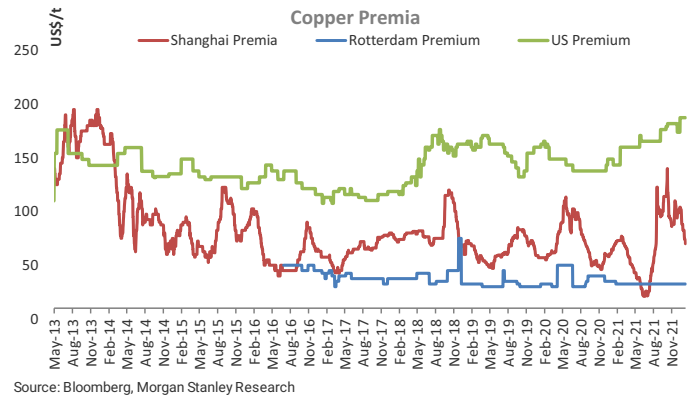
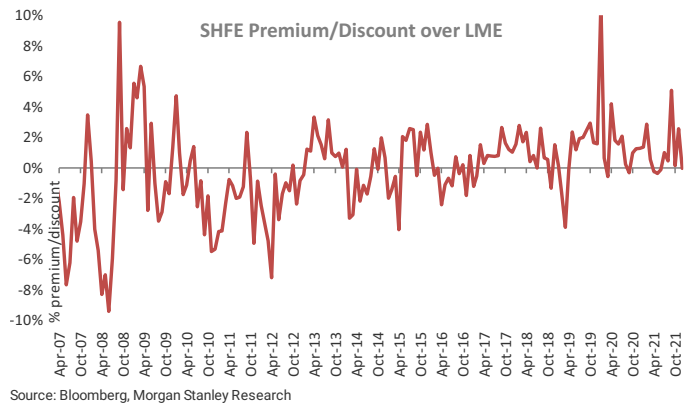
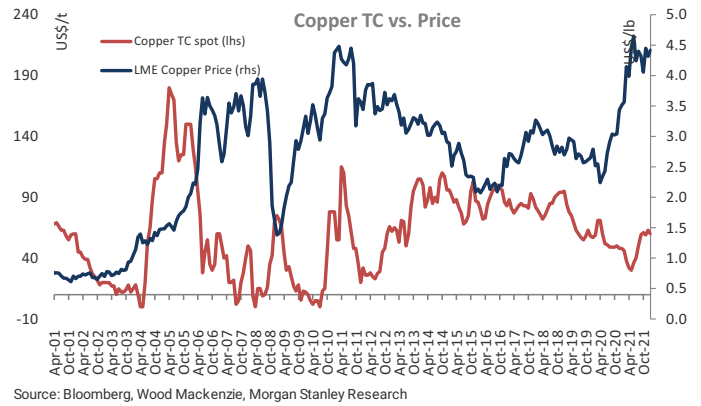
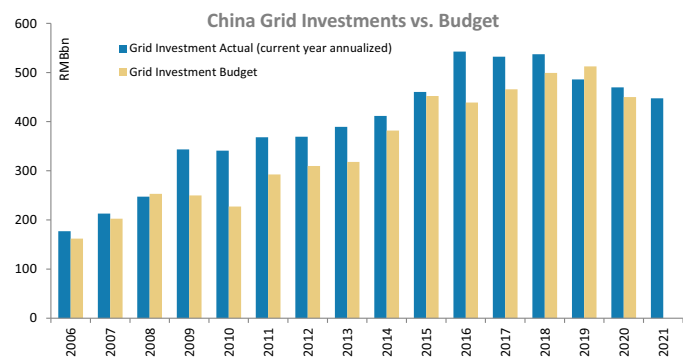
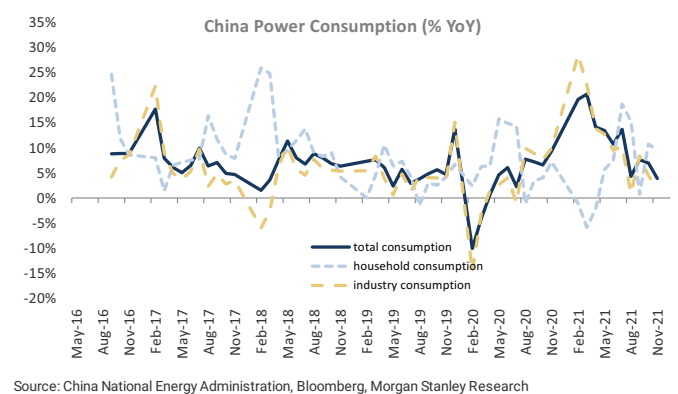
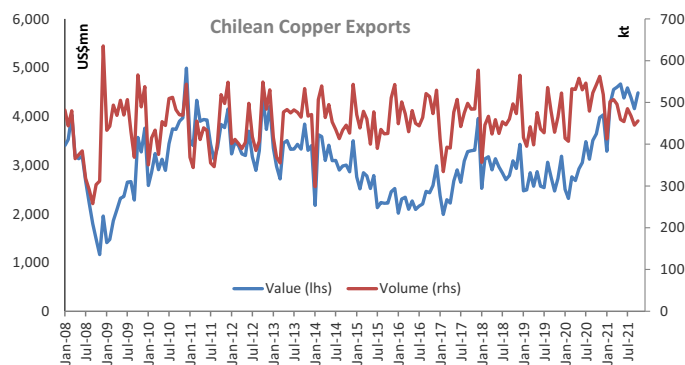
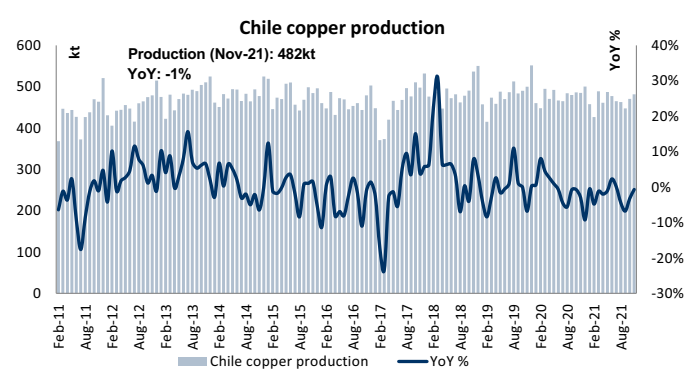
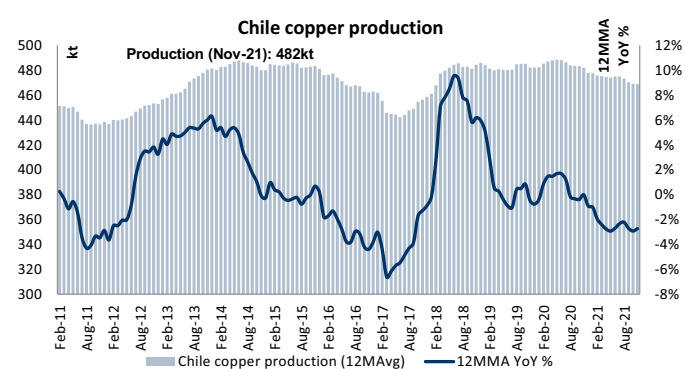
Exhibit 69: Raw materials: China's copper concentrate and scrap monthly imports

Exhibit 70: Physical demand: copper premia by region

Exhibit 71: Price differentials: SHFE vs. LME

Exhibit 72: Copper treatment charges (TCs) vs. price

Exhibit 73: China grid investments (annualised) vs. government spending budget

Exhibit 74: China total power consumption (% YoY) vs. household and industry consumption


Exhibit 75: Chilean copper exports (monthly)


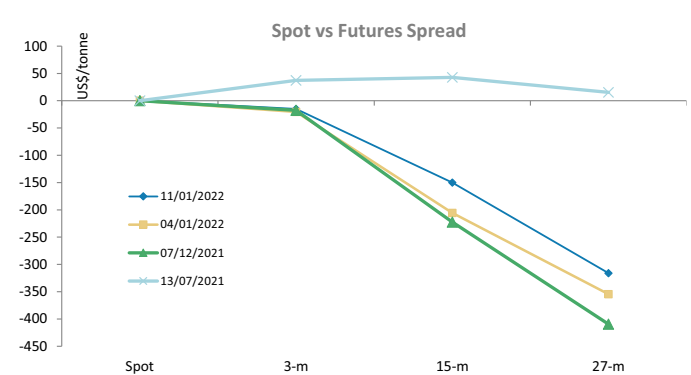
Source: Datastream, Morgan Stanley Research

Exhibit 76: Chile copper production


Source: Cochilco, Bloomberg, Morgan Stanley Research

Exhibit 77: Chile copper production – 12MMA


Source: Cochilco, Bloomberg, Morgan Stanley Research

Exhibit 78: Contango vs. backwardation: copper futures curve movement


Source: Bloomberg, Morgan Stanley Research

Iron Ore and Manganese

Exhibit 79: Iron ore inventories at Chinese sea ports and inventory days of consumption

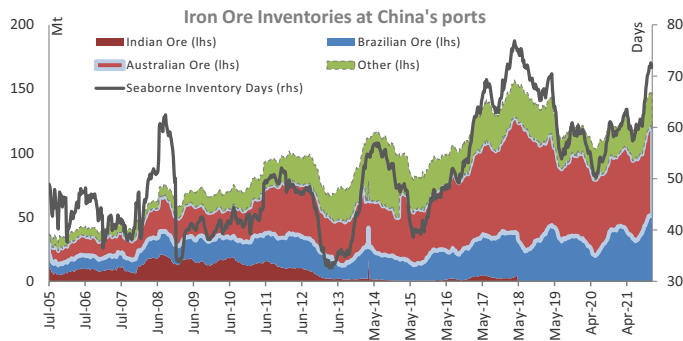


Exhibit 80: China's crude steel production, absolute and YoY change

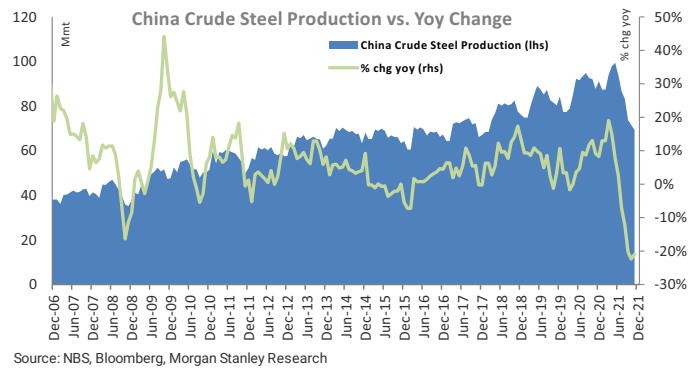


Exhibit 81: China's iron ore prices vs. steel prices



Exhibit 82: Freight rates from key shipping regions to China



Exhibit 83: China iron ore inventories at small and mid-sized steel mills

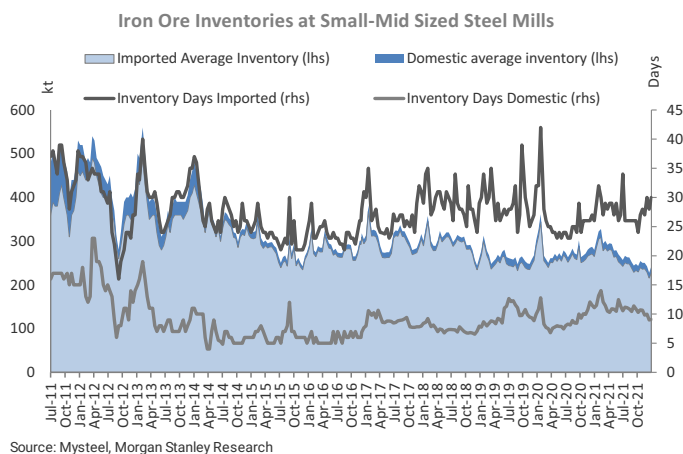


Exhibit 84: China steel product inventories at distributor level

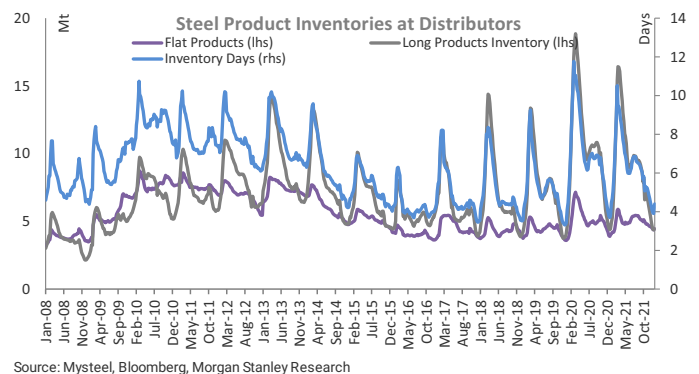
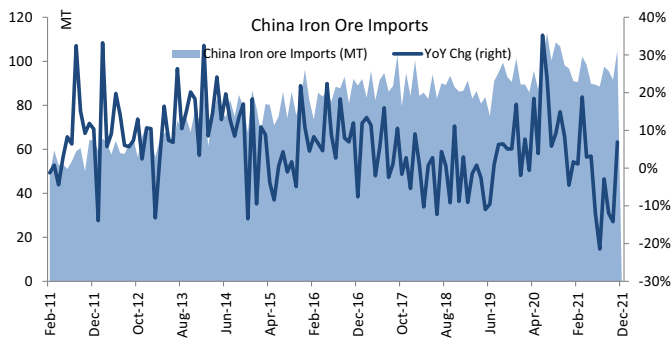
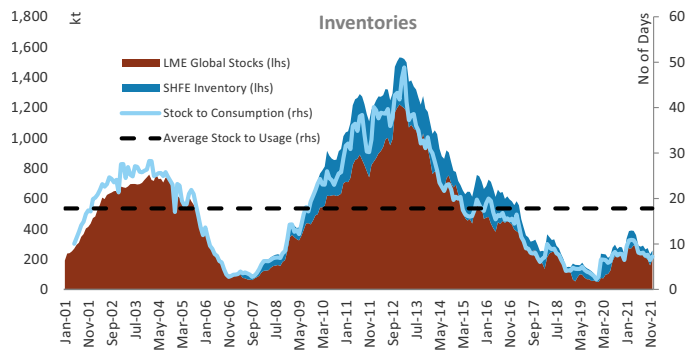


Exhibit 85: China iron ore imports

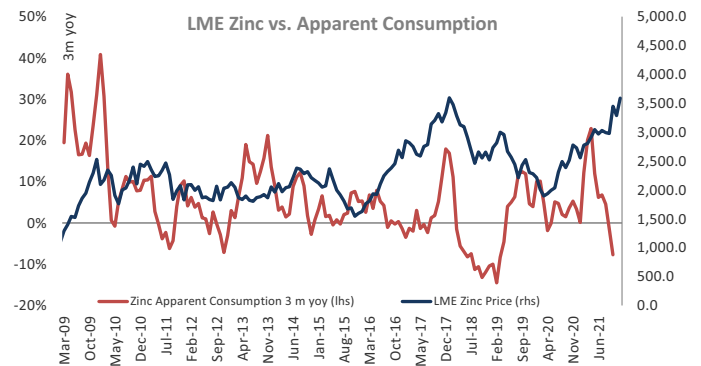


Source: Bloomberg, Morgan Stanley Research

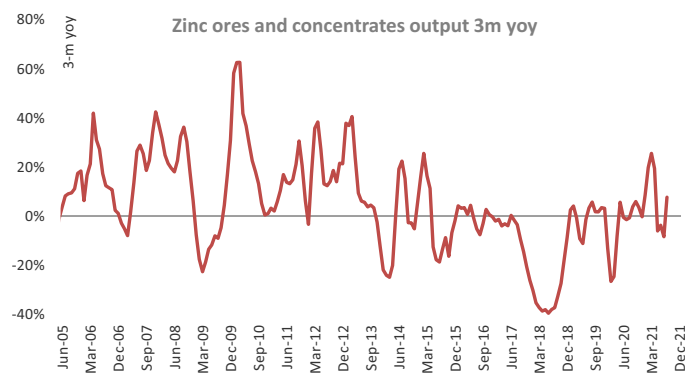
Zinc

Exhibit 86: Zinc exchange inventories and days of consumption

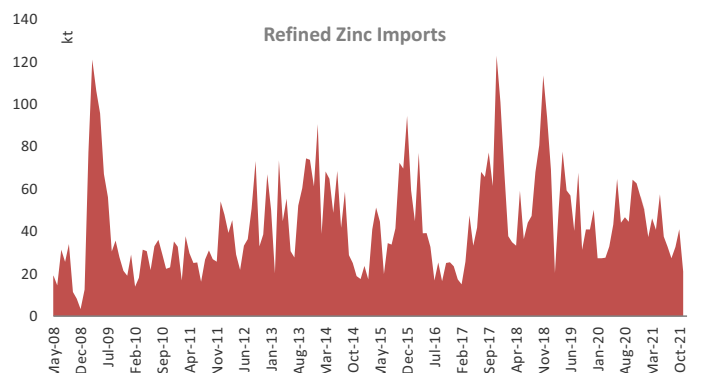
Source: Bloomberg, ILZSG, Morgan Stanley Research

Exhibit 87: China's apparent zinc consumption vs. LME price

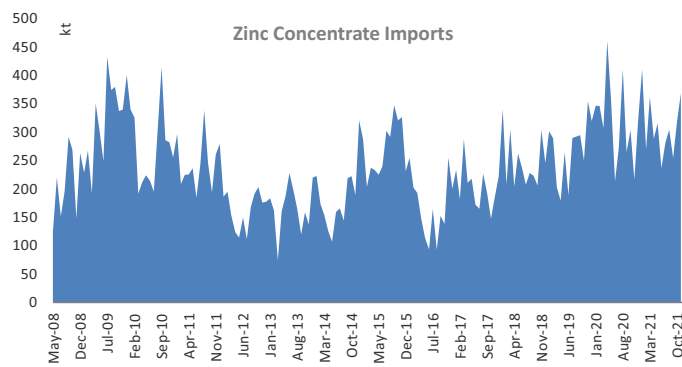
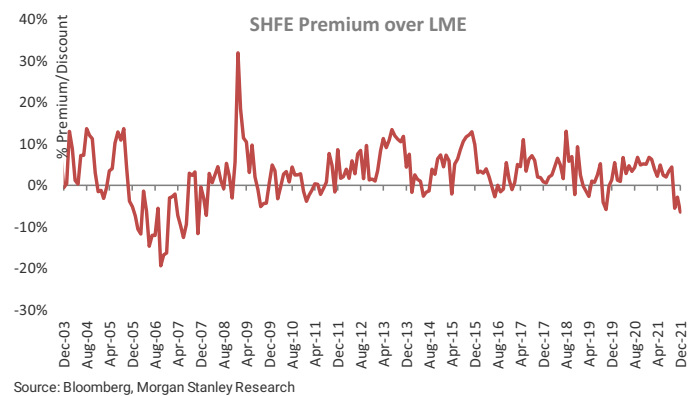
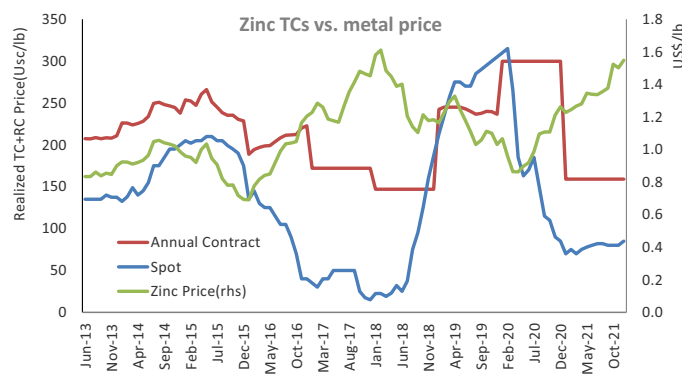
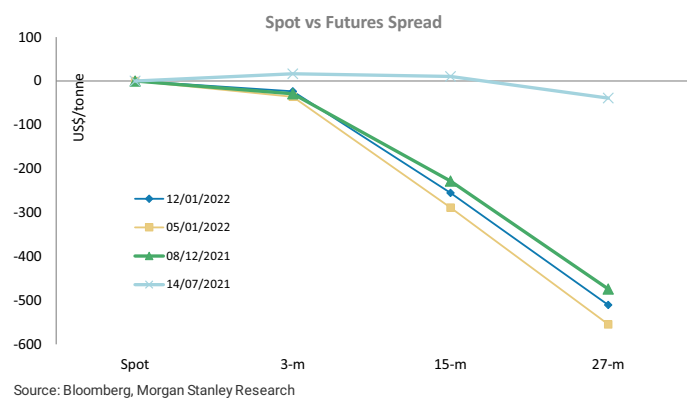
Source: Bloomberg, Morgan Stanley Research

Exhibit 88: Supply drivers: China's zinc ore and concentrate output

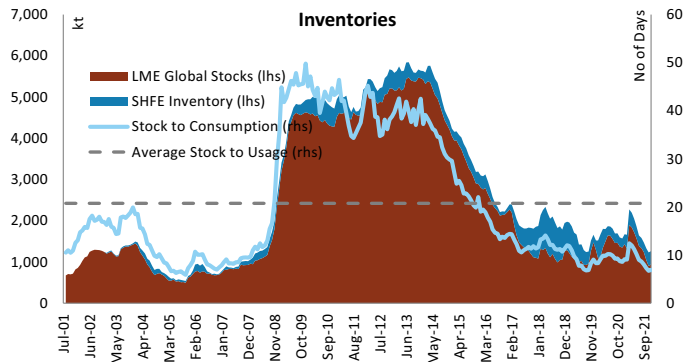
Source: Bloomberg, Morgan Stanley Research

Exhibit 89: Finished metal: China's refined zinc imports

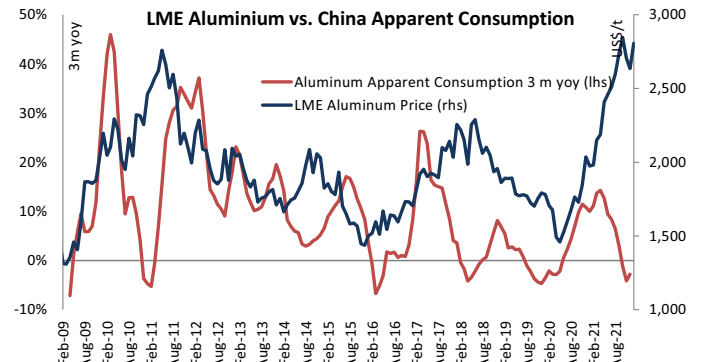
Source: Bloomberg, Morgan Stanley Research

Exhibit 90: Raw materials: China's zinc concentrate imports

Exhibit 91: Zinc price differentials: SHFE vs. LME

Exhibit 92: Zinc TCs vs spot

Exhibit 93: Contango vs. backwardation: zinc futures curve movement


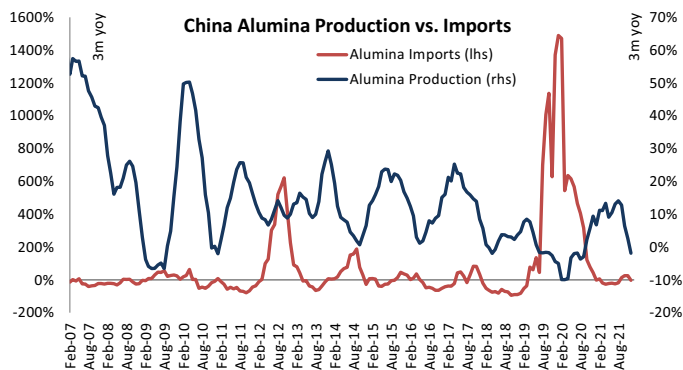
Aluminium

Exhibit 94: Aluminium exchange inventories and days of consumption

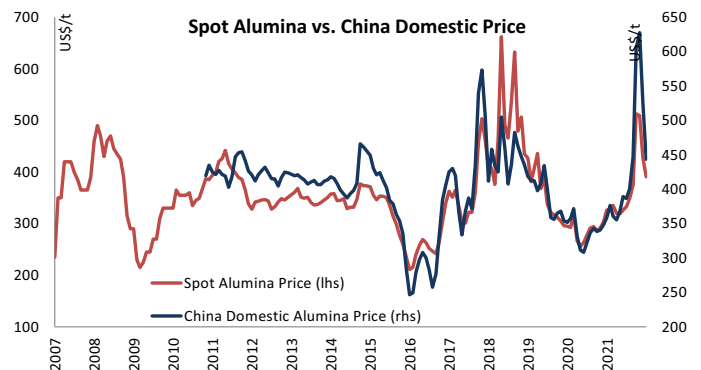
Source: Bloomberg, WBMS, Morgan Stanley Research

Exhibit 95: China's apparent aluminium consumption vs. LME price

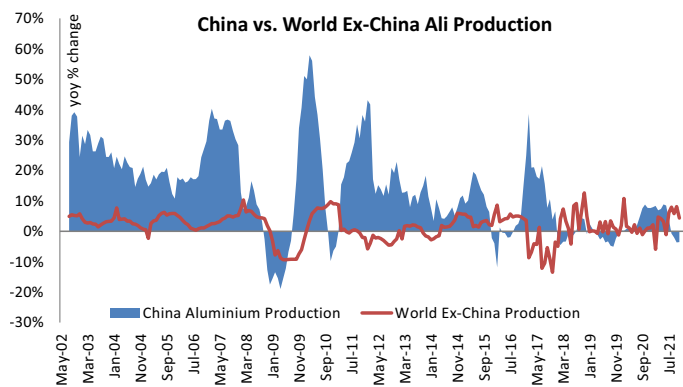
Source: Bloomberg, Morgan Stanley Research

Exhibit 96: Raw materials: China's alumina production vs. imports

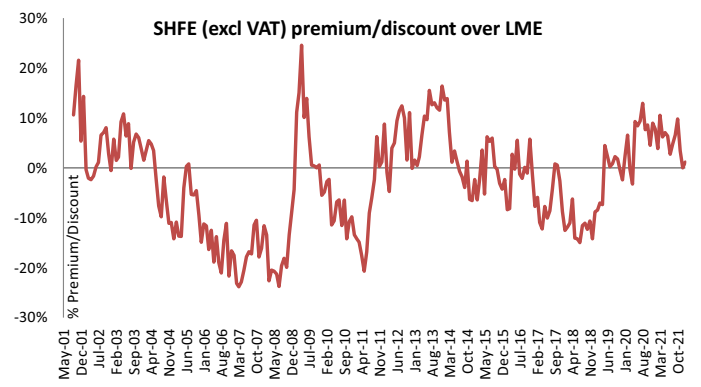
Source: Bloomberg, Morgan Stanley Research

Exhibit 97: Raw materials: spot alumina vs. China domestic price

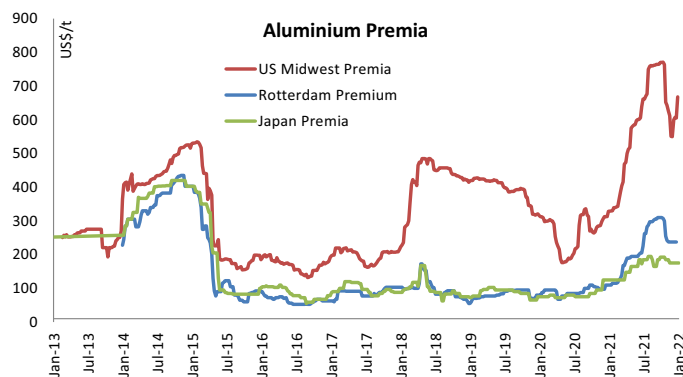
Source: Bloomberg, Morgan Stanley Research

Exhibit 98: Aluminium world production ex-China

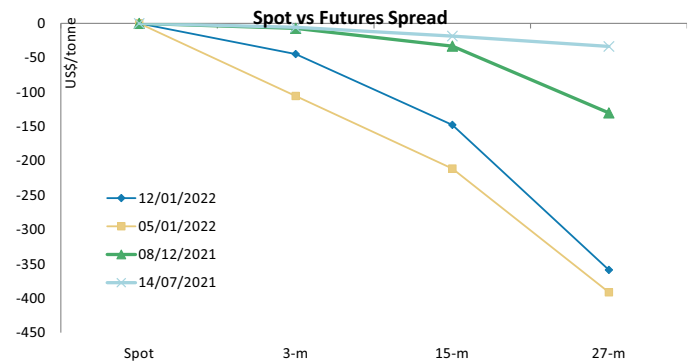
Source: Bloomberg, Morgan Stanley Research

Exhibit 99: Price differentials: SHFE vs. LME

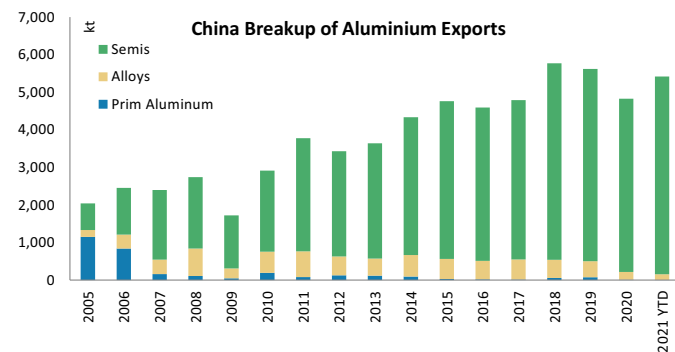
Source: Bloomberg, Morgan Stanley Research

Exhibit 100: Physical demand: aluminium premia by region


Source: Bloomberg, Morgan Stanley Research

Exhibit 101: Contango vs. backwardation: aluminium futures curve movement


Source: Bloomberg, Morgan Stanley Research

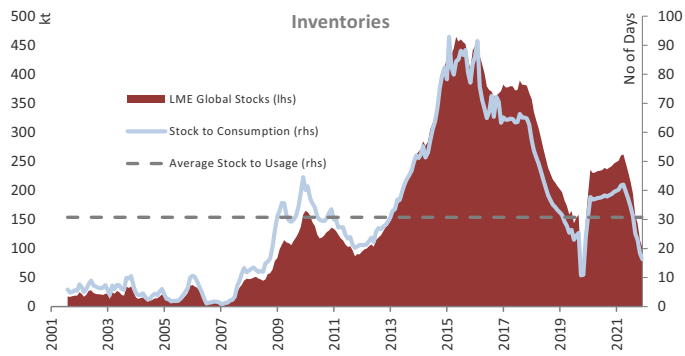
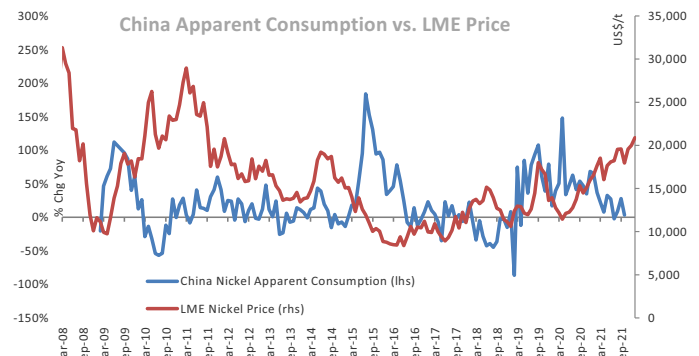
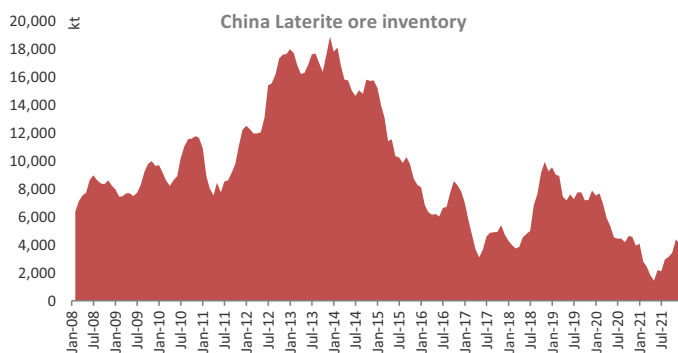
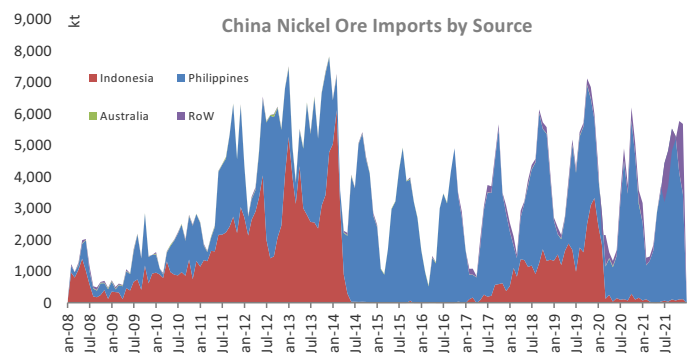
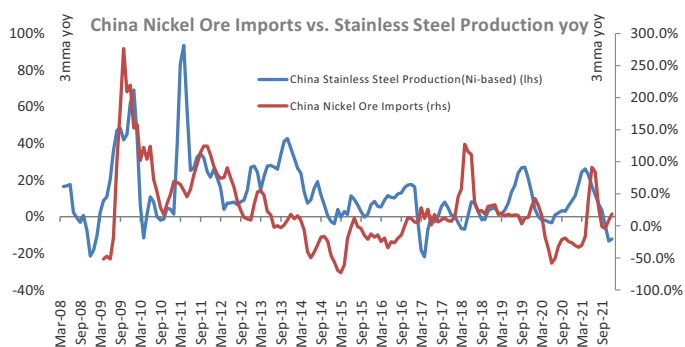
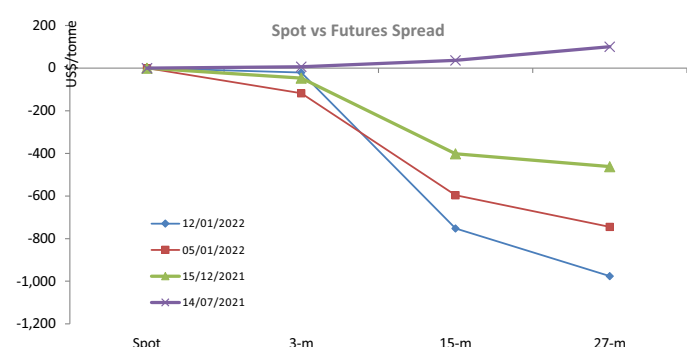
Exhibit 102: China aluminium exports: breakdown by product type


Source: Bloomberg, Morgan Stanley Research, 2021 * YTD= Annualized figures

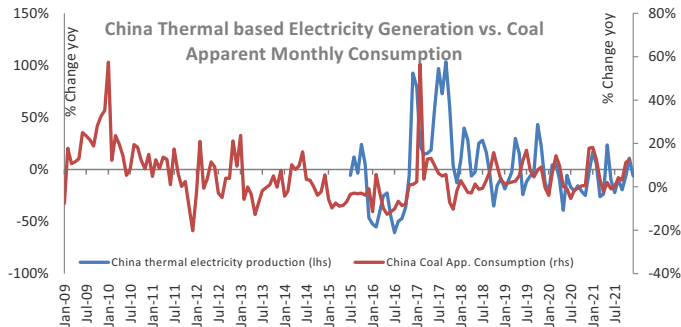
Exhibit 103: China aluminium net exports


Source: Bloomberg, Morgan Stanley Research

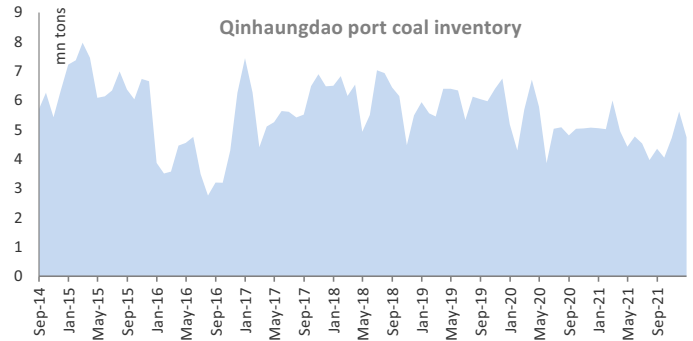
Nickel

Exhibit 104: Nickel exchange inventories and days of consumption**Exhibit 105:** China's apparent nickel consumption vs. LME price**Exhibit 106:** Raw materials: nickel laterite ore inventories**Exhibit 107:** Raw materials: China's ore imports by source**Exhibit 108:** China's nickel ore imports vs. stainless steel production**Exhibit 109:** Contango vs. backwardation: nickel futures curve movement

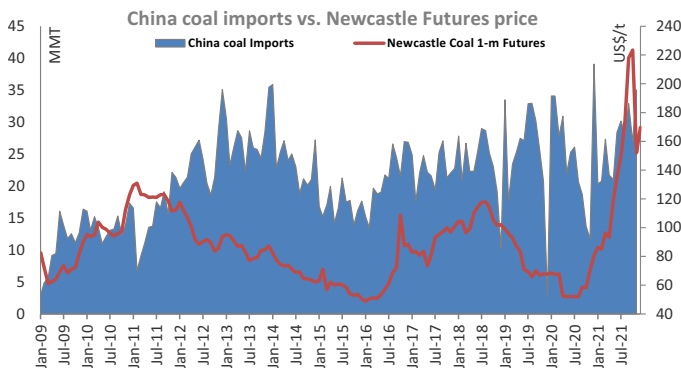
Coal

Exhibit 110: China's thermal-based power generation vs. coal apparent monthly consumption

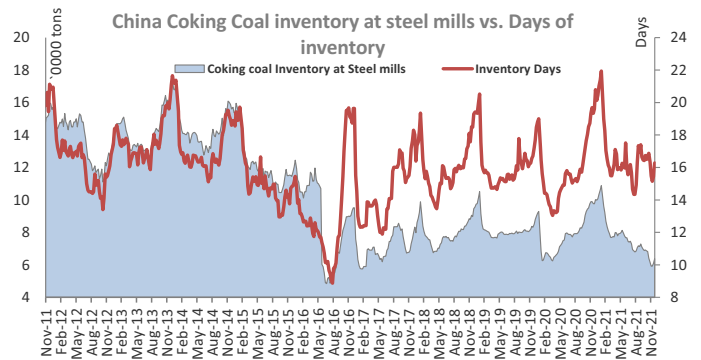
Source: NBS, Bloomberg, Morgan Stanley Research. Apparent Consumption is calculated as Domestic raw coal output less net coal exports

Exhibit 111: Inventories: Qinhuangdao port coal stocks

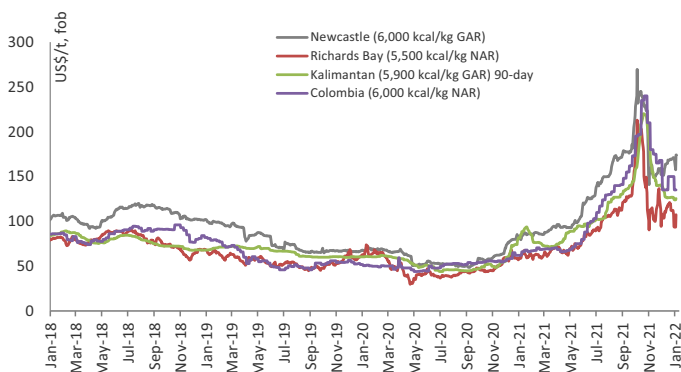
Source: Bloomberg, Morgan Stanley Research

Exhibit 112: China coal imports vs. prices

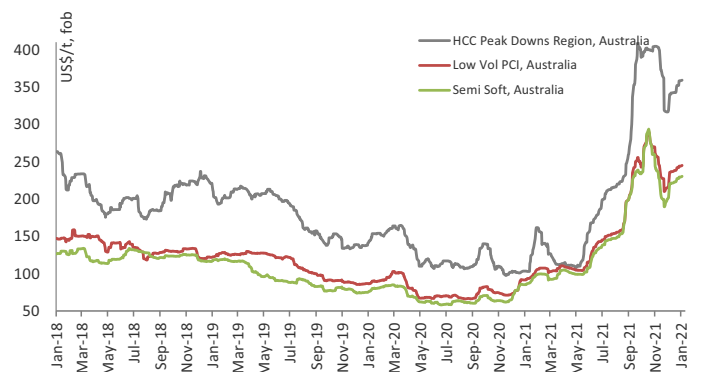
Source: Bloomberg, Morgan Stanley Research

Exhibit 113: Inventories: China's coking coal inventories at steel mills vs. days of consumption

Source: Mysteel, Bloomberg, Morgan Stanley Research

Exhibit 114: Thermal coal prices (US\$/t fob)

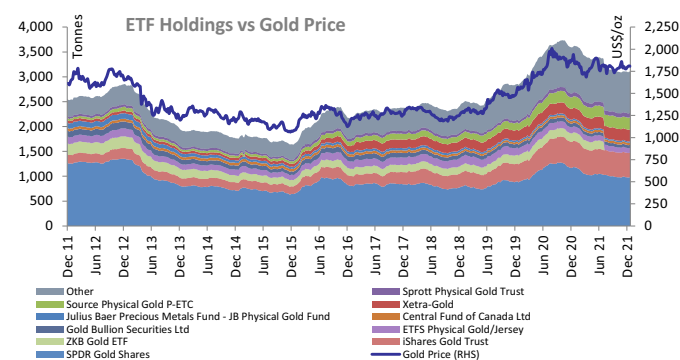
Source: Morgan Stanley Research, IHS, Tex Report, Platts

Exhibit 115: Metallurgical coal prices (US\$/t fob)

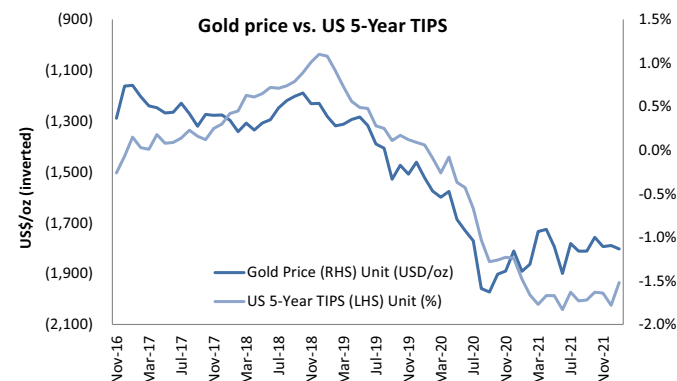
Source: Morgan Stanley Research, IHS, Tex Report, Platts

Gold and Precious Metals

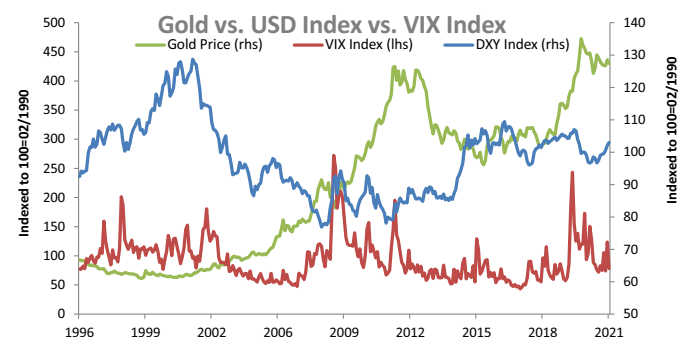
Gold

Exhibit 116: ETF gold holdings vs. gold price

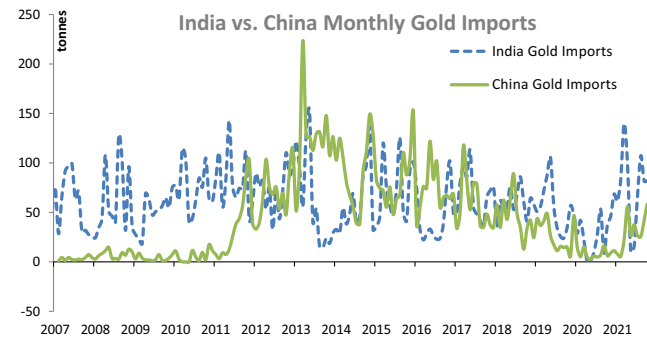
Source: Bloomberg, Morgan Stanley Research (Other includes: ETFs Gold Trust, Central GoldTrust, Royal Canadian Mint - Canadian Gold Reserves, iShares Gold Bullion ETF, db Physical Gold ETC, UBS ETF CH-Gold CHF hedged CHF, db Physical Gold Euro Hedged ETC, Pictet CH Precious Metals Fund - Physical Gold, iShares Gold CH, iShares Gold CHF Hedged CH, db Physical Gold ETC EUR, ETFs Physical Swiss Gold, db Physical Gold SGD Hedged ETC, db Physical Gold CHF Hedged ETC, ETFs Physical Swiss Gold, EUWAX Gold, FinEx Gold ETF USD, iShares Physical Gold ETC, iShares Gold EUR Hedged CH, Raiffeisen ETF - Solid Gold Ounces - AC, Raiffeisen ETF - Solid Gold, RBS Physical Gold ETC, RBS Physical Gold ETC, UBS ETF CH-Gold EUR hedged EUR A-dis, UBS ETF CH-Gold USD, Reliance ETF Gold BeES, SBHETF Gold, Japan Physical Gold ETF, ValueGold ETF, NewGold Issuer Ltd, ETFs Metal Securities Australia Ltd - ETFs Physical Gold, Credit Suisse Institutional Fund II CH - Gold Fund, BMG Gold Bullion Fund, Spriott Gold Bullion Fund, Huanan Yifu Gold ETF, E Fund Gold Tradable Open-end Securities Investment Fund, HDFC Gold Exchange Traded Fund, Kotak Gold ETF, UTI-Gold Exchange Traded Fund)

Exhibit 117: Gold price vs. US 5-year TIPS

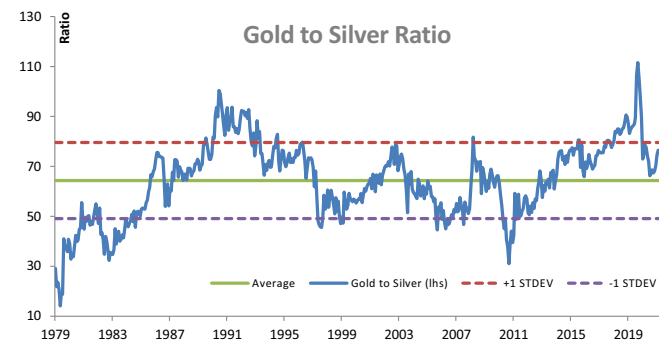
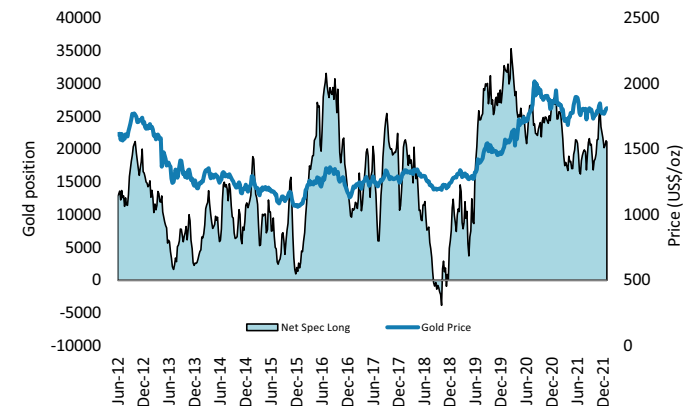
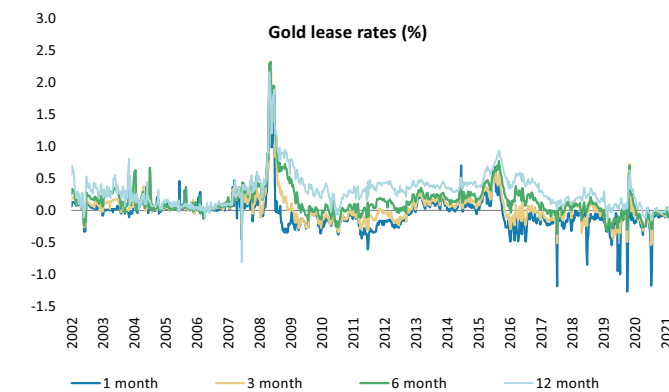
Source: Bloomberg, Morgan Stanley Research

Exhibit 118: Gold performance vs. volatility index vs. dollar index

Source: Bloomberg, Morgan Stanley Research

Exhibit 119: Gold imports: China vs. India

Source: Bloomberg, Morgan Stanley Research

Exhibit 120: Gold to silver ratio

Exhibit 121: Nymex positioning as per COTR

Exhibit 122: Lease rates (%)


Platinum

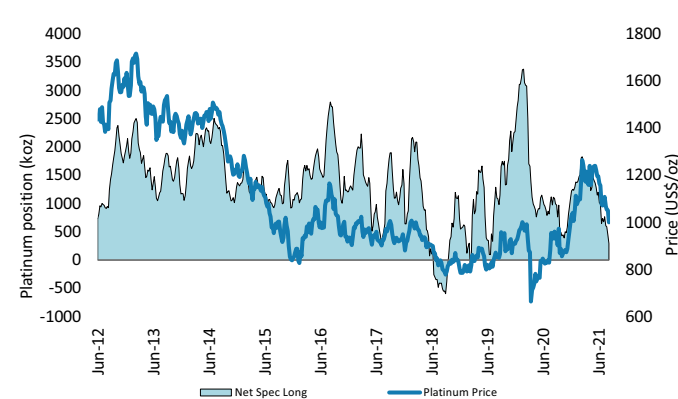
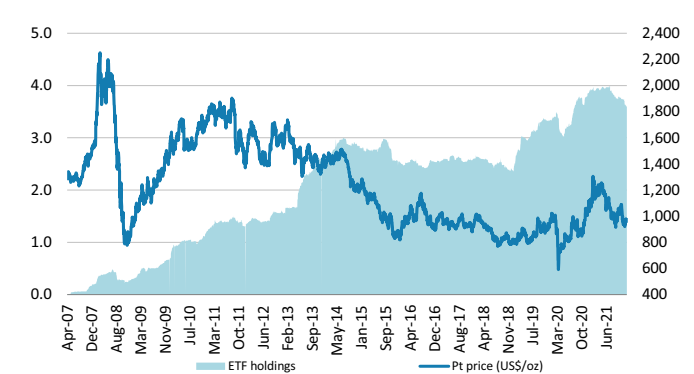
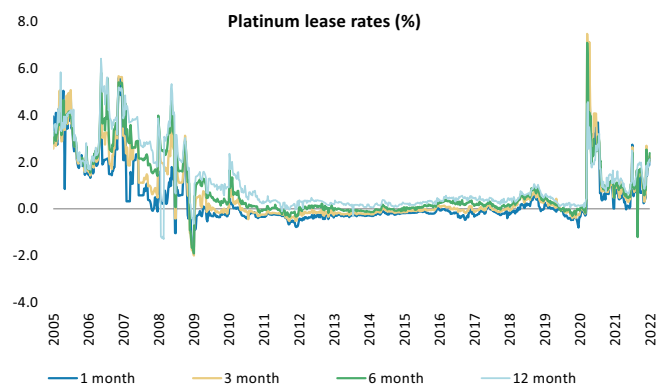
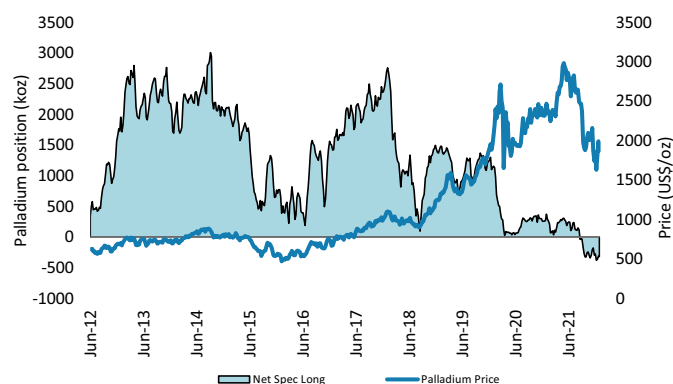
Exhibit 123: Nymex positioning as per COTR

Exhibit 124: ETF Holdings


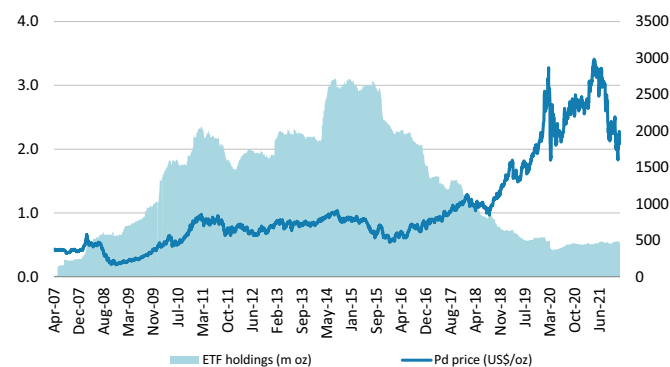
Exhibit 125: Lease rates (%)


Source: Bloomberg

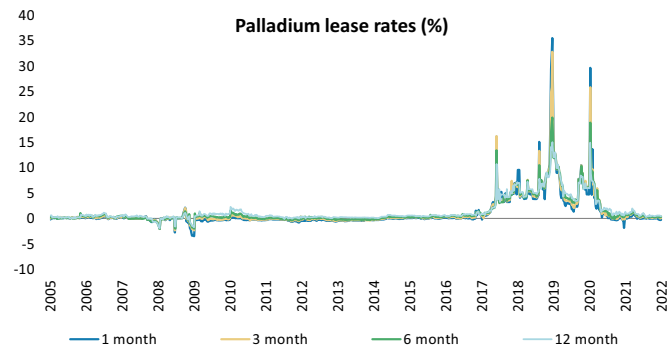
Palladium

Exhibit 126: Nymex positioning as per COTR


Source: COTR, Morgan Stanley Research

Exhibit 127: ETF Holdings


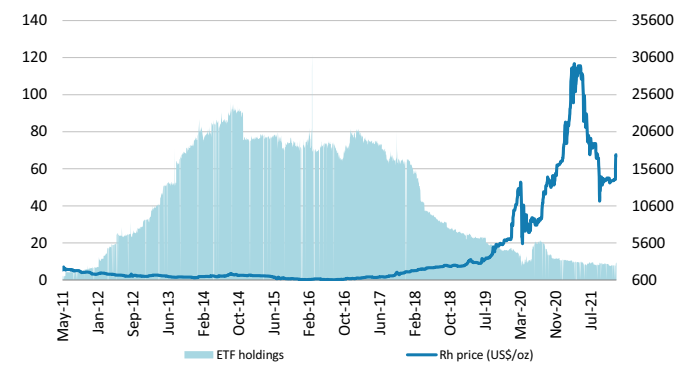
Source: Bloomberg

Exhibit 128: Lease rates (%)


Source: Bloomberg

Rhodium

Exhibit 129: ETF holdings



Source: Bloomberg

Diamonds

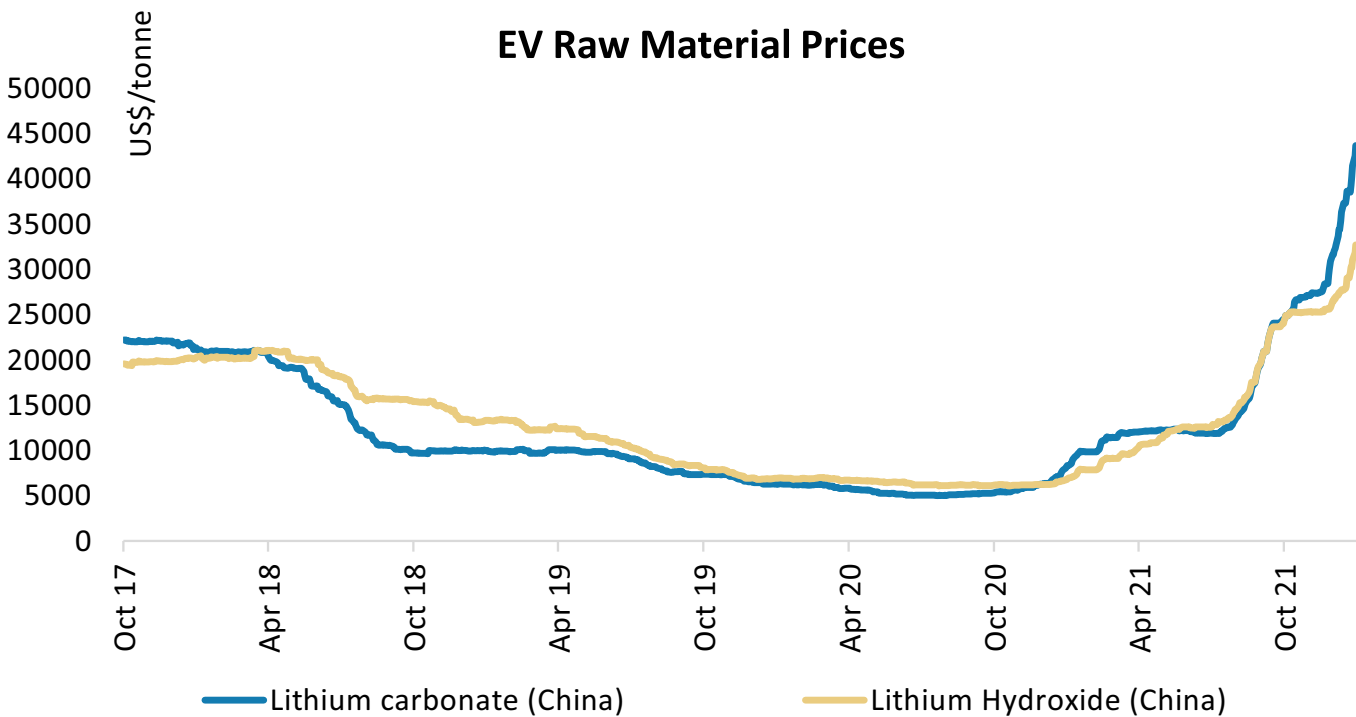
Exhibit 130: Polished Diamond Prices



Source: DataStream

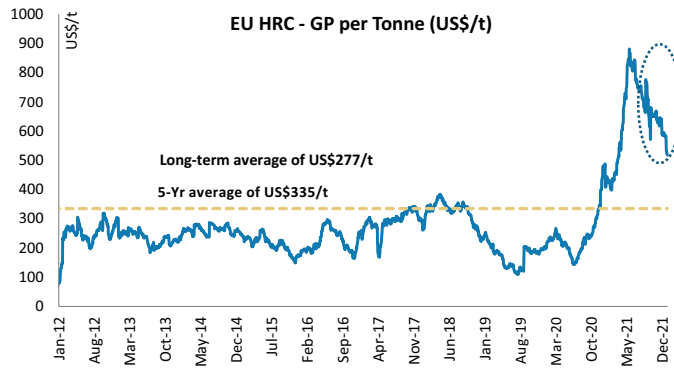
EV raw material prices

Exhibit 131: EV raw material prices

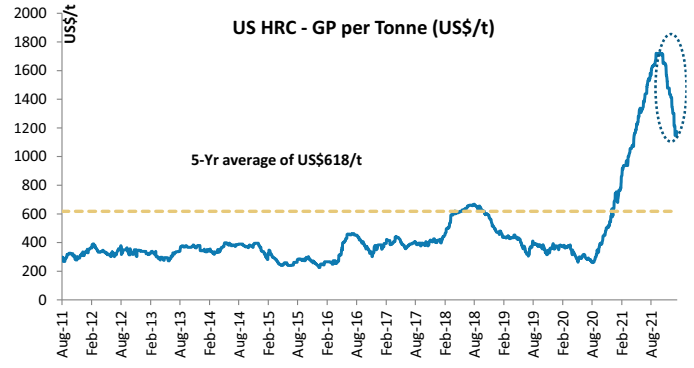


Source: Bloomberg, Datastream

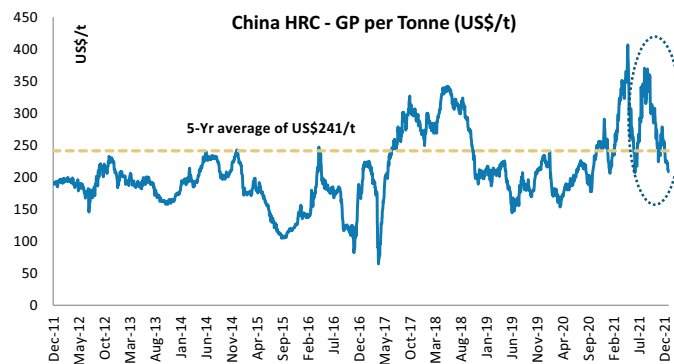
Steel Economics

Exhibit 132: EU HRC – GP per tonne

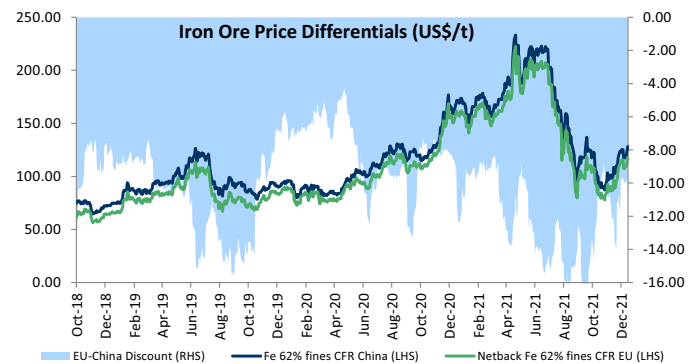
Source: Bloomberg, Morgan Stanley Research

Exhibit 133: US HRC – GP per tonne

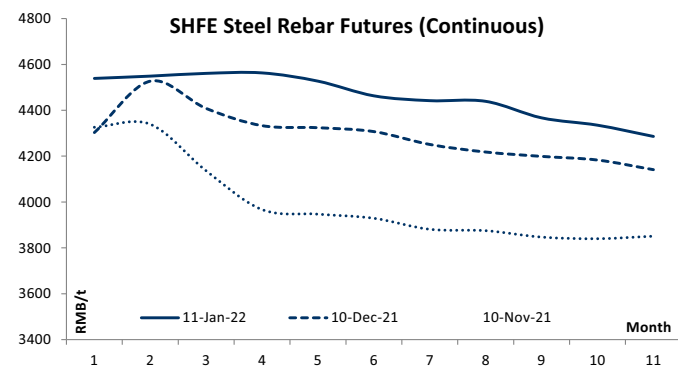
Source: Bloomberg, Morgan Stanley Research

Exhibit 134: China HRC – GP per tonne

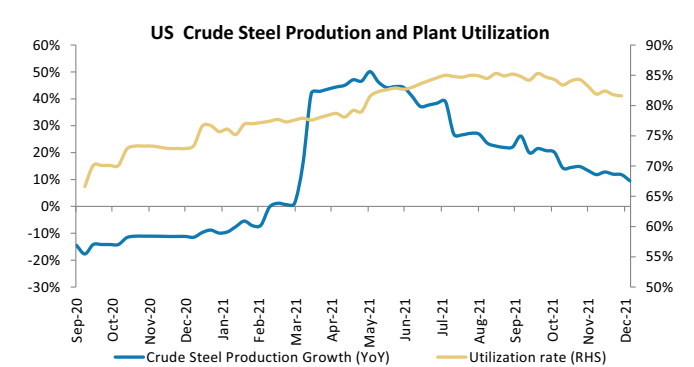
Source: Bloomberg, Morgan Stanley Research

Exhibit 135: Iron ore price differential (US\$/t)

Source: Datastream, Morgan Stanley Research

Exhibit 136: SHFE Steel Rebar Futures

Source: Datastream, Morgan Stanley Research

Exhibit 137: US Crude steel production and plant utilization

Source: AISI, Morgan Stanley Research

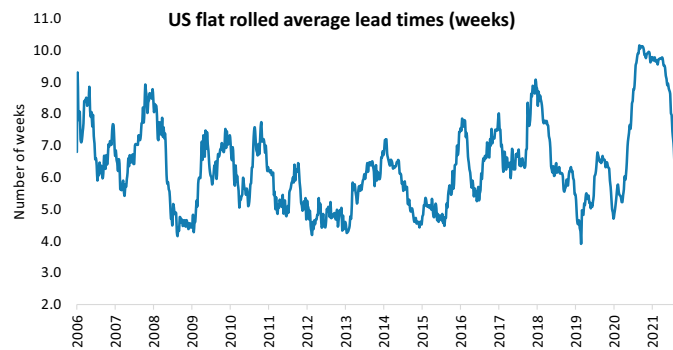
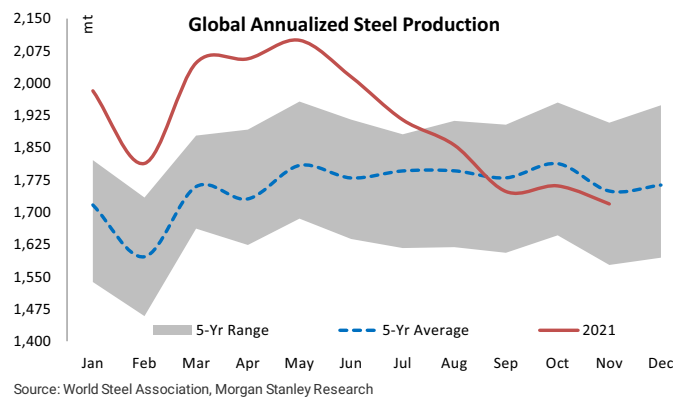
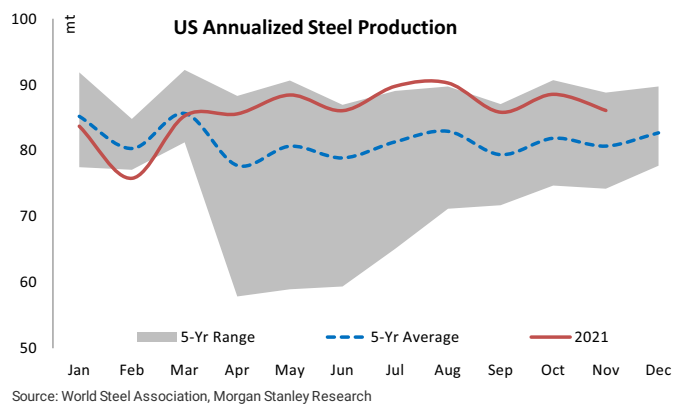
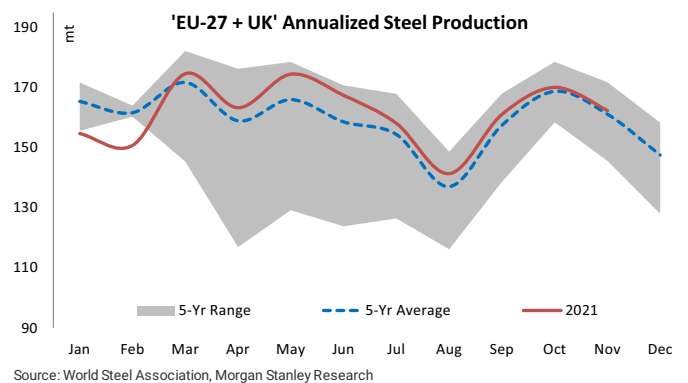
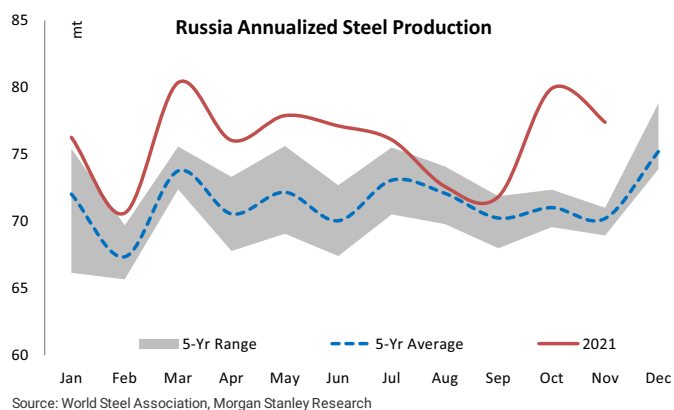
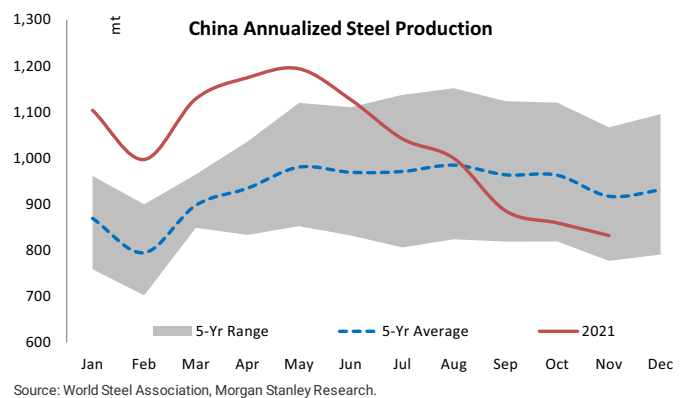
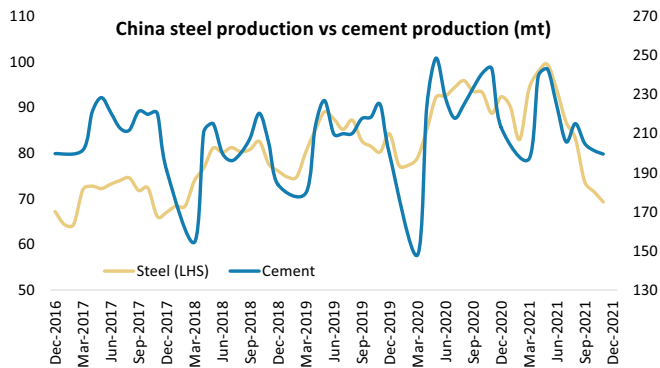
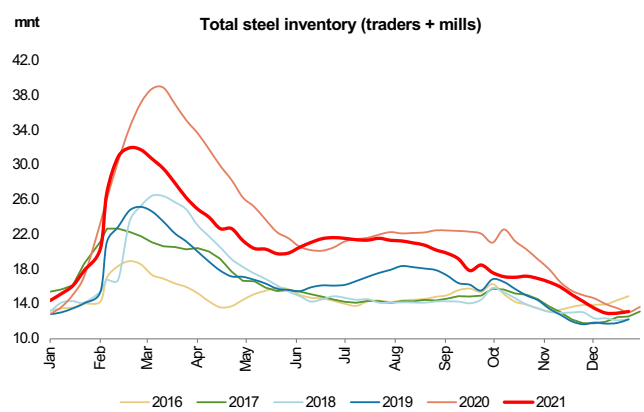
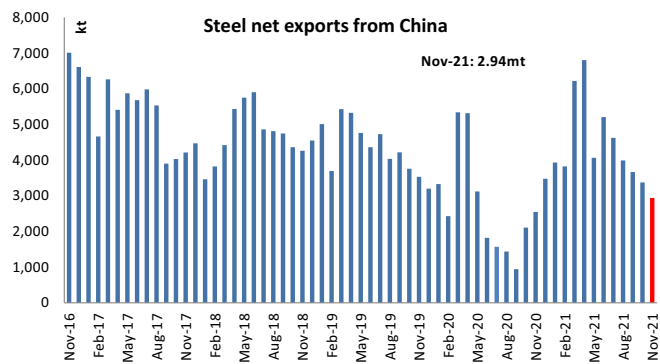
Exhibit 138: US flat rolled steel average lead times (weeks)

Exhibit 139: Global steel annualised production

Exhibit 140: US steel annualised production

Exhibit 141: EU-28 steel annualised production

Exhibit 142: Russia steel annualised production

Exhibit 143: China steel annualised production


Exhibit 144: China Steel and Cement production


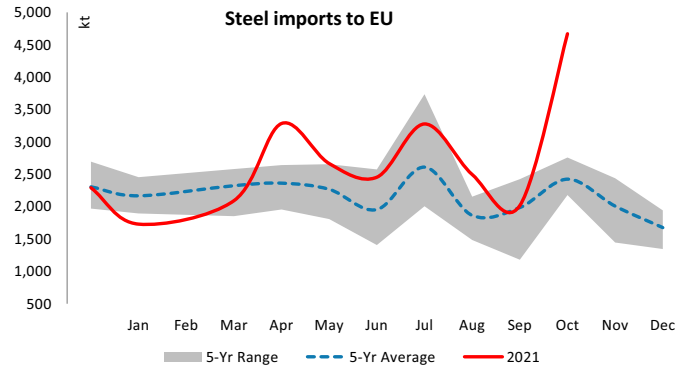
Source: NBS, DataStream, Morgan Stanley Research. Data for January and February is not available on datastream

Exhibit 145: Total steel inventory (traders + mills)


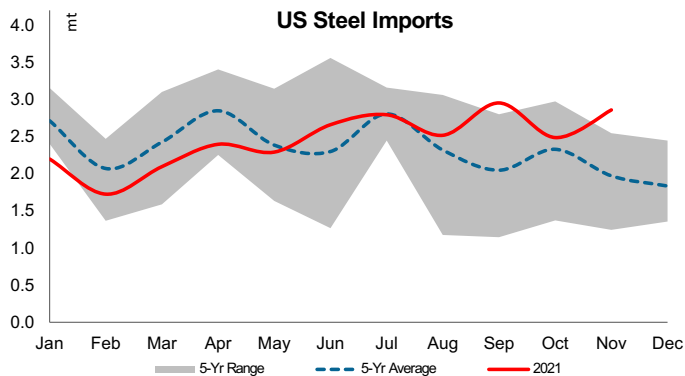
Source: Mysteel, Morgan Stanley Research

Exhibit 146: Steel net exports from China


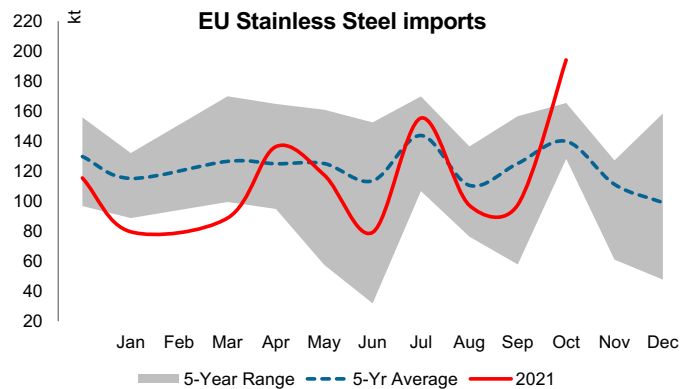
Source: CEIC, Morgan Stanley Research

Exhibit 147: Steel imports to EU


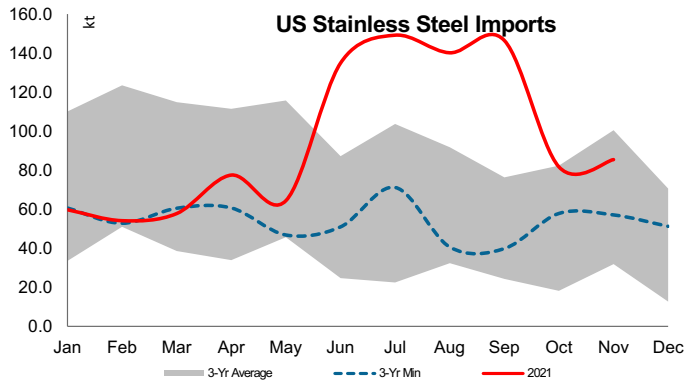
Source: Eurofer, Morgan Stanley Research

Exhibit 148: Steel imports to US


Source: US Census Bureau, Morgan Stanley Research

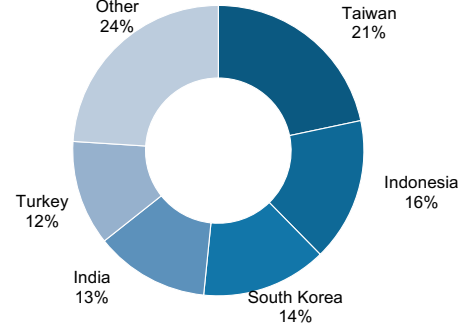
Exhibit 149: Stainless steel imports to EU


Source: Eurofer, Morgan Stanley Research

Exhibit 150: Stainless steel imports to US


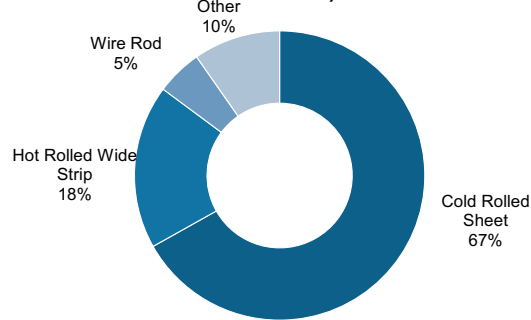
Source: US Census Bureau, Morgan Stanley Research

Exhibit 151: Stainless steel imports by country (2021 YTD)

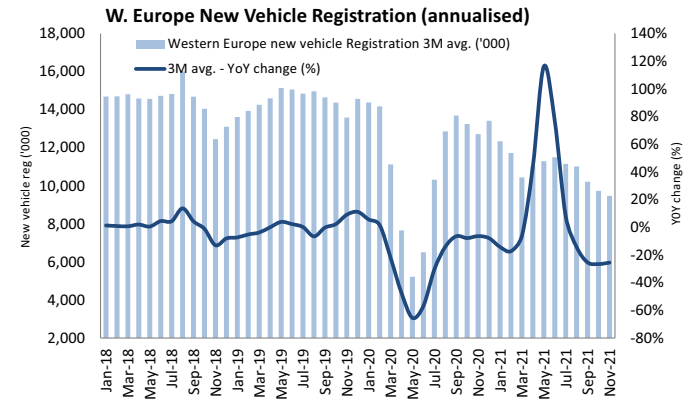
EU total stainless steel imports by country (Jan 21- Oct 21)


Source: Eurofer, Morgan Stanley Research

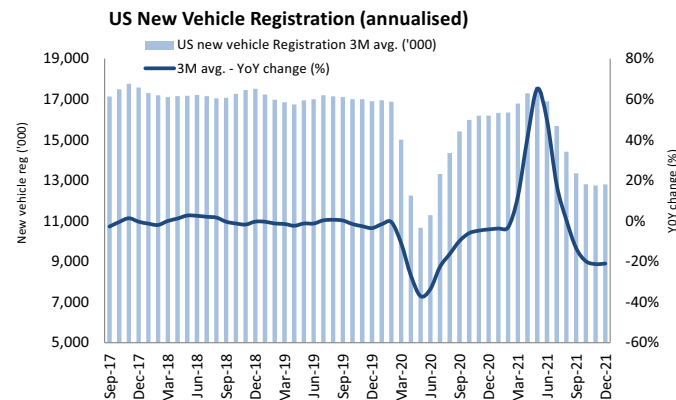
Exhibit 152: Stainless steel imports by product (2021 YTD)

EU total stainless steel imports by product (Jan 21- Oct 21)


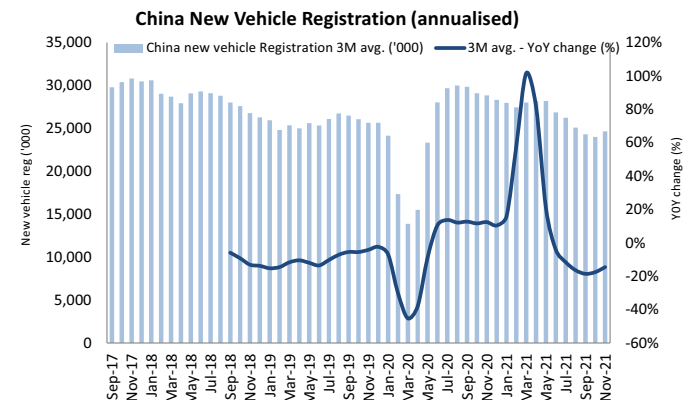
Source: Eurofer, Morgan Stanley Research

Exhibit 153: W. Europe new vehicle registration


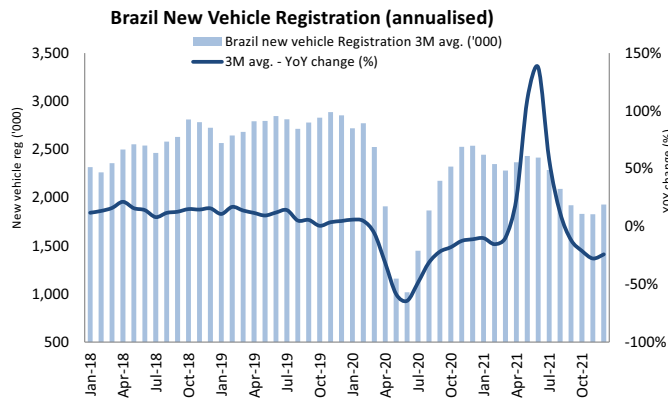
Source: ACEA, Morgan Stanley Research

Exhibit 154: US new vehicle registration


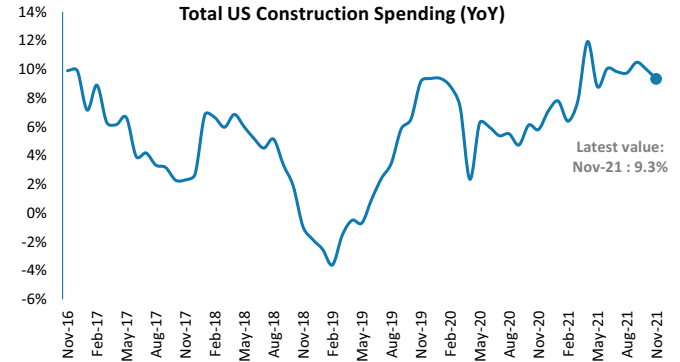
Source: SAAR, Morgan Stanley Research

Exhibit 155: China new vehicle registration


Source: CAAM, Morgan Stanley Research

Exhibit 156: Brazil new vehicle registration


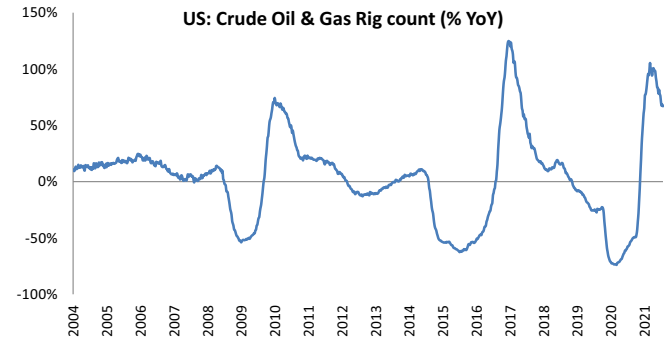
Source: ANFAVEA, Morgan Stanley Research

Exhibit 157: Total US construction spending (YoY)


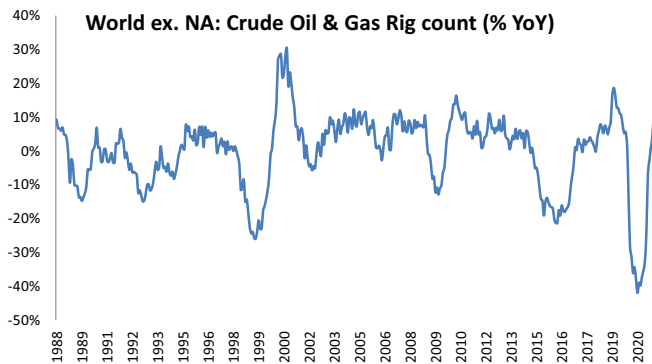
Source: Datastream, Morgan Stanley Research

Exhibit 158: EU CO₂ emission allowance


Source: EEX, Morgan Stanley Research

Exhibit 159: US: crude oil & gas rig count (% YoY)


Source: Baker Hughes, Morgan Stanley Research

Exhibit 160: World ex. NA: crude oil & gas rig count (% YoY)


Source: Baker Hughes, Morgan Stanley Research

Key Morgan Stanley Forecasts

Exhibit 161: Base Metal Forecasts

Period	Aluminium (US\$/lb)			Nickel (US\$/lb)			Copper (US\$/lb)			Zinc (US\$/lb)		
	Bear	Base	Bull	Bear	Base	Bull	Bear	Base	Bull	Bear	Base	Bull
2022e	1.15	1.27	1.46	6.87	9.81	13.74	3.25	4.06	4.79	0.99	1.16	1.57
2023e	1.00	1.12	1.36	5.78	8.25	12.38	2.87	3.38	4.39	0.95	1.05	1.32
2024e	0.94	1.11	1.38	5.28	7.54	11.31	3.29	3.65	4.75	0.97	1.08	1.40
2025e	0.98	1.15	1.44	5.46	7.80	10.92	3.42	3.80	5.13	0.99	1.10	1.42
2026e	0.95	1.12	1.40	5.53	7.90	10.27	3.42	3.80	5.32	1.05	1.17	1.46
2027e	0.95	1.12	1.40	5.46	7.80	9.36	3.33	3.70	4.81	1.03	1.21	1.45
LT Nominal	1.02	1.13	1.30	5.52	7.89	9.46	2.94	3.46	4.49	0.96	1.21	1.33

Source: Morgan Stanley Commodities Research estimates (e)

Exhibit 162: Bulks Metal Forecasts

Period	Fe Fines (CFR China) (US\$/t)			Fe Lumps (CFR China) (US\$/t)			Alumina spot (US\$/t)		
	Bear	Base	Bull	Bear	Base	Bull	Bear	Base	Bull
2022e	80	100	170	92	115	195	309	344	395
2023e	65	81	130	76	95	153	259	288	351
2024e	53	66	133	64	80	161	258	304	380
2025e	54	68	149	65	82	180	272	320	400
2026e	56	70	140	67	84	168	289	340	425
2027e	58	73	131	69	87	156	315	370	463
LT Nominal	53	75	130	66	94	161	316	372	447

Source: Morgan Stanley Commodities Research estimates (e)

Exhibit 163: Bulks Forecasts: Coal

Period	Hard Coking Coal (US\$/t)			Thermal Coal - Newcastle			PCI Coal (US\$/t)			Semi Soft Coal (US\$/t)		
	Bear	Base	Bull	Bear	Base	Bull	Bear	Base	Bull	Bear	Base	Bull
2022e	147	245	417	91	130	195	115	192	327	108	181	307
2023e	125	156	313	71	95	162	97	121	243	89	112	223
2024e	115	144	259	56	75	128	87	109	196	80	100	181
2025e	119	149	238	60	80	120	90	113	203	83	104	187
2026e	123	154	215	64	85	119	93	117	210	86	107	193
2027e	130	163	211	68	90	117	98	123	221	91	113	204
LT Nominal	134	167	217	70	93	121	102	127	165	94	117	152

Source: Morgan Stanley Commodities Research estimates (e)

Exhibit 164: Precious Metals and PGM Forecasts

Period	Gold (US\$/oz)			Platinum (US\$/oz)			Palladium (US\$/oz)			Silver (US\$/oz)		
	Bear	Base	Bull	Bear	Base	Bull	Bear	Base	Bull	Bear	Base	Bull
2022e	1,471	1,730	2,076	840	1,050	1,260	1,470	2,100	2,520	18	23	27
2023e	1,406	1,563	1,875	924	1,155	1,386	1,295	1,850	2,405	19	22	31
2024e	1,328	1,475	1,844	1,232	1,369	1,779	1,024	1,463	1,755	18	21	30
2025e	1,302	1,400	1,820	1,283	1,425	1,853	951	1,359	1,631	20	22	33
2026e	1,330	1,400	1,960	1,273	1,415	1,839	961	1,373	1,648	20	23	33
2027e	1,330	1,400	1,960	1,259	1,399	1,818	1,110	1,387	1,665	20	23	33
LT Nominal	1,223	1,358	1,902	1,263	1,403	1,824	1,122	1,403	1,684	20	23	30

Source: Morgan Stanley Commodities Research estimates (e)

Global Metals & Mining Team

Exhibit 165: Global team and contact details

GLOBAL METALS & MINING TEAM

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(as of December 31, 2021)

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STOCK RATING CATEGORY	COVERAGE UNIVERSE		INVESTMENT BANKING CLIENTS (IBC)			OTHER MATERIAL INVESTMENT SERVICES CLIENTS (MISC)	
	COUNT	% OF TOTAL	COUNT	% OF TOTAL IBC	% OF RATING CATEGORY	COUNT	% OF TOTAL OTHER MSC
Overweight/Buy	1505	42%	403	45%	27%	671	42%
Equal-weight/Hold	1547	43%	402	45%	26%	695	44%
Not-Rated/Hold	0	0%	0	0%	0%	0	0%
Underweight/Sell	544	15%	90	10%	17%	220	14%
TOTAL	3,596		895			1586	

Data include common stock and ADRs currently assigned ratings. Investment Banking Clients are companies from whom Morgan Stanley received investment banking compensation in the last 12 months. Due to rounding off of decimals, the percentages provided in the "% of total" column may not add up to exactly 100 percent.

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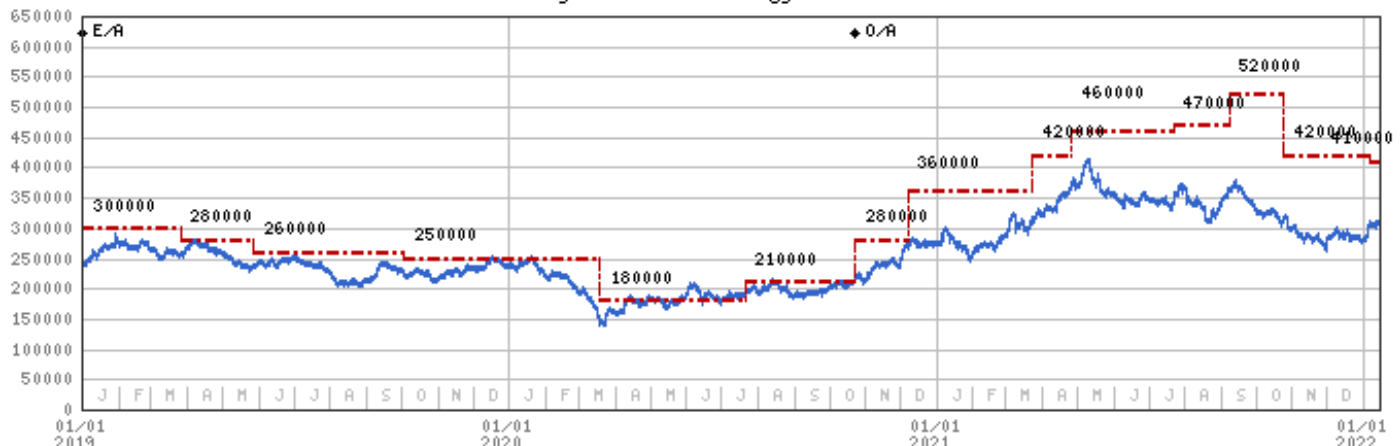
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POSCO (005490.KS) - As of 1/13/22 in KRW
Industry : S. Korea Energy & Materials

Stock Rating History: 1/1/17 : O/A; 9/13/18 : NA/A; 11/7/18 : E/A; 10/23/20 : O/A

Price Target History: 12/1/16 : 290000; 8/23/17 : 400000; 1/25/18 : 450000; 9/13/18 : NA; 11/7/18 : 300000; 3/26/19 : 280000; 5/28/19 : 260000; 10/3/19 : 250000; 3/18/20 : 180000; 7/21/20 : 210000; 10/23/20 : 280000; 12/7/20 : 360000; 3/24/21 : 420000; 4/26/21 : 460000; 7/22/21 : 470000; 9/8/21 : 520000; 10/25/21 : 420000; 1/7/22 : 410000

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INDUSTRY COVERAGE: EEMEA - Metals & Mining

COMPANY (TICKER)	RATING (AS OF)	PRICE* (01/13/2022)
Alain Gabriel, CFA		
Anglo American (AGLJ.J)	E (09/17/2021)	ZAc 70,588
BHP GROUP PLC (BHPJ.J)	++	ZAc 50,724
Brian Morgan		
African Rainbow Minerals (ARIJ.J)	O (01/13/2020)	ZAc 24,599
Exaro Resources Limited (EXXJ.J)	U (12/08/2021)	ZAc 17,186
Kumba Iron Ore (KIOJ.J)	U (02/16/2015)	ZAc 51,984
Thungela Resources Ltd (TGAJ.J)	O (09/28/2021)	ZAc 8,950
Christopher Nicholson		
Anglo Platinum Limited (AMSJ.J)	U (11/17/2021)	ZAc 186,269
Implats Limited (IMPJ.J)	O (11/17/2021)	ZAc 23,329
Northam Platinum Limited (NPHJ.J)	O (07/07/2016)	ZAc 22,055
Royal Bafokeng Platinum Ltd (RBPJ.J)	E (11/17/2021)	ZAc 16,600
Sibanye-Stillwater (SSWJ.J)	E (11/06/2019)	ZAc 5,707
Dan Shaw		
AK Alrosa PAO (ALRS.MM)	U (06/22/2021)	RUB 118.20
Endeavour Mining (EDV.L)	E (09/10/2021)	1,600p
Erdemir (EREGL.IS)	O (12/02/2019)	TL 31.62
EVRAZ plc (EVRE.L)	O (09/17/2021)	604p
MMC NORILSK NICKEL PJSC (NKELYq.L)	E (12/08/2021)	US\$29.94
Novolipetsk Steel PAO (NLMKq.L)	E (05/28/2021)	US\$28.90
Polymetal International PLC (POLYP.L)	O (12/08/2021)	1,198p
Severstal' PAO (SVSTq.L)	E (03/24/2020)	US\$20.22
Jared Hoover		
AngloGold Ashanti Ltd (ANGJ.J)	E (03/23/2021)	ZAc 31,678
Gold Fields Limited (GFIJ.J)	E (10/25/2019)	ZAc 16,735
Harmony Gold Mining Company Ltd (HARJ.J)	U (06/22/2021)	ZAc 5,995

Stock Ratings are subject to change. Please see latest research for each company.

* Historical prices are not split adjusted.

INDUSTRY COVERAGE: Carbon Steel

COMPANY (TICKER)	RATING (AS OF)	PRICE* (01/13/2022)
Alain Gabriel, CFA		
ArcelorMittal SA (MT.AS)	O (03/10/2016)	€32.94
Salzgitter AG (SZGG.DE)	U (12/08/2021)	€36.88
SSAB AB (SSABa.ST)	O (03/23/2021)	SKr 61.32
thyssenkrupp AG (TKAG.DE)	E (05/23/2021)	€10.76
voestalpine AG (VOES.V)	U (01/09/2020)	€34.84

Stock Ratings are subject to change. Please see latest research for each company.

* Historical prices are not split adjusted.

INDUSTRY COVERAGE: Gold and Precious Metals

COMPANY (TICKER)	RATING (AS OF)	PRICE* (01/13/2022)
Dan Shaw		
Centamin PLC (CEY.L)	E (03/07/2019)	91p
Polyus Gold (PLZLq.L)	E (12/08/2021)	US\$79.90

Stock Ratings are subject to change. Please see latest research for each company.

* Historical prices are not split adjusted.

INDUSTRY COVERAGE: Stainless Steel

COMPANY (TICKER)	RATING (AS OF)	PRICE* (01/13/2022)
Ioannis Masvoulas, CFA		
Acerinox SA (ACX.MC)	O (02/01/2021)	€12.80
Aperam SA (APAM.LAS)	E (02/01/2021)	€55.50
Outokumpu Oyj (OUT1V.HE)	O (03/23/2021)	€6.48

Stock Ratings are subject to change. Please see latest research for each company.

* Historical prices are not split adjusted.