

## Mining, Steel, Pulp &amp; Paper - LatAm

4Q23 preview: and this quarter goes to...  
iron ore miners and pulp companies

Price Objective Change

## Iron ore miners and pulp companies to shine this quarter

We expect LatAm steelmakers to struggle this quarter for the most part with lower steel prices and seasonally weaker volumes keeping margins pressured. Meanwhile, iron ore miners should benefit from seasonally stronger volumes and higher price realizations given the rise in the benchmark and positive provisional pricing effects. Pulp companies should also shine given higher pulp prices, stronger shipments and lower cash costs. We expect shares of Vale, Suzano and CSN to outperform peers during 4Q earnings season (all Buy rated). We summarize our new POs on Exhibit 1 and new estimates on Exhibit 9-Exhibit 11.

## Increasing our pulp price forecasts for 2024

We raise our pulp price forecasts for 2024. Our new China hardwood net price forecast is \$627/t for 2024 up from our prior \$580/t. Meanwhile, our new China softwood net price forecast is \$730/t, up from our prior \$706/t. We see prices declining moderately to \$575-600/t through 3Q on the combination of China's weakness (destocking's conclusion coupled with still-weak paper and board demand), seasonality and new capacity. However, we expect the drop in prices to be quick given prices remain close to cost support and therefore we anticipate swift capacity adjustments if prices do drop ([please refer to our report](#)). We plug new forecasts into our models (details on Exhibit 12) and keep our preference within pulp & paper for Suzano.

## Mining: favored by stronger supply seasonality and prices

Iron ore miner earnings should be boosted by higher benchmark prices, positive provisional pricing effects and seasonally stronger shipments. Vale should benefit from this leading to a 38% and 34% q/q respective increase in EBITDA. We see Vale's C1 cash cost also dropping on the back of higher fixed cost dilution. SCCO should report flattish earnings sequentially.

## Steel: tough to operate in these markets

We expect to see an overall weak set of earnings from steelmakers due to a combination of seasonally weak demand, lower prices, strong competition with imports and worse sales mix (exports share growing). This should drive Gerdau and Ternium earnings down sequentially while CSN should benefit from stronger iron ore prices which should compensate for a lackluster steel division performance.

## Pulp &amp; Paper: prices, volumes and costs all supportive

We see pulp & paper companies benefitting from seasonally stronger shipments, lower costs and higher pulp prices this quarter. This should drive a 11% EBITDA rebound for Suzano.

24 January 2024

Equity  
Latin America  
Mining, Steel, Pulp & Paper

**Caio Ribeiro**  
Research Analyst  
BofAS  
+1 646 855 4051  
[caio.ribeiro@bofa.com](mailto:caio.ribeiro@bofa.com)

**Leonardo Neratika >>**  
Research Analyst  
Merrill Lynch (Brazil)  
+55 11 2188 4200  
[leonardo.neratika@bofa.com](mailto:leonardo.neratika@bofa.com)

**Guilherme Rosito >>**  
Research Analyst  
Merrill Lynch (Brazil)  
+55 11 2188 4363  
[guilherme.rosito@bofa.com](mailto:guilherme.rosito@bofa.com)

**George L. Staphos**  
Research Analyst  
BofAS  
+1 646 855 4495  
[george.l.staphos@bofa.com](mailto:george.l.staphos@bofa.com)

## Exhibit 1: Summary of PO change

We are updating our POs ahead of 4Q23 results

	Rating	PO	Old PO
<b>CSN</b>	Buy	R\$ 22.0	R\$ 21.0
<b>CSN (ADR)</b>	Buy	\$4.6	\$4.4
<b>GGBR</b>	Neutral	R\$ 23	R\$ 24
<b>GGBR (ADR)</b>	Neutral	\$4.9	\$5.0
<b>SCCO</b>	U/P	\$47	\$47
<b>SUZB</b>	Buy	R\$ 67	R\$ 65
<b>SUZB (ADR)</b>	Buy	\$14	\$14
<b>Ternium</b>	Buy	\$50	\$49
<b>Vale (ADR)</b>	Buy	\$20	\$20
<b>Vale</b>	Buy	R\$ 95	R\$ 95

Source: BofA Global Research estimates  
BofA GLOBAL RESEARCH

U/P: Underperform

>> Employed by a non-US affiliate of BofAS and is not registered/qualified as a research analyst under the FINRA rules.

Refer to "Other Important Disclosures" for information on certain BofA Securities entities that take responsibility for the information herein in particular jurisdictions.

**BofA Securities does and seeks to do business with issuers covered in its research reports. As a result, investors should be aware that the firm may have a conflict of interest that could affect the objectivity of this report. Investors should consider this report as only a single factor in making their investment decision.**

**Refer to important disclosures on page 9 to 12. Analyst Certification on page 8. Price Objective Basis/Risk on page 6.**

12650375

Timestamp: 24 January 2024 11:46PM EST

## Steels: it's better to be a miner this quarter

We estimate Gerdau EBITDA at R\$2.2bn, down 35% q/q, with EBITDA down q/q in all divisions. North American results should be impacted by higher costs q/q, volumes should drop on weaker seasonality while prices should remain flat q/q. We expect North American EBITDA at R\$1.1bn, down ~27% q/q, at a 18.9% margin. In the Brazilian division we expect EBITDA to drop 43% q/q to R\$500mn (8.4% margin), driven by the combination of worse shipment mix (domestic sales declining while exports up) and lower prices on a q/q basis, more than offsetting lower cash costs.

For CSN we expect EBITDA to increase 18% q/q to R\$3.3bn, driven by stronger mining results. CSN's steel EBITDA should increase ~55% to R\$282mn (5.3% margin), given higher volumes and lower cash cost q/q more than offsetting lower prices on q/q basis. As for Usiminas, we expect EBITDA to increase to R\$43mn from negative levels as the stronger mining results should more than offset weak steel results.

As for Ternium, we see 4Q23 EBITDA at \$579mn, down 17% q/q, mostly on lower prices, given the drop in benchmark prices during 3Q23, which is not passing through fully in Ternium's results given the lag in contracts, more than offsetting higher volumes q/q.

## Mining: iron ore results strong across the board

Vale should ship 92Mt of iron ore in total (+14% q/q; -0.2% y/y). Vale's nickel shipments should come in at 45Kt (+15% q/q; -22% y/y) and copper at 98kt (+33% q/q; +36% y/y). The stronger volumes coupled with higher iron ore prices in the quarter should drive Vale's revenue up q/q.

We see C1 cash costs/t lower for Vale, given the higher fixed cost dilution due to higher volumes, with Vale delivering \$21.5/t (-16% q/q; -1% y/y). We expect Vale to report a 38% q/q EBITDA increase to \$6.5bn, driven by ferrous segment on the back of higher iron ore volumes and higher base metals results as well.

For copper names, we expect EBITDA down 1% q/q at \$1.3bn for Southern Copper (SCCO) given lower copper prices q/q.

## Pulp & Paper: higher prices to boost results q/q

Pulp prices rallied through 4Q and rose roughly ~US\$88/t, boosting pulp results across the board. We expect Suzano to report a R\$4.4bn EBITDA, up 11% q/q given the combination of higher realized prices, lower cash costs/t and higher volumes, as Suzano did not carry out any maintenance stoppages in the quarter on top of the market related downtime they announced in 2Q (which we estimate should impact 4Q volumes by ~170Kt).

## Commodity and FX behavior in the quarter

Iron ore prices rose sequentially in 4Q23 and averaged \$129/t in the quarter, up from \$114/t in 3Q and \$99/t in 4Q22 and closed 2023 at \$140/t, which should also offer some extra support to iron ore miners pricing realization given the provisional pricing mechanism. Meantime, Brazilian steel demand remained lackluster during 4Q, and steelmakers gave discounts particularly for flat steel, leading domestic HRC (hot-rolled coil) prices 7% down q/q to R\$4,000/t (-14% y/y), while domestic rebar prices averaged R\$3,736/t, down a more modest 1% q/q but 13% below 4Q22. On the other hand, HRC prices in North America rose q/q, with US HRC up 16% q/q and Mexican HRC up 7% q/q. Aluminum prices also rose a shy 2% q/q.

As for pulp, prices in China continued to recover during 4Q23 and averaged \$620/t for hardwood (HW), up 16% or US\$88/t q/q. Meantime, softwood (SW) averaged US\$754/t, up 13% or \$89/t q/q. Prices also rose q/q in Europe, with HW averaging \$908/t (+9% q/q) and SW averaging \$1,191/t (+1% q/q). Separately, the BRL appreciated against the USD, averaging R\$4.95 in the quarter.

**Exhibit 2: Commodity prices and FX variations**

Prices were mixed during the quarter

Metal Prices					
	4Q23A	3Q23A	q/q	4Q22A	y/y
Iron ore (US\$/t)	129	114	13%	99	30%
Copper (US\$/t)	8,166	8,367	-2%	8,020	2%
Nickel (US\$/t)	17,288	20,392	-15%	25,460	-32%
Zinc (US\$/t)	2,498	2,435	3%	3,009	-17%
Aluminum (US\$/t)	2,194	2,160	2%	2,335	-6%
Brazil HRC (R\$/t)	4,000	4,313	-7%	4,634	-14%
Brazil Rebar (R\$/t)	3,736	3,774	-1%	4,316	-13%
US HRS (US\$/t)	1,009	870	16%	764	32%
Mexico HRC (US\$/t)	936	877	7%	777	20%
Pulp Prices					
	4Q23A	3Q23A	q/q	4Q22A	y/y
HW China (US\$/t)	620	532	16%	860	-28%
SW China (US\$/t)	754	665	13%	922	-18%
HW Europe (US\$/t)	908	835	9%	1,380	-34%
SW Europe (US\$/t)	1,191	1,175	1%	1,466	-19%
FX					
	4Q23A	3Q23A	q/q	4Q22A	y/y
BRL/USD	4.95	4.88	1%	5.26	-6%
CLP/USD	896	852	5%	915	-2%

Source: BofA Global Research, Platts, Fastmarkets FOEX, Bloomberg

BofA GLOBAL RESEARCH

## Summary of our 4Q23 estimates

### Steels

**Exhibit 3: CSN – Summary of key 4Q23 forecasts (R\$m)**

4QE EBITDA of R\$3,326mn, up 18% q/q

	4Q23E	3Q23A	q/q	4Q22A	y/y
Revenues	11,531	11,125	4%	11,129	4%
Adjusted EBITDA	3,326	2,815	18%	3,093	8%
Adjusted Margin (%)	29%	25%	4 pp	28%	1 pp
Adjusted Net Income	1,254	433	189%	395	217%
Steel Volume (kt)	1,065	1,018	5%	1,009	6%
Steel Net Revenue/ton	5,026	5,247	-4%	6,001	-16%
Iron Ore Volumes (kt)	10,943	11,642	-6%	9,729	12%

Source: BofA Global Research estimates, company reports

BofA GLOBAL RESEARCH

**Exhibit 4: Gerdau – Summary of key 4Q23 forecasts (R\$m)**

4QE EBITDA of R\$2,164mn, down 35% q/q

	4Q23E	3Q23A	q/q	4Q22A	y/y
Revenues	15,653	17,063	-8%	17,964	-13%
EBITDA	2,164	3,349	-35%	3,630	-40%
Margin (%)	14%	20%	-6 pp	20%	-6 pp
Net Income	1,042	1,768	-41%	1,596	-35%
Steel Volume (kt)	2,738	2,838	-4%	2,728	0%
Steel Net Revenue/ton	5,716	6,012	-5%	6,585	-13%

Source: BofA Global Research estimates, company reports

BofA GLOBAL RESEARCH

**Exhibit 5: Ternium – Summary of key 4Q23 forecasts (R\$mn)**

4QE EBITDA of US\$579mn, down 17% q/q

	4Q23E	3Q23A	q/q	4Q22A	y/y
<b>Revenues</b>	4,872	5,185	-6%	3,546	37%
<b>EBITDA</b>	579	698	-17%	303	91%
<b>Margin (%)</b>	12%	13%	-2 pp	9%	3 pp
<b>Net Income</b>	348	-739	-147%	40	773%
Steel Volume (kt)	3,137	3,101	1%	3,020	4%
Steel Net Revenue/ton	1,167	1,258	-7.2%	1,174	-1%

Source: BofA Global Research estimates, company reports

BofA GLOBAL RESEARCH

**Mining****Exhibit 6: Southern Copper – Summary of key 4Q23 forecasts (US\$mn)**

4QE EBITDA of US\$1,272mn, down 1% q/q

	4Q23E	3Q23A	q/q	4Q22A	y/y
<b>Revenues</b>	2,549	2,506	2%	2,817	-10%
<b>EBITDA</b>	1,272	1,291	-1%	1,648	-23%
<b>Margin (%)</b>	50%	52%	-2 pp	58%	-9 pp
<b>Net Income</b>	634	620	2%	900	-29%
Copper Volumes (kt)	245	225	9%	233	5%
Cash Cost/lb (excluding by-products)	2.15	2.24	-4%	2.04	6%

Source: BofA Global Research estimates, company reports

BofA GLOBAL RESEARCH

**Exhibit 7: Vale – Summary of key 4Q23 forecasts (US\$mn)**

4QE EBITDA of US\$6,458mn, up 38% q/q

	4Q23E	3Q23A	q/q	4Q22A	y/y
<b>Revenues</b>	13,270	10,623	25%	11,941	11%
<b>EBITDA</b>	6,458	4,681	38%	4,949	30%
<b>Margin (%)</b>	49%	44%	5 pp	41%	7 pp
<b>Net Income</b>	4,553	2,878	58%	3,762	21%
C1 Cash Cost/t	21.5	25.6	-16%	21.7	-1%
Iron Ore Sales Volumes (Mt)	91.8	80.6	14%	92.0	-0.2%
Nickel Sales Volumes (Mt)	45.1	39.2	15%	58.0	-22%
Copper Sales Volumes (Mt)	98.2	73.8	33%	72.0	36%

Source: BofA Global Research estimates, company reports

BofA GLOBAL RESEARCH

**Pulp & Paper****Exhibit 8: Suzano – Summary of key 4Q23 forecasts (R\$mn)**

4QE EBITDA of R\$4,371mn, up 11% q/q

	4Q23E	3Q23A	q/q	4Q22A	y/y
<b>Revenues</b>	9,867	8,948	10%	14,370	-31%
<b>EBITDA</b>	4,371	3,920	11%	8,175	-47%
<b>Margin (%)</b>	44%	44%	0 pp	57%	-13 pp
<b>Net Income</b>	4,026	-729	-652%	7,459	-46%
Pulp Sales Volumes (kt)	2,665	2,486	7%	2,759	-3%
Paper Sales Volumes (kt)	374	332	13%	338	11%
Pulp Production Cash Cost (R\$/t)	823	935	-12%	976	-16%

Source: BofA Global Research estimates, company reports

BofA GLOBAL RESEARCH

## BofA vs Consensus

### Exhibit 9: BofA vs. consensus – LatAm Steels

Our 4Q estimates are above consensus for all steel names, except Gerdau

4Q23E				2024E			2025E			
	BofA's	Cons.	%	BofA's	Cons.	%	BofA's	Cons.	%	
Revenues	CSN (R\$mnn)	11,531	11,541	-0.1%	43,483	44,261	-1.8%	37,937	43,312	-12.4%
	Gerdau (R\$mnn)	15,653	15,581	0.5%	64,414	67,332	-4.3%	67,432	68,080	-1.0%
	Ternium (US\$mnn)	4,872	4,903	-0.6%	20,213	19,226	5.1%	20,870	20,385	2.4%
EBITDA	CSN (R\$mnn)	3,326	3,159	5.3%	12,040	11,528	4.4%	9,141	10,937	-16.4%
	Gerdau (R\$mnn)	2,164	2,223	-2.7%	9,317	11,310	-17.6%	10,547	11,468	-8.0%
	Ternium (US\$mnn)	579	535	8.1%	3,606	2,950	22.3%	3,792	3,255	16.5%
Net Income	CSN (R\$mnn)	1,254	963	30.2%	2,944	2,129	38.3%	686	1,930	-64.5%
	Gerdau (R\$mnn)	1,042	1,300	-19.9%	4,408	5,380	-18.1%	5,045	5,349	-5.7%
	Ternium (US\$mnn)	348	211	64.7%	2,257	1,537	46.8%	2,387	1,651	44.6%

Source: BofA Global Research estimates, Bloomberg

BofA GLOBAL RESEARCH

### Exhibit 10: BofA vs. consensus – LatAm Mining

We are above consensus for all mining names in 4Q23

4Q23E					2024E			2025E		
		BofA's	Cons.	%	BofA's	Cons.	%	BofA's	Cons.	%
Revenues	SCCO (US\$mnn)	2,549	2,501	1.9%	10,325	10,645	-3.0%	12,207	11,787	3.6%
	Vale (US\$mnn)	13,270	12,809	3.6%	44,178	42,273	4.5%	39,221	42,041	-6.7%
EBITDA	SCCO (US\$mnn)	1,272	1,198	6.2%	5,571	5,402	3.1%	7,193	6,310	14.0%
	Vale (US\$mnn)	6,458	6,045	6.8%	19,978	19,052	4.9%	15,104	18,397	-17.9%
Net Income	SCCO (US\$mnn)	634	562	12.9%	2,792	2,848	-2.0%	3,747	3,401	10.2%
	Vale (US\$mnn)	4,553	3,806	19.6%	12,502	10,408	20.1%	8,295	9,685	-14.3%

Source: BofA Global Research estimates, Bloomberg

BofA GLOBAL RESEARCH

### Exhibit 11: BofA vs. consensus – LatAm Pulp & Paper

We are below consensus on the Chileans, but above consensus on Brazilian P&P companies

		4Q23E			2024E			2025E		
		BofA's	Cons.	%	BofA's	Cons.	%	BofA's	Cons.	%
Revenues	Suzano (R\$mnn)	9,867	9,935	-0.7%	41,288	41,263	0.1%	45,259	47,731	-5.2%
EBITDA	Suzano (R\$mnn)	4,371	4,705	-7.1%	19,824	19,635	1.0%	22,315	23,370	-4.5%
Net Income	Suzano (R\$mnn)	4,026	3,063	31.5%	9,540	4,829	97.6%	5,891	7,777	-24.3%

Source: BofA Global Research estimates, Bloomberg

BofA GLOBAL RESEARCH

## Old vs new estimates

### Exhibit 12: Pulp & Paper old vs new estimates

We update our estimates with our new pulp price forecasts

		2024E			2025E		
		New	Old	%	New	Old	%
Suzano (R\$mnn)	Revenues	41,288	39,487	4.6%	45,259	45,883	-1.4%
	EBITDA	19,824	18,186	9.0%	22,315	22,877	-2.5%
	Net income	9,540	8,173	16.7%	5,891	6,364	-7.4%

Source: BofA Global Research estimates

BofA GLOBAL RESEARCH

**Exhibit 13: Stocks mentioned**

Prices and ratings for stocks mentioned in this report

BofA Ticker	Bloomberg ticker	Company name	Price	Rating
SID	SID US	Cia Siderurgica SA	US\$ 3.58	C-1-8
SIDHF	CSNA3 BZ	Cia Siderurgica SA	BRL 17.82	C-1-8
GGBUF	GGBR4 BZ	Gerdau S. A.	BRL 21.72	C-2-8
GGB	GGB US	Gerdau S.A.	US\$ 4.41	C-2-8
SCCO	SCCO US	Southern Copper	US\$ 83.25	B-3-8
SUZ	SUZ US	Suzano	US\$ 10.44	B-1-7
XXRTF	SUZB3 BZ	Suzano	BRL 51.87	B-1-7
TX	TX US	Ternium	US\$ 39.1	C-1-7
VALEF	VALE3 BZ	Vale	BRL 69.9	B-1-8
VALE	VALE US	Vale SA	US\$ 14.17	B-1-8

Source: BofA Global Research

BofA GLOBAL RESEARCH

**Price objective basis & risk****CSN (SIDHF / SID)**

Our price objective of R\$22/share (US\$4.6/ADR) blends a DCF and 4.5x 2024E EV/EBITDA multiple, below peers given the higher iron ore prices. The multiple uses a discount to its historical average closer to 6x given elevated prices. For the DCF assume a 2.5% perpetuity growth and a 12.8% WACC based on a 15.7% cost of equity and a 5.0% cost of debt (with a 34% tax rate).

Upside risks to our PO are 1) stronger-than-expected pricing power in the domestic market, 2) stronger-than-expected volume recovery/growth for steel and iron ore, 3) higher-than-expected iron ore sales and prices, 4) further growth from its strong FCF, whether downstream or via M&A, and 5) further progress on deleveraging and/or a higher-than-expected dividend payment announcements.

Downside risks to our PO are: 1) weaker-than-expected Chinese steel and global iron ore prices, 2) an appreciating BRL, 3) lower-than-expected iron ore/steel demand or higher costs, 4) any execution issues with its assets, particularly its planned iron ore expansion, and 5) any political Brazil risk.

**Gerdau S. A. (GGBUF / GGB)**

Our BRL23/share (US\$4.9/ADR) price objective reflects a 50/50 blend of DCF and EV/EBITDA analysis. Our DCF factors in a 10.8% WACC. Our EV/EBITDA analysis uses a 5.5x 2024E multiple, below its historical average and global peers given peak earnings.

Upside risks to our price objective are: 1) stronger-than-expected demand in N. America and Brazil, 2) stronger-than-expected improvement in global macro outlook, and 3) higher-than-expected steel prices in the Brazilian market.

Downside risks to our price objective are: 1) higher costs, leading to weaker margins, 2) weaker-than-expected demand in the US long steel market, 3) weaker-than-expected demand environment in Brazil, and 4) lower-than-expected Chinese steel prices.

**Southern Copper (SCCO)**

Our price objective of US\$47/share blends our DCF model and a multiple valuation approach. Our DCF uses a 10.4% WACC and 2.5% terminal growth. For our multiple valuation, we use a 8x 2024E EV/EBITDA, below its 10-year average of c. 9x, which we view as appropriate given higher prices and peak earnings forecasts.

Upside risks to our price objective are: 1) Better macro outlook, 2) higher-than-expected

copper prices, 3) faster-than-expected development of projects, particularly Tia Maria, 4) better global copper demand sentiment, and 5) less political risk in Mexico/Peru.

Downside risks to our price objective are: 1) metal price risk as 80% of SCCO revenues come from copper, 2) operational risks including from strikes and other labor disputes, 3) higher costs, 4) any project delays/cost inflation, 5) political risk, and 6) weaker-than-expected copper pricing and demand.

### **Suzano (XXRTF / SUZ)**

Our R\$67 (\$14/ADR) PO is based on an average of (a) a discounted cash flow (DCF) model, which uses a 9.4% WACC, 2.5% growth rate in perpetuity, and our forecasts through 2028E, and (b) an EV/EBITDA multiple of 7.0x 2024E, fairly in line with its average multiple over the past couple years.

Risks: (1) Global cycle trends, particularly in N America, Europe, and Asia, (2) global cycle trends in key products' pricing, particularly (though not limited to) hardwood pulp pricing to China, (3) potential volatility in the Brazilian economy and the Brazilian Real [BRL], (4) various operational risks associated with Suzano's large fleet of pulp and paper mills, (5) various merger-related integration and other risks associated with the Fibria combination, (6) capital-allocation, cycle, balance sheet/leverage and operating risks associated with large investment projects, such as (but not limited to) new pulp mills, (7) paper/board and pulp sector volatility & demand/pricing trends, (8) demand, supply-chain and other risks created by the COVID-19 pandemic.

As with all our paper/forest/packaging companies, fundamental trends (volumes, pricing, inflation, macro trends) may wind up better or worse than expected.

### **Ternium (TX)**

Our price objective for Ternium of \$50/share is based on a 50/50 blend of DCF analysis (with a WACC of 15%) and a 4.0x 2024E EV/EBITDA multiple valuation approach, in-line with its historical average.

Upside risks to our price objective are: 1) a benign outcome from the USMCA agreement, 2) a smooth Argentine economic recovery, 3) multiple re-rating, 4) better steel prices than our forecast, 5) better demand conditions than we forecast, and 6) removal of Section 232 tariffs/quotas against LatAm.

Downside risks to our price objective are: 1) worsening economic conditions in Argentina, 2) a negative outcome from the USMCA agreement for Mexican exports, 3) sustained or heightened tariffs on steel, 4) any operational disruptions, and 5) worse prices than we forecast.

### **Vale (VALE / VALEF)**

Our US\$20 (R\$95/local share) PO is based on a 50/50 blended valuation approach. On multiples, we use a 4.0x 2024E EV/EBITDA (slightly below its normalized 4.5-5x given elevated prices), and our DCF using a WACC of 12% and terminal growth rate of 2.5%. We use a below normalized 4.0x EV/EBITDA 2024E, below its 5x historical average given our above-normal iron ore forecasts.

Downside risks to our price objective: 1) weaker than expected iron ore prices, 2) a global economic slowdown, negatively impacting metals prices, 3) appreciation of the Brazilian Real and the Canadian Dollar (80% of Vale's costs are denominated in those currencies), without an offsetting increase in metal prices, 4) slowdown in infrastructure spending or global steel production, mainly in China, 5) higher freight rates, reducing Vale's competitiveness in China, 6) higher government intervention, and 7) more fallout from its Brumadinho tailings dam tragedy.

Upside risks: 1) Stronger than expected iron ore prices, 2) stronger than expected global economic growth, 3) acceleration of infrastructure spending or global steel production, mainly in China, and 4) change in China's policy on steel production cuts.

## **Analyst Certification**

We, Caio Ribeiro, Guilherme Rosito and Leonardo Neratika, hereby certify that the views each of us has expressed in this research report accurately reflect each of our respective personal views about the subject securities and issuers. We also certify that no part of our respective compensation was, is, or will be, directly or indirectly, related to the specific recommendations or view expressed in this research report.

## **Special Disclosures**

BofA Securities is currently acting as exclusive Financial Advisor to Manara Minerals Investment Company LLC in connection with its proposed strategic partnership with Vale S.A. on Vale Base Metals Limited, which was announced on 27 Jul 2023.



## Latin America - Natural Resources Coverage Cluster

Investment rating	Company	BofA Ticker	Bloomberg symbol	Analyst
<b>BUY</b>				
	3R Petroleum	XPXXF	RRRP3 BZ	Leonardo Marcondes
	Alpek SAB de CV	ALPKF	ALPEKA MM	Leonardo Marcondes
	CSN	SIDHF	CSNA3 BZ	Caio Ribeiro
	CSN	SID	SID US	Caio Ribeiro
	Dexco SA	DURXF	DXCO3 BZ	Leonardo Neratika
	Empresas CMPC SA	XEMCF	CMPC CI	Leonardo Neratika
	Enauta Participacoes S.A.	QGEPF	ENAT3 BZ	Leonardo Marcondes
	Orbia	MXCHF	ORBIA* MM	Leonardo Marcondes
	Petro Rio	HRTPF	PRI03 BZ	Caio Ribeiro
	Petrobras	PBRQF	PETR3 BZ	Caio Ribeiro
	Petrobras	PBR	PBR US	Caio Ribeiro
	Petrobras PN	PBRA	PBR/A US	Caio Ribeiro
	Petrobras PN	PTRBF	PETR4 BZ	Caio Ribeiro
	PetroReconcavo	XPXYF	RECV3 BZ	Leonardo Marcondes
	Suzano	XXRTF	SUZB3 BZ	Caio Ribeiro
	Suzano S.A.	SUZ	SUZ US	Caio Ribeiro
	Ternium	TX	TX US	Caio Ribeiro
	Usiminas SA	USNZY	USNZY US	Caio Ribeiro
	Usiminas SA	USSPF	USIM5 BZ	Caio Ribeiro
	Vale	VALE	VALE US	Caio Ribeiro
	Vale	VALEF	VALE3 BZ	Caio Ribeiro
	Vibra Energia SA	XUBRF	VBBR3 BZ	Leonardo Marcondes
<b>NEUTRAL</b>				
	Bradespar	BRDQF	BRAP4 BZ	Caio Ribeiro
	Companhia Brasileira de Alumínio	XZUDF	CBAV3 BZ	Leonardo Neratika
	CSN Mineracao	XZRAF	CMIN3 BZ	Caio Ribeiro
	Ecopetrol S.A.	XESSF	ECOPETL CB	Caio Ribeiro
	Ecopetrol S.A.	EC	EC US	Caio Ribeiro
	Gerdau S. A.	GGBUF	GGBR4 BZ	Caio Ribeiro
	Gerdau S.A.	GGB	GGB US	Caio Ribeiro
	Metalurgica Gerdau	MZGPF	GOAU4 BZ	Caio Ribeiro
	Ultrapar	XLRUF	UGPA3 BZ	Leonardo Marcondes
	Ultrapar Pa-ADR	UGP	UGP US	Leonardo Marcondes
<b>UNDERPERFORM</b>				
	Empresas Copec SA	PZDCF	COPEC CI	Leonardo Neratika
	Grupo Mexico	GMBXF	GMEXICOB MM	Caio Ribeiro
	Klabín S.A	XLWDF	KLBN11 BZ	Caio Ribeiro
	Klabín S.A	KLBY	KLBY US	Caio Ribeiro
	Southern Copper	SCCO	SCCO US	Caio Ribeiro
	YPF SA	YPF	YPF US	Leonardo Marcondes
	YPF SA	YPFSF	YPFD AR	Leonardo Marcondes
<b>RSTR</b>				
	Braskem SA-A	BAKAF	BRKM5 BZ	Leonardo Marcondes
	Braskem SA-ADR	BAK	BAK US	Leonardo Marcondes

## Disclosures

## Important Disclosures

## Equity Investment Rating Distribution: Non-Ferrous Metals/Mining &amp; Minerals Group (as of 31 Dec 2023)

Coverage Universe	Count	Percent	Inv. Banking Relationships <sup>R1</sup>	Count	Percent
Buy	58	53.70%	Buy	26	44.83%
Hold	24	22.22%	Hold	10	41.67%
Sell	26	24.07%	Sell	13	50.00%

**Equity Investment Rating Distribution: Paper/Forest Products Group (as of 31 Dec 2023)**

Coverage Universe	Count	Percent	Inv. Banking Relationships <sup>R1</sup>	Count	Percent
Buy	9	45.00%	Buy	8	88.89%
Hold	2	10.00%	Hold	1	50.00%
Sell	9	45.00%	Sell	5	55.56%

**Equity Investment Rating Distribution: Steel Group (as of 31 Dec 2023)**

Coverage Universe	Count	Percent	Inv. Banking Relationships <sup>R1</sup>	Count	Percent
Buy	14	43.75%	Buy	9	64.29%
Hold	12	37.50%	Hold	7	58.33%
Sell	6	18.75%	Sell	3	50.00%

**Equity Investment Rating Distribution: Global Group (as of 31 Dec 2023)**

Coverage Universe	Count	Percent	Inv. Banking Relationships <sup>R1</sup>	Count	Percent
Buy	1895	53.62%	Buy	1083	57.15%
Hold	832	23.54%	Hold	454	54.57%
Sell	807	22.84%	Sell	383	47.46%

<sup>R1</sup> Issuers that were investment banking clients of BofA Securities or one of its affiliates within the past 12 months. For purposes of this Investment Rating Distribution, the coverage universe includes only stocks. A stock rated Neutral is included as a Hold, and a stock rated Underperform is included as a Sell.

**FUNDAMENTAL EQUITY OPINION KEY:** Opinions include a Volatility Risk Rating, an Investment Rating and an Income Rating. **VOLATILITY RISK RATINGS**, indicators of potential price fluctuation, are: A - Low, B - Medium and C - High. **INVESTMENT RATINGS** reflect the analyst's assessment of both a stock's absolute total return potential as well as its attractiveness for investment relative to other stocks within its Coverage Cluster (defined below). Our investment ratings are: 1 - Buy stocks are expected to have a total return of at least 10% and are the most attractive stocks in the coverage cluster; 2 - Neutral stocks are expected to remain flat or increase in value and are less attractive than Buy rated stocks and 3 - Underperform stocks are the least attractive stocks in a coverage cluster. An investment rating of 6 (No Rating) indicates that a stock is no longer trading on the basis of fundamentals. Analysts assign investment ratings considering, among other things, the 0-12 month total return expectation for a stock and the firm's guidelines for ratings dispersions (shown in the table below). The current price objective for a stock should be referenced to better understand the total return expectation at any given time. The price objective reflects the analyst's view of the potential price appreciation (depreciation).

Investment rating	Total return expectation (within 12-month period of date of initial rating)	Ratings dispersion guidelines for coverage cluster <sup>R2</sup>
Buy	≥ 10%	≤ 70%
Neutral	≥ 0%	≤ 30%
Underperform	N/A	≥ 20%

<sup>R2</sup> Ratings dispersions may vary from time to time where BofA Global Research believes it better reflects the investment prospects of stocks in a Coverage Cluster.

**INCOME RATINGS**, indicators of potential cash dividends, are: 7 - same/higher (dividend considered to be secure), 8 - same/lower (dividend not considered to be secure) and 9 - pays no cash dividend. **Coverage Cluster** is comprised of stocks covered by a single analyst or two or more analysts sharing a common industry, sector, region or other classification(s). A stock's coverage cluster is included in the most recent BofA Global Research report referencing the stock.

Price Charts for the securities referenced in this research report are available on the [Price Charts website](#), or call 1-800-MERRILL to have them mailed.

BofAS or one of its affiliates acts as a market maker for the equity securities recommended in the report: Cia Siderurgica SA, Gerdau S.A., Southern Copper, Suzano, Ternium, Vale SA. The issuer is or was, within the last 12 months, an investment banking client of BofAS and/or one or more of its affiliates: Cia Siderurgica SA, Gerdau, Southern Copper, Suzano, Ternium S.A-ADR, Vale SA.

BofAS or an affiliate has received compensation from the issuer for non-investment banking services or products within the past 12 months: Cia Siderurgica SA, Gerdau, Southern Copper, Suzano, Ternium S.A-ADR, Vale SA.

The issuer is or was, within the last 12 months, a non-securities business client of BofAS and/or one or more of its affiliates: Cia Siderurgica SA, Gerdau, Southern Copper, Suzano, Ternium S.A-ADR, Vale SA.

BofAS or an affiliate has received compensation for investment banking services from this issuer within the past 12 months: Gerdau, Suzano, Vale SA.

BofAS or an affiliate expects to receive or intends to seek compensation for investment banking services from this issuer or an affiliate of the issuer within the next three months: Cia Siderurgica SA, Gerdau, Southern Copper, Suzano, Ternium S.A-ADR, Vale SA.

BofAS together with its affiliates beneficially owns one percent or more of the common stock of this issuer. If this report was issued on or after the 9th day of the month, it reflects the ownership position on the last day of the previous month. Reports issued before the 9th day of a month reflect the ownership position at the end of the second month preceding the date of the report: Cia Siderurgica SA, Gerdau, Vale SA.

The country in which this issuer is organized has certain laws or regulations that limit or restrict ownership of the issuer's shares by nationals of other countries: Cia Siderurgica SA, Gerdau, Suzano, Vale SA.

BofAS or one of its affiliates is willing to sell to, or buy from, clients the common equity of the issuer on a principal basis: Cia Siderurgica SA, Gerdau S.A., Southern Copper, Suzano, Ternium, Vale SA.

The issuer is or was, within the last 12 months, a securities business client (non-investment banking) of BofAS and/or one or more of its affiliates: Cia Siderurgica SA, Gerdau, Southern Copper, Suzano, Ternium S.A-ADR, Vale SA.

BofA Global Research personnel (including the analyst(s) responsible for this report) receive compensation based upon, among other factors, the overall profitability of Bank of America Corporation, including profits derived from investment banking. The analyst(s) responsible for this report may also receive compensation based upon, among other factors, the overall profitability of the Bank's sales and trading businesses relating to the class of securities or financial instruments for which such analyst is responsible.

## Other Important Disclosures

From time to time research analysts conduct site visits of covered issuers. BofA Global Research policies prohibit research analysts from accepting payment or reimbursement for travel expenses from the issuer for such visits.

Prices are indicative and for information purposes only. Except as otherwise stated in the report, for any recommendation in relation to an equity security, the price referenced is the publicly traded price of the security as of close of business on the day prior to the date of the report or, if the report is published during intraday trading, the price referenced is indicative of the traded price as of the date and time of the report and in relation to a debt security (including equity preferred and CDS), prices are indicative as of the date and time of the report and are from various sources including BofA Securities trading desks.

The date and time of completion of the production of any recommendation in this report shall be the date and time of dissemination of this report as recorded in the report timestamp.

Recipients who are not institutional investors or market professionals should seek the advice of their independent financial advisor before considering information in this report in connection with any investment decision, or for a necessary explanation of its contents.

Officers of BofA or one or more of its affiliates (other than research analysts) may have a financial interest in securities of the issuer(s) or in related investments.

Refer to [BofA Global Research policies relating to conflicts of interest](#).

**"BofA Securities" includes BofA Securities, Inc. ("BofAS") and its affiliates. Investors should contact their BofA Securities representative or Merrill Global Wealth Management financial advisor if they have questions concerning this report or concerning the appropriateness of any investment idea described herein for such investor. "BofA Securities" is a global brand for BofA Global Research.**

#### Information relating to Non-US affiliates of BofA Securities and Distribution of Affiliate Research Reports:

BofAS and/or Merrill Lynch, Pierce, Fenner & Smith Incorporated ("MLPF&S") may in the future distribute, information of the following non-US affiliates in the US (short name: legal name, regulator): Merrill Lynch (South Africa): Merrill Lynch South Africa (Pty) Ltd., regulated by The Financial Service Board; MLI (UK): Merrill Lynch International, regulated by the Financial Conduct Authority (FCA) and the Prudential Regulation Authority (PRA); BofASE (France): BofA Securities Europe SA is authorized by the Autorité de Contrôle Prudentiel et de Résolution (ACPR) and regulated by the ACPR and the Autorité des Marchés Financiers (AMF). BofA Securities Europe SA ("BofASE") with registered address at 51, rue La Boétie, 75008 Paris is registered under no 842 602 690 RCS Paris. In accordance with the provisions of French Code Monétaire et Financier (Monetary and Financial Code), BofASE is an établissement de crédit et d'investissement (credit and investment institution) that is authorised and supervised by the European Central Bank and the Autorité de Contrôle Prudentiel et de Résolution (ACPR) and regulated by the ACPR and the Autorité des Marchés Financiers. BofASE's share capital can be found at [www.bofamli.com/BofASEdisclaimer](http://www.bofamli.com/BofASEdisclaimer); BofA Europe (Milan): Bank of America Europe Designated Activity Company, Milan Branch, regulated by the Bank of Italy, the European Central Bank (ECB) and the Central Bank of Ireland (CBI); BofA Europe (Frankfurt): Bank of America Europe Designated Activity Company, Frankfurt Branch regulated by BaFin, the ECB and the CBI; BofA Europe (Madrid): Bank of America Europe Designated Activity Company, Sucursal en España, regulated by the Bank of Spain, the ECB and the CBI; Merrill Lynch (Australia): Merrill Lynch Equities (Australia) Limited, regulated by the Australian Securities and Investments Commission; Merrill Lynch (Hong Kong): Merrill Lynch (Asia Pacific) Limited, regulated by the Hong Kong Securities and Futures Commission (HKSF); Merrill Lynch (Singapore): Merrill Lynch (Singapore) Pte Ltd, regulated by the Monetary Authority of Singapore (MAS); Merrill Lynch (Canada): Merrill Lynch Canada Inc, regulated by the Canadian Investment Regulatory Organization; Merrill Lynch (Mexico): Merrill Lynch Mexico, SA de CV, Casa de Bolsa, regulated by the Comisión Nacional Bancaria y de Valores; Merrill Lynch (Argentina): Merrill Lynch Argentina SA, regulated by Comisión Nacional de Valores; BofAS Japan: BofA Securities Japan Co., Ltd., regulated by the Financial Services Agency; Merrill Lynch (Seoul): Merrill Lynch International, LLC Seoul Branch, regulated by the Financial Supervisory Service; Merrill Lynch (Taiwan): Merrill Lynch Securities (Taiwan) Ltd., regulated by the Securities and Futures Bureau; BofAS India: BofA Securities India Limited, regulated by the Securities and Exchange Board of India (SEBI); Merrill Lynch (Israel): Merrill Lynch Israel Limited, regulated by Israel Securities Authority; Merrill Lynch (DIFC): Merrill Lynch International (DIFC Branch), regulated by the Dubai Financial Services Authority (DFSA); Merrill Lynch (Brazil): Merrill Lynch S.A. Corretora de Títulos e Valores Mobiliários, regulated by Comissão de Valores Mobiliários; Merrill Lynch KSA Company: Merrill Lynch Kingdom of Saudi Arabia Company, regulated by the Capital Market Authority.

This information has been approved for publication and is distributed in the United Kingdom (UK) to professional clients and eligible counterparties (as each is defined in the rules of the FCA and the PRA) by MLI (UK), which is authorized by the PRA and regulated by the FCA and the PRA - details about the extent of our regulation by the FCA and PRA are available from us on request; has been approved for publication and is distributed in the European Economic Area (EEA) by BofASE (France), which is authorized by the ACPR and regulated by the ACPR and the AMF; has been considered and distributed in Japan by BofAS Japan, a registered securities dealer under the Financial Instruments and Exchange Act in Japan, or its permitted affiliates; is issued and distributed in Hong Kong by Merrill Lynch (Hong Kong) which is regulated by HKSF; is issued and distributed in Taiwan by Merrill Lynch (Taiwan); is issued and distributed in India by BofAS India; and is issued and distributed in Singapore to institutional investors and/or accredited investors (each as defined under the Financial Advisers Regulations) by Merrill Lynch (Singapore) (Company Registration No 198602883D). Merrill Lynch (Singapore) is regulated by MAS. Merrill Lynch Equities (Australia) Limited (ABN 65 006 276 795), AFS License 235132 (MLEA) distributes this information in Australia only to 'Wholesale' clients as defined by s.761G of the Corporations Act 2001. With the exception of Bank of America N.A., Australia Branch, neither MLEA nor any of its affiliates involved in preparing this information is an Authorised Deposit-Taking Institution under the Banking Act 1959 nor regulated by the Australian Prudential Regulation Authority. No approval is required for publication or distribution of this information in Brazil and its local distribution is by Merrill Lynch (Brazil) in accordance with applicable regulations. Merrill Lynch (DIFC) is authorized and regulated by the DFSA. Information prepared and issued by Merrill Lynch (DIFC) is done so in accordance with the requirements of the DFSA conduct of business rules. BofA Europe (Frankfurt) distributes this information in Germany and is regulated by BaFin, the ECB and the CBI. BofA Securities entities, including BofA Europe and BofASE (France), may outsource/delegate the marketing and/or provision of certain research services or aspects of research services to other branches or members of the BofA Securities group. You may be contacted by a different BofA Securities entity acting for and on behalf of your service provider where permitted by applicable law. This does not change your service provider. Please refer to the [Electronic Communications Disclaimers](#) for further information.

This information has been prepared and issued by BofAS and/or one or more of its non-US affiliates. The author(s) of this information may not be licensed to carry on regulated activities in your jurisdiction and, if not licensed, do not hold themselves out as being able to do so. BofAS and/or MLPF&S is the distributor of this information in the US and accepts full responsibility for information distributed to BofAS and/or MLPF&S clients in the US by its non-US affiliates. Any US person receiving this information and wishing to effect any transaction in any security discussed herein should do so through BofAS and/or MLPF&S and not such foreign affiliates. Hong Kong recipients of this information should contact Merrill Lynch (Asia Pacific) Limited in respect of any matters relating to dealing in securities or provision of specific advice on securities or any other matters arising from, or in connection with, this information. Singapore recipients of this information should contact Merrill Lynch (Singapore) Pte Ltd in respect of any matters arising from, or in connection with, this information. For clients that are not accredited investors, expert investors or institutional investors Merrill Lynch (Singapore) Pte Ltd accepts full responsibility for the contents of this information distributed to such clients in Singapore.

#### General Investment Related Disclosures:

Taiwan Readers: Neither the information nor any opinion expressed herein constitutes an offer or a solicitation of an offer to transact in any securities or other financial instrument. No part of this report may be used or reproduced or quoted in any manner whatsoever in Taiwan by the press or any other person without the express written consent of BofA Securities.

This document provides general information only, and has been prepared for, and is intended for general distribution to, BofA Securities clients. Neither the information nor any opinion expressed constitutes an offer or an invitation to make an offer, to buy or sell any securities or other financial instrument or any derivative related to such securities or instruments (e.g., options, futures, warrants, and contracts for differences). This document is not intended to provide personal investment advice and it does not take into account the specific investment objectives, financial situation and the particular needs of, and is not directed to, any specific person(s). This document and its content do not constitute, and should not be considered to constitute, investment advice for purposes of ERISA, the US tax code, the Investment Advisers Act or otherwise. Investors should seek financial advice regarding the appropriateness of investing in financial instruments and implementing investment strategies discussed or recommended in this document and should understand that statements regarding future prospects may not be realized. Any decision to purchase or subscribe for securities in any offering must be based solely on existing public information on such security or the information in the prospectus or other offering document issued in connection with such offering, and not on this document.

Securities and other financial instruments referred to herein, or recommended, offered or sold by BofA Securities, are not insured by the Federal Deposit Insurance Corporation and are not deposits or other obligations of any insured depository institution (including, Bank of America, N.A.). Investments in general and, derivatives, in particular, involve numerous risks, including, among others, market risk, counterparty default risk and liquidity risk. No security, financial instrument or derivative is suitable for all investors. Digital assets are extremely speculative, volatile and are largely unregulated. In some cases, securities and other financial instruments may be difficult to value or sell and reliable information about the value or risks related to the security or financial instrument may be difficult to obtain. Investors should note that income from such securities and other financial instruments, if any, may fluctuate and that price or value of such securities and instruments may rise or fall and, in some cases, investors may lose their entire principal investment. Past performance is not necessarily a guide to future performance. Levels and basis for taxation may change.

This report may contain a short-term trading idea or recommendation, which highlights a specific near-term catalyst or event impacting the issuer or the market that is anticipated to have a short-term price impact on the equity securities of the issuer. Short-term trading ideas and recommendations are different from and do not affect a stock's fundamental equity rating, which reflects both a longer term total return expectation and attractiveness for investment relative to other stocks within its Coverage Cluster. Short-term trading ideas and recommendations may be more or less positive than a stock's fundamental equity rating.

BofA Securities is aware that the implementation of the ideas expressed in this report may depend upon an investor's ability to "short" securities or other financial instruments and that such action may be limited by regulations prohibiting or restricting "shortselling" in many jurisdictions. Investors are urged to seek advice regarding the applicability of such regulations prior to executing any short idea contained in this report.

Foreign currency rates of exchange may adversely affect the value, price or income of any security or financial instrument mentioned herein. Investors in such securities and instruments,

including ADRs, effectively assume currency risk.

BofAS or one of its affiliates is a regular issuer of traded financial instruments linked to securities that may have been recommended in this report. BofAS or one of its affiliates may, at any time, hold a trading position (long or short) in the securities and financial instruments discussed in this report.

BofA Securities, through business units other than BofA Global Research, may have issued and may in the future issue trading ideas or recommendations that are inconsistent with, and reach different conclusions from, the information presented herein. Such ideas or recommendations may reflect different time frames, assumptions, views and analytical methods of the persons who prepared them, and BofA Securities is under no obligation to ensure that such other trading ideas or recommendations are brought to the attention of any recipient of this information.

In the event that the recipient received this information pursuant to a contract between the recipient and BofAS for the provision of research services for a separate fee, and in connection therewith BofAS may be deemed to be acting as an investment adviser, such status relates, if at all, solely to the person with whom BofAS has contracted directly and does not extend beyond the delivery of this report (unless otherwise agreed specifically in writing by BofAS). If such recipient uses the services of BofAS in connection with the sale or purchase of a security referred to herein, BofAS may act as principal for its own account or as agent for another person. BofAS is and continues to act solely as a broker-dealer in connection with the execution of any transactions, including transactions in any securities referred to herein.

#### **BofA ESGMeter Methodology:**

ESGMeter is a proprietary metric based on quantitative analysis and fundamental analyst inputs that reflects our assessment of a company's Environmental, Social and Governance-related attributes. The ESGMeter is intended to indicate a company's likelihood of experiencing stronger financial stability (higher return on equity and lower earnings and price volatility) over the next three years relative to peer group. There are three ESGMeter levels - Low, Medium, and High - which indicate whether a company has attributes most likely to translate into superior financial stability (in the case of a High level) or weaker financial stability (in the case of a Low level) over the next three years relative to its peer group. A Medium level suggests that a company exhibits ESG characteristics that are likely associated with financial stability results in line with its peer group over the next three years. Full details of our methodology, financial stability definition and disclaimers are available at [BofA ESGMeter methodology](#). ESGMeter is not indicative of a company's future stock price performance and is not an investment recommendation or rating. ESGMeter is independent of the BofA Global Research fundamental equity analyst's investment rating, volatility risk rating, income rating or price objective for that company.

#### **Copyright and General Information:**

Copyright 2024 Bank of America Corporation. All rights reserved. iQdatabase® is a registered service mark of Bank of America Corporation. This information is prepared for the use of BofA Securities clients and may not be redistributed, retransmitted or disclosed, in whole or in part, or in any form or manner, without the express written consent of BofA Securities. BofA Global Research information is distributed simultaneously to internal and client websites and other portals by BofA Securities and is not publicly-available material. Any unauthorized use or disclosure is prohibited. Receipt and review of this information constitutes your agreement not to redistribute, retransmit, or disclose to others the contents, opinions, conclusion, or information contained herein (including any investment recommendations, estimates or price targets) without first obtaining express permission from an authorized officer of BofA Securities.

Materials prepared by BofA Global Research personnel are based on public information. Facts and views presented in this material have not been reviewed by, and may not reflect information known to, professionals in other business areas of BofA Securities, including investment banking personnel. BofA Securities has established information barriers between BofA Global Research and certain business groups. As a result, BofA Securities does not disclose certain client relationships with, or compensation received from, such issuers. To the extent this material discusses any legal proceeding or issues, it has not been prepared as nor is it intended to express any legal conclusion, opinion or advice. Investors should consult their own legal advisers as to issues of law relating to the subject matter of this material. BofA Global Research personnel's knowledge of legal proceedings in which any BofA Securities entity and/or its directors, officers and employees may be plaintiffs, defendants, co-defendants or co-plaintiffs with or involving issuers mentioned in this material is based on public information. Facts and views presented in this material that relate to any such proceedings have not been reviewed by, discussed with, and may not reflect information known to, professionals in other business areas of BofA Securities in connection with the legal proceedings or matters relevant to such proceedings.

This information has been prepared independently of any issuer of securities mentioned herein and not in connection with any proposed offering of securities or as agent of any issuer of any securities. None of BofAS or any of its affiliates or their research analysts has any authority whatsoever to make any representation or warranty on behalf of the issuer(s). BofA Global Research policy prohibits research personnel from disclosing a recommendation, investment rating, or investment thesis for review by an issuer prior to the publication of a research report containing such rating, recommendation or investment thesis.

Any information relating to the tax status of financial instruments discussed herein is not intended to provide tax advice or to be used by anyone to provide tax advice. Investors are urged to seek tax advice based on their particular circumstances from an independent tax professional.

The information herein (other than disclosure information relating to BofA Securities and its affiliates) was obtained from various sources and we do not guarantee its accuracy. This information may contain links to third-party websites. BofA Securities is not responsible for the content of any third-party website or any linked content contained in a third-party website. Content contained on such third-party websites is not part of this information and is not incorporated by reference. The inclusion of a link does not imply any endorsement by or any affiliation with BofA Securities. Access to any third-party website is at your own risk, and you should always review the terms and privacy policies at third-party websites before submitting any personal information to them. BofA Securities is not responsible for such terms and privacy policies and expressly disclaims any liability for them.

All opinions, projections and estimates constitute the judgment of the author as of the date of publication and are subject to change without notice. Prices also are subject to change without notice. BofA Securities is under no obligation to update this information and BofA Securities ability to publish information on the subject issuer(s) in the future is subject to applicable quiet periods. You should therefore assume that BofA Securities will not update any fact, circumstance or opinion contained herein.

Subject to the quiet period applicable under laws of the various jurisdictions in which we distribute research reports and other legal and BofA Securities policy-related restrictions on the publication of research reports, fundamental equity reports are produced on a regular basis as necessary to keep the investment recommendation current.

Certain outstanding reports or investment opinions relating to securities, financial instruments and/or issuers may no longer be current. Always refer to the most recent research report relating to an issuer prior to making an investment decision.

In some cases, an issuer may be classified as Restricted or may be Under Review or Extended Review. In each case, investors should consider any investment opinion relating to such issuer (or its security and/or financial instruments) to be suspended or withdrawn and should not rely on the analyses and investment opinion(s) pertaining to such issuer (or its securities and/or financial instruments) nor should the analyses or opinion(s) be considered a solicitation of any kind. Sales persons and financial advisors affiliated with BofAS or any of its affiliates may not solicit purchases of securities or financial instruments that are Restricted or Under Review and may only solicit securities under Extended Review in accordance with firm policies.

Neither BofA Securities nor any officer or employee of BofA Securities accepts any liability whatsoever for any direct, indirect or consequential damages or losses arising from any use of this information.