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## Steel Market developments: Q4 2023

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## Executive summary

Global steel markets appear to be entering a period of increased turbulence. Global excess capacity is on the rise, steel demand is showing signs of sluggishness, with risks of a significant downturn in Chinese steel demand owing to a growing real estate crisis, and steel production is down sharply in many countries, particularly in Europe. Chinese government interventions in the steel industry are helping strengthen national champions, which, through relocation and joint ventures, are helping to secure raw materials sources abroad for the Chinese steel industry as well as for other sectors of the Chinese economy.

Global crude steelmaking capacity is increasing rapidly, reaching a record-high level of 2 498 million metric tons (mmt) by the end of 2023. Markets are becoming bifurcated, with ASEAN, the Middle East and Africa expanding their crude steel producing capacity at a rapid pace, whereas capacity growth in Europe, the Americas and Oceania is much more modest. Recent developments are also impacting these markets differently, with production dropping sharply in Europe and in the Americas, but increasing in Asia, Africa and the Middle East. Global steel production decreased during the first semester of 2023, which, coupled with sluggish steel demand, will widen the gap between capacity and production and exacerbate global steel excess capacity. Steel prices in Europe, Japan and the Americas remain stubbornly higher than in the People’s Republic of China (hereafter “China”), and Chinese exports of steel as well as indirect exports from steel-intensive downstream products have surged.

Chinese steel production has increased, in spite of a domestic relocation trend that should reduce domestic capacity. This may reflect several factors. The domestic relocation of Chinese steel plants, although subject to a significant capacity reduction requirement<sup>1</sup>, is often accompanied by strong financial and non-financial incentives and subsidies from many levels of governments. Such incentives can act in similar ways as a cost reduction, thereby artificially boosting the price competitiveness of exports. Mergers and acquisitions are also geared towards concentrating the industry and creating competitive, strong “national champions”. In stark contrast to domestic relocations, Chinese’s steel firms’ capacity expansions abroad are not subject to total net capacity reduction requirements. In ASEAN, 89% of the projected increase in the region’s capacity is related to investments by Chinese companies. The impact of foreign investments from Chinese steel firms may go far beyond the steel sector as such, as exemplified in Latin America, where steel firms are securing not only raw material resources essential for steel production, such as iron ore, but also other raw materials which are crucial to other industries. The latter includes lithium, which is needed for the construction of electric batteries.

This report provides an overview of recent steel market developments during the first semester of 2023, with reflections on the outlook for steel markets going forward, and a topical section on steel plants' relocation within China and China’s Going Out policy in Latin America. Key observations of this report include:

- **World GDP growth is projected to be 3.1% in 2022 and 2.2% in 2023.** Higher borrowing costs are endangering the real estate sector.
- **World crude steel production decreased by 1.1% during the first half of 2023 year-on-year with very contrasting developments across regions,** with the European Union (-10.9%) and Other Europe (-14.1%) continuing to fall the most.
- **The ongoing excess capacity crisis risks escalating significantly.** Steelmaking capacity is forecast to reach 2 498.6 mmt in 2023, adding 57.1 mmt in 2023 which is

the highest growth rate in a decade. The global steel capacity/production gap has widened, reaching 610.8 mmt in 2023 amid weakening demand and production challenges.

- **In the largest steel producing economy, China, subsidies are being provided to steel firms to achieve the Chinese government’s targets of domestic relocation of steel plants.** Subsidies provided are in the form of land-use, cash grants and cash awards, tax breaks, reduced tax rates, and below market financing. Relocation of steel plants serves three purposes: it is a regional development strategy, a way to concentrate steel firms and thus strengthen “national champions”, and a way to achieve the government’s environmental objectives.
- **China’s “Going Out” policy in Latin America, on top of obvious commercial goals, includes a strong focus on achieving broader strategic goals such as securing raw materials sources for both the Chinese steel industry and other critical industries, and strengthening China’s economic links with Latin American countries.** Subsidies are mostly in the form of guarantees offered to joint ventures to lower a project’s financing costs, or subsidised lending on behalf of China’s state-owned banks such as the Industrial and Commercial Bank of China and the Bank of China. In exchange, China secures raw materials and new cutting-edge technologies, some proprietary to Latin America steel firms.
- **In the first quarter of 2023, global steel export volumes experienced a year-on-year decline of 2.5%.** This contraction can be attributed to the slowdown in the export performance of key steel-producing economies, despite a notable upswing in exports (+18%) from China.
- **Steel prices have moved sideways, though with fluctuations during the first semester of 2023.** Prices vary significantly across regions, with the United States, Europe and Japan maintaining historically high prices, contrary to China. As raw material prices receded, price margins have increased, which should temporarily alleviate some steel firms’ profit margins which are currently being squeezed.
- **Indeed, steel firms’ average profit margins were cut by half in 2022 compared to one year earlier,** falling below their previous 2019 lows. Steel firms’ debt has started to grow again and steel firms are borrowing more short term than before, hence reversing previous deleveraging trends.
- **Steel consumption was forecast in April of this year to increase by 2.3% to reach 1 822.3 mmt in 2023, with growth slowing to 1.7% to 1 854.0 mmt in 2024, driven by manufacturing.** The set of measures taken by the Chinese government related to the real estate sector are more geared towards avoiding a local government debt crisis and softening the real estate sector landing than towards creating new demand for steel.

## 1. The OECD economic outlook

*Although headline inflation is declining following lower energy prices, its core components remain at elevated levels, while the tightening of monetary policy worldwide has started to expose vulnerabilities of financing schemes and business models put in place during the period of extremely low interest rates. The estimates provided in the rest of this section are taken from the OECD's June 2023 Economic Outlook.<sup>1</sup> Further information and estimates of the effects of the Russian Federation (hereafter "Russia")'s war of aggression against Ukraine can be accessed through the OECD webpage<sup>2</sup>.*

### 1.1. Global prospects

Global GDP growth is projected to moderate from 3.3% in 2022 to 2.7% in 2023, before edging up to a still subdued 2.9% in 2024, according to the OECD's June 2023 Economic Outlook. Restrictive monetary policy should constrain demand growth, with the full effects from policy tightening in 2022 only appearing later in 2023 and early 2024. A more persistent inflation rate than anticipated would be a major risk to the outlook, as it would depress household demand but also force central banks to tighten monetary policy further, negatively impacting asset valuations and increasing bank loan delinquencies, and thus has the potential to endanger financial stability. Some signs of stress have emerged in some financial market segments. Another key downside risk to the outlook relates to the uncertain course of Russia's war of aggression against Ukraine and the associated risks of renewed disruptions in global energy and food markets. On the upside, reduced uncertainty from an early end to the war, easier-than-expected financial conditions, more robust labour force growth, and greater use of accumulated savings by households and businesses would all improve growth and investment prospects.

Table 1 below presents the GDP growth forecasts according to the OECD's June 2023 Economic Outlook<sup>3</sup>.

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<sup>1</sup> The OECD's Economic Outlook is updated regularly and the newest projections for each country can be found at: <http://www.oecd.org/eco/outlook/economic-outlook>.

Table 1. The OECD economic projections (June 2023)

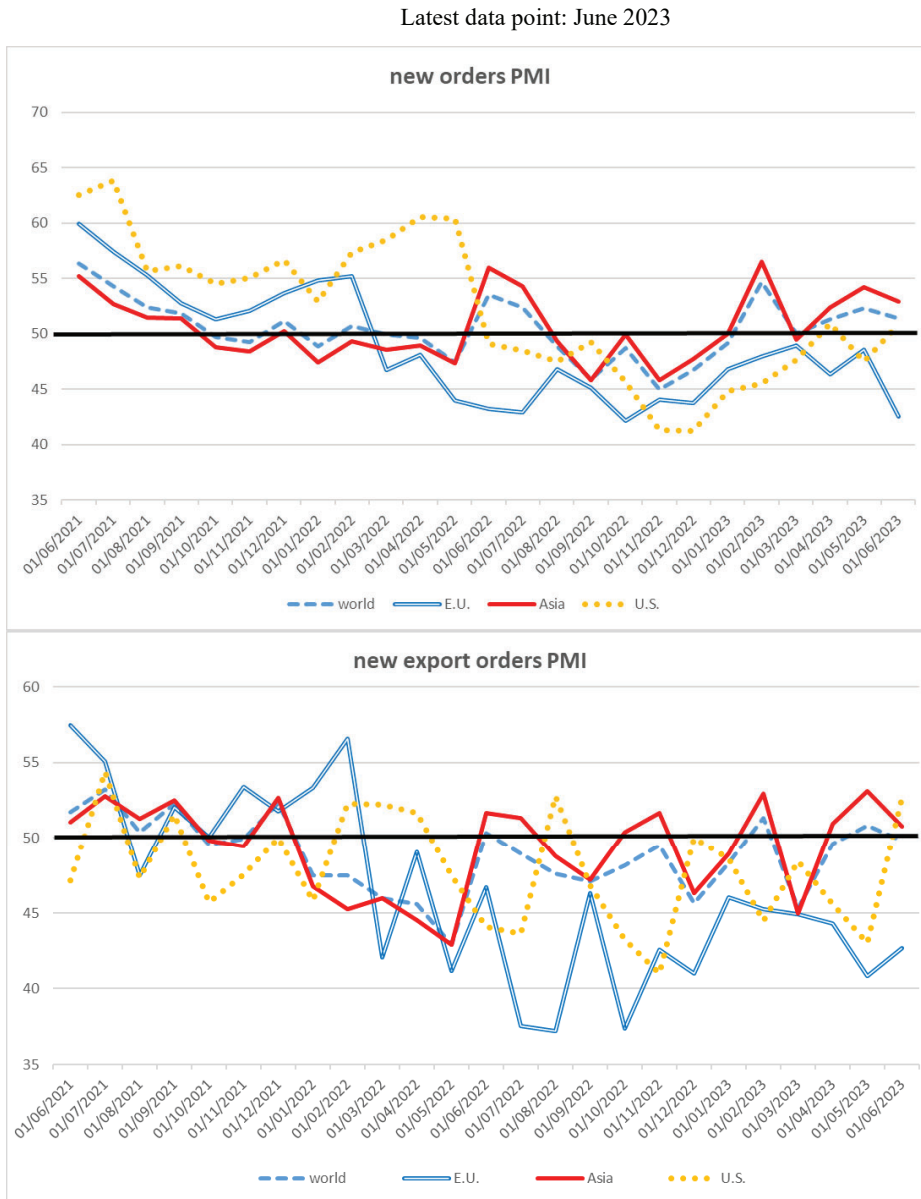
	2019	2020	2021	2022	2023	2024
<b>World</b> <sup>1</sup>	2.8	-3.1	6.1	3.3	2.7	2.9
United States	2.3	-2.8	5.9	2.1	1.6	1.0
Euro area	1.6	-6.2	5.2	3.5	0.9	1.5
Germany	1.1	-4.1	2.6	1.9	0.0	1.3
France	1.9	-7.7	6.4	2.5	0.8	1.3
Italy	0.5	-9.0	7.0	3.8	1.2	1.0
Spain	2.0	-11.3	5.5	5.5	2.1	1.9
Japan	-0.4	-4.3	2.2	1.0	1.3	1.1
United Kingdom	1.6	-11.0	7.6	4.1	0.3	1.0
Mexico	-0.2	-8.0	4.7	3.1	2.6	2.1
Korea	2.2	-0.7	4.1	2.6	1.5	2.1
Canada	1.9	-5.1	5.0	3.4	1.4	1.4
Türkiye	0.8	1.9	11.4	5.6	3.6	3.7
Australia	1.9	-1.9	5.2	3.6	1.8	1.4
China (People's Republic of)	6.0	2.2	8.4	3.0	5.4	5.1
India <sup>2</sup>	3.9	-5.8	9.1	7.2	6.0	7.0
Russia	2.2	-2.6	5.6	-2.0	-1.5	-0.4
Brazil	1.2	-3.6	5.3	3.0	1.7	1.2
Indonesia	5.0	-2.1	3.7	5.3	4.7	5.1
South Africa	0.3	-6.3	4.9	2.0	0.3	1.0
<b>OECD</b> <sup>1</sup>	1.7	-4.4	5.7	3.0	1.4	1.4
<b>Non-OECD</b> <sup>1</sup>	3.8	-2.0	6.5	3.7	3.9	4.1
<b>World real GDP growth</b>	2.8	-3.1	6.1	3.3	2.7	2.9

Note: 1. Moving nominal GDP weights using **purchasing power parities**. 2. Fiscal years starting in April  
Source: OECD Economic Outlook, June 2023, available at: <http://www.oecd.org/eco/outlook/economic-outlook>

### 1.1.1. Manufacturing indices

Manufacturing activity expectations indicate, overall, poor expectations for future buying of steel-intensive products from purchasing managers of companies worldwide. To the extent purchasing managers are correct in their expectations, this signals a bleak picture of future market-driven steel demand. The IHS-Markit indices for new orders and new export orders of steel-intensive sectors, two forward-looking sub-indices of the broad Markit's Purchasing Managers' Index (PMI), are depicted in Figure 1. New orders indices for all three represented regions (Asia, United States and the European Union (EU)) are barely above 50, which indicates that only a small majority of purchasing managers expect an increase of purchase of steel-intensive products in the coming months. There are some mixed signals though, for example there is an improvement of new export order expectations in the United States, with an index reading of 52.7% indicating an increase over the previous month, whereas total new orders remain flat for the United States.

**Figure 1. Market Purchasing Managers' Indices: new orders and new export orders among Steel-Intensive Sectors**



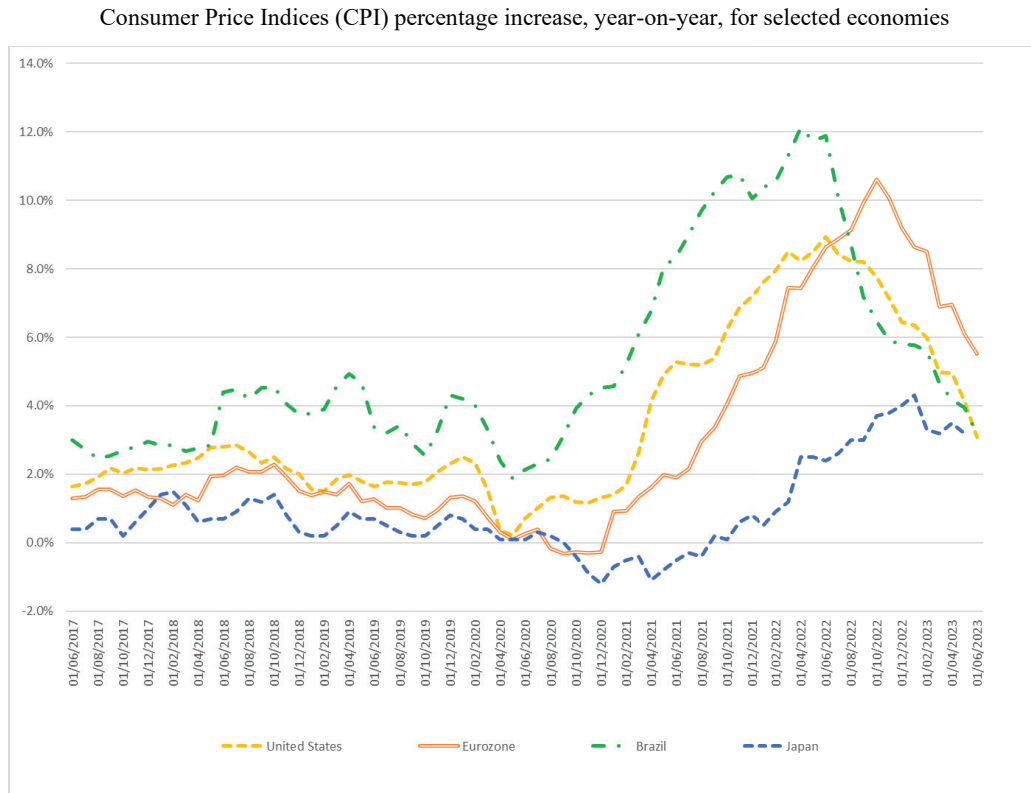
Note: An index reading of less than 50 indicates that more purchasing managers expect a decrease over the upcoming month compared to the current month than an increase  
 Source: Markit economics, via LSEG.

**1.1.2. Increasing prices for consumers will continue to weigh on demand**

A downside risk to the manufacturing sector, but also to the general economy, are the higher prices paid by consumers in most economies for a representative basket of goods, which would reduce discretionary spending, particularly on discretionary products for which steel is often a major component (electronic appliances and household equipment, automobiles, etc., as well as investment in the machinery to make those consumer goods). Consumer price indices are represented for a few selected jurisdictions in Figure 2. Consumer price inflation has been increasing in most jurisdictions, albeit at different rates. Eurozone consumer price inflation has moderated slightly, while price increases in Brazil and in the

United States have decreased to a larger extent. Price increases in Japan, on the contrary, continue to remain close to their peak. Despite the decrease in inflation rates, consumer prices continue to increase, sometimes at a pace multiple times that of the central banks’ targets.

**Figure 2. Consumer price inflation has slowed down but remains at elevated levels**

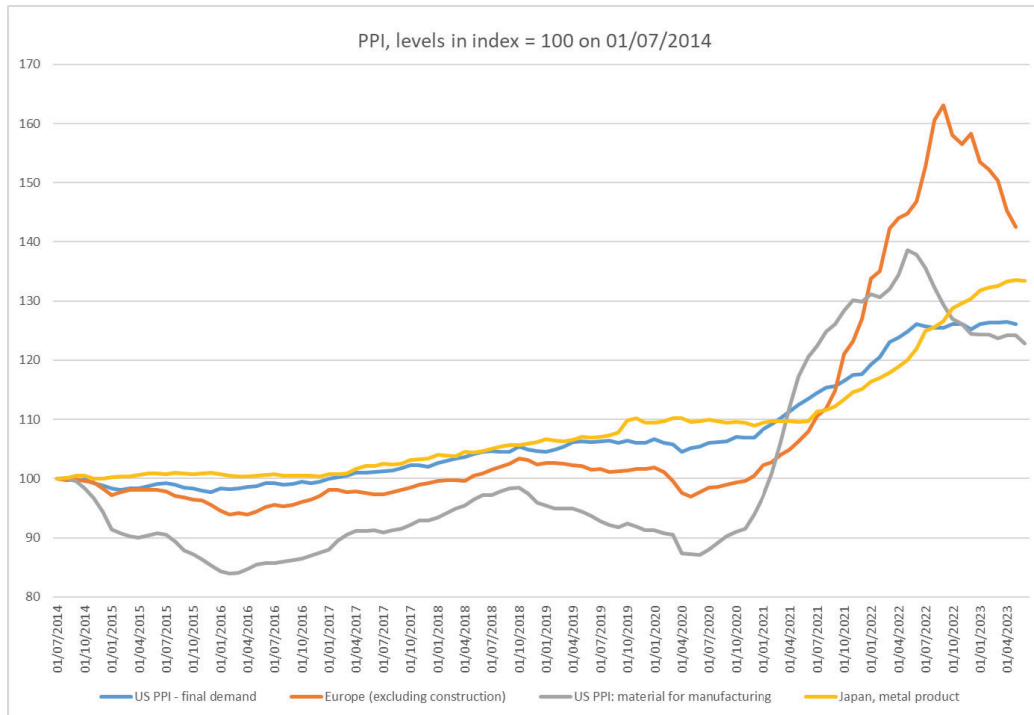


Source: LSEG

Producer prices have been decreasing, or stabilising, from recent peaks, but all indices remain at historically high levels (Figure 3). This should help ease any upward pressure that high producer costs would put on consumer prices going forward, although it should be noted that producers never fully passed on their higher costs to the consumer during recent months. Instead, they chose to let their margins erode. Hence, some reversal of this trend is possible, with producer prices being passed on to consumer prices going forward.

**Figure 3. Producer price inflation has decreased since its peak but remains at elevated levels**

Producer Price Indices (PPI), indices, for a few selected economies



Source: LSEG.

## 1.2. Regional prospects

In the euro area, GDP grew a meagre 0.1% quarter on quarter during the first quarter of 2023, but is expected to accelerate to 0.9% in 2023 and to 1.5% in 2024. The main factors weighing down on economic activity are persistent inflation, declining real household incomes, uncertainty in the banking sector, and the longer-term impact of higher energy costs caused by sanctions introduced in response to Russia's war of aggression against Ukraine. On the positive side, the energy crisis seems to have somewhat abated, a consequence of both a stronger supply which includes the steady inflows of liquified natural gas into Europe, and of a reduced domestic market demand due to a decline in consumption following mild weather conditions during the winter and production cuts or curtailments by many firms in energy-intensive industries in response to non-economical prices. Russia's war of aggression against Ukraine is nevertheless still impacting the euro area economy through persisting supply chain disruptions, elevated costs for some agricultural commodities, and energy price uncertainties which dampens investments.

In Ukraine, GDP plummeted 29.1% in 2022, running quarterly declines of more than 30% over the end of the year. During 2023, however, economic indicators started to show some resilience despite the challenging context. GDP fell by only 10.5% in the first quarter of 2023, when comparing to a relatively high base of the first quarter of 2022 when data only partially captured the impact of the Russia's war of aggression against the country. Also, a divergent dynamic in foreign trade was observed. Imports showed a cumulative increase of 19%, reaching 2021 pre-war levels while exports contracted by 16% year-on-year due to the shelling and destruction of the country's key ports and facilities in Odesa and Danube. The 'Grain Deal' that enabled the country to export food products through the North Sea was also suspended in July 2023, further deteriorating prospects (IER, 2023[107]).

In the United States, GDP grew by 1.3% during the first quarter of 2023 compared to 2.6% in the fourth quarter of 2022. GDP is projected to grow by 1.6% in 2023 and 1.0% in 2024. Increases in the federal funds rate are expected to continue weighing on economic growth with some lag. Temporary fiscal support introduced during the pandemic has now unwound and the stock of household savings that had been accumulated during the pandemic has been largely exhausted, as households have been using their savings to face higher consumer prices. As demand slows, unemployment is expected to increase to 4.5% in 2024, which will put a halt on rising labour costs and weight down, albeit to a lesser extent, on consumer prices. A downside risk to the US economy would be larger risks than anticipated materialising from financial vulnerabilities unveiled by the rise of borrowing costs to higher levels more in line with their historical levels.

In Japan, GDP grew by 0.4% quarter-on-quarter in the first quarter of 2023, sustained by a robust internal demand. GDP is projected to expand by 1.3% in 2023 and 1.1% in 2024 due to internal demand. Government support to households facing the energy price shock and increased defence spending<sup>4</sup> should boost consumption and investment. Despite high inflation weighing on real disposable incomes, consumer confidence has risen and household consumption, especially in service sectors, has been growing steadily, reflecting the restoration of socio-economic activities. Following the opening of borders in October 2022, the Japanese government has classified COVID-19 in the same category as normal influenza from May 8, a measure that is expected to consolidate a robust level of domestic demand. The labour market is thus expected to remain tight, with an unemployment rate expected to decrease to 2.4% in 2024. Headline consumer price inflation is still high by historical standards, standing at 3.5% in April 2023, and the tentatively agreed increases of 2.1% in base pay and 3.7% in headline wages in this year's *Shunto* wage negotiations should continue to put upward pressure on wages.

In China, GDP growth rebounded in the first quarter of 2023 to 4.5% year-on-year and is expected to increase to 5.4% in 2023 and 5.1% in 2024. The shifting away from strict, zero-COVID restrictions has released pent-up demand for in-person services, increasing revenues in services industries hard hit by lockdowns such as tourism or entertainment. Furthermore, the easing of housing-related prudential regulations and lower mortgage costs have helped stabilise property sales. Carryover of sizeable infrastructure projects from the previous year should continue to boost the domestic construction sector. Export growth should be limited, given the weak external demand. Consumer price inflation will remain benign due to a recovery of domestic demand somehow limited, a limited import content for food, and the use of domestically produced coal for heating, as well as discounted Urals oil and gas from Russia which is helping contain inflation pressures and refill Liquefied Natural Gas (LNG) reserves in a cost-effective way. Monetary policy has become more supportive with a series of interest rate and reserve requirement cuts. Although infrastructure investment seemed to be picking up again at the beginning of the semester, somehow helped by the interest rate cuts and support measures, the optimism was short-lived due to a number of recent developments in the Chinese real estate market and in some Shadow Banking products that finance local governments (see Box 4, Section 8).

In India, weak global demand and the effect of monetary policy tightening to manage inflationary pressures will constrain the economy in Fiscal Year (FY) 2023-24, limiting real GDP growth to 6%. Moderating inflation and monetary policy easing in the second half of 2024, as well as improved global conditions, should increase GDP growth to 7% in real in FY 2024-25. High inflation, in particular for energy and food, and the ensuing monetary tightening to anchor expectations, are weighing on purchasing power and household consumption, particularly in urban areas. Tighter financial market conditions are reflected in weakening credit-supported demand for capital goods and business investments. India was also impacted by higher energy costs: the merchandise trade deficit

was 40% larger in FY 2022-23 than in FY 2021-22, with trade in petroleum accounting for over two-fifths of the deterioration.

In Brazil, GDP increased by 2% in the first quarter of 2023, supported by services and a large expansion of agricultural production. GDP growth is expected to slow in 2023 to 1.7% and to 1.2% in 2024 due to weaker private consumption and exports. Lower employment growth, still high inflation and tighter credit conditions are expected to limit household spending capacity despite higher social transfers. Private investment would continue to rise, albeit at a slower pace. Exports will be affected by lower commodity prices and subdued global demand. Inflation declined markedly over 2022 but is expected to remain above target in 2023, which would justify a continuation of a restrictive monetary policy. Agricultural production is expected to reach a new record in 2023, driven by favourable weather conditions on average. This has more than offset localised drought-related declines in agricultural production in the south of the country. However, industrial production continues to stagnate and is still 2.2% below pre-pandemic levels, owing to weak demand and supply constraints for raw materials, electronic components, and other inputs. Investment declined by 3.4% in the first quarter of 2023 on the back of rising financing costs. Job creation also dropped, contributing to a slight increase in unemployment.

## 2. Steel Production

World crude steel production decreased overall by 1.1% year-on-year during the first half of 2023, a smaller contraction than the 4.4% decline witnessed in 2022. This overall decrease hides very diverging paths across regions, with the European Union (-10.9%) and Other Europe (-14.1%) continuing to fall the most, while steel production increased year-on-year during the first semester of 2023 in the Middle East (+3.0%), as well as in China (+1.7%).

The decrease in steel production was indeed the sharpest in the European Union (-10.9%) and Other Europe (-14.1%), as shown in Table 2. The decline was also significant in South America (-7.0%) and North America (-3.5%). Steel production was, according to worldsteel's statistics, stable in Russia and the Commonwealth of Independent States (CIS)<sup>5</sup>, while Asia and Oceania (+0.7%), the Middle East (+3%) and Africa (+4.1%) all registered an increase.

**Table 2. World crude steel production developments during the first semester of 2023**

	Jun-23		Jan-Jun 2023	
	% change, y-o-y	level, thousands tones	% change, y-o-y	level, thousands tones
Africa	11.5%	1 300	4.1%	7 600
Asia and Oceania	0.8%	119 700	0.7%	708 200
of which China:	0.4%	91 100	1.3%	535 600
Russia & CIS	3.1%	6 318	0.0%	40 459
European Union	-11.1%	10 600	-10.9%	66 000
Other Europe	-1.8%	3 700	-14.1%	20 200
Middle East	9.4%	4 200	3.0%	23 000
North America	-0.5%	9 200	-3.5%	54 800
South America	-12.4%	3 300	-7.0%	20 400
World	-0.1%	158 800	-1.1%	943 900

Note: Data are based on monthly production data and can differ from annual data published after December of each year. Furthermore, monthly production data can be revised at any time. The 4 CIS covered by the statistics are the Belarus, Kazakhstan, the Republic of Moldova and Uzbekistan.

Source: worldsteel data, as released on 25 July 2023, <https://worldsteel.org/steel-topics/statistics/steel-data-viewer/>

### 2.1. Americas

In North America, total crude steel production decreased by about 3.5% year-on-year during the first semester of 2023 mainly driven by the fall in production in Mexico (-11.5%) and the United States (-2.9%). Canada's steel production, on the contrary, registered an increase (+4.9%).

In South America, steel production also decreased, falling by 7.0% in the first half of 2023. Production decreases were led by Brazil (-8.9%), which accounts for the majority of the steel produced in South America, but decreases happened in many smaller producing economies, with the sharpest being in Venezuela (-45.3%). Argentina (+6.5%), Colombia (+8.6%) and Chile (+2.2%) all managed to register positive growth.

### 2.2. Africa and the Middle East

African steel production increased by 4.1% year-on-year during the first semester of 2023, driven by a rebound in steel production in South Africa. Indeed steel production managed to rebound by 14% in South Africa after the country experienced in 2022 a significant steel production decrease due to numerous disruptions such as strikes, transportation issues, and

energy supplies interruptions (Kallanish, 2022<sup>[1]</sup>) (Kallanish, 2022<sup>[2]</sup>). Egypt's steel production was practically stable (-0.5%).

In the Middle East, steel production increased by 3.0% year-on-year during the first semester of 2023, led by Iran's strong growth in crude steel production (+4.8%). The Iranian steel sector, although plagued by low domestic demand, a depreciating local currency, and subdued demand in its largest export market, China, has government-set production targets and benefits from significant government support to achieve those targets. Steel production was stable in Saudi Arabia (+0.1%).

### 2.3. Asia and Oceania

Steel production in Asia increased by 0.7% year-on-year during the first semester of 2023, driven by the increase in steel production in China.

In China, steel production increased by 1.3% year-on-year during the first semester of 2023 despite weak domestic steel demand due to adverse economic conditions such as an ailing real estate sector. Going into the second semester steel production has continued unabated in spite of sluggish end-user demand (Zhang, 2023<sup>[3]</sup>). The main reasons seems to be the expectation from mills and the market that government-mandated steel output cuts in 2023 will be much smaller than in 2022, and mainly targeting environmentally sensitive regions (Zhang, 2023<sup>[3]</sup>). China's continued steel production in the face of weak end-user demand, the latter due to a deteriorating property sector, has led to a general rise in steel inventories in China since the start of July 2023 for all steel products (Zhang, 2023<sup>[3]</sup>), as summarised in the table below:

**Table 3. Chinese steel product inventories are rising.**

Increases as of 19 August 2023		
	Increase from July 2023	Year-on-year increase
Rebar inventories in eastern trading hub Hangzhou	15%	50%
Hot-rolled coil inventories in eastern China's Shanghai	28%	4%

Source: S&P, (Zhang, 2023<sup>[3]</sup>)

India increased its steel production by a robust 7.4% due to strong domestic demand, linked to an uptick in infrastructure spending and a pick-up in the real estate and construction activities amid an overall economic revival (Anand, 2023<sup>[4]</sup>). Steel production in Korea was stable (-0.5%).

Other Asian economies experienced decreases in the first half of this year: steel production decreased by 4.7% in Japan, by 10.5% in Chinese Taipei, and by 18.3% in Viet Nam.

### 2.4. Europe and CIS Economies

In the European Union, steel production fell by 10.9% year-on-year during the first semester of 2023. Amongst the larger steel producers of the European Union, the decrease was more pronounced in France (-28.5%), followed by Spain (-10.0%), Italy (-6.7%), and Germany (-5.3%). European steel makers have been very heavily impacted by rising energy prices in 2022 (S&P Global, 2022<sup>[5]</sup>). For steelmakers, the squeeze from rising fuel and energy costs has happened on two fronts simultaneously: steel firms use either blast furnaces or electric arc furnace (EAF) technologies to produce steel. The former relies

heavily on metallurgical coal, while the latter requires other energy inputs such as electricity from a grid (S&P Global, 2022<sup>[5]</sup>). Affordable energy is thus an important factor for steel produced through both blast furnaces and EAF. It is not clear if the recent decrease in energy prices will alleviate the plight of European companies going forward, as it remains to be seen if energy prices start increasing again with the approach of the winter.

Steel production in the United Kingdom decreased by 4.6% year-on-year during the first semester of 2023, a smaller decrease than in 2022 but significant nonetheless. According to the UK Steel Forum<sup>6</sup>, the fall in steel production in 2022 was mainly demand-driven, a consequence of weakness in the UK automotive sector, high inflation which had a knock-on effect on consumer confidence and spending, as well as higher mortgage rates in the United Kingdom which dampened construction activity (Kinch, 2022<sup>[6]</sup>). Electricity prices in the United Kingdom are multiple times higher than historically, and this hampers the competitiveness of the UK steel industry (Kinch, 2022<sup>[6]</sup>).

In the “Other Europe” region, steel output decreased by 14.1% year-on-year during the first semester of 2023, driven by the Republic of Türkiye’s (hereafter, Türkiye) decrease in steel production of 16.3%.

In Ukraine, Russia’s war of aggression took a large toll on steel production, which dropped by 37.7% year-on-year during the first semester of 2023, following a 70.7% drop in 2022. The war disrupted logistics chains and destroyed two major steelmaking plants, Azovstal and Illich Steel, both owned by Metinvest (Bor, 2023<sup>[7]</sup>). Missile strikes on Ukraine’s energy infrastructure, which intensified at the end of 2022 and going forward, triggered power shortage that also affected steel operations, forcing companies to temporarily suspend or cut production, according to steel making industry association Ukrmetallurgprom (Bor, 2023<sup>[7]</sup>). Ukraine’s iron ore mining industry is also operating at 15% to 20% of its capacity due to power shortages and pig iron production fell 86.6% in 2022. There are no signs that the situation may improve while the war continues. On the contrary, recent data show that crude steel production dropped 85% year on year to 284 000 metric tonnes in January 2023 (Bor, 2023<sup>[7]</sup>).

### 3. The global steelmaking capacity challenge

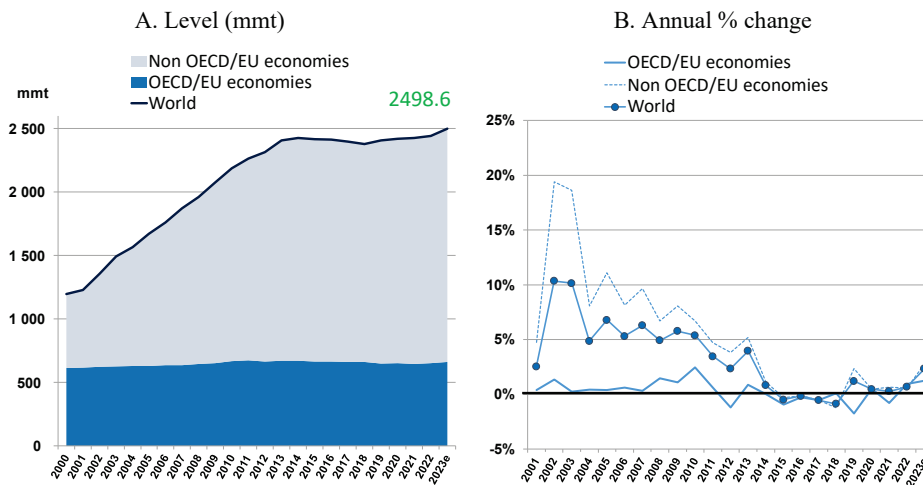
*The ongoing excess capacity crisis risks are escalating significantly. Capacity is expected to grow to 2 498.6 mmt in 2023. This is an increase of 57.1 mmt compared to last year and the highest growth rate in a decade. Regional developments show significant growth in Africa, ASEAN and the Middle East, while the two largest steel producing economies, China and India, are contributing the most to aggregate capacity expansion due to their size. Steelmaking capacity is estimated to have increased by 4% over the last five years, whereas production increased by only 1% over the same period. The global steel capacity/production gap is thus widening, reaching 610.8 mmt in 2023, amid weakening demand and production challenges.*

Steelmaking capacity peaked in 2014 and, after declining until 2018, has now increased for five years in a row to reach historically high levels. According to the latest available information (as of June 2023), global steelmaking capacity is expected to increase to 2 498.6 mmt by the end of 2023, an increase of 2.3% (i.e. by 57.1 mmt) compared to the level observed at the end of 2022. This is the first time in 10 years that the annual increase in capacity will exceed 50.0 mmt.

Asia accounts for 53.3%, or 30.5 mmt, of the total 57.1 mmt global capacity increase. Within Asia, China is expected to add 25.0 mmt, making it the economy with the largest capacity increase. However, given that “the Implementation Measures for Capacity Replacement in the Iron and Steel Industry legislation”, came into force in 2018, it seems unlikely that China will add any net capacity expansion (Kallanish, 2021<sup>[8]</sup>). Indeed, the timing of new capacity starts and closures and the possibility that some information on new capacity and closures may not have been disclosed may explain the net increase in capacity this time.

The increase in world steelmaking capacity is a net increase (not a gross increase), i.e. it takes into account the latest information on new capacity additions, both in operation in 2023 and under construction for 2023, as well as closures.

**Figure 4. Evolution of crude steelmaking capacity in OECD economies and non-OECD economies**



Note: Capacity data reflect information available to June 2023  
 Source: OECD Capacity Database.

In terms of growth rates, the Middle East, ASEAN and Africa could see significant capacity growth, although the latter from a relatively low base. Asian's growth rate is relatively low, but it is contributing to capacity expansion the most in terms of absolute numbers.

**Table 4. Steelmaking capacity development by region (mmt)**

	2019	2020	2021	2022	2023e	2019vs 2023e(%)	2019vs 2023e(volume)
Africa	44.6	44.7	43.5	45.8	51.4	15.1%	6.8
Asia	1,616.5	1,622.5	1622.6	1626.1	1656.6	2.5%	40.1
China	1,148.3	1,147.9	1146.5	1149.9	1173.3	2.2%	25.0
India	128.7	128.7	133.9	133.9	138.4	7.5%	9.7
ASEAN	74.6	78.7	80.4	80.4	82.9	11.1%	8.3
CIS	143.4	142.6	143.9	145.0	145.1	1.2%	1.7
Europe	287.4	287.5	288.1	289.3	294.3	2.4%	7.0
EU	216.0	213.4	213.4	213.4	213.6	-1.1%	-2.32
Other Europe	71.4	74.1	74.7	75.9	80.7	13.0%	9.3
Latin America	73.9	73.4	73.9	73.9	75.9	2.7%	2.0
Middle East	80.7	84.1	89.0	92.3	103.3	28.0%	22.6
North America	154.2	157.5	157.7	162.8	165.8	7.5%	11.6
Oceania	6.4	6.4	6.4	6.4	6.4	0.0%	0.0
OECD/EU economies Total	649.7	653.1	647.8	654.1	662.1	1.9%	12.4
non-OECD/EU economies Total	1,757.3	1,765.5	1777.3	1787.4	1836.5	4.5%	79.2
World Total	2,407.0	2,418.6	2425.2	2441.5	2498.6	3.8%	91.6

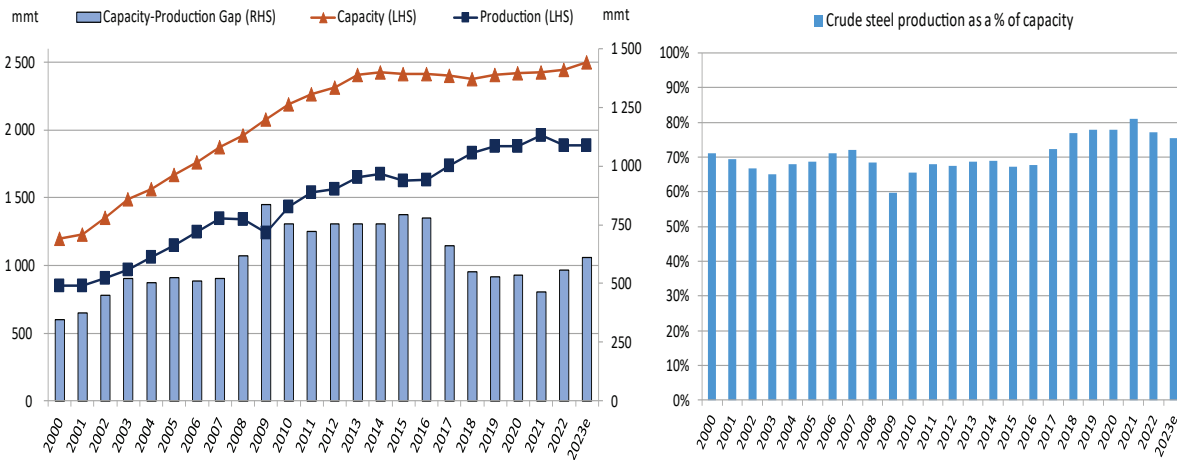
Note: "e" denotes estimation. The capacity data reflect information up to June 2023. The table "Europe" includes both OECD/EU economies and non-OECD/EU economies in Europe, as well as Türkiye. Please see Annex C for detailed capacity data by individual economies. Figures for the European Union (EU) include all EU Member States.

Source: OECD

Steelmaking capacity has increased steadily over the last five years and is expected to increase by 4% in 2023. Similar to capacity, production has also been increasing. However, after peaking in 2021, production growth has slowed, thus averaging 1% during over the last five years. Capacity and production, therefore, appear to have decoupled to some extent.

As a result, the gap between global steelmaking capacity and crude steel production could widen from 556.1 mmt in 2022 to 610.8 mmt in 2023, reflecting renewed weakness in global steel demand and production amid continued capacity growth. The global capacity utilisation rate could decline for the second consecutive year, falling by 1.7 percentage points to 75.6% in 2023. The global economy is slowing due to high raw material and fuel prices, continued inflation, and monetary tightening in major economies and regions. Uncertainty is expected to persist well into 2023.

Figure 5. Global crude steelmaking capacity, crude steel production and capacity utilisation rate



Note: “e” denotes estimation. Capacity data reflect information up to June 2023. The production figure for 2023 is the annualised level observed during the first six months of the year. All production data are from the World Steel Association: figures for 2023 are based on the monthly release of 25 July 2023 while annual data from 2000 to 2022 are from 2023 World Steel in Figures (worldsteel, 2023<sup>[9]</sup>).  
 Source: OECD Capacity Database for crude steelmaking capacity and World Steel Association for crude steel production.

#### 4. The relocation of Chinese steel firms within and outside China: a multi-purpose and heavily subsidised process

This section explores the link between Chinese firms’ relocation, domestically or abroad, with a special focus on Latin America, and the provision of subsidies and incentives by the Chinese government. It is an integral part of the continuous monitoring of subsidies undertaken by the Steel Committee (see Box 1).

The section shows that subsidies are provided in the form of land-use, cash grants and cash awards, tax breaks and reduced tax rates, and, probably, below market financing, to Chinese steel firms by different level of government in China in order to induce Chinese steel firms to relocate domestically (Section 4.1). Relocation of steel firms is altogether i) a regional development strategy; ii) a way to concentrate steel firms and thus strengthen “national champions”, and iii) a stated way to achieve government environmental objectives. A comprehensive inventory of steel plants’ relocation since 2019 is provided in Annex A.

China’s “Going Out” policy in Latin America seems to pursue other strategic goals such as securing raw materials sources for both the Chinese steel industry (e.g. iron ore) and other industries (e.g. lithium for electric car vehicle batteries), and creating a more interlinked economy with Latin America through the use of numerous partnerships and collaborations (Section 4.2). Joint-projects and collaborations enable Latin American companies to benefit from Chinese steel companies access to below-market financing for their projects, be it under the form of guarantees offered by Chinese steel firms to lower a project’s financing costs, or through the provision of credit support through various financial instruments directly from China’s state-owned banks such as the Industrial and Commercial Bank of China and the Bank of China. In exchange, China secures raw materials and new cutting-edge technologies, such as advanced green technologies, that are proprietary to some Latin American firms. These interlinkages, both across jurisdictions and across industries, may make the use of a typical trade instrument on steel imports more complex going forward, as considerations of multiple partnerships going well beyond the steel sector per se will have to be taken into account by policy makers.

##### Box 1. The Steel Committee work on subsidies and government measures

**The Steel Committee has been monitoring subsidy and government support since 2017**, expanding gradually the geographical scope of its monitoring until it included all of the top 19 crude steel producing jurisdictions<sup>7</sup>. Such monitoring serves a dual objective:

- to obtain a **comprehensive picture of the subsidisation of the steel sector** across jurisdictions (standardised database and qualitative results), and;
- to gather sufficient data to perform a **robust analytical study on the potential impact of subsidies on capacity expansions** and other variables.

**Some insights from the Steel Committee’s data collection** can be found in (Mercier, 2023<sub>[10]</sub>). Although the analysis it presents is based on aggregated data, the data used was retrieved at the steel firm level. A few of the main findings are:

- total subsidies provided in terms of cash grants, cash awards and cost refunds, when compared to unit of crude steel production capacity, are remarkably

constant over time, i.e. **the stock of crude steel production capacity built over time tend to attract (new) subsidies at a constant rate pro rata**<sup>8</sup>;

- **steel firms located in non-OECD economies received on average 10.7 times more subsidies through cash grants, cash awards and tax refunds than steel firms in OECD countries** over the whole of the 2008 to 2020 period;
- **subsidies are in most cases provided to steel firms with the stated purpose to expand capacity, or support new investment, or help acquire capital equipment (40%)**, rather than for the purpose of R&D (28%) or the environment (13%);
- **subsidies for capacity extension, new investment, and capital equipment have consistently been significant for all years during the 2008-2020**, with the exception of the year 2009, when they were temporally replaced by subsidies provided for social reasons.

Those later findings strongly suggest that a precise, firm-level study of the impact of subsidies on capacity increase is warranted, given the current global issue of excess capacity in the steel sector. The results of such an analytical study, which is currently being undertaken by the Steel Committee and is planned to be completed by 2024, should help inform policy makers on the real impact of subsidies going forward.

This section of the Steel Market Development paper series is an integral part of the Steel Committee monitoring work. It considers industrial relocation in China, a phenomenon which continues to rely extensively on subsidies from all levels of government to incentivise steel firms to relocate domestically, and which seems to insert itself into broader economic and geostrategic goals abroad.

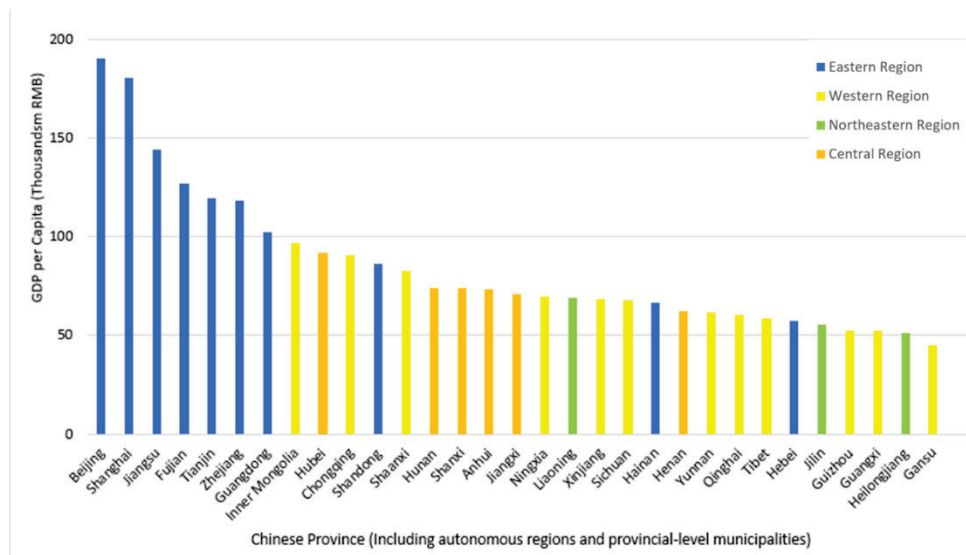
It will be complemented by other topical studies in the subsequent editions of the Steel Market Development series on similar topics, in China and/or in jurisdictions which have recently witnessed sharp increases in their steel producing capacity, such as, Malaysia, Iran, Viet Nam, Algeria, Pakistan and Indonesia.<sup>9</sup>

## 4.1. China's domestic relocation of steel plants

### *4.1.1. Rebalancing economic development across Chinese provinces is the overarching goal of domestic relocation of steel firms*

On March 11, 2021, China released its 14th Five-Year Plan for National Economic and Social Government that laid out its long-term development objectives for 2025 (Communist Party of China, 2021<sub>[11]</sub>). China re-stated its strong commitment to promote economic development in China's Western provinces by pushing forward industrial relocation plans. The relocation of heavy-manufacturing industries such as the steel industry, but also the coal, iron ore and oil industries, is prioritised in China's approach to bringing labour opportunities, technological advancement, and economic opportunities for Chinese Western provinces. Indeed, as can be seen in Figure 6, there are still significant disparities in terms of economic development between Chinese provinces and regions.

Figure 6. Chinese GDP per inhabitant in 2022 shows large variation across provinces and regions



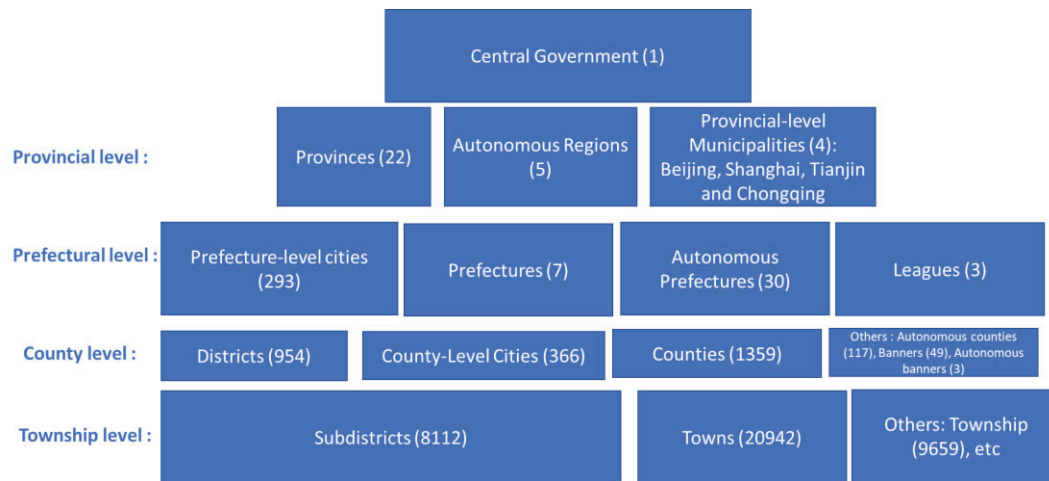
Source: National Bureau of Statistics of China (NBS)

The guidelines to promote relocation include the following points:

- Promoting the direct transfer of industry through the development of a skilled labour pool, building infrastructure, and cooperating with the Eastern coast to promote regional collaboration.
- Optimising comparative advantages by promoting transfers of recommended industries within geographically adept regions.
- Fostering innovation by forming urban agglomerations and city clusters to divide labour efficiently within technologically advanced industries.

Broad directives and approaches that provincial and prefectural governments need to undertake have been indicated, but it is up to the provincial and prefectural governments to define the practical steps that the concrete implementation of the central government directives will take. In that sense, local governments hold considerable autonomy to tailor their approach under the specified guidelines and can differ significantly across provinces and municipalities. A diagram illustrating the different layers of the Chinese government is shown below (Figure 7).

Figure 7. China’s levels of government



Source: China Central Government

#### *4.1.2. Relocation to the Western provinces was emphasised in 1999 and was already tightly linked to subsidies and other incentives to steel firms*

The “Go West” Campaign (西部大开发), was initially launched in 1999 by the Chinese Government, and is aimed at addressing economic development regional disparities between Western and Eastern provinces. In response to Deng Xiaoping’s economic reforms in 1988 favouring Eastern provinces’ economic development, the “Go West” Campaign additionally promotes infrastructural and technological development within Western provinces (Jespersen, 1997<sub>[12]</sub>). To incentivise manufacturing enterprises to relocate, the Chinese Government adopted additional policy changes and financial incentives (Mercier, 2023<sub>[10]</sub>). On July 5, 2010, the Central Committee of the Communist Party of China (CPC) and the State Council, declared the implementation of a preferential tax policy for the period 2011 to 2020. Industrial enterprises broadly recommended in the “Catalogue of Encouraged Industries in the Western Region” thus received a reduced corporate income tax rate of 15% (China State Tax Center, 2016<sub>[13]</sub>). This corporate income tax reduction was extended until the end of year 2030 (China's State Taxation Administration, 2020<sub>[14]</sub>).

Despite implementing preferential tax policies for industries encouraged to relocate, Chinese authorities believe that more needs to be done in order to reach its developmental policy goals in the Western provinces (税屋汇总, 2021<sub>[15]</sub>). This points towards a continuation or increase in the subsidies and incentives accompanying such relocations going forward. In terms of instruments used, it is possible that growing local government balance sheet pressures may prompt local governments to increasingly rely more on tax incentives compared to direct cash transfers and other instruments that require funding.<sup>10</sup>

#### *4.1.3. Green development is now an integral part of China’s relocation programme*

China’s National Development and Reform Commission (NDRC) and the Ministry of Ecology and Environment recommended a **Coastal Relocation Strategy** emphasising the importance of low-emission and “green development” amongst heavy-polluting manufacturing steel enterprises (Communist Party of China, 2021<sub>[11]</sub>). To further refine its guidelines, the NDRC issued specific opinions and recommendations for iron and steel smelting projects in alignment with the CPC's objectives furthering for green development

within the 14<sup>th</sup> Five-Year Development Plan. The NDRC opinions and recommendations for iron and steel smelting projects suggest relocating steel industries from heavily polluted urban areas to rural/outer regions within the same province (National Development and Reform Commission, 2021<sup>[16]</sup>).

According to the NDRC’s opinions and recommendations for iron and steel smelting projects, prefectural and provincial governments should collaborate with enterprises to establish industrial steel bases throughout the coast, including the following: Bayuquan (Liaoning Province), Caofeidian (Hebei Province), Rizhao (Shandong Province), Zhanjiang (Guangdong Province), and Fangchenggang (Guangxi Province) (Zhuanlan, 2023<sup>[17]</sup>). Forms of collaboration among government entities and enterprises vary per agreement; however, these can include subsidies in the form of relocation compensation and corporate tax reduction.

#### *4.1.4. Relocation incentives in China rely heavily on the subsidisation of steel firms, involve every level of government, and are intimately linked to the creation of “national champions”*

Provincial governments have as objectives to diminish polluting emissions from steel industries or to reduce steel production excess capacity in order to meet the Chinese central government requirements. To achieve this aim, they tend to adopt different financial incentives and strategies. On 12 December 2020, the Ministry of Industry and Information Technology published the “**Guiding Opinions on Promoting the High-Quality Development of the Iron and Steel Industry**” holding specific initiatives promoting the development of the steel industry following the release of China’s 14<sup>th</sup> Five-Year Plan. To promote the relocation of the main steel firms, provincial or prefectural governments offer a financial or non-financial compensation to the firm for undergoing the process. Then, provincial governments facilitate the process for steel firms to merge and re-locate, concentrating the number of firms and their steel production capacity. The following guidelines indicate the targets of two primary steel firm relocation provinces in more detail:

- a. **Liaoning Province** aims to facilitate the collaborative restructuring of central and local iron and steel enterprises, exemplified by Anshan Iron and Steel and Benxi Iron and Steel. The focus is on cultivating world-class steel enterprises with global competitiveness. Additionally, the province strives to enhance industry concentration, drive upgrades and innovation within the steel sector, and integrate lean management principles in the context of industrial Internet and digital advancements (Department, 2016<sup>[18]</sup>).
- b. Building on insights from the Provincial Development and Reform Commission's report, **Hebei Province** is committed to sustaining progress made in reducing steel production capacity. The province seeks to further amplify industrial concentration, bolster the overall competitiveness of steel products, and promote high-quality development within the steel industry. The ultimate goal is to achieve positive outcomes that contribute to the industry's growth and excellence (Chinese Government, 2022<sup>[19]</sup>).

In a majority of cases, the prefectural or county governments will provide some financial compensation or subsidy to the enterprise relocating from their county or prefecture, as the relocation processes commonly occur within the province (National Development and Reform Commission, 2021<sup>[16]</sup>).

**Relocation is often coupled with merger and acquisition goals and targets set by China.** Following the release of the 14<sup>th</sup> Five-Year Plan, the Ministry of Industry and Information Technology expressed how the merger and acquisition process for the steel

industry in China will be further promoted. The following directives stated by the Ministry outline the central government focus on the development of mergers and acquisitions within the steel industry:

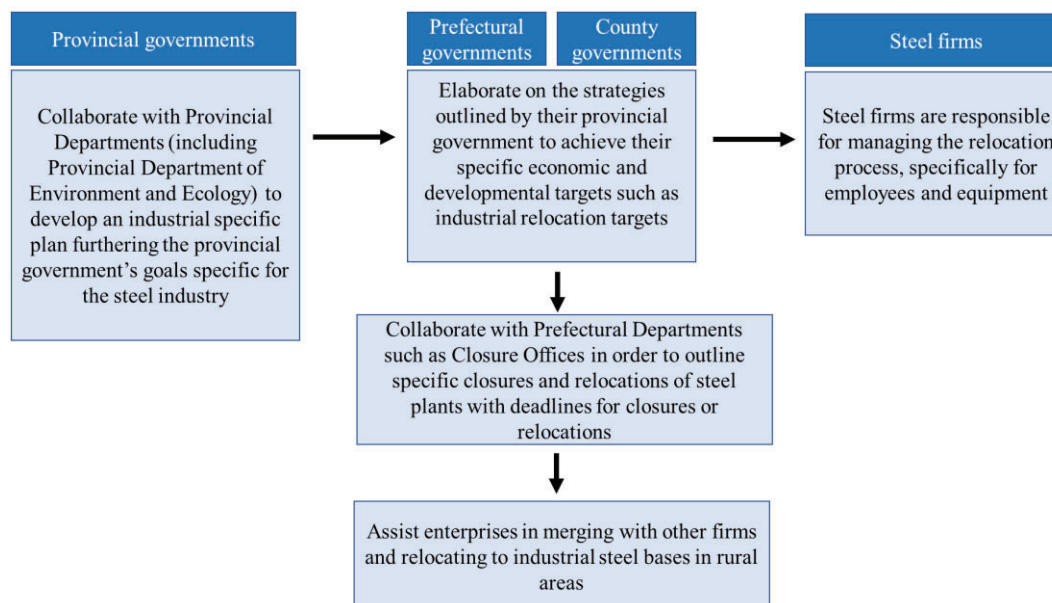
- a. **Establish large steel enterprise groups and professional leading enterprises.** Through the development of ownerships rules pertaining to steel enterprises, provincial, prefectural, and county governments should encourage joint ownership through the merger and reorganisation of prominent steel companies within the industry (MIIT Sina Finance, 2021<sub>[20]</sub>).
- b. **Increase policy support for mergers and acquisitions.** Steel companies completing mergers will receive support for smelting projects and enjoy preferential tax policies. Financial institutions will actively provide comprehensive financial services to steel companies undergoing mergers and acquisitions, adhering to principles of controllable risks and commercial sustainability (MIIT Sina Finance, 2021<sub>[20]</sub>).
- c. **Improve upstream and downstream industrial chain cooperation and reorganisation.** The goal is to promote cooperation and restructuring in the steel industry's supply chain to enhance overall competitiveness by encouraging steel enterprises to strengthen ties with upstream and downstream partners, and facilitating the merger and reorganisation of independent hot rolling and coking enterprises in the Beijing-Tianjin-Hebei region and nearby areas with established steel companies (MIIT Sina Finance, 2021<sub>[20]</sub>).

Because domestic relocation is tightly linked to the concentration targets set forth by the Chinese government for its steel industry, it can be seen as a preparation or strengthening of the international role of Chinese steel giants, described to some extent in Section 4.2 which discusses salient aspects of the “Going Out” of Chinese steel firms in Latin America.

#### *4.1.5. The process of relocation varies significantly depending on the local governments involved*

Steel firms' relocation processes can vary significantly since each provincial and municipal government holds the autonomy to cooperate with enterprises across differing dimensions and to different degrees, depending on the provincial and municipal government's goals. Each provincial government outlines the direction of its approach throughout its own Five-Year Economic and Development Plan that builds upon China's Five-Year Plan general directives and establish its concrete steps of implementation (Asian Development Bank, 2021<sub>[21]</sub>). If a provincial government focuses primarily on certain industries, it publishes additional directives outlining the province's strategies, which are then elaborated upon by prefectural governments or county entities to achieve their industrial relocation target (Figure 8). For example, provinces whose prime focus is relocating heavy-polluting, coal-fired steel plants will collaborate with the province's Departments of Ecology and Environment and Prefectural Elimination Offices to promote specific plants closures and relocations (Sina Finance, 2021<sub>[22]</sub>). Once the closure notices are issued, steel firms will have to meet specific deadlines to close their plants, and the government and industry will facilitate steel firms' mergers with other firms and relocation to the industrial steel bases established within rural rather than urban territories. To facilitate steel firms' relocations, provinces additionally promote the development of their infrastructural, educational, and developmental guidelines within the counties holding industrial steel bases. However, steel firms are responsible for managing the relocation process specific to employees and equipment (Sina Finance, 2023<sub>[23]</sub>), as indicated in Figure 8.

**Figure 8. Responsibilities of actors involved in provinces focused on relocating heavy-polluting, coal-fired steel plants**



Source: OECD Secretariat desk research

A comprehensive list of Chinese steel plants' relocation and the subsidies attached to them is provided in Annex A.

#### *4.1.6. Hebei Province's "Measures to accelerate the high-quality of the steel industry within Hebei" guideline*

30. The following section provides a specific example of the types of subsidies associated with a joint guideline for the Hebei Province and illustrates how different departments and different levels of local government collaborate to achieve their province's objectives for the steel sector.

To accelerate reaching its goal of climbing up the value chain in the steel industry, in particular for specialty steel varieties, on 28 February 2022, the Provincial government of Hebei, the Provincial Department of Industry and Information Technology, the Provincial Development and Reform Commission, and the Provincial Department of Ecology and Environment jointly released a development plan entitled "**Measures to accelerate the high-quality of the steel industry within Hebei**". Within the development plan, the provincial government encourages prefectural and county governments to support the steel industry in various forms in addition to recommending specific subsidies (Quyung County Government, 2022<sup>[24]</sup>). In response to the development plan, counties such as Quyung further published their Interpretations of the guidelines in the provincial development plan (Quyung County, 2022<sup>[25]</sup>).

The development plan includes:

- **Improving Research, Development, and Innovation outreach.** Assisting steel companies in spearheading scientific and technological advancements by conducting essential research and development in cross-industry and interdisciplinary key technologies. Providing financial backing of up to RMB 3 million for the execution of significant provincial science and technology initiatives (Guideline 1) (Quyung County Government, 2022<sup>[24]</sup>)<sup>11</sup>.

- **Improving Quality and Efficiency.** Awards are used to positively signal to the broad market specific steel firms' achievements. They can also be of substantial amounts, although some are more symbolic due to their lower nominal amounts. Concerning the overall goal of quality and efficiency, steel firms attaining the “China Quality Award” will be granted RMB 1 million and those receiving the “China Quality Award nomination” will receive RMB 500 thousand. Recipients of the “Provincial Government Quality Award Organization” will be acknowledged with smaller RMB 500 thousand or RMB 300 thousand, based on their accomplishments. Moreover, firms newly recognized as well-known trademarks in China will be rewarded with RMB 200 thousand or RMB 100 thousand, depending on the level of recognition. Similar awards will also be provided to enterprises leading the formulation and revision of international, national, and industry standards (Guidelines 20) (Quyang County Government, 2022<sub>[24]</sub>)
- **Implementing Preferential Tax Policies.** Enacting favorable tax policies to support enterprise mergers and reorganisations, which include benefits related to enterprise income tax, value-added tax, land value-added tax, stamp duty, deed tax, value-added tax for industrial waste heat and residual pressure power generation, comprehensive utilization of resources, pre-tax deduction of research and development expenses, and export tax rebates (Quyang County Government, 2022<sub>[24]</sub>).
- **Environmental Subsidies.** Enterprises exceeding national and local standards by maintaining air and water pollutant concentrations below 50% of the stated air and water pollution target will be eligible for reduced environmental protection taxes, thus alleviating the tax burden, enhancing market competitiveness, and promoting overall efficiency.

#### *4.1.7. Relocation directives and support can have various stated environmental motives*

As a primary objective for steel plants' relocations, the NDRC has proposed concentrating steel enterprises across industrial bases to manage and control air pollution from PM<sub>2.5</sub>, sulfur dioxide (SO<sub>2</sub>), volatile organic compounds (VOC), and nitrogen oxide (NO<sub>x</sub>) emissions from steel plants (National Development and Reform Commission, 2021<sub>[16]</sub>). Through the relocation process the central government emphasises the need for a reduction in production capacity in order to decrease pollution levels.<sup>12</sup> The current “swap ratio” is 1.5:1, meaning that for each tonne and half of crude steel production capacity closed, one tonne can be opened (Liu, 2021<sub>[26]</sub>). The relocation allows to concentrate steel firms production in specific areas and for a better monitoring and implementation of environmental standards, making it more manageable for authorities to make sure that steel firms comply with the central government and the prefectural-environment guidelines (Chinese Central Government, 2019<sub>[27]</sub>). In addition, to comply with low-emission standards, the Ministry of Ecology and Environment encourages steel firms to transform from blast furnace-converter to electric furnaces. The use of high-efficiency desulfurisation, denitrification, and dust removal facilities in the new plants is also encouraged by government entities (Chinese Central Government, 2022<sub>[28]</sub>).

Each province or prefecture has large degrees of freedom to decide to incentivise firms by providing them with subsidies, hence some provinces and prefectures will use more subsidies than others to incentivise steel firms to improve their air and water pollution levels. As of May 2023, the industrial base of Xingang signed contracts with providers including the Italian enterprise, Tenoun, to acquire an electric furnace and a contract with the United States' Primetals to acquire rolling mills. Additionally, they will implement

hydrogen-based fusion-reduction technology to implement across the base (Sohu Finance, 2023<sup>[29]</sup>).

According to a 2021 Press Conference with China's Ministry of Ecology and Environment, steel industrial relocations have already contributed to reducing acid rain and SO<sub>2</sub> emissions. However, the government believes additional efforts are required to further lower VOC and NO<sub>x</sub> emissions throughout recent relocation developments/changes (Ministry of Ecology and Environment for the People's Republic of China, 2021<sup>[30]</sup>).

#### *4.1.8. A concrete relocation example: the Tangshan Iron and Steel Group*

On August 19, 2020, the Tangshan Prefectural Government, henceforth “Tangshan City”, and HBIS’s Tangshan Iron and Steel Branch (唐山钢铁集团有限责任公司), henceforth, “the Tangshan Branch”, signed the “City Relocation Agreement” regarding the closure and relocation of the Tangshan Branch. The Tangshan Branch, previously situated in Lubei District of Tangshan City (Hebei Province), held an iron-making capacity of 7.04 million tonnes, steel-making capacity of 6.84 million tonnes, and rolling capacity of 11 million tonnes, with suspended assets valued at RMB 38.5 million (USD 5 million) (HBIS Group, 2020<sup>[31]</sup>). The Tangshan Branch relocated to the Economic Development Zone in Laoting County (Hebei Province) developed by HBIS. The plant's new name is HBIS Laoting Steel Co., Ltd. (河钢乐亭钢铁有限公司).

Tangshan City has agreed to convert the industrial land occupied by the Tangshan Branch into commercial and residential lands through HBIS Laoting Steel Co., Ltd.'s wholly-owned subsidiary, Tangshan Tangsteel Construction and Development Co., Ltd. (唐山唐钢建设开发有限公司), and it will obtain commercial and residential land use rights. The estimated total compensation for relocation amounts to RMB 33.4 million (USD 4.5 million). In 2022, HBIS reported that approximately 10,260 mu<sup>13</sup> of industrial land was cleared during the relocation process and is intended for transformation into about 5,760 mu of commercial and residential land according to city planning. As of July 6, 2022, the Tangshan Branch has received RMB 14.169 million (USD 2 million), accounting for 42.42% of the total compensation (HBIS Group, 2022<sup>[32]</sup>).

## **4.2. China's "Going out" policy in Latin America uses subsidies and steel firms' expertise to achieve broader ambitions that go beyond the steel sector as such**

China's growing influence over critical and natural mineral resources in Latin America<sup>14</sup> presents a considerable opportunity for the Chinese steel industry. Latin America already contributes substantially to the global supply of copper, nickel, and iron, and the region's well-established mining sector serves as a foundation for the Chinese diversification into increasingly sought out minerals such as lithium (China Ministry of Industry and Information Technology, 2021<sup>[33]</sup>). Chinese steel firms have continued to support investing in mineral extraction, particularly in Brazil, in addition to the development of raw materials industries through participation in joint projects. However, as firms begin to show interest in minerals crucial for green development, Latin America has become an even more valuable asset, as shown for example by the attractiveness of its “Lithium Triangle”, which Chinese steel firms have started to invest in (Berg and Sady-Kennedy, 2021<sup>[34]</sup>).

#### ***4.2.1. Chinese steel firms are securing iron ore supplies in Latin America through international projects and cooperation with large iron ore producers***

In 2019, the China Communication Construction Company (CCCC), owner of the Concremat subsidiary in Brazil, and Vale, the largest of Brazil's metal mining enterprises, formed a joint venture to construct a flat steel rolling mill in Marabá (Southeastern Pará, Brazil). The planned investment for the venture was BRL 1.5 billion (USD 300 million), and Chinese support would be given through the issuance of guarantees facilitating the financing for the plant by the CCCC and Concremat (Agencia Para, 2019<sup>[35]</sup>). The plant would hold a capacity of 300 thousand tonnes per annum (TTPA) of laminated steel and applied for the licensing documents in 2020. As of May 2022, Vale began the construction of the plant which will utilise Vale's newly developed technology TecnoRed, enabling the creation of "green steel" through the substitution of metallurgical coal with biomass (Vale S.A., 2022<sup>[36]</sup>).

Vale has additionally adopted further measures to increase cooperation with China, including a Memorandum of Understanding (MoU) with China's Baowu Steel Group Corporation and joint investment agreements with varying Chinese enterprises (Vale S.A., 2023<sup>[37]</sup>). On March 29, 2023, Vale announced the following cooperation activities outlined by the agreements with differing Chinese firms:

**Project Investment Agreement for Indonesia:** Vale's subsidiary in Indonesia (PT Vale Indonesia), along with Taiyuan Iron & Steel Co. Ltd. (Tisco) and Shangdong Xinhai Technology Co. Ltd. (Xinhai), signed an agreement to build a Rotary Kiln-Electric Furnace (RKEF) ferronickel processing plant in Morowali, Indonesia. The project aims to produce 73,000 metric tonnes of nickel annually, using gas-fired power for electricity, emphasising its green and low-carbon nature (Vale S.A., 2023<sup>[37]</sup>).

**Biochar Development:** Vale and Baoshan Iron & Steel Co., a subsidiary of China Baowu, signed a MoU on November 11, 2021, with the purpose of cooperating to reduce greenhouse gas emissions within the steel industry (Vale S.A., 2023<sup>[37]</sup>). The agreement focuses on developing and using biocarbon in blast furnaces as a carbon-neutral alternative to fossil energy. Additionally, Vale is considering an investment in China Baowu's biocarbon plant pilot project with an estimated value of CHN 60-70 million (Vale S.A., 2023<sup>[37]</sup>).

**Zero-Emission Motor Grader:** Vale partnered with XCMG, China's largest construction machinery group, to co-develop the world's first zero-emission motor grader for mining operations. This equipment, used to level mine accesses, will be tested in Brazil, and if successful, Vale intends to acquire several models in the future as part of its efforts to reduce scope 1 and 2 emissions by 33% by 2030 (Vale S.A., 2023<sup>[37]</sup>).

**Financial Cooperation:** Vale signed multi-year MoUs with the Industrial and Commercial Bank of China (ICBC) and the Bank of China (BOC). These agreements aim to support Vale's business development and strengthen partnerships, with the Chinese banks offering credit support through various financial instruments (Vale S.A., 2023<sup>[38]</sup>).

**Technical Cooperation:** Vale entered into a cooperation agreement with Central South University (CSU) to bolster their technical collaboration. This builds on a previous donation agreement, where Vale contributed USD 5.81 million to support CSU in establishing a new lab for low-carbon metallurgy and hydrogen research (Vale S.A., 2023<sup>[37]</sup>).

**Economic Research Cooperation:** Vale and Tsinghua University signed a four-year partnership agreement to continue their support for the Academic Center for Chinese

Economic Practice and Thinking (ACCEPT) at Tsinghua University. The collaboration focuses on researching China's economic practice and thinking, as well as the discipline of Government and Market Economics (Vale S.A., 2023<sup>[37]</sup>).

Additionally, a subsidiary of China's Honbridge Holdings Limited, Sulamericana de Metais (SAM), is working to develop a so-called "Block 8 project" to build an iron ore production complex. The project holds an investment of USD 2.1 billion and is listed under the Brazilian Federal Government's list of strategic projects (bnamericas, 2020<sup>[39]</sup>). Specifically, the project would work on the process of revitalisation by extracting low-grade ores (with an average Fe content of 20%) and converting them to high-quality ores with a 275 total tonnes of product annum. (Permanent Secretariat of Forum for Economic Trade and Cooperation between China and Portuguese Speaking Countries (MACAO), 2022<sup>[40]</sup>).

China's Shougang Group's subsidiary in Peru, Shougang Hierro Peru (SHP), plans to invest USD 109.7 million in an expansion and integration project in their San Juan de Marcona Mine. The project aims to integrate SHP's Numbers 2-4 and 9-10 Mines to consolidate the extraction of iron ore in one location (EnergiMinas, 2022<sup>[41]</sup>). Additionally, SHP would expand their Ica Mine by 20% (20.2 ha), which would take place from 2023-26 in order to ensure the productivity and increase operations within the mine (EnergiMinas, 2022<sup>[42]</sup>).

#### ***4.2.2. Chinese steel firms are investing in Latin America's "Lithium Triangle"***

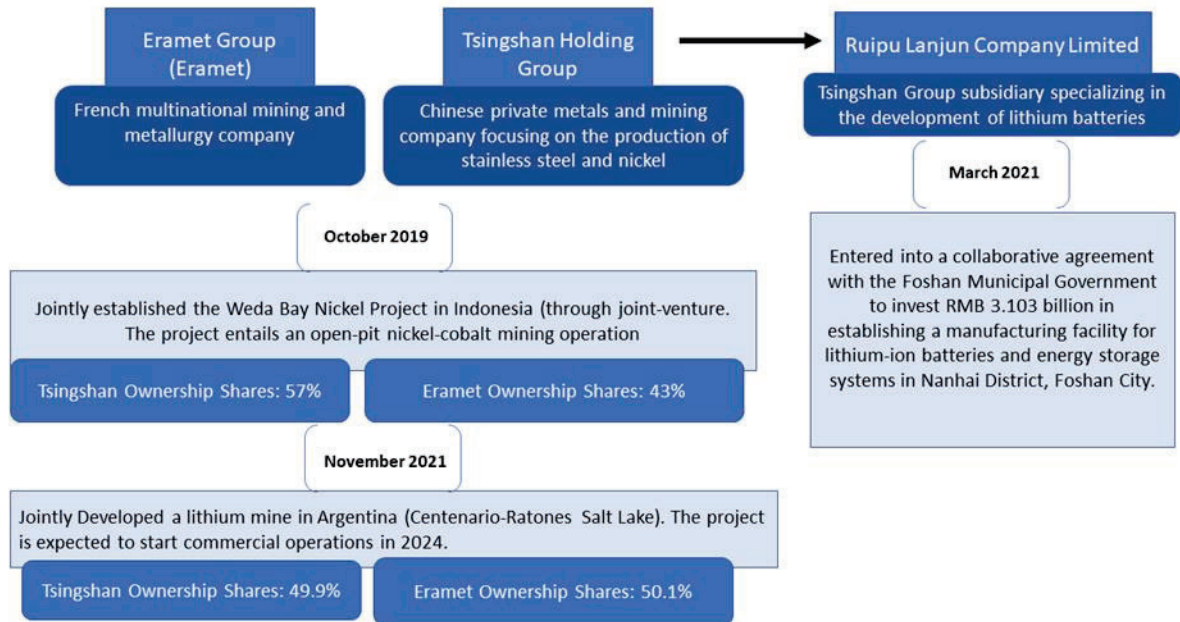
As lithium's importance increases as a critical component of clean energy systems, so will investments for its extraction within Latin America. Indeed, the region holds the largest amount of lithium, most specifically within the "Lithium Triangle" composed of Argentina, Chile, and Bolivia (Berg and Sady-Kennedy, 2021<sup>[34]</sup>). Those three countries, with the addition of Peru, contain above 67% of world lithium reserves.

Within the steelmaking process, lithium carbonate is primarily used for efficiency purposes throughout the steel molding process (Solutions for Human Progress (SQM)<sup>[43]</sup>). However, enterprises seeking lithium are usually focused on the development of lithium-ion batteries mostly aimed for the electric (automobile) industry. Having already partnered on Indonesia's Weda Bay Project (open-pit nickel-cobalt mining operation), the French steel mining enterprise Eramet cooperated with China's Tsingshan Group to develop a lithium mine in Argentina on November 9, 2021 (Tsingshan Group, 2021<sup>[44]</sup>). The 24,000-ton Lithium Carbonate Equivalent battery-grade lithium extraction project located in Centenario-Ratones Salt Lake (Argentina) began construction in 2022, and is planned to start commercial operations in 2024. Tsingshan invested a total of USD 3 million towards the project, holding a 49.9% share (BJX China News, 2021<sup>[45]</sup>).

Following its shift towards a green economy, Tsingshan aims to develop a new energy industrial chain to benefit from different extraction sectors (Tsingshan Group<sup>[46]</sup>). In order to further their presence within the lithium industry, in March 2021, Tsingshan Holdings and its subsidiary, Ruipu Energy, entered into a collaborative agreement with the Foshan Municipal Government to invest RMB 3.103 billion (USD 426 million) in establishing a manufacturing facility for lithium-ion batteries and energy storage systems in Nanhai District, Foshan City (Figure 9). The proposed manufacturing base is expected to have an annual production capacity of 30 GWh (BJX China News, 2021<sup>[45]</sup>). Ruipu Lanjun additionally is exploring opportunities to build production plants across Latin America, Europe, and Southern China (Sina Finance, 2021<sup>[47]</sup>). Tsingshan's focus on lithium extraction and downstream production has been notable, as the enterprise built a power

battery factory in India in 2019 (China Automs, 2019<sub>[48]</sub>), while continuing to expand its involvement in the lithium industry.

Figure 9. Agreements and relationships between companies involved and related processes



Source: OECD Secretariat desk research

#### 4.2.3. Latin America’s steel firms have started investing in China’s steel sector through partnership with Chinese steel firms

Foreign Direct Investment (FDI) from Latin America into China has been gaining traction, including in the steel industry. Recent collaborations between major Latin American companies and Chinese partners show the growing interest of Latin American steel firms for investing in China. China’s strategic initiatives, including preferential tax rates for enterprises located in the western region among specific tax rates that the government applies to its regions, have further bolstered the appeal of investing in the country (MOFCOM, n.d.<sub>[49]</sub>). Enterprises from Argentina, Chile, and Brazil plan to invest in China through cross-regional ties and economic relationships.

In December 2020, Tenaris and Baotou Steel entered into an agreement to establish a joint-venture company, TenarisBaosteel (泰纳瑞斯包钢), in Baotou, China, aimed at constructing a steel pipe premium connection threading plant to manufacture oil tubular goods (OCTG) products. Tenaris holds a majority stake of 60% in the joint venture, while Inner Mongolia Baotou Steel (内蒙古包钢) owns the remaining 40% (Tenaris, 2020<sub>[50]</sub>). The new plant, which spans approximately 30,000 square meters and has an initial annual production capacity of 45,000 tons, officially started operations in the first quarter of 2022 (Tenaris, 2021<sub>[51]</sub>).

On March 3, 2020, the Chilean Andean Mining Company and China Chongqing Leap Investment Co., Ltd. signed a MoU for the Domingo iron ore cooperation project at the National Logistics Hub of Orchard Port in Liang jiang New Area (Chongqing Liang Jiang New Area, 2023<sub>[52]</sub>). The project involves an investment of approximately USD 30 billion

and encompasses four cooperation sectors: smart mining area, smart port, smart power plant, and smart desalination plant. With the gradual implementation of the Domingo iron ore project, the two companies will establish a joint venture in the Orchard Port National Logistics Hub Area, strengthen commercial exchanges between China and Chile, as China will look further into foreign direct investment in Chile (Chongqing Liang Jiang New Area, 2023<sup>[52]</sup>).

The Zhongzhai Pre-blending Project has begun construction in China as a joint effort between Vale, Jiangsu Shagang Group Co., Ltd., and Ningbo Zhoushan Port Company Limited. The project, led by Ningbo Zhoushan Port, is expected to operate by 2023 and aims to establish advanced silo-blending facilities at the Zhongzhai Ore Terminal in Zhejiang Province. These facilities will be capable of blending up to 8 different iron ore products, with a total capacity of 15 million tons per annum. Once completed, the blended ores will be exclusively supplied to Shagang (Vale S.A., 2022<sup>[53]</sup>). Vale will contribute a portion of the blended loads, including high-quality products such as BRBF<sup>15</sup>, and will provide technical support for the blending activities. The innovative pre-blending service, which combines various iron ore products at the port before sintering, enhances Vale's extended supply chain, offering numerous benefits like improved ore mix quality, enhanced logistics efficiency, and reduced raw material inventory at steel mills.

#### ***4.2.4. China's steel firms are building up crude steel capacity in Latin America: the example of Brazil***

To reduce production capacity in China, Chinese steel firms approached diverse opportunities for relocation. In 2019, in cooperation with Brazil, Zhonghuan Group (中寰集团)<sup>16</sup> approached an investment and capacity relocation opportunity through the signing of the MoU on Cooperation of China-Brazil Integrated Iron and Steel (中巴钢铁综合一体化项目合作谅解备忘录签约仪式在京举办). Focused on the partnership between Zhonghuan International Trade Group Company Limited (中寰国际贸易集团有限公司)<sup>17</sup>, the integration development project is planned to take place in Port Aratu in Bahia, and to create over 30,000 jobs (Agencia Bahia Governo, 2019<sup>[54]</sup>). The project is estimated to hold an investment of USD 7 billion, the Chinese Group aims to transfer 1,500 tons of steel, supporting ancillary facilities and 1,000 million kilowatts of installed power generation capacity overseas. In addition to a steel plant, the industrial park would include a power plant, manufacturing units and a cement factory. The project aims to construct an industrial park tailored for steel production (Noticias Metro, 2023<sup>[55]</sup>). In April 2023, the current Governor of Bahia, Jeronimo Rodriguez, further conducted meetings to attract additional investment across manufacturing sectors into the planned industrial plant in Bahia holding various projects including a steel mill and power plant (Acesse Politica, 2023<sup>[56]</sup>).

## 5. World steel trade

*During the first quarter of 2023, steel exports experienced a limited decline compared to the previous year (-2.5%). This overall marginal decline results from a significant surge in exports (+18%) from China coupled with a reduction in outbound shipments from India, Russia and Türkiye.*

After experiencing a decline over two consecutive quarters, **global merchandise trade** witnessed a significant rebound in the first quarter of 2023, marking a 2% increase compared to the fourth quarter of 2022 (UNCTAD, 2023<sup>[57]</sup>). This growth was primarily driven by a revival of economic activity in China and a surge in the trade of road vehicles and pharmaceuticals. According to the WTO, eliminating tariffs and reducing non-tariff measures on some energy-related environmental goods could further boost exports by 5% by 2030. However, the current projection for the second quarter of 2023 suggests a slowdown in global trade expansion. Recent downward revisions in global economic forecasts, coupled with persisting inflation, financial vulnerabilities, and ongoing conflicts like Russia's war of aggression against Ukraine, as well as geopolitical tensions, will pose substantial challenges to international trade in the second part of the year (WTO, 2023<sup>[58]</sup>).

Steel trade has been on a persistent downward trajectory, with a notable 25.5% decline in volume since 2016 (Figure 10). Despite this decline, steel demand, measured as apparent steel use (ASU), has continued to rise, albeit at a slower pace in recent years.

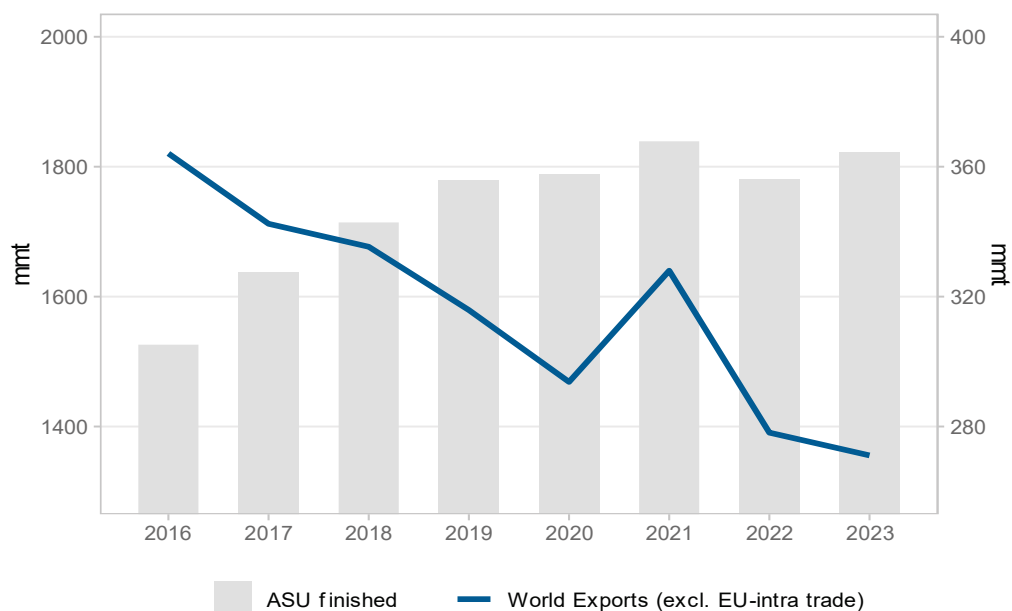
During the first quarter of 2023, there was a decline in steel exports in comparison to the previous year. Total steel exports, excluding intra-EU trade, reached 67.7 mmt, indicating a decrease of 2.5% compared to the 2022 figures. However, when taking into account EU intra-trade, the overall global exports saw a minor reduction of only 0.3%. This suggests a noteworthy recovery in EU domestic trade, which stands in contrast to the trends observed in previous years (Table 5).

The current weakness in exports seems to run counter to the positive steel demand projections for 2023 – see Figure 10. According to worldsteel, there is a projected increase of approximately 1.8% this year, bringing the total steel demand to 1814.5 mmt. However, factors such as persistent high inflation and elevated interest rates are expected to exert constraints on steel demand recovery throughout year, despite encouraging developments such as Europe's resilience amid the energy crisis, and the easing of supply chain bottlenecks (worldsteel, 2023<sup>[59]</sup>).

Worldsteel demand projections for 2024 shows a more promising outlook, anticipating a growth of approximately 1.9%. This increase is largely driven by the positive economic prospects in both European and ASEAN countries (respectively 5.8% and 5.2%) whereas China's anticipated 0% steel demand growth is expected to limit recovery. China's weak prospects on residential construction will significantly weigh on steel demand recovery in the short and medium term.

In the medium term, regions that are actively pursuing decarbonisation in their economies are expected to experience a further surge in steel demand as steel holds a strategic position as a vital material in facilitating the transition towards a greener economy (see also (EUROFER, 2023<sup>[60]</sup>)).

Figure 10. Global steel trade and demand



Note: Blue line (right axis) represents global exports of steel products (including finished and semi-finished products). Gray bars show the evolution of global ASU (left axis). Data in volumes (mmt). World export data for 2023 are annualised figures based on the first quarter of the year.

Source: OECD calculations based on ISSB and worldsteel data.

### 5.1. East and Southeast Asian economies

China, the world's largest steel producer, has seen its trade balance in steel products widen significantly so far in the first quarter of the year. Exports are at their highest level since 2016, amounting to 79 mmt in annualised terms (+20% vs 2022), while imports plummeted to 10 mmt from 17 mmt in 2022 (-40%). Low domestic demand in the construction sector, coupled with a weak RMB, helped to keep down prices of Chinese steel products, which found place in foreign markets, in particular ASEAN countries, that have experienced an increase in steel demand in the first quarter of 2023.

Looking at the breakdown at product level, the increase in foreign sales is driven mostly by shipments of flat products to Viet Nam, Korea and Thailand, and long products to Korea. On the other hand, the contraction in imports is explained by lower inbound shipments of flats from Japan and semi-finished material from Indonesia and Russia. Overall, looking at trade patterns over the period 2020-23, the Chinese trade balance in steel keeps widening from the lows observed in the mid-2020.

Japanese exports of steel have remained stable so far this year, while a modest growth in imports has been recorded despite weak demand. A strong decrease in exports of flat products to China (-32% ann. vs 2022) was compensated by higher exports of these products to Korea (+30.7%) and, to a lesser extent, Türkiye (+5.5%).

ASEAN imports of steel remained elevated in 2023. After the 2009 financial crisis, ASEAN imports have kept increasing up to reach almost 70 mmt in 2016, with a significant surge attributed to the sharp increase in shipments to Viet Nam and Thailand. Currently, ASEAN imports stand at about 50 mmt in 2023 annualised figures, which means that ASEAN economies as a group are the first importer of steel globally. Looking at the

country breakdown, to the largest importers are Thailand, Viet Nam and Indonesia (14.7, 12.3, and 13.3 mmt respectively).

## 5.2. Europe

In the EU, the steel trade dynamics have seen notable improvements in the first quarter of the year. The growth in steel exports (+3% ann. vs 2022) combined with a substantial contraction in imports (-20%) has resulted in a significant reduction of the steel trade deficit (-10.5 mmt ann. vs. -19.3 mmt in 2022). In the context of a weaker domestic steel demand expected for this year, an important increase of shipments of steel tubes, mostly to Mexico and the US, and semi-finished material to Mexico is evidenced. This was compensated by decreased exports of long and flat products to the US and Türkiye. As for imports, there has been a considerable contraction, particularly from Türkiye and Russia, focusing on finished products.

## 5.3. Americas

The US steel market showed a growth in exports (+7.3% ann. vs 2022) combined with a fall in imports (-3% ann.). In a year in which a slight rise in domestic steel demand is expected, foreign sales are growing, mostly to Mexico and Canada, in particular for flat products. The fall in imports was mainly explained by a reduction in inbound shipments of finished products (longs and flats) from the EU27, Mexico and Korea.

For Canada, the steel trade balance is also improving driven by a growth in exports, (mostly driven by an increase in shipments of tubes to the US); and a stronger reduction in imports of finished products from Türkiye, Korea, and EU; and semi-finished materials from South America.

## 5.4. Other major steelmaking economies: India, Russia, Brazil and Türkiye

India has experienced a significant growth in imports, mainly driven by higher inbound shipments of flat products from ASEAN economies and Japan. On the other hand, Indian exports remain low as a result of the export duties on steel products enacted in 2022. Most of the reduction in steel exports is due to the contraction in exports towards EU and Viet Nam.

In Russia, based on mirror information from its trading partners since the country does not publish international trade data, both exports and imports are decreasing markedly. However, a significant growth in sales to Egypt of finished and semi-finished products; and to a lesser extent, Indonesia and Brazil (semi-finished products) is observed.

In the first quarter of 2023, Brazil's exports of steel have seen a notable increase, primarily driven by higher shipments of semi-finished products to the US. Simultaneously, imports have also witnessed growth, with an upswing in purchases of semis from Russia and long products from the EU and China.

In the first quarter of 2023, Türkiye experienced a notable decline in its steel exports compared to the figures in 2022. This reduction has been observed across all major export markets, particularly in the EU, Israel, and Canada. As for imports, the country is substituting shipments of semi-finished goods from Russia and Ukraine with increased shipments from Algeria and Oman.

Table 5. Steel exports, yearly data

2017-23, major steelmaking economies

	2017	2018	2019	2020	2021	2022	2023 (Jan-Mar)	2023 (ann.)	Change 2022-23 (%)
CHN	74,489	68,378	63,295	52,707	65,817	67,580	19,928	79,711	17.95%
EU27	34,490	33,121	33,149	25,384	25,755	22,785	5,916	23,664	3.86%
IND	15,993	10,728	13,032	17,102	19,927	11,614	2,685	10,739	-7.54%
JPN	37,424	35,792	33,080	31,039	33,730	31,707	7,926	31,705	-0.01%
USA	10,133	8,534	7,195	6,536	8,080	8,248	2,213	8,851	7.31%
RUS	31,151	33,333	29,453	28,652	32,546	17,832	3,384	13,535	-24.10%
KOR	31,276	29,977	29,911	28,514	26,700	25,391	6,538	26,150	2.99%
TUR	16,272	19,759	19,618	18,563	21,921	17,418	2,670	10,682	-38.67%
BRA	15,305	13,906	12,719	10,704	11,480	12,095	3,310	13,241	9.47%
TWN	12,117	12,285	11,234	10,558	10,796	9,874	2,316	9,264	-6.18%
MEX	5,121	5,773	5,096	5,143	5,882	6,505	742	2,969	-54.35%
IDN	2,420	3,784	4,231	5,793	9,837	9,191	2,081	8,324	-9.43%
CAN	6,482	6,435	5,686	5,141	7,539	6,587	1,713	6,851	4.00%
MYS	1,709	1,679	5,147	8,474	8,297	7,113	1,667	6,669	-6.24%
EGY	1,476	1,453	1,162	2,009	1,990	1,287	404	1,617	25.70%
SAU	1,137	3,115	2,493	1,302	1,522	1,083	198	794	-26.70%
UKR	15,221	15,079	15,555	15,205	15,699	4,785	508	2,030	-57.57%
GBR	4,687	4,588	4,085	4,399	3,427	3,370	817	3,267	-3.06%
<b>WLD</b>	<b>449,778</b>	<b>443,832</b>	<b>418,715</b>	<b>385,436</b>	<b>434,471</b>	<b>376,662</b>	<b>93,864</b>	<b>375,457</b>	<b>-0.32%</b>
<b>WLD_EIT</b>	<b>342,416</b>	<b>335,342</b>	<b>315,861</b>	<b>293,737</b>	<b>327,975</b>	<b>278,122</b>	<b>67,777</b>	<b>271,109</b>	<b>-2.52%</b>

Note: All values are expressed in thousands of metric tonnes. The column labelled "2023 (Jan-Mar)" presents actual trade data for the period spanning from January to March 2023. The column labelled "2023 (Ann)" features annualized trade data for the year 2023, enabling comparisons with data from previous years. Notably, "EU27 data" specifically pertains to external trade.

The annualisation applied to the 2023 data is an approximation achieved by multiplying the January to March figures by 12/3. This method aims to facilitate year-to-year comparisons. However, it is important to acknowledge that import and export numbers often exhibit monthly variations and seasonal patterns. Consequently, annualised Jan.-Mar. 2023 data may not accurately represent the entirety of 2023.

Source: OECD calculations based on ISSB data.

Table 6. Steel imports, yearly data

2017-23, major steelmaking economies

	2017	2018	2019	2020	2021	2022	2023 (Jan-Mar)	2023 (ann.)	Change 2022-23 (%)
CHN	13,816	14,244	15,405	38,623	27,738	16,969	2,529	10,117	-40.38%
EU	42,415	46,654	41,442	34,481	45,676	42,122	8,545	34,182	-18.85%
IND	8,850	8,974	8,879	5,283	5,847	6,850	2,100	8,398	22.60%
JPN	6,190	5,997	6,415	5,174	5,427	5,287	1,367	5,467	3.41%
USA	35,146	31,506	26,906	19,972	29,319	28,653	6,943	27,773	-3.07%
RUS	6,466	6,339	6,782	4,998	4,924	1,198	258	1,033	-13.79%
KOR	19,249	14,857	16,282	11,913	13,989	13,593	4,109	16,437	20.92%
TUR	15,799	14,034	12,344	12,940	16,136	15,815	4,401	17,605	11.32%
BRA	2,282	2,346	2,306	1,995	4,885	3,269	1,017	4,069	24.48%
TWN	7,425	7,694	7,303	7,405	9,551	7,099	1,684	6,736	-5.11%
MEX	11,495	10,902	11,453	9,905	14,492	10,778	3,870	15,480	43.63%
IDN	11,411	11,691	13,432	9,703	10,227	11,198	3,314	13,257	18.39%
CAN	8,809	9,110	7,249	6,932	9,866	9,404	1,874	7,495	-20.30%
MYS	7,713	7,922	7,339	5,818	6,319	5,679	1,799	7,197	26.72%
EGY	1,638	420	591	192	1,238	2,841	498	1,990	-29.95%
SAU	4,599	5,319	7,918	7,025	3,863	4,909	1,275	5,099	3.87%
UKR	1,399	1,578	1,532	1,313	1,260	664	187	750	12.95%
PAK	3,365	3,577	2,684	2,624	3,393	2,314	374	1,498	-35.28%
GBR	7,583	7,803	7,031	4,938	6,397	5,504	1,194	4,776	-13.23%
<b>WLD</b>	<b>381,613</b>	<b>377,979</b>	<b>362,041</b>	<b>332,570</b>	<b>384,353</b>	<b>342,380</b>	<b>84,375</b>	<b>337,499</b>	<b>-1.43%</b>
<b>WLD_EIT</b>	<b>276,843</b>	<b>270,563</b>	<b>259,074</b>	<b>240,499</b>	<b>277,312</b>	<b>243,899</b>	<b>59,447</b>	<b>237,787</b>	<b>-2.51%</b>

Note: All values are expressed in thousands of metric tonnes. The column labelled "2023 (Jan-Mar)" presents actual trade data for the period spanning from January to March 2023. The column labelled "2023 (Ann)" features annualized trade data for the year 2023, enabling comparisons with data from previous years. Notably, "EU27 data" specifically pertains to external trade.

The annualisation applied to the 2023 data is an approximation achieved by multiplying the January to March figures by 12/3. This method aims to facilitate year-to-year comparisons. However, it is important to acknowledge that import and export numbers often exhibit monthly variations and seasonal patterns. Consequently, annualised Jan.-Mar. 2023 data may not accurately represent the entirety of 2023.

Source: OECD calculations based on ISSB data.

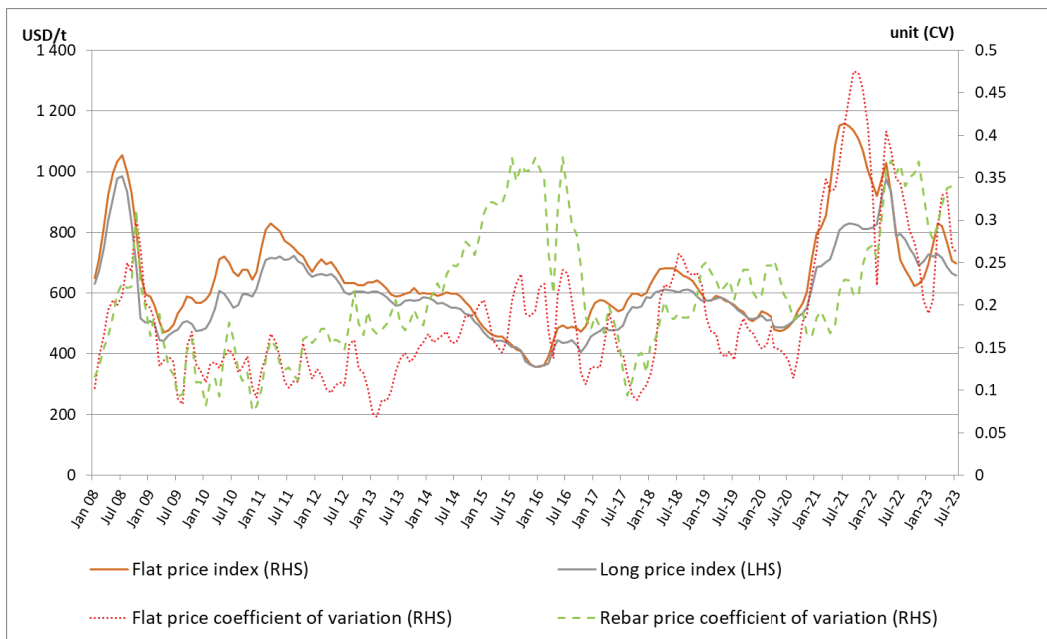
## 6. Steel and raw material prices

Steel prices have remained relatively stable during the first half of 2023, whereas the prices of the main input for crude steel have, in general, decreased significantly. The sharpest decrease was for international coking coal prices, which are 31% lower in June 2023 than they were six months before. Scrap prices have also decreased, falling by about 9%, whereas iron ore prices gained 4%. Raw material prices are thus in line with their historical averages, except for iron ore which is 10% higher. Price margins have increased, which should relieve some pressure on steel firms' net margins for the first semester of 2023.

### 6.1. Global steel prices

Broad indices of both flat steel prices and rebar prices were relatively stable, and as of June 2022 stood respectively 7% higher and 6% lower than six months earlier. Rebar and flat prices are broadly in line with their historical standards, being 7% and 10% higher<sup>18</sup>, respectively, than their average over the whole period from January 2008 to December 2022 (Figure 11).

Figure 11. Aggregate flat and long steel price averages



Note: The flat price and long steel price indices are defined as the arithmetic average of the individual regional Platts price series for the United States, Northern Europe, China, Japan and India, when available. This indicator had the closest fit to the two global Platts price indices used in Steel Market Developments reports prior to being discontinued (in September 2017). The coefficients of variation (CV) are the ratio of the standard deviation of the regional Platts price series making up the indices to their mean, thus capturing price dispersion across regions.

Source: Platts Steel Business Briefing.

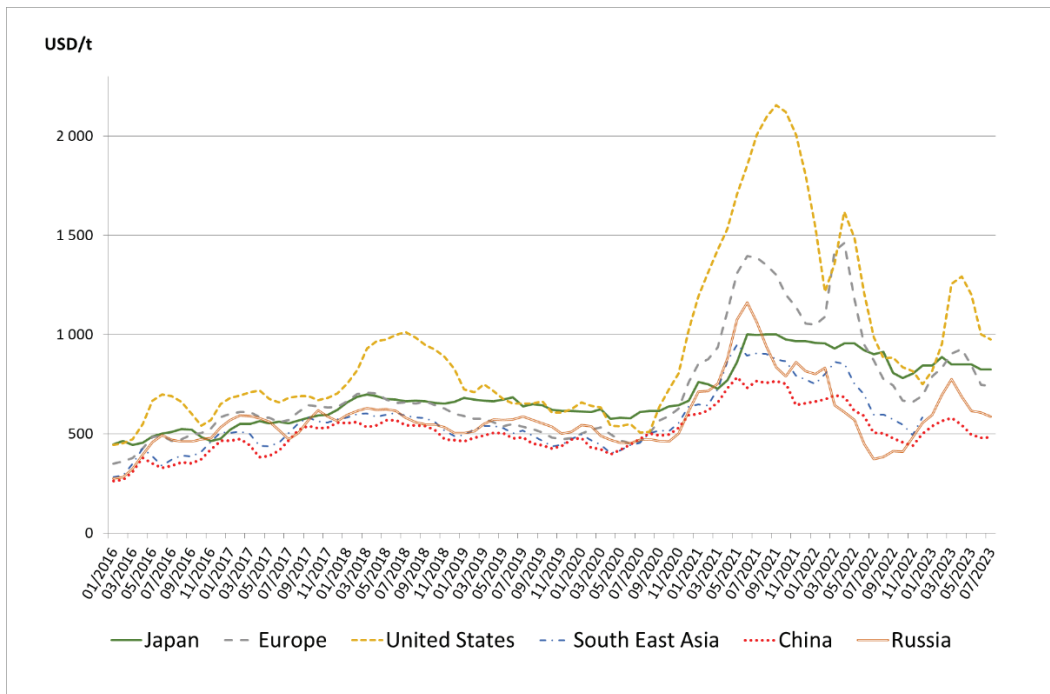
## 6.2. Steel prices per region

Flat steel product prices followed similar dynamics across regions during the first semester of 2023: an increase (albeit smaller than their 2021 jump) followed by a decrease. Nevertheless, and despite their recent decrease, flat steel product prices remain very dispersed, with, on the one hand, the United States, Europe and Japan having prices quite high historically, and, on the other hand, Chinese prices falling back in line with their historical averages (Figure 12). Rebar steel prices show an even more pronounced dispersion across regions, with Japanese and US prices being stuck at levels close to their 2022 historical highs (Figure 13).

It is not clear if the price dispersion will reduce over time. A May 2023 survey in the United States indicated that US integrated mills still saw good demand in all of their end-user market, including the automobile market for which some mills were able to raise their fixed-price contracts (Ruggiero, 2023<sub>[61]</sub>). Economic uncertainties nevertheless explain why steel buyers continue keeping their steel inventory lean. Some long products distributors believe that falling scrap prices, as well as an increasing downward pressure on US domestic prices from cheaper imports, should push US prices lower going forward (Ruggiero, 2023<sub>[61]</sub>). The market also does not expect Chinese steel prices, in particular rebar prices, to be able to increase in any significant manner, given that the deteriorating property investment and weak new home construction starts is expected to undermine seasonal demand recovery while inventory are increasing (Zhang, 2023<sub>[3]</sub>). Negative news about Country Garden, the second largest indebted real estate company after Evergrande, are continuing to weigh on the Chinese rebar market. Country Garden is currently facing a total debt of more than CNY 1.4 trillion and has become another major crisis in China's real estate market (Kallanish Asia, 2023<sub>[62]</sub>).

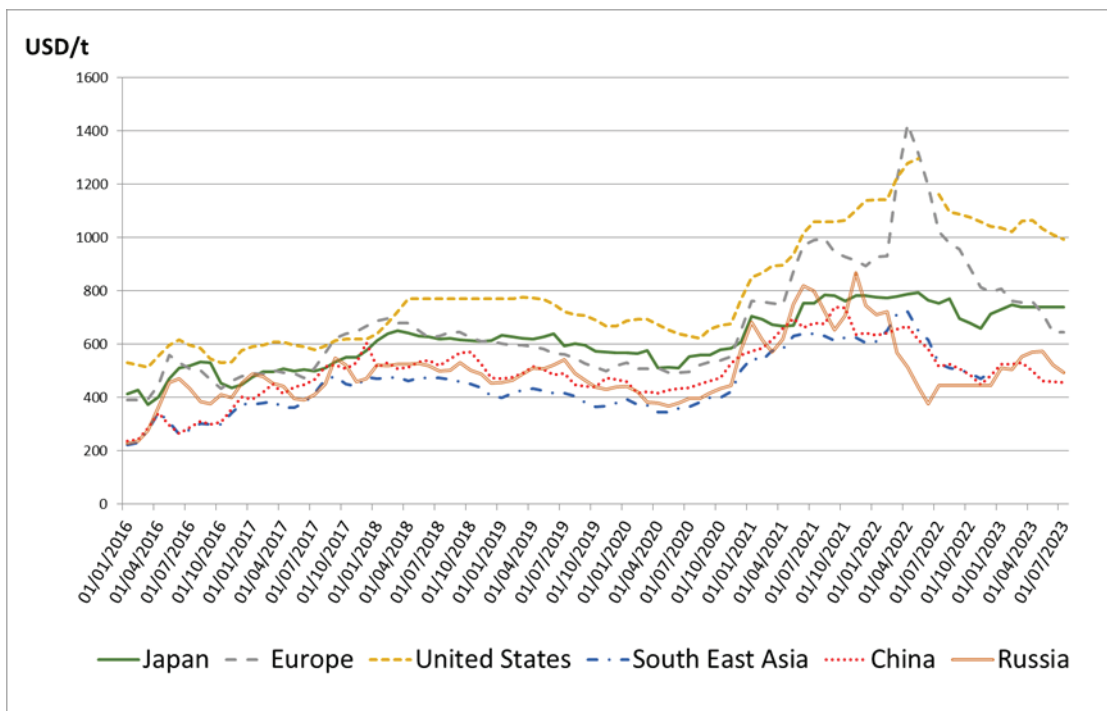
Price differentials across regions, if they persist, have the potential to change global trading patterns on the longer term, first because they make steel imports from regions with lower prices more competitive abroad, and second because they impact the price-competitiveness of steel-intensive downstream sectors such as automobile and machinery.

Figure 12. Flat steel products’ price dispersion across regions remains high



Note: Latest price: July 2023.  
 Source: Platts Steel Business Briefing.

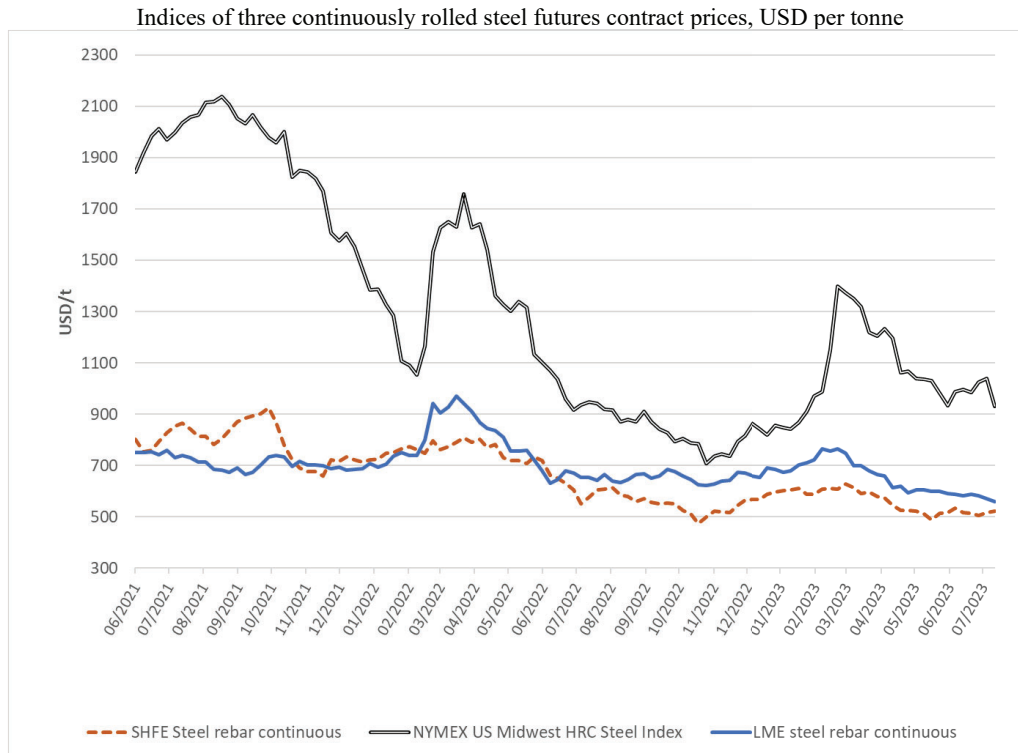
Figure 13. Steel prices for rebar have come down for China and Europe, but remain high for Japan and the United States



Note: The latest price is July 2023.  
 Source: Platts Steel Business Briefing.

Steel futures prices tend to move slightly in advance of spot prices, suggesting that they may be able to predict steel spot price dynamics at short frequencies by being quicker to incorporate new market information. Figure 14 below shows three steel futures prices obtained by rolling short-term futures provided by the London Stock Exchange Group (LSEG). They confirm a decline in nominal terms, but on a limited basis.

Figure 14. Steel futures prices (as of 25 July 2023)



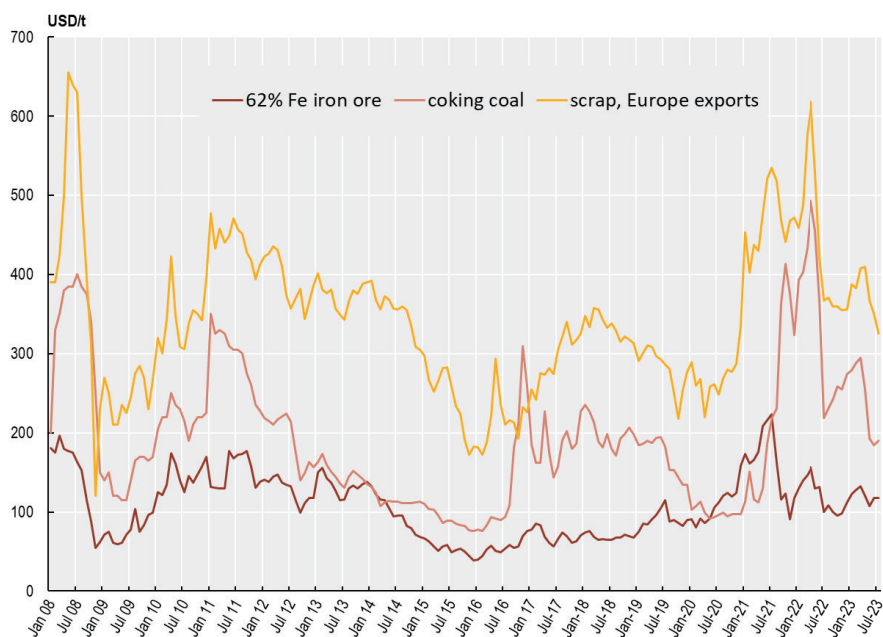
Note: NYMEX US Midwest futures prices were converted to correspond to metric tonnes rather than short tons. SHFE Steel rebar futures prices were converted from RMB to USD using daily exchange rates at closing. For more information on contract specifications, please refer to <https://www.lme.com/en-GB/Metals/Ferrous/Steel-Rebar#tabIndex=0> for LME steel rebar contracts; to <http://www.shfe.com.cn/en/products/SteelRebar/contract/9220216.html> for SHFE steel rebar continuous contracts, and to <https://www.cmegroup.com/education/files/hot-rolled-coil-steel-index-futures-options.pdf> for NYMEX US Midwest HRC contracts. For a more detailed description of steel futures market, see (OECD, 2018<sup>[63]</sup>). Source: LSEG.

### 6.3. Steel raw material prices

Prices of scrap and coking coal have decreased during the first semester of 2023, albeit to a lesser extent than during the first semester of 2023. As of end of June 2023, coking coal prices and scrap prices are largely in range with their historical levels: coking coal prices are only 2% higher than their historical average over the period 2008 to 2022, not adjusting for inflation, while scrap prices are 5% lower than their historical average for that period (Figure 15). Iron ore prices, on the contrary, are 10% higher than historically, in nominal terms (Figure 15). Recession concerns are pulling down steel demand and raw material prices globally, and the Ukraine war has had a disruptive effect on raw material prices by changing trade routes (Platts, 2022<sup>[64]</sup>). The higher price of iron ore and lower prices for

scrap and coking coal translates into a typical basket of raw material which is in line with historical averages over the period 2008 to 2022 (1% above the average).

**Figure 15. Prices for key steel-making raw materials (as of January 2023)**



Note: The iron ore price series is Platt's "Forwards / SGX 62% Fe Iron Ore cash-settled swaps (dry metric tonne) / China import CFR Tianjin port USD /t"; the coking coal price series is LSEG's "Premium Coking Coal Australia"; the scrap price series is Platts "Scrap / Shredded / N.Europe domestic delivered USD /t"

Source: Platts Steel Business Briefing (SBB), LSEG.

Going forward, many market participants believe there is a limit to the downside in scrap prices after June 2023, given that many EAF mills are still running at utilisation rates which are below year-ago levels and would thus take advantage of lower scrap prices to increase their production (Ruggiero, 2023<sup>[61]</sup>). Over the longer term, scrap scarcity and too high scrap prices do remain a main challenge for the steel industry. Some countries are taking concrete steps to improve scrap availability. For example, the Indian government is working on various policies on recycling projects to support generating enough scrap to cater to the rising domestic scrap demand in India and become self-sufficient in scrap in the next decade, according to the Material Recycling Association of India (MRAI) vice president Zain Nathani (Aameer, 2023<sup>[65]</sup>). Scrap is not only a crucial raw material for the EAF route, with supply availability being a worry in steel markets for some time now, but a also crucial for the achieving the decarbonisation of the steel sector (Box 2).

### **Box 2. Scrap and the circular economy are key building blocks for steel decarbonisation**

#### **Scrap and the circular economy are two key building blocks for steel decarbonisation.**

To comply with Paris Agreement objectives, direct emissions of global steel production have to decrease by 90% by 2050. Despite regional heterogeneities in decarbonisation pathways, net-zero scenarios suggest that circular economy and ferrous scrap will play

a key role in reaching near zero emission steel globally. It further highlights the growing strategic nature of scrap in a decarbonisation context.

**Uneven scrap use across economies, uneven role in crude steel production.**

Scrap accounts for about 30% of the total metallic input to steel production globally, and global scrap use reached 630 mmt in 2022. China remains by far the largest user of scrap for steel production in the world, representing nearly 35% of global scrap use in 2022, followed by the EU (13 %) and the US (9%). Mirroring differences in steel asset's structure, the share of scrap in steel production strongly differs across economies. While scrap accounts for a small share of China's crude steel production (around 20%), it accounts for 85% in Türkiye.

**Imports and exports of scrap are concentrated in a limited number of economies.**

The five biggest scrap exporters (US, EU, Canada, Japan, and the UK) together represented around 85% of total exports in 2022. As for scrap imports, the ten biggest importers accounted for nearly 90% of the global volume. India and Türkiye – the two largest importers – together accounted for around half of total global imports. On balance, there is little two-way trade in the global scrap steel market; most net-importing economies export little or no scrap. Similarly, of the most important net-exporting economies, only the US and the EU import a significant (albeit relatively small) volume of scrap. Some countries had low steel production in the past and thus have little scrap available, and hence cannot export scrap. Higher current production and domestic consumption in most of those countries nevertheless indicate that they are well positioned for future scrap generation.”

**Current scrap export restrictions have a relatively limited scope.**

On the trade side, only around 10% of global scrap traded volume is subject to export restrictions, mainly through export taxes. Among OECD countries there were nearly no restrictions in place in 2021. Most export restrictions were implemented by African countries, many of which play a small role in the global scrap trade and steelmaking capacity.

**Circularity in the steel sector has various dimensions: reduce, reuse, remanufacture and recycle.**

The ‘4Rs’ provides a comprehensive approach to circularity in the steel sector through:

- Reducing, by decreasing the quantity of resources and energy used for production, as well as reducing the weight of products.
- Reusing, by using a product again - either for its original or for a similar purpose - without significantly altering its physical form.
- Remanufacturing, by restoring durable steel products to as-new condition.
- Recycling, by melting steel products at the end of their life to create new ones.

**The potential for emission reduction can be harnessed by material efficiency strategies, at every stage of steel products' lifecycle.**

The concept of material efficiency refers to delivering goods and services using less material. Such strategies can be applied at various stages in the life cycle, including in the design, manufacturing, use and end of life phases. Material efficiency strategies could significantly contribute to reducing global emissions from the steel sector. Net-

zero scenarios indeed highlight that such measures could lower steel demand by at least 20% in 2050, compared to a business-as-usual approach.

**Despite on-going efforts in the steel industry, the circular economy faces multiple barriers.**

Steel producers are taking up circular economy practices, but challenges remain for a wider implementation. Economic barriers - whether related to secondary metals market, government support or un-priced environmental externalities as well as the lack of policy incentives and governance structure - may hamper the uptake of circular models. Enabling market forces to drive price signals should also receive greater attention. These signals are amongst the best incentives to stimulate supplies of scrap on the market for steel producers.

Another challenge lies in the necessity to consider a product's life cycle approach (including eco-design considerations and Extended Producer Responsibility), and the involvement of all the stakeholders along the value chain. Finally, other challenges related to scrap include the downgrading of recycled steel, the required infrastructure for sorting and collecting, or the insufficient data and tracing on scrap composition.

**Scrap policies and steel circularity plans are scarce and would benefit from a stronger implementation focus.**

Policies aiming to foster domestic scrap supply and use are scarce, as are circular economy policies focusing on steel.

Several steel-producing economies have announced circular economy plans. However, these strategies vary on the sectors' coverage, and existing circular economy policies are mainly focused on end products. Furthermore, there are differences across plans in terms of levels of ambition and implementation.

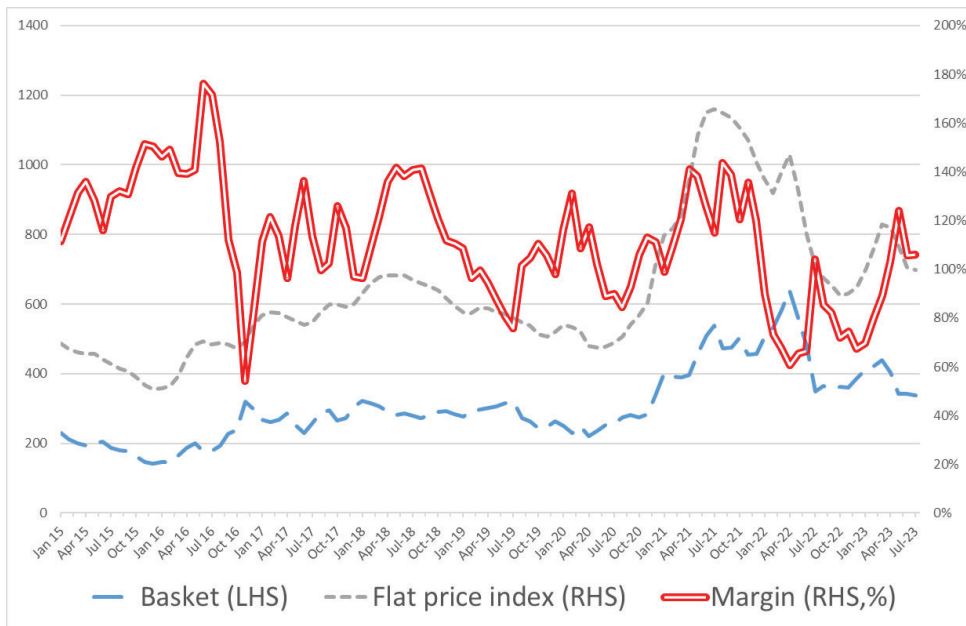
In most cases, both scrap policies and circular economy strategies would benefit from further measurable targets and implementation details. This reinforces the need for developing an enabling regulatory and policy framework to support the uptake of scrap and steel circularity in a net-zero context.

Source: "The role of steel scrap in decarbonising: implications for supply, demand and trade of steel scrap", 94<sup>th</sup> Steel Committee held on 25-26 September 2023, <https://web-archive.oecd.org/2023-10-09/664054-94th-session-of-the-steel-committee.htm>.

Furthermore, iron ore prices are expected to be sustained by Chinese demand, as it is believed (as of 23 August 2023) that the Chinese government is studying the issuance of a new round of about CNY 1.5 trillion of local government special refinancing bonds in order to ease the financial pressure on local governments (Kallanish Asia, 2023<sup>[66]</sup>). This would help local government continue their infrastructure projects and thus translates into a continuation of iron ore imports.

The steel raw material price margin, measured by the difference between the price of steel and a generic basket of steel inputs, has jumped following the decrease in raw material costs and sticky steel prices. Indeed, at the beginning of the year, the margin indicator between steel products' prices and a representative basket of raw materials needed to obtain steel products was 32% lower than historically, whereas as of June 2023, six-months later, they are in line with their historical average (+1% higher)<sup>19</sup> (Figure 16).

Figure 16. The margin between steel and raw material prices has started to increase again



Note: Last data point is June 2022. The raw materials basket for steel production is made up of 70% of the usual quantities of iron ore (1.6 tonne) and coking coal (0.77 tonne) needed to produce steel in the integrated process and 30% of the quantity of ferrous scrap (1.07 tonne) needed to produce steel in the electric arc furnace process (see OECD, 2016). Prices used are as follows: Iron ore Fines, 62% Fe, SPOT, CFR China; Hard coking coal spot, FOB Australia; Scrap, shredded North Europe domestic price. The basket is compared against HRC world prices. The margin is defined as the percentage difference between the steel flat price and the raw materials basket price.

Source: OECD based on data from LSEG and Platts Steel Business Briefing (SBB).

## 7. Financial performance of steel companies

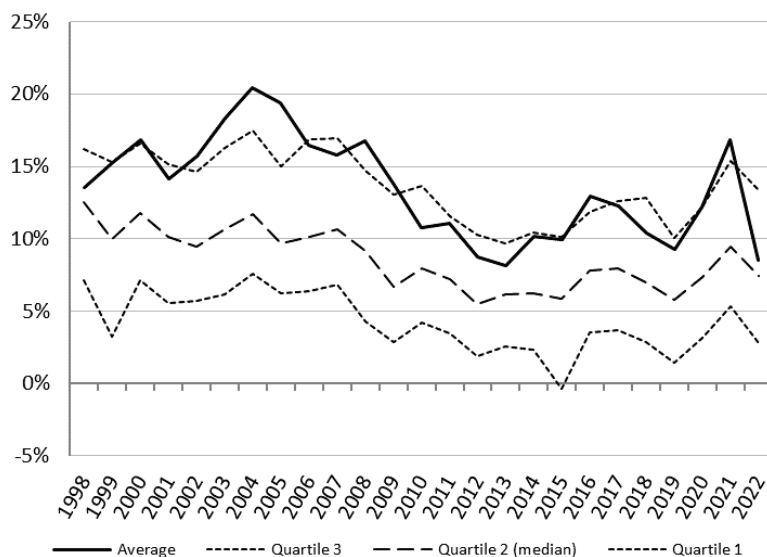
The year 2022 witnessed a sharp reversal of the upward trend in steel firms' profitability that had started in 2019, with average profitability levels being cut by half, and falling below their previous 2019 lows. Steel firms' deleveraging trends also reversed in 2022, with average indebtedness staling at similar levels than in 2021 or even increasing for the most indebted firms, and with most steel firms increasing the share of their short-term debt relative to their longer term borrowings.<sup>20</sup> This financial deterioration was accurately predicted in the previous edition of the Steel Market Development report Paper Series (OECD, 2023<sub>[67]</sub>), which pointed out the conjugated effects of an adverse global economic outlook and of the sharper correction of steel prices compared to steel key raw material prices that happened during the first half of 2022.

### 7.1. Profitability

The average operating profitability<sup>21</sup> of the global steelmaking industry fell by half from 2021 to 2022, standing at 8.5% in 2022 compared to 17% one year earlier (Figure 17). Median operating profitability also decreased, albeit to a lesser extent, from 6.7% in 2021 to 4.3% in 2021, as well as the other quartiles of the distribution of firms' profitability, indicating that the fall in profitability affected steel firms across the board. In the previous edition of this Steel Market Development paper series (OECD, 2023<sub>[67]</sub>), the sustainability of higher levels of profits for steel firms witnessed in 2022 had already been questioned, and was attributed to speculative price swings in the face of uncertainty rather than to lasting structural improvement of steel markets that would make the steel sector resilient and its growth sustainable.

Furthermore, profitability is probably still below sustainable levels for a number of steel firms. For example, the third quartile line in Figure 17 indicates that in 2021, 25% of the companies had operating profitability levels below 2.8%.

Figure 17. Evolution of operating profits between 1998 and 2022



Note: Operating profitability is defined as EBITDA (earnings before interest, taxes, depreciation and amortisation) to sales revenue in per cent. The dotted lines provide information on the distribution (first and third quartiles) of operating profitability across the firms in the sample: 25% of the companies have operating profitability below (above) the first (third) quartile line. The long dashed line provides information on median operating profitability across firms in the sample: this line divides the distribution in two halves with 50% of the companies having operating profitability below the line. The heavy line depicts the industry average operating profitability, weighted by total sales.

Source: OECD calculations based on data from LSEG.

The steel industry’s net profit, which is derived from operating profit by deducting all expenses incurred by firms, including taxes, interest paid on debt, depreciation and amortisation, paints a similar picture of deteriorating margin conditions in the year 2022 (Figure 18). Median net profit margins were 2.9% in 2022, below their recent 2019 lows, compared to 10.6% in 2021, which represents a 73% drop in net profit margins. The decrease is similar across all quartiles of the distributions, suggesting that the same factors, such as high energy costs, increased wage costs and increased financing costs, are weighing down on firms’ net profits across the board.

Figure 18. Evolution of net profit margin between 1998 and 2022



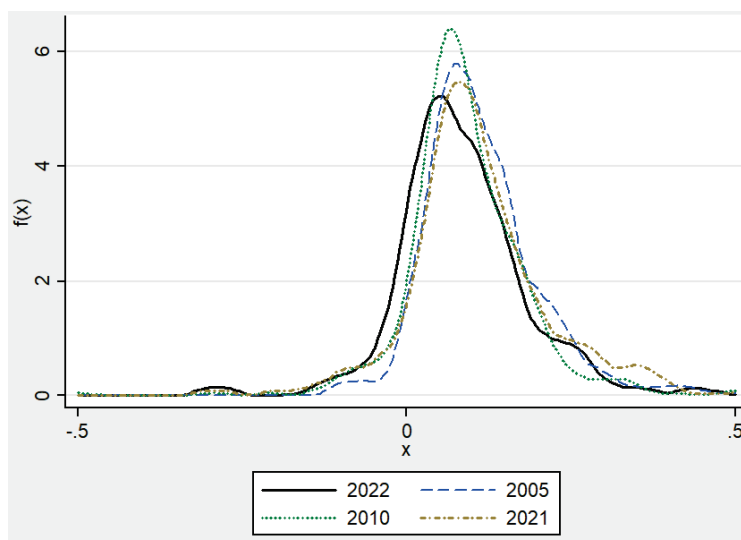
Note: The dotted lines provide information on the distribution (first and third quartiles) of net profits across the firms in the sample: 25% of the companies have net profits below (above) the first (third) quartile line. The long dash line provides information on median net profits across firms in the sample: this line divides the distribution in two halves with 50% of the companies having net profits below the line. The heavy line depicts the industry average net profits, weighted by sales.

Source: OECD calculations based on data from LSEG.

Figure 19 below shows how the distribution of net profit margins across steelmaking companies has changed between 2005, 2010, 2021 and 2022. After a strong shift in the distribution towards the left (i.e. lower profitability) between 2005 and 2015, the distribution shifted back to the right in 2021, seemingly regaining a position comparable to the one it had 2005, albeit with a larger dispersion, which indicates a greater number of underperforming and better performing firms in 2021 compared to 2005 (fatter tails).

Nevertheless, in 2022 the distribution shifted abruptly to the left again, indicating lower profitability across the board.

**Figure 19. The distribution of steel firms' profits, as measured by EBITDA, shifted over the years**



Note: This figure plots the distributions of net profit margin in different years using kernel density estimates. The kernel density estimate gives an approximation of the probability density function of a given distribution — up to a given point  $x$  in the horizontal axis, the area under this function provides the percentage of observations that have values that are lower or equal to  $x$ . The total area below the curve for each year equals one. For presentation purposes, the net profit values shown on the X axis of the chart range between 50% and 50%.

Source: OECD calculations based on data from LSEG.

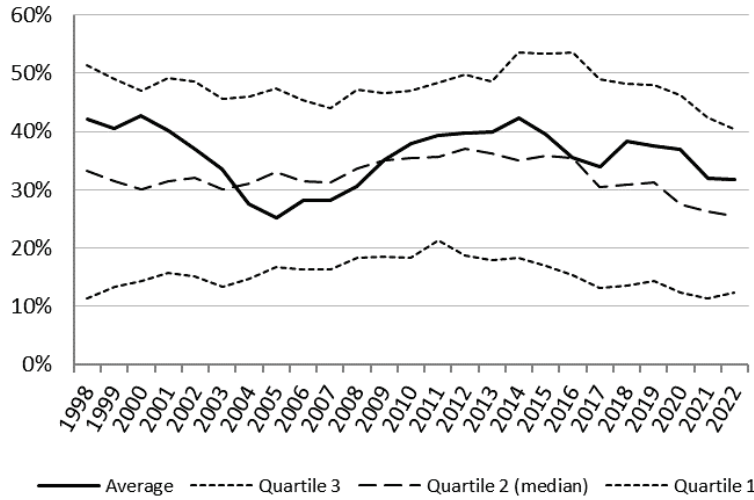
## 7.2. Indebtedness

Overall, the steel sector seems to have stopped its deleveraging process, with average debt levels relative to assets falling from 42% in 2014 to 32% in 2021, and remaining at the same level in 2022 (Figure 20).

As in previous reports, caution is warranted in interpreting steel companies' indebtedness. First, there are sample limitations in the data presented in this section as only debt of publicly listed companies is included in the LSEG data used for this report. Hence, debt levels represented in Figure 20 exclude data for unlisted firms (including state-owned companies), some of which are possibly large and indebted. Second, in some large steel-producing economies, debt has been reduced by using debt-for-equity swaps that are not necessarily market-driven and lack clarity concerning losses in cases of bankruptcy. Finally, the maturity of the debt and the average interest rate paid are two other relevant aspects to consider for assessing corporate indebtedness. This means that the total indebtedness represented in Figure 20 does not completely capture steel firms' financial conditions, which may be more precarious than they seem.

Figure 21, which tries to capture the ratio of total liabilities<sup>22</sup> of steel firms to their assets, paints a slightly more positive picture of steel firms deleveraging continuing into 2022.

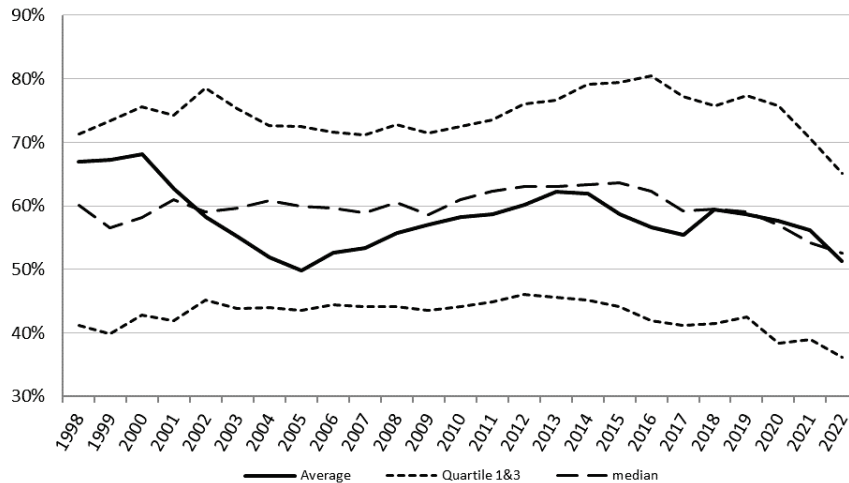
Figure 20. Evolution of indebtedness between 1998 and 2022



Note: The dotted lines provide information on the distribution (first and third quartiles) of indebtedness across the firms in the sample: 25% of the companies have debt to asset ratios below the quartile line at the bottom of the chart, and 25% have ratios above the quartile line at the top. The remaining 50% of companies have debt to asset ratios between the first and third quartile lines. The long dash line provides information on median indebtedness across firms in the sample: this line divides the distribution in two halves with 50% of the companies having debt to assets ratios below the line and 50% above the line. The heavy line depicts the industry average indebtedness, weighted by sales.

Source: OECD calculations based on data from LSEG.

Figure 21. Ratio of steel firms' liabilities over assets

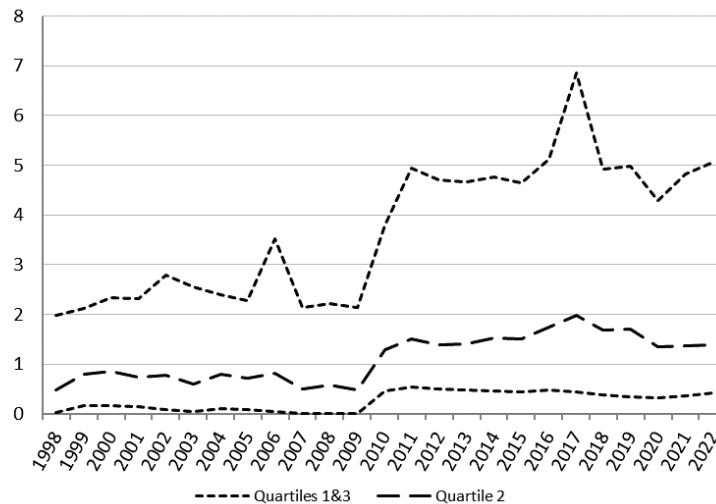


Note: Liabilities are defined here as total liabilities, including short-term and long-term debt, account payables and deferred income tax. Assets are defined as total assets, which includes properties, plants, long-term investments, but also intangibles (e.g. patents). The dotted lines provide information on the distribution (first and third quartiles) of the ratio of liabilities over assets across the firms in the sample: 25% of the companies have liabilities to assets ratios below the quartile line at the bottom of the chart, and 25% have ratios above the quartile line at the top. The remaining 50% of companies have liabilities to assets ratios between the first and third quartile lines. The long dash line provides information on median ratio of liabilities over assets across firms in the sample. The heavy line depicts the industry average ratio, weighted by sales.

Source: OECD calculations based on data from LSEG.

Figure 22 considers the composition of steel firms' debt in more detail, as it compares the level of long-term (debt of maturity superior to one year) versus short-term debt (debt of maturity less or equal to one year). It shows that the median amount of short-term debt relative to the amount of long-term debt of steel companies in the sample has increased in 2022. A potential explanation could be steel firms trying to decrease further their borrowing costs to boost their net profits, by borrowing more at the shorter end of the curve. Another potential explanation could be more reluctance from investors to lend to steel firms at longer maturities, given the uncertainty in the financial health of the sector.

**Figure 22. Ratio of short-term debt over long term debt of steel firms**



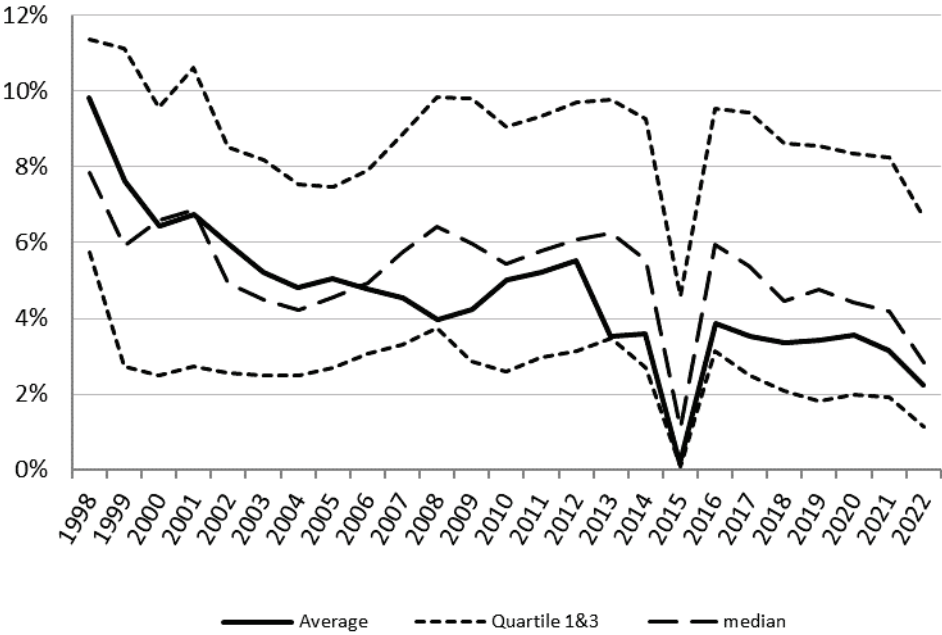
Note: The dotted lines provide information on the distribution (first and third quartiles) of debt composition, represented by the ratio of short term debt over long term debt, across all the firms in the sample: 25% of the companies have a short term debt over long term debt ratio below the quartile line at the bottom of the chart, and 25% have ratios above the quartile line at the top. The remaining 50% of companies have debt to asset ratios between the first and third quartile lines. The long dash line provides information on the median short term debt over long term debt ratio across firms in the sample: this line divides the distribution in two halves with 50% of the companies having debt to assets ratios below the line and 50% above the line.

Source: OECD calculations based on data from LSEG.

In 2021, steel firms paid an average (weighted by sales) interest of 2.2% on their outstanding debt (across all maturities) in 2022, compared to 3.2% in 2021, as shown in Figure 23. This is an historical low, and, besides the shortening of the maturity of their debt, which can explain part of the decrease, seems at odds with the general increase of interest rates worldwide.

Nevertheless, there are significant differences in debt's costs across steel firms, as can be seen by the large differences between the first and third quartile: from the third quartile line we can see that 25% of steel firms pay higher than 6.6% interest rates on their debt, while the first quartile indicates that 25% of steel firms pay less than 1.1% on their debt.

Figure 23. Evolution of interest paid on total debt from 1998 to 2022



Note: The dotted lines provide information on the distribution (first and third quartiles) of interest paid over total debt across the firms in the sample: 25% of the companies have a ratio of interest paid over total debt below the quartile line at the bottom of the chart, and 25% have ratios above the quartile line at the top. The remaining 50% of companies have ratios of interest paid over total debt between the first and third quartile lines. The long dash line provides information on the ratio of interest paid over total debt across firms in the sample. The heavy line depicts the industry average indebtedness, weighted by sales.  
 Source: OECD calculations based on data from LSEG.

## 8. Steel consumption and outlook

*In its April 2023 Short Range Outlook (SRO), worldsteel forecasts steel demand to resume growth in 2023 by 2.3% to 1 822.3 mmt, and to expand further in 2024 at 1.7% to reach 1 854.0 mmt.*

*The global economy is expected to continue to recover, albeit at a slower pace, and against a challenging environment. Restrictive monetary policies are negatively affecting investment and consumption decisions with an impact on overall economic activity. In this context, steel demand is forecast to show only a moderate recovery after a 3.2% decline in 2022. Growth is expected to be driven by manufacturing production, offsetting in this way weak steel demand from residential construction, notably in China.*

*Prevailing conditions of high interest rates and elevated inflation are expected to remain a major headwind for steel demand. Risks of second-round effects on inflation forcing a continuation of the hiking cycle could dampen growth prospects.*

### 8.1. Global steel market outlook

Global apparent steel consumption outside China has registered an increase of only 1.4% during the first half of 2023. The year is expected to result in an overall expansion of 2.2%. High interest rates are increasing the cost of credit and affecting firms' collateral, thus discouraging investment in fixed assets and equipment and the consumption of durable goods. Public infrastructure spending is also likely to be dampened in a context where private residential construction activity remains depressed. Towards the end of 2023 and early 2024, growth is expected to accelerate as a result of improved economic expectations. A continuation of the downward trend in inflation and a likely end in the interest rate hike cycle could boost growth. These factors should positively impact steel demand throughout 2024. As of 18 August 2023, World Steel Dynamics expects global steel consumption outside China to increase by 3.1% during the second half of 2023 compared to the same period last year (World Steel Dynamics, 2023<sup>[68]</sup>).

Additional government stimulus measures in the Chinese economy announced in July 2023 are expected to have a positive although moderate impact on global steel demand. This will depend on the reaction of the residential construction market in that country to the improvement in financial conditions aimed at encouraging private investment. The reaction of public infrastructure investment alone is unlikely to be sufficient to sustain the market.

### 8.2. Regional steel market outlook

#### 8.2.1. Americas

In Central and South America, amid weak growth prospects, steel demand is expected to increase by a moderate rate of 1.4% in 2023 and to accelerate to 2.3% in 2024 (Worldsteel Association, 2023<sup>[69]</sup>).

In Argentina, after a first half of 2023 in which crude steel production increased by 6.5% compared to the same period last year, expectations point to a worse performance in the second half due to the slowdown in the local economy, strong upward exchange rate pressure, and increasing regulatory constraints on importing key intermediate goods (Cámara Argentina del Acero, 2023<sup>[70]</sup>).

In Brazil, during the first quarter of 2023 steel consumption showed a slight growth of 0.6% year-on-year, mainly led by flat products (+1.9%). In the same period, local production of crude steel fell by 9.8% and imports increased by 22% (Intituto Aço Brasil, 2023<sup>[71]</sup>). The outlook for 2023 is negative, with steel consumption expected to decline by 1.5-2% amid weak performance of the main steel consumption sectors, such as automobiles, capital goods and civil construction, (Kallanish, 2023<sup>[72]</sup>).

In Chile, the Chilean Steel Institute (ICHA) reported that apparent steel consumption in the first quarter of 2023 registered the lowest level in 5 years (603 thousand tonnes), representing a fall equivalent to 12.7% compared to the same period of 2022. The contraction was mainly explained by a strong decrease in the consumption of steel long products, which fell by 29.5% year-on-year, while flat products expanded by 2.6%. Weak demand for steel is particularly noticeable in the construction sector, where a cumulative decline of 36.9% year-on-year in new building area has been recorded up to the first half of 2023, which partly explains the decrease of demand for long-products. This led the ICHA to revise its projections for apparent steel consumption for 2023 from a 7.1% increase last April to only 1.2% in their last report in August (Instituto Chileno del Acero, 2023<sup>[73]</sup>).

In Colombia, the economy is going through a slowdown with a fall in investment due to low dynamism in construction and a reduction in machinery and equipment output, which is affecting steel demand. The private housing market is in sharp decline, with new construction licenses falling 26.4% year-on-year in the first half of 2023. The central bank forecasts that GDP will grow by only 0.9% in 2023 (Banco República, 2023<sup>[74]</sup>).

In North America, steel demand is expected to increase a moderate 1.6% year-on-year to reach 135 mmt after a 3.1% drop in 2022. In 2024, growth would accelerate slightly to 2.3% (Wordsteel Association, 2023<sup>[69]</sup>).

In Canada, during the first half of 2023, the economy surprised by showing higher than expected growth. Household spending was robust, supported by a tight labour market, population growth and accumulated savings. In the second part of 2023, high interest rates and a low expected dynamism of exports will have a negative impact, thus moderating growth. The Canadian central bank forecasts that the economy will grow 1.8% in 2023, with a slowdown in the second half (1.0%). The higher cost of financing is already impacting the property market and durable goods consumption. A decrease in investment in large infrastructure projects by businesses is also expected (Bank of Canada, 2023<sup>[75]</sup>).

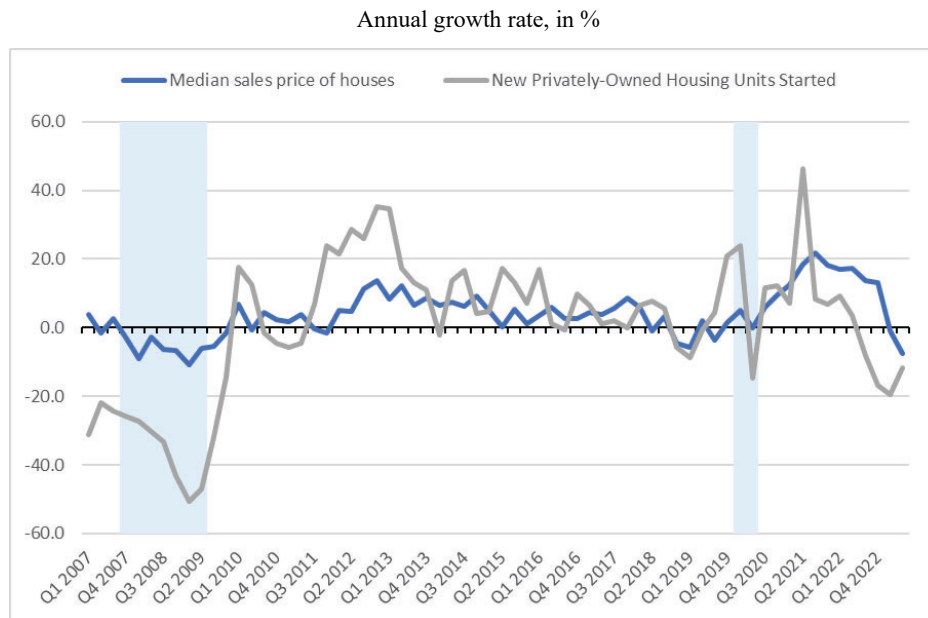
In Mexico, although overall GDP proved resilient in the first quarter of 2023 and recorded higher-than-expected growth, steel demand related sectors, such as construction and manufacturing production, slowed down. In the case of construction, an increase in commercial real estate and public infrastructure investments like railroad and electricity infrastructure in the central and southern states of Mexico counterbalanced weak residential investment (Real Estate Market, 2023<sup>[76]</sup>). The latter continues to be affected by interest rate hikes and structural factors, which have led construction companies to diversify into the office and industrial segments, which are more attractive from a risk-return standpoint than the residential real estate market (Arena Pública, 2023<sup>[77]</sup>). The Central Bank foresees a slowdown in GDP for 2023, which would reach 2.3%, after 3.1% recorded in 2022 (Banco de México, 2023<sup>[78]</sup>).

In the United States, steel consumption has been in a downturn during the first half of 2023, based on a 3.6% cumulative year-on-year drop in steel shipments, and a 15.9% year-on-year plunge in final steel imports for the January-July 2023 period (American Iron and Steel Industry, 2023<sup>[79]</sup>). In an environment of high interest rates and inflation still above the Federal Reserve's target, demand is suffering from the low activity levels in capital

goods manufacturing and, particularly, in residential construction. During the first half of 2023, housing starts was down 15.7% while house prices dropped 4.2% with respect to the same period of 2022, indicating that market demand is weak (Figure 24). Other steel consuming sectors, such as automotive and non-residential construction, on the other hand, have been growing at a good pace, partially offsetting the overall decline. Many U.S. steel mills are seeing record shipments in 2023 of flat products related to the automotive industry (Argus Media, 2023<sup>[80]</sup>). In this context, apparent steel consumption is expected to recede by 2.3% in 2023. However, a recovery is foreseen in the early months of 2024, coinciding with the an expected end of the Federal Reserve's interest rate hike cycle and a positive shift in the residential construction market (World Steel Dynamics, 2023<sup>[68]</sup>). In line with this forecast, tubular makers that provide pipes to the oil and gas industry in the US expect some uplift in demand only for the fourth quarter of 2023 after a long slowdown throughout the year (Argus Media, 2023<sup>[81]</sup>).

In the coming years, demand for U.S. steel is expected to remain strong due to planned 8-year public infrastructure investments in bridges, highways, rail infrastructure, airports and others (Fast Markets, 2021<sup>[82]</sup>); and tax incentives and subsidies under the Inflation Reduction Act that will favour the adoption of green technologies, particularly in the energy sector (solar, wind, carbon capture and clean hydrogen) (Fast Markets, 2023<sup>[83]</sup>). According to figures estimated by the American Iron and Steel Industry and World Steel Dynamics, these initiatives could collectively represent an additional 3.3 mmt per year of steel demand in the U.S. (World Steel Dynamics, 2023<sup>[68]</sup>), which will impact positively the steel industry.

**Figure 24. Weak activity in US residential market**



Note: The shaded area corresponds to recessions in the U.S. economy

Source: US Census Bureau and Federal Reserve of St. Louis

### 8.2.2. Africa and the Middle East

According to worldsteel's April 2023 SRO, African steel demand is expected to fall slightly by 0.2% in 2023 and resume grow at 4% in 2024 (Worldsteel Association, 2023<sup>[69]</sup>).

In South Africa, during the first half of the year, the economic activity felt the effects of the most severe electricity shortage crisis in the country's history due to a lack of investment in power projects that forced some steel mills to suspend activities for a period of time (voanews, 2023<sup>[84]</sup>). Balance sheets of steel companies also deteriorated because of significant raw material and electricity increases, and a drop in domestic steel prices (Reuters, 2023<sup>[85]</sup>). Manufacturing and mining sectors, important for steel demand, recorded year-on-year declines of 1.3% and 4.2% in the first five months of the year which was partially offset by significant growth in the automotive sector, with car sales increasing 3% in the first half compared to the same period last year. In this scenario, the local steel demand outlook for the year remains negative, with projected crude steel production reaching about half of previous peak historical performances and many mills looking to increase steel exports in other African countries (Creamer Media's Engineering news, 2023<sup>[86]</sup>). However, by 2024-2025, the sector could see the positive impact of some infrastructure investments presented in the national budget supporting projects in transportation and logistics, water and sanitation, and the construction sector (njr steel, 2023<sup>[87]</sup>).

In the Middle East and North Africa (MENA), steel demand is expected to increase by 0.6% and 3.4% in 2023 and 2024, respectively (Wordsteel Association, 2023<sup>[69]</sup>). The weak expansion expected this year comes amid deteriorating economic expectations. The International Monetary Fund (IMF) announced lower growth expectations in its July 2023 report to 2.5% for 2023 (versus 2.9% in last April) and 3.2% for 2024 (versus 3.5%), pointing to the lower activity in the oil and gas industry in Saudi Arabia, where production cuts are expected for 2023 amid more restrictive macroeconomic measures (IMF, 2023<sup>[88]</sup>).

In Egypt, the economy is facing very high inflation, which reached 36.5% in July 2023 compared to the same month of the previous year and peaked at over 4.5% month on month in January and February (70% annualized) amidst a devaluation of the exchange rate and sharp increases in food prices. This forced the government to tighten fiscal deficit targets (Reuters, 2023<sup>[89]</sup>), which resulted in deep spending cuts in many areas, after several years in which spending had expanded with an ambitious social path (Al Awsat, 2023<sup>[90]</sup>)<sup>23</sup>. Also, due to higher capital outflows, there is strong pressure on the international currency exchange rate. The lack of foreign currency in the country is hampering the supply of raw materials for steel production and is leading Egyptian producers to increase exports to cover payments of imported inputs at the expense of increasing supply in the domestic market. In this difficult context, steel demand is proving weak and is forecast to decrease by 10% during 2023 compared to the previous year (Ahram online, 2023<sup>[91]</sup>).

Worldsteel forecasts steel consumption to increase by 2.2% in the Middle East in 2023 and accelerate to 3.2% in 2024 (Wordsteel Association, 2023<sup>[69]</sup>).

In the United Arab Emirates, the construction sector registered 9.2% year-on-year growth in the first quarter of 2023 with real estate expanding at 3.1%. Stronger interest from Chinese and Russian nationals from 2022 partly explains good momentum, according to companies in the sector. This positively impacted GDP, which rose by 3.8%, and was also driven by the non-oil sector, which increased 4.5%, and particularly by the transport and storage sector (+10.9%) (Kallanish, 2023<sup>[92]</sup>).

In Iran, the IMF projects the economy to grow by 2.5% in 2023 in its July 2023 World Economic Outlook report, due to a better economic performance in China which resulted in a boost of Iran's oil exports (Iran Front Page, 2023<sup>[93]</sup>). However, industrial sectors and particularly steel production experienced power and gas outages between March and June 2023 causing significant drops in production (Iran International, 2023<sup>[94]</sup>).

### 8.2.3. Asia and Oceania

In worldsteel's April 2023 SRO, steel consumption in Asia and Oceania is forecast to increase by 2.9% in 2023 and 1.2% in 2024 after a 2.6% decrease in 2022 (Worldsteel Association, 2023<sup>[69]</sup>).

In China, the easing of strict Covid lockdown measures allowed consumption, industrial activity, and investment to recover in the first quarter of 2023. From April 2023 onwards, however, economic performance began to deteriorate and showed strong signs of a slowdown. Manufacturing PMI was below the expansion zone from April to July 2023 while business revenue accumulated zero growth in the first half of 2023.

Likewise, the Chinese real estate sector showed further signs of slowdown and financial stress, being the main steel demanding sector. Many local government financing vehicles (LGFVs)'s (Box 3) missed payments on their commercial paper, an event that worsened an already weak environment and prompted the central government to intervene further (Box 4).

Overall, and according to recent World Steel Dynamics projections, steel demand is forecast to increase 3.2% year-on-year in the second half of 2023 after decreasing 0.9% in the first half, implying that the year would end with a meagre 0.9% growth (World Steel Dynamics, 2023<sup>[68]</sup>).

#### Box 3. The crucial role of shadow banking in the financing of local government spending, infrastructure and real estate

Funding from China's shadow banking flows mainly into three types of borrowers: LGFVs, enterprises with excess capacity, and real estate developers (Sun, 2019<sup>[95]</sup>). Commercial banks and SOE banks are important participant of the so-called "shadow banking" sector and can create loans that extend the money supply through shadow banking practices.

A SOE bank, for example, may want to extend a loan to an industry in excess capacity, such as steel, or to a local government, but may not be in a position to do it through traditional lending because it has its maximum authorised credit limit to the sector. It has various options<sup>24</sup> to avoid being subject to the regulation, and this regulatory arbitrage explains the development of the Chinese shadow banking system and its use by traditional banks.

Local government financing vehicles (LGFVs) are extensively used by Chinese local governments to obtain financing following the credit restrictions set on them by the central government to restrict their debt and prevent asset bubbles. The International Monetary Fund estimates CHN 66 trillion (USD 9.1 trillion) in total debt is held by LGFVs (Yao, 2023<sup>[96]</sup>). LGFV often obtain funding through the shadow banking system, which uses different accounting rules than the traditional banking system and is not subject to the same regulations.

While local governments were formally prohibited under a 1995 budget law to borrow, typical arrangements would be for a local government to transfer the ownership of land (government asset) to an LGFV, which would use the land as collateral to borrow from banks or capital markets. In many cases, local governments provided guarantees on LGFVs' debt, until the practice was forbidden by a 2014 Budget law. There have been,

since 2017, many efforts from Chinese authorities to bring the shadow banking system under tighter control.

LGFV are often of higher yields than traditional borrowing. Still, they are in high demand by local governments which are always tempted to spur their GDP growth by financing real estate and infrastructure projects and have hit their authorised borrowing limits.

On the credit supply side, banks as well as non-bank financial institutions have strong incentives to provide credit to LGFVs through the shadow banking channels, which explain their popularity:

- banks lend to LGFVs at higher interest rates than they typically charge state-owned enterprises (SOEs);
- there is the perception that LGFV carry the implicit guarantees by local governments, and ultimately by the central government, and so are risk-free;
- operating costs are lower; and
- banks can avoid the credit policies and bank lending guidance from the central government, due to a separate accounting system for those products.

Source: (Sun, 2019<sup>[95]</sup>).

#### Box 4. China's real estate market seems to continue to deteriorate

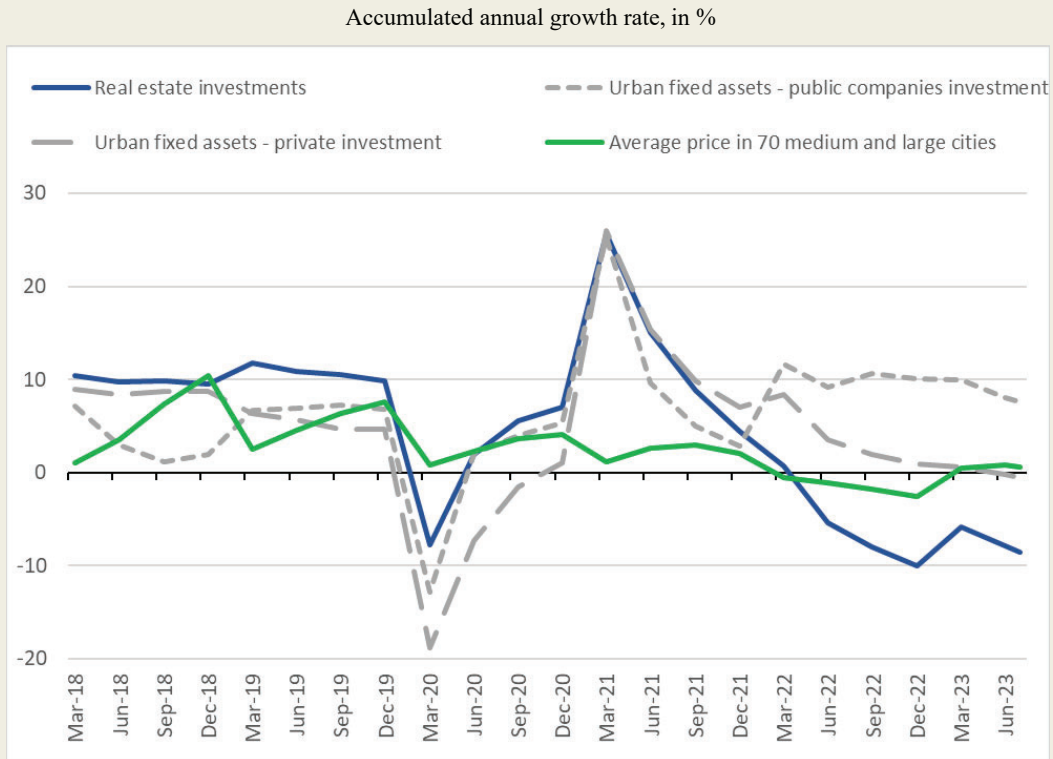
##### **The real estate slowdown continues, with further signs of financial stress and little chance of recovery in the short to medium term**

China's real estate market, the country's main steel-consuming sector and a symbol of Chinese strong economic fundamentals in recent decades, has been in a slowdown phase since mid-2021. In the first quarter of 2023, along with more dynamism in the economy, the sector showed some signs of improvement when comparing to the low activity levels experienced in 2022. However, during the second quarter of the year, most of the indicators began to deteriorate again, and an increase in the financial fragility of the firms operating in the sector was observed, with the default on the debt of one of the developers with the largest amount of assets, Country Garden Group.

The main real estate indicators registered year-on-year slowdowns and contractions during the first half of 2023 (Figure 25). Following a 10% decrease in 2022, real estate investments experienced a cumulative decline of 8.5% up to July 2023. The floor area of newly started buildings showed a significant 24.5% drop while that corresponding to projects already under construction fell at a much lower rate (6.8%), indicating that developers are increasingly choosing to reduce the number of new projects in the pipeline, thereby lowering risks in the wake of low demand and debt defaults (World Steel Dynamics, 2023<sup>[68]</sup>). Housing prices also weakened as reflected by the average home price index for 70 medium-to-large Chinese cities that registered a cumulative increase of only 0.6% year-on-year to July 2023, after recording two month-on-month declines in June and July 2023 (0.16% and 0.17%, respectively) (CNN Business, 2023<sup>[97]</sup>). This was additional to the 2.6% drop in average house prices experienced in 2022.

Additionally, urban fixed asset investment, an indicator that measures aggregated investment in construction and equipment by the different sectors of the economy, decelerated from 5.1% cumulative to March 2023 to 3.4% in July 2023, in a context in which private investment showed a cumulative decrease (-0.5%) and only that of state-owned enterprises increased (+7.6%).

**Figure 25. The real estate market is faltering**



Note: The surveyed cities are 70 large and medium-sized cities, including 35 cities including municipalities directly under the Central Government, provincial capitals, capital cities of autonomous regions (excluding Lhasa) and cities under separate state planning, as well as 35 cities including Tangshan and Qinhuangdao.  
Source: National Bureau of Statistics of China (NBS)

**Transmission mechanisms through contagion and defaults in shadow banking sector products may have significant second round effects and pressured the central government to take more actions mid-August.**

***Transmission mechanisms are threatening to derail the world's largest asset class even further, with potential risks of a recession, and is a main downside risk to the steel sector***

China's real estate market accounts for a quarter of its recent GDP growth, and is showing increasing signs of stress, as exemplified by the default on the debt of its largest developer, Country Garden Group, and the missed payments of a number of local government financing vehicles (LFGV). Any crisis, or slowdown, of the largest consumer of steel and a main driver of Chinese economic growth will have profound direct and indirect effect on steel demand. Direct effect, as the real estate sector is the largest consumer of steel products, and indirect effects, as its slowdown could push the country in a recession and decrease overall steel demand.

Risks of transmission through impaired trust are obvious: the recent default of Country Garden Group on its debt obligations was seen as a sign of the poor health of the real estate sector by investors, and the prices of bonds of other developers, including investment-grade developers, are falling rapidly. For example, the price of the bonds of Gemdale Corporation and Seazen Group Ltd., two developers which are also among those chosen to sell state-guaranteed local notes in a similar fashion as Country Garden did, fell significantly (Bloomberg, 2023<sup>[98]</sup>), illustrating the risk of contagion and the evaporating trust in the financing vehicles for local government (IMF, 2022<sup>[99]</sup>). Bonds issued by Longfor Group Holdings Ltd. and China Vanke Co., two of the country's few private-sector investment grade developers, suffered the same fate.

The Country Garden Group default on its debt also entails a worsening of the balance sheet position of the so-called shadow banking sector, which is a crucial player for promoting financing to real estate and infrastructure investments. Some of the largest funds have delayed payments on maturing wealth products and in local government financing vehicles (LGFV). This reduces the liquidity of the system and increases the systemic risk of the sector. Successive defaults can produce spillover effects within real estate developers and to other sectors of the economy. However, some market commentators argue that the contagion in the credit market may be lower than during the Evergrande default episode in 2021, as they believe that around two-thirds of private developers that were in financial difficulties have already defaulted (Financial Times, 2023<sup>[100]</sup>). This stance may not take into account that the real estate market reversal may put in financial difficulties many more private developers and decrease confidence in investing in LGFV.

***After a disappointing stimulus in July, the Chinese government intervened to try to stop the default in local government financing vehicles through a debt swap which may prevent transmission but will not boost steel demand***

**The Chinese government, faced in June with the real estate slowdown, first announced in early summer a set of stimulus measures** aimed mainly at improving financing conditions for the real estate sector, reducing interest rates for property purchases to prompt up demand, lifting some real estate purchase restrictions, and promoting private investment. The National Development and Reform Commission released 17 measures to boost private investment and compiled a list of over 2 900 projects that required a total expected investment value of CNY 3.2 trillion. The measures consisted in supportive financing from state-owned banks, facilitating land use, and waiving taxes on returns on investment. Measures also included, among others, providing state-backed guarantees for good credit rating loans, and promoting the issuance of real estate investment trusts (REITs) for infrastructure projects (China Briefing, 2023<sup>[101]</sup>). Local initiatives were also seen the property market. For instance, Zhengzhou, a large Chinese city, lifted some of the restrictions on the home resale market, tax reductions on property transactions and subsidies for the purchase of new homes (Reuters, 2023<sup>[102]</sup>). All those measures can be seen as subsidies on the end-users of Chinese steel and were intended to strike a balance between avoiding a hard landing of the sector while not further inflating real estate price and increasing local governments debt burden further.

However, these measures could only begin to boost steel demand in the medium term as projects kick off, which would only happen in 2024. Furthermore, the measures did not imply the creation of additional new projects, and hence did not fundamentally impacted forecasts of steel consumption (Kallanish, 2023<sup>[103]</sup>).

**Mid-July, the State Council provided a new guidance on shantytown redevelopment** which also failed to spur the market, not only because the guidance came unfunded (i.e.

the central government did not allocate any funds for the projects), but also because it was exclusively focused on top tier cities, whereas the impact of such previous guidance a decade ago had mainly be due to the low-tier cities: projects paid by the government to build modern housing to replace poor quality housing (hence the term, “shantytown”) (Kallanish, 2023<sub>[103]</sub>). Overall, the measure was seen by the market as a disappointment.

**Mid-August, the Chinese government intervened quickly by significantly increasing local governments borrowing authorisations.** The measure was a direct response to reports that about 48 LGFVs had missed payments on their commercial papers<sup>25</sup>. The Chinese government, wanting to address “one of the biggest threats to the nation’s economy and financial stability”, authorised provincial-level governments to raise about CHN 1 trillion (USD 139 billion) via bond sales to repay the debt of LFGV and other off-balance sheet issuers (Bloomberg, 2023<sub>[104]</sub>). All provincial-level governments but Beijing, Shanghai, Guangdong and Tibet will be able to use the bonds to repay off-balance-sheet liabilities (Yao, 2023<sub>[96]</sub>). Authorities also identified 12 provinces and cities as “high-risk” areas where more support will be provided, including the provinces of Guizhou, Hunan, Jilin and Anhui, as well as Tianjin city (Bloomberg, 2023<sub>[104]</sub>).

Despite the debt-swap, the current debt will still have to be serviced by local governments, and thus will not free local government’s fiscal space for new infrastructure projects.<sup>26</sup> Furthermore, in terms of size the measure appears much less significant than a similar swap in 2015 which allowed for CHN 12.2 trillion debt-swap over a few years.<sup>27</sup> Consequently, it should not have any impact on the projected steel consumption of the real estate and construction sector in China, besides, admittedly, avoiding a worsening of the crisis that would have dire consequences for steel consumption of this sector, as well as other cyclical steel consuming sectors in China.

In India, steel demand is expected to grow by 7.3% in 2023 and by 6.7% in 2024 (Wordsteel Association, 2023<sub>[69]</sub>). Industrial production indicators for the first half of 2023 showed that manufacturing and mining grew at a firm pace, recovering from a slowdown in the last quarter of 2022. New car registrations data up to July also showed great dynamism. According to the Indian Steel Association, all the steel key downstream sectors are expected to grow at 6% or above in the coming years. Demand will increase driven by investment spending amid positive expectations for the government’s announced infrastructure spending package projected for 2024 that plans to boost construction, railways and capital goods (Indian Steel Association, 2023<sub>[105]</sub>).

In Japan, steel demand in the first half of 2023 has been disappointing, judging by activity indicators in downstream industries, especially construction. While the automotive market is growing at a very good pace, this is offset by poor steel demand from the construction goods industry (-5.4% in the first half of 2023 versus the same period in 2022). Indicators of new housing starts are also 2.2% down (Reuters, 2023<sub>[106]</sub>) (Bank of Japan, 2023<sub>[107]</sub>).

In Korea, steel demand in 2022 suffered a sharp drop due to a decline in investment and construction activity, further impacted by flood damage in the Pohang mills. In 2023, the manufacturing and construction industry grew at a good pace and recovered in the first half of the year. However, data on orders in construction and domestic machinery as well as business sentiment indicators point to a slowdown in demand for the second half. Primary metals are suffering from an increased supply in China that is driving prices down (Pulse News, 2023<sub>[108]</sub>). Steel demand is expected to increase by 2.9% in 2023 and 2% in 2024 (Wordsteel Association, 2023<sub>[69]</sub>).

In the ASEAN-5 region (Indonesia, Malaysia, Philippines, Thailand and Viet Nam), steel demand slightly decreased by 0.6% in 2022 and is expected to resume rapid growth this year, increasing by 6.2% in 2023 and 5.7% in 2024 (Wordsteel Association, 2023<sub>[69]</sub>).

In Indonesia, manufacturing PMI data remained in very positive territory in the first half of 2023, accumulating month-on-month growth in factory activity. Expectations are also positive for the rest of year with levels of business confidence at the highest in June 2023 (S&P Global, 2023<sub>[109]</sub>). According to the Southeast Asia Iron and Steel Institute (SEAISI), Indonesia steel demand will reach 17.4 mmt in 2023, showing an annual increase of 5% (Yieh Steel Market News, 2023<sub>[110]</sub>)

In Malaysia, construction and manufacturing industries maintained positive momentum at the beginning of 2023. Construction expanded by 9.4% in the first quarter with respect to the same period last year while manufacturing output increased by 2.4% year-on-year in the period January-May 2023. However, PMI data is showing signs of a slowdown due to weak new orders inflows. Expectations remained optimistic looking the year-ahead outlook amid hopes that demand would increase in the second half of the year (S&P Global, 2023<sub>[111]</sub>)

In Thailand, steel production and import data indicate that steel demand is slowing down. Consumption and higher tourist arrivals were the main drivers for economic growth in the first quarter of 2023 as industrial sectors are being affected by weaker export dynamism in line with the slowdown in global demand. Growth is projected to accelerate from 2.6% in 2022 to 3.9% in 2023 mainly due to private consumption growth and tourism recovery. Private investment is expected to slow while public investment will remain weak given the higher public deficit and the transition towards a new government (World Bank, 2023<sub>[112]</sub>).

In Viet Nam, data for 2023 shows that the economy is slowing down, especially the industrial and construction sectors which went from growing at 7.7% year-on-year in the first semester 2022 to only 1.13% in the same period for 2023. There is less export dynamism weighing on manufacturing and especially on automobile production (Vietnam Briefing, 2023<sub>[113]</sub>). Construction materials are showing year-on-year declines despite increased efforts by the state though public capital spending.

#### *8.2.4. Europe and CIS economies*

In the EU, the European Steel Association (Eurofer) expects a contraction for steel demand of 3% for 2023 after revising downwards its previous projection of -1%. During the first quarter of 2023, apparent steel consumption decreased significantly versus the same period in 2022 (-11.7%) in a context of high production costs and economic uncertainty. However, steel using sectors showed positive growth, particularly in automotive, mechanical engineering and transport sectors, anticipating that a recovery could be expected in the second half of the year. On the contrary, construction experienced a slowdown and could enter a recession due to a contraction in the residential real estate market. A rebound in steel demand of 6.2% is forecast for 2024 (Eurofer, 2023<sub>[114]</sub>).

New EU car registrations increased significantly in the first half of 2023 (+17.9% versus same period in 2022). Positive developments in recent months indicate that the European automotive industry is recovering from supply disruptions that affected the market since the pandemic (The European Automobile Manufacturers' Association, 2023<sub>[115]</sub>).

In Other Europe, steel consumption is expected to grow by 7.4% in 2023 and 6% in 2024 recovering from 2022 where it decreased by 2.4% (Wordsteel Association, 2023<sub>[69]</sub>).

In Türkiye, while steel production in the first half of the year contracted by 16% on an annual basis, imports of steel products, which account for a large share of total

consumption, are growing at a robust pace (a +11.3% year-on-year increase in annualised term). Economic data also showed some acceleration of the GDP in the first quarter of 2023, with construction growing by over 4%. Manufacturing sectors, on the other hand, remained stagnant for the first five months of 2023.

Steel demand in the CIS region (which includes Russia) and Ukraine is expected to continue to shrink by 3.5% and 4.3% in 2023 and 2024, after the slump in 2022 (-8.7%) (Worldsteel Association, 2023<sup>[69]</sup>).

GDP and domestic demand, in this difficult context, remained (Bank of Japan, 2023<sup>[107]</sup>) very weak, with estimates indicating that they are still 25% below July 2021 levels. Crude steel production was down 38% in the first half of the year with respect to the same period last year, with utilisation rates below 30% in some steel mills (GMK Center, 2023<sup>[116]</sup>).

## Annex A. Summary of Chinese Steel firm's relocation implemented following the Coastal Strategy started in 2019

**Table A A.1. Main relocations implemented since 2019 and subsidies attached to them**

Name of Steel Enterprise	Name of Subsidiary (if applicable)	Year	Prior and New Location	Encouraged by the Government?	Compensation Received	Capacity (TTPA)	Description
China Baowu Steel Group (中国宝武钢铁集团有限公司)	Baosteel Huangshi Coated Sheet Company Limited (宝钢股份黄石涂镀板有限公司)	2020	<b>Prior:</b> No. 18, Hangzhou West Road, Tuanchengshan, Huangshi City, Hubei Province <b>New:</b> Yangxin County, Huangshi, Hubei Province	Yes; initiative occurred due to signing of "Relocation Cooperation Agreement" between the Huangshi Prefectural Government and the company. Company had additionally received many complaints from nearby residences regarding the air pollution exhibited by the company (1)	Lack of Information regarding specific compensation	Specific's plant capacity isn't specified; however, Huangshi's Department of Ecology and Environment informs that the production capacity has doubled throughout the relocation due technological transformation and upgrades	This relocation is known as the Second Phase of Baosteel's Xinggang Industrial Park Relocation Plant. It involves the relocation of the stated plant to the industrial base constructed in 2016. The third phase of the project is noted to transfer "some sheet production capacity from a Baosteel plant in Shanghai". Full details of phases from annual report: the completion of the second phase are mentioned. The first phase includes the construction of a 200,000-ton galvanized unit, a 120,000-ton building color coating unit, and an 80,000-ton home appliance color coating unit, along with supporting workshops and facilities. The second phase involves relocating the Tuanchengshan production base to Xinggang Park. The third phase will see the transfer of some thin plate production capacity from Baosteel Shanghai.
Hesteel Group Company Limited (河北钢铁集团有限公司)	Tangshan Iron and Steel Group Company Limited (唐山钢铁集团有限责任公司)	2020	<b>Prior:</b> Lubei District, Tangshan City, Hebei Province <b>New:</b> Tangshan Harbour Economic Development Zone, Laoting, Laoting County, Tangshan City, Hebei Province	Yes; relocation and closure of Tangshan Iron and Steel Group were made in cooperation with Hebei Provincial government and the Tangshan Prefectural Government once encouraged to relocate	Tangshan Iron and Steel Group continues to receive relocation compensation from the Tangshan Prefectural Government agreed to be RMB 33.4 million (2)	6840 TTPA	On August 19, 2020, the Tangshan Prefectural Government and HBIS's Tangshan Iron and Steel Branch signed the "City Relocation Agreement" for the closure and relocation of the Tangshan Branch. The Tangshan Branch moved to the Economic Development Zone in Laoting County under the name Hbis Laoting Steel Co., Ltd. The Tangshan Prefectural Government agreed to convert the industrial land occupied by the Tangshan Branch into commercial and residential lands, granting land use rights through the Tangshan's Branch subsidiary. CHN 14.169 million of the compensation has been received as of July 6, 2022, covering approximately 42% of the total amount.
	Handan Iron and Steel Group Company Limited (邯郸钢铁集团有限责任公司)	2021	<b>Prior:</b> Fuxing District, Handan City, Hebei Province <b>New:</b> Longxi Industrial Park, She County,	Yes; the relocation and closure were made in cooperation with Hebei Provincial government and the Handan Prefectural	Compensation will be provided by the Handan Prefectura		During the 14th Five-Year Plan period (2021-2025), HBIS Co., Ltd. will relocate the Handan Branch's iron and steel production capacity from Handan City to the New District in Handan County. The relocation involves shutting down the main urban area

			Handan City, Hebei Province	Government once encouraged to relocate	Government; however, the specific relocation amount has not been stated	operations and transferring to the newly constructed facilities. The financing will be covered through land compensation and asset disposal income, aiming to optimize the company's layout and enhance its competitiveness in the steel industry. The land involved in the relocation is approximately 6969.22 mu. As of December 2022, the new area in Shixian is already under construction.
Taiyuan Iron and Steel Group	Taiyuan Steel Mill (太原钢铁集团不锈钢自备电厂)	2021	<b>Prior:</b> Wanbailin District, Taiyuan City  <b>New:</b> Xiaohu Industry, Shanxi Transformation and Comprehensive Reform Demonstration Zone, Jincaoping, Taiyuan City, Shanxi Province	Yes; the relocation occurred due to encouraged relocation from Shanxi Provincial Government	Compensation will be provided by the Shanxi Provincial Government; however, the specific relocation amount has not been stated	Taiyuan Heavy Industry Co., Ltd. (Taiyuan Heavy) received notice from its controlling shareholder, Taiyuan Heavy Machinery Group Co., Ltd., about the approval of the government for the relocation of the entire group from the city. The relocation plan involves moving the company and its subsidiaries to the Xiaohu Industrial Park, Shanxi Transformation Comprehensive Reform Demonstration Area, to meet the city's urban planning needs. The specific implementation and completion times, losses, and compensation amounts are currently uncertain. The government will compensate for the losses caused by the relocation, and Taiyuan Heavy believes the compensation and asset disposal income will cover the relocation losses. However, due to uncertainties, the company will continue to monitor the progress and fulfill disclosure obligations accordingly.

Note: The table outlines relocations of steel enterprises from 2019-2023  
Source: Secretariat desk research

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## *Endnotes*

<sup>1</sup> Domestic relocations of steel plants mandate a reduction of crude steel production capacity at a ratio of 1.5 units of old capacity for 1 unit of new capacity.

<sup>2</sup> Please refer to <https://www.oecd.org/economic-outlook>.

<sup>3</sup> <https://www.oecd.org/economic-outlook>.

<sup>4</sup> Defence spending are projected to increase from JPY 5.4 trillion in 2022 to around JPY 9 trillion by 2027 according to a new five-year plan announced in December 2022

<sup>5</sup> The 4 CIS covered by the statistics are the Belarus, Kazakhstan, the Republic of Moldova and Uzbekistan.

<sup>6</sup> The first UK Steel Forum was held in London and organised by a group of six steel industry associations including producers' group UK Steel, the UK-based International Steel Trade Association ISTA and the European steel distributors' association Eurometal. UK's crude steelmakers belong mainly to foreign-based groups: Tata Steel UK (a subsidiary of India's major Tata industrial group); British Steel (acquired by China's Jingye Group in 2020); Liberty Steel, owned by Sanjeev Gupta's GFG Alliance; Spanish Celsa Steel, Finnish Outokumpu; and UK Ministry of Defence-owned Sheffield Forgemasters (Kinch, 2022<sup>[6]</sup>).

<sup>7</sup> The ranking of steel production was, at the time of the exercise: China, the European Union (at supra-national level), Japan, India, the United States, Russia, Korea, Germany, Türkiye, Brazil, Italy, Chinese Taipei, Ukraine, Iran, Mexico, France, Indonesia, Viet Nam and Saudi Arabia.

<sup>8</sup> The results are all the more striking as the analysis considers the money flows from subsidies into the steel firms when they are actually disbursed for purchases, as opposed to the accounting values of subsidies than annual reports will indicate. Subsidies are often attached to a particular purchase of a piece of equipment, and the expectation is thus that subsidies flows will drop once the equipment has been purchased. On the contrary, the results indicate that a "rolling out" of diverse subsidies must be taking place to keep the ratio of subsidies per installed piece of equipment constant over time.

<sup>9</sup> In its new Programme of Work and Budget (PWB) for 2023-2024, the Steel Committee decided to continue its work on subsidies and government support measure. The Steel Committee decided to restrict the scope of its monitoring exercise by excluding jurisdictions which are the most transparent regarding their provision of subsidies to the steel sector, such as those jurisdictions currently participating in the GFSEC and exchanging information regarding their subsidies to the steel sector in this Forum. Simultaneously, the Steel Committee also decided to expand the scope of its monitoring to jurisdictions which have recently witnessed sharp increases in their steel producing capacity, such as: Malaysia, Iran, Viet Nam, Algeria, Pakistan and Indonesia.

<sup>10</sup> <https://www.imf.org/-/media/Files/Publications/WP/2023/English/wpica2023154-print-pdf.ashx>

<sup>11</sup> Guideline 1 of (Quyang County Government, 2022<sup>[24]</sup>)

<sup>12</sup> According to the Ministry of Industry and Information Technology (MIIT), they held a target to cut steelmaking capacity from 1,130 Mt in 2015 to less than 1,000 Mt in 2020. However, China produced a record-breaking 1,065 Mt of crude steel in 2020 (Energy and Clear Air, 2021)

<sup>13</sup> Unit of measurement used in China corresponding to 1/15 of a hectare or about 666.67 m<sup>2</sup>; Chinese: 亩; pinyin: mǔ or 畝, mǔ

<sup>14</sup> In 2022, China's foreign direct investment (FDI) in Latin America and the Caribbean has continued to increase over the years and amounted to roughly USD 12 billion (about 9% of the

region’s total FDI). Meanwhile, the state-owned China Development Bank and the Export-Import Bank of China are among the region’s leading lenders; between 2005 and 2020, they together loaned some USD 137 billion to Latin American governments, often in exchange for oil and used to fund energy and infrastructure projects. In 2022 alone, loans totalled USD 813 million (Roy, 2023<sup>[183]</sup>).

<sup>15</sup> Brazilian Blend Fines (BRBF) is a product launched by Vale that combines iron ore fines from different systems in Brazil. Blending process enables more efficient mining plans, dry processing methods, and reduces investments and water usage.

<sup>16</sup> Often abbreviated in “Easteel” in Brazilian sources.

<sup>17</sup> This name is often abbreviated as Zhonghuan Group (中寰集团) in Chinese sources, and as “Easteel” in Brazilian source. The Chinese for “Government of Bahia” is simply 巴伊亚州政府.

<sup>18</sup> Notice that the prices are not adjusted for inflation.

<sup>19</sup> A word of caution is nevertheless warranted when interpreting the broad averages indicated in Figure 16. Indeed, price divergences observed and commented upon in this report for both steel and raw materials alike means that generic price margins should rather be estimated on a region-specific basis than as a world average.

<sup>20</sup> Contrary to the other sections of this paper, this section looks back at the year 2021 in its entirety and not at the first semester of 2022, due to the delays for obtaining firms’ annual reports and financial performance once they are audited and released to the public.

<sup>21</sup> Average operating profitability is defined here by the ratio of earnings before interest, taxes and depreciation (EBITDA) to sales revenues (weighted by total sales).

<sup>22</sup> Although debt usually constitutes the bulk of the liabilities that a steel firm carries, there are other forms of liabilities. For example, outstanding bills to suppliers, also known as account payables, are another type of liability and so are wages due and pensions. Technically, a steel firm could reduce its debt by delaying the payment it makes to its suppliers. To avoid misinterpreting the situation due to these possible substitution effects, it is useful to consider the ratio of total liabilities over assets as presented in Figure 21.

<sup>23</sup> Two social safety net programs, Takaful and Karama, increased the total number of their grants, and social benefits by 50.2 percent from 2013/2014 to 2021/2022, reaching EGP343.4 billion in 2021/2022, compared to EGP228.6 billion in 2013/2014. Food subsidies tripled during the period, increasing from EGP35.5 billion in 2013/2014 to EGP96.8 billion in 2021/2022, and minimum wages rose from EGP1,200 in 2014 to EGP3,000 in 2022 (Al Awsat, 2023<sup>[90]</sup>).

<sup>24</sup> For example, another bank can be chosen as agent to make the loan to the borrower, while the initial SOE bank guarantees its repayments. Because of the guarantee of the SOE bank, the agent bank can record its lending as interbank lending, which carries a smaller risk weight than companies or even local governments. The balance sheet of the SOE bank remains unchanged, as the guarantee is recorded off-balance sheet, despite the SOE bank being the ultimate risk-taker. The implications for systemic risks are much greater than in ‘traditional’ shadow banking, which is simply the channelling of pre-existing money from creditors to debtors through structured products, as the process described above implies money creation at the time the agent bank makes the loan and so increase aggregate money supply (Sun, 2019<sup>[95]</sup>).

<sup>25</sup> Commercial papers are a short-term form of debt (maturity less than one-year).

<sup>26</sup> Projections from 2019 concerning Chinese government debt paths until 2030 under diverse assumptions of swaps of LGFVs into traditional debt by local government (such as: every year one-third of the transferred debt is swapped) can be found in (OECD, 2019<sup>[182]</sup>).

<sup>27</sup> The IMF estimates that LGFVs will hold about CHN 66 trillions by the end of the 2023 (IMF, 2022<sup>[99]</sup>). Admittedly, some regions have shorter average maturities for LGFVs than others.