

PANORAMA



Taking stock of global metal sector trends and outlook

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COFACE METAL PRICES MODEL FORECAST

The most-widely traded base and ferrous metals have benefitted from a bull market¹ since mid-2016. Prices have increased on the back of robust global economic growth and technological shifts that have triggered a surge in metal use. Such an uptick in demand has not been observed since the period following the 2008-2010 economic and financial crisis. The use of these metals has been buoyed by highly synchronised growth recovery in the major economies, and has helped the mining and smelting sectors to recover after the end of the commodity super-cycle² in the late 2000s. This environment of rising prices and booming demand has triggered the reopening of some mines, which could reduce global supply deficits for aluminium, copper, and zinc.

However, we expect that the trends in the sector will be mixed going forward. Taking into account the rising demand for metal in the context of a still-positive global economic outlook, it appears that we are already beyond the peak of global growth³, which should theoretically exert downside pressure on prices in the medium- to long-term.

Other factors that are likely to impact the metal sector include the still-high level of

geopolitical tension and an increasingly protectionist environment. Metals, being an important component for the manufacturing industry, are often the target of protectionist measures – an example being the United States' March 2018 decision to impose duties on all imported steel (25%) and aluminium (10%) products, in order to protect American jobs as per President Donald Trump's electoral campaign promises.

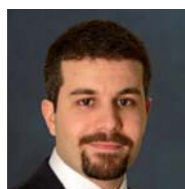
A reshuffling of priorities in important markets across the world, such as China and the eurozone, could also hamper this momentum. Speculative forces have fostered volatility, most notably in the zinc market. While these factors are all valid, some key differences are noteworthy, and the outlook is not homogenous for all metals.

Coface's statistical pricing model predicts that the price of base metals will continue to increase over the next two years, while steel prices will continue to increase in 2018 before declining in mid-2018. According to the results of our statistical model, at the end of 2019, we forecast increases for aluminum (2%), copper (2.4%), nickel (18%), and zinc (14%). Steel will be the only metal to post a decrease (-19%).

¹ A market in which securities or commodities are persistently rising in value.

² The super-cycle was the boom in many commodities' prices, fuelled by the Chinese need to fulfil its infrastructure needs. It ended when Chinese economic growth softened from 2012 onwards.

³ Coface Economic Research Department (2018). *Barometer - Q1 2018, beyond the peak of global growth*. Paris: Coface.



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1 2017: A YEAR OF CHANGES FOR THE METAL SECTOR

Metal prices rebound in 2017, but risks remain

After making a comeback in 2016 following a difficult few years, the metal sector has so far showed signs of resilience in 2018, despite minor backlashes in some products. This is the case for ferrous⁵ and non-ferrous metals⁶, both of which have been supported by the global economic upturn (Graph 2). Moreover, a weaker US dollar since mid-2017 has helped to sustain major industrial metal prices. When the US dollar strengthens, as is currently the case, commodity

prices decrease as trade partners see their purchasing power increase. The dollar's trade-weighted value has been decreasing since the beginning of 2018, and has reached its lowest level since 2014. Compounded with highly-synchronised global growth last year, this has translated into a metal price rally, with aluminium posting a 37% year-to-date increase compared to the beginning of 2016, while cobalt quadrupled, copper and nickel prices grew by +44% and +53% respectively, and zinc prices doubled (+104%) over the same period.

INSERT 1:

Why is the metal sector one of the riskiest as per Coface's Sector Assessments?

The majority of regions for which Coface produces sector assessments are evaluated as having a "High Risk" metal sector⁴ (see Table 1). Metals' fate is subject not only to economic activity and growth in global trade, but also to political interferences and geopolitical disruptions, which can generate volatility and price hikes.

Metal companies suffered lacklustre demand from 2012 to 2015, which heavily impacted profitability and burned a lot of cash. Debt increased, as a means to enable day-to-day activity in a capital intensive industry, and also to sustain share buybacks. The perceived fragility across the entire value chain, from miners to metal wholesalers, led Coface to downgrade its assessments in successive Barometers from 2013 to 2016.

While growth and profitability have got back on track for some segments (notably upstream), we continue to closely watch feeble actors pertaining to wholesaling activity, who suffer from asymmetric relationships with their big player customers (large construction, big industrial companies, etc.) and small suppliers (smelting companies, etc.). This upstream segment is also characterised by narrow business margins, requiring extensive access to funds to buy commoditised products.

In addition, not all metal-processing companies are doing well. Producing highly commoditised goods might help under favourable economic conditions, but competition dents margins and can be accompanied by softening economic activity, resulting in reduced market opportunities.

Table 1:
Coface Regional Risk Assessments - Q1 2018

Sector	Central & Eastern Europe	Emerging Asia	Latin America	Middle East & Turkey	North America	Western Europe
Metals	High Risk	High Risk	High Risk	High Risk	High Risk	High Risk

Business Default Risk

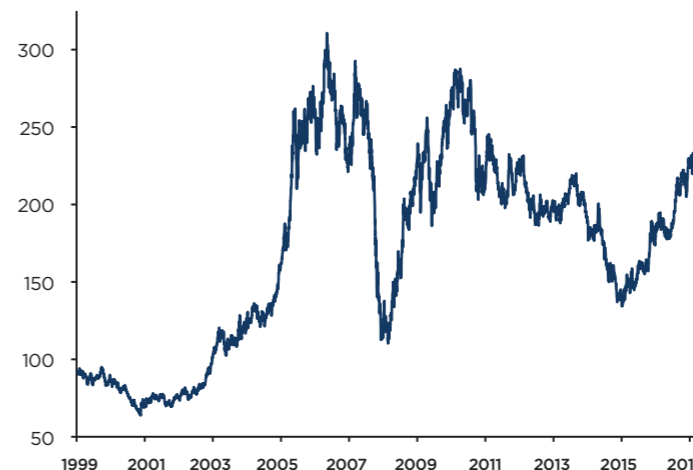
■ Low Risk
 ■ Medium Risk
 ■ High Risk
 ■ Very High Risk
 ↗ Upgrade
 ↘ Downgrade

⁴ Each quarter, Coface publishes its Country and Sector Risk Barometer, which assesses risk levels for 160 countries, and 13 economic sectors in 24 countries that represent 85% of the world economy.

⁵ Ferrous metals include iron and steel.

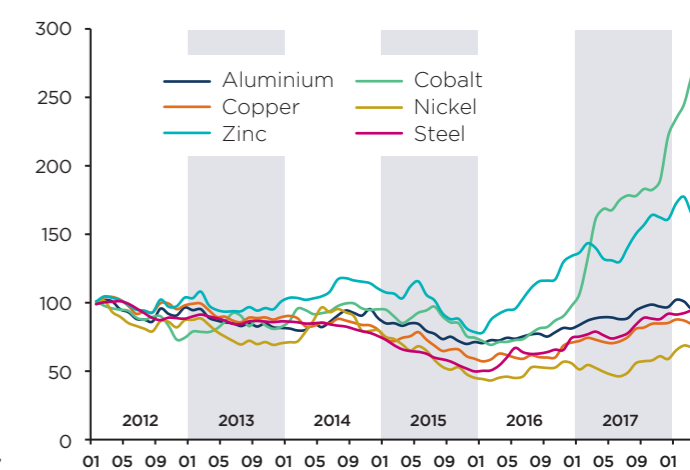
⁶ Nonferrous metals include cobalt, nickel, zinc, copper and aluminium.

Graph 1:
Industrial metal price (composite) and weighted USD



Source: Bloomberg and Coface

Graph 2:
Base metals prices rise faster than ferrous (base 100 = January 2012)



Source: LME, SteelHome, and Coface

Investments are picking up, despite challenges

A global favourable environment for investments in the metal sector...

Supportive global economic growth and reductions in supply have sustained prices so far. However, evidence suggests that we have passed the peak of global growth. There is currently a gradual divergence between global growth evolution and reducing supplies, with the 2015-2016 supply reduction continuing in 2018.

On the one hand, economic fundamentals supported the sector expansion in factory orders as measured by PMIs⁷ around the world. This is still the case today: PMI figures remain strong (although we expect them to somewhat decline in 2018) and offer a solid base to many metal miners and smelters, which they can use to further expand their business. On the other hand, a general lack of prospective projects and board pressure to distribute cash has led metal operators to downsize mining and smelting operations, which will exert downside pressure on PMIs going forward.

...but many mines suffer from lack of competitiveness and prospective projects.

As a consequence of a general lack of economic prospects, projects were put on hold around the world between 2014 and 2016, particularly the costly ones. Some mines were closed due to a lack of competitiveness (Insert 1). As an example, the leading global mining and trading house Glencore closed two copper mines in Zambia and the Democratic Republic of the Congo (DRC) in 2014. Major large iron ore producers like Rio Tinto, BHP Billinton, and Vale closed some of their mines in West Africa to refocus their activity on their home markets in Australia and Brazil, where they benefit

from cheaper production costs and operating infrastructures. Big mining and metalworking companies remained focused on brownfield investments due to financial constraints, waiting for favourable conditions to expand their activities in greenfield projects.

INSERT 2:

Coface model shows financials will improve - for some metals

We performed a statistical analysis on companies' financial data. These companies belong to the mining and metalworking sectors, and include ArcelorMittal, Alcoa, and BHP Billiton. We have examined around 200 companies over a time range of 18 years (2000-2017), and have analysed several quarterly financial metrics - including revenue, net margin, net debt ratio, return on equity - in order to constitute clusters of corporates. After having performed a PCA⁸ in order to retain only seven dimensions, accounting for 90% of total variance, we conducted k-means⁹ clustering and a hierarchical¹⁰ clustering on top of this to isolate only two groups, facilitating the interpretation.

The first cluster is composed of small and intermediate companies, which have been deeply affected since the end of the super-cycle, but the biggest ones managed to stay afloat. Their rebound was less dramatic than that of their second group counterparts, which include big names like Rio Tinto, Glencore, Vale, or Posco. Companies in this second group were more heavily impacted by the negative trend experienced after the super-cycle than smaller companies, but were able to face the difficulties by deleveraging; closing inefficient mines and plants to save cash to return to their shareholders. Furthermore, they were quick to offer higher returns on equity. Their global footprint, and the fact that they trade many commodities and are not over-specialized, helped them. Also, they own more efficient mines and plants, and have significant bargaining power when dealing with their customers.

⁷ The Purchasing Manufacturing Index measures the activity level of purchasing managers.

⁸ Principal component analysis is a statistical technique allowing us to reduce the dimensionality of a data set.

⁹ This statistical technique enabled us to form homogeneous clusters of companies, in terms of sharing the same characteristics.

¹⁰ Another quantitative technique that agglomerates groups at each step, this is generally performed after k-means clustering because it allows us to visualize the group in an effective manner.

Investments are expected to continue to rise despite challenges

Despite these companies' financial difficulties (**Insert 2**) and competitiveness challenges, the rise in investment in the metal sector seen in recent years is expected to continue, boosted by higher prices. Data provided by S&P¹¹ shows that the combined exploration budget for surveyed companies increased by 17% between 2016 and 2017 (USD 7.2 billion versus USD 8.4 billion). The downward trend in exploration stopped after budgets slumped by 28% between 2015 and 2016, but we expect improvements ahead: the total 2018 budget of all surveyed companies is estimated to be worth around USD 21.5 billion.

Accordingly, financial results were disappointing between 2013 and 2015, as demand decreased and high fixed costs remained a burden for industrial metal smelters and miners. Added to that, high levels of indebtedness¹² forced companies to sell off many assets. These actors recorded their worst net margin¹³ figures in a decade during 2015 and 2016, and indebtedness only started falling after 2016, when it spiked to 24% for metalworking companies and 18% for miners (vs 12% and 6% in 2007).

Diverging trends: base metals and ferrous metals

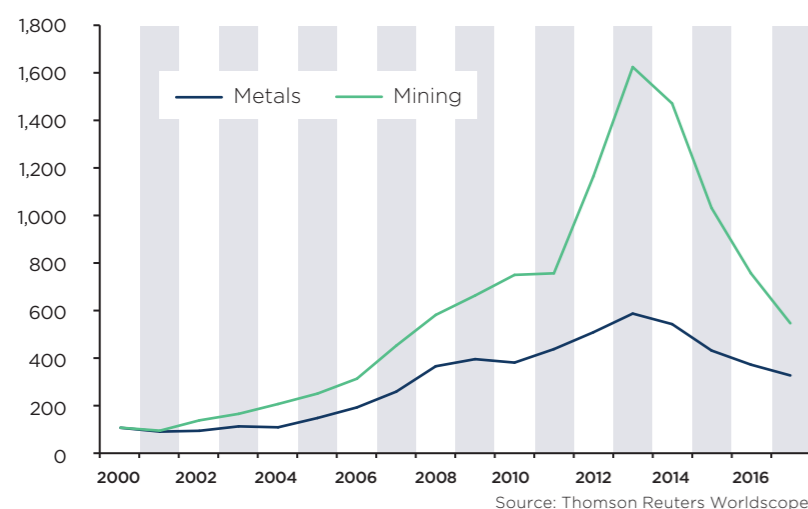
At the end of the super-cycle, many global mining companies were forced to reduce capital expenditure (**Graph 3**) and devote cash to dividends. This resulted in a supply deficit in the following years, a phenomenon that we have witnessed since the end of 2016. The growth synchronization of major economies

adds further pressure. Demand is back despite some bottlenecks in supply of various kinds. For instance, some countries, like the Philippines and Indonesia – both major producers – enacted laws to restrain production and exports of nickel ore, further fostering the imbalance. According to S&P¹⁴, exploration was muted between 2012 and 2016, and slightly increased in 2017 for zinc, cobalt, and lithium, which is related to the demand for electric vehicles and batteries. As a consequence, S&P analysts expect supply constraints to prevail in the three to four coming years, which corresponds with Coface views.

The dynamics for non-ferrous metals are slightly different. Steel is often viewed as a barometer of global activity because it is used in so many sectors and segments (including construction, vehicle manufacturing, ship building, consumer goods, electronics, and household appliances). The pickup in global activity has certainly played a key role in boosting demand and therefore prices, and has subsequently boosted the demand for iron ore, one of the main inputs of steel. Higher steel prices have enabled smelters to shift to higher quality iron ore, which requires less energy to process, saving costs at a time when energy prices are on the rise. As a result, global demand for higher quality iron ore has increased, exerting upside pressure on this commodity.

Supply-side factors have also played a crucial role in boosting prices. China accounts for approximately half of the 1.7 billion tonnes of steel produced globally, according to World Steel Association¹⁵ figures. The Chinese government implemented mandatory factory closures in 2017, aimed at reducing corporate leverage and alleviating pollution concerns. This translated into a reduction in overcapacity, exerting upside pressure on prices. Steel output is expected to slow sharply in 2018, as these aforementioned policies begin to bite. This means that the world's largest producer of metal will only experience a moderate increase in steel output this year, according to S&P forecasts, which could contribute to restoring balance to a global market that was ravaged by overcapacity concerns during 2015-2016. However, it is unclear if supply constraints will continue to be a factor driving ferrous metals' prices, as some uncertainties remain. These are predominantly related to the efficiency of China's overcapacity curbs and the fact that many of these closures were seasonal (**Insert 3**). For these reasons, we expect downside pressures on ferrous metal prices to remain in 2018¹⁶.

Graph 3:
Mining companies' Capex evolution base 100 = 2000



11 Ferguson, M. (2018). *World Mining Exploration Trends Report*. New York: S&P Global Market Intelligence. N.B. iron ore and coal are not included in this survey.

12 Net debt ratio = total debt minus free cash flow ÷ total assets

13 Net margin ratio is computed as follows: net margin ÷ sales

14 Jelasko, E., Zhong, M., et al (2018). *Metals Stay Strong: S&P Global Ratings Raises Its Price Assumptions For Metals Again*. New York: S&P Global Market Intelligence.

15 World Steel in Figures 2017, Brussels: World Steel Association

16 A more in-depth evaluation of our metal price forecasts can be found in the last section of this report (see p. 1)

INSERT 3:

The Chinese puzzle

In an effort to ramp up its years-long drive to reduce overcapacity concerns in its bloated and heavily state-dominated steel sector, the Chinese Ministry of Industry and Information announced measures to reduce its steel capacity. The original plan called for reducing 150 million tonnes of steel production capacity by 2020, but China could potentially meet its target for reducing steel production capacity two years ahead of schedule: according to official announcements, China shut down 115 million tonnes of steel capacity between 2016 and 2017, and closed an additional 140 million tonnes of induction furnaces that use scrap metal to make steel. The government also implemented measures to reduce illegal smelting, and announced seasonal production cuts to alleviate pollution concerns in China's major population centres in the North (Beijing, Tianjin) and Eastern (Shanghai) parts of the country. This has translated into more favourable supply-demand dynamics.

Given China's share of global steel production (almost 50%), any developments in the country have large implications for global steel prices. For example, a steep rise in Chinese steel exports in 2016 contributed to a collapse in the price of steel (**Graph 4**), reducing the revenues of global market leaders, including India's ArcelorMittal, South Korea's Posco, Japan's Nippon Steel & Sumitomo Metal Corporation (NSSMC), and US Steel. This triggered major job losses, and raised questions about the industry's future. However, this situation reversed in 2017. Supply side reforms in China have led to an uptick in prices, which in turn has led to producer price inflation, as shown by the remarkable rebound of China's Producer Price Index (PPI) in 2017 (**Graph 5**). Higher industrial prices helped to boost earnings, thereby improving the profitability of steel players in China and beyond. With that said, it is likely that this movement will begin to reverse in 2018.

China will face more pressure in tackling overcapacity, as strong prices have reduced steelmakers' willingness to cut capacity, as pointed out by the Chinese Ministry of Industry and Information Technology. Despite stricter controls and capacity curbs, China produced a record volume of steel in 2017: 832 million tonnes. This is because trying to control steel capacity in China is like playing a game of whack-a-mole. Rising steel prices helped to

push 2017 profits up sevenfold from the previous year to 177.3 billion Chinese yuan (approx. 27.74 billion US dollars), while sales revenues rose 34.1% year-on-year to CNY 3.69 trillion (approx USD 580 billion), according to a release by the Ministry of Industry. Higher prices and better profitability have incentivized steel producers to boost outputs in order to reap the benefits from the short-term impact of China's steel capacity clean-up.

This is notably the case for producers outside the areas affected by the seasonal pollution control cuts (**Graph 6**). We observed a significant decrease in production between September 2017 and April 2018 in industrial areas neighbouring cities where pollution cuts were present. For example, production fell by -60%, -33% and -20% respectively in Tianjin, Henan and Hebei, all of which are industrial powerhouses surrounding Beijing. Production fell by -32% in Zhejiang, which neighbours Shanghai. Meanwhile, steel production was allowed to increase in areas that were exempt from the winter pollution controls (Fujian 11%, Hunan 12% and Yunnan 17%), or in provinces where the steel sector accounts for a very important proportion of GDP and employment (Heilongjiang 24% and Jilin 52%). To make matters worse, producers began to increase production in March 2018 as the winter pollution controls began to fade out, meaning more capacity will hit the grid, adding to downside pressures on global steel prices.

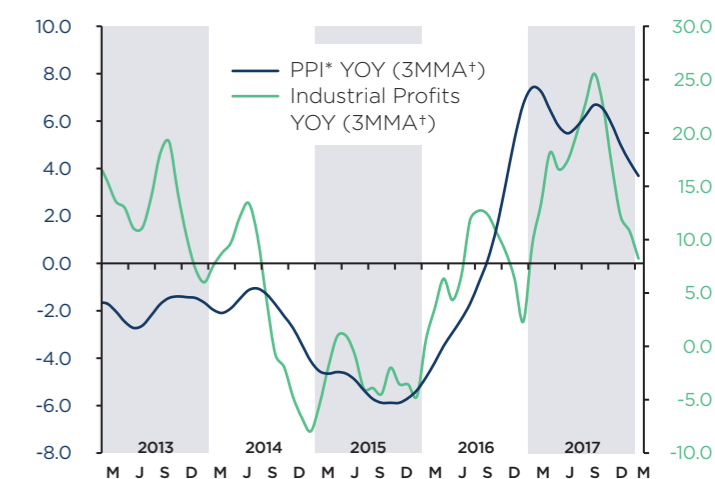
China began carrying out checks in the first half of 2018 on closed induction furnaces and illegal furnaces to prevent them from resuming production. It is also possible that the authorities will consider banning the addition of new capacity in any form. In April 2018, China issued stricter rules for building new steel production capacity to replace obsolete facilities, and Tangshan (the steel capital of China) announced that it would extend the winter pollution curbs in order to improve the environment. The latest moves underscore the authorities' determination to curb excess capacity in its massive and bloated steel sector. However, given the structural and geographical shifts in production that were observed during the past months, it is unlikely that they will succeed unless a gradual and stable decline in steel prices is engineered.

Graph 4:
Chinese steel exports and global steel prices (USD)



Source: Bloomberg and Coface

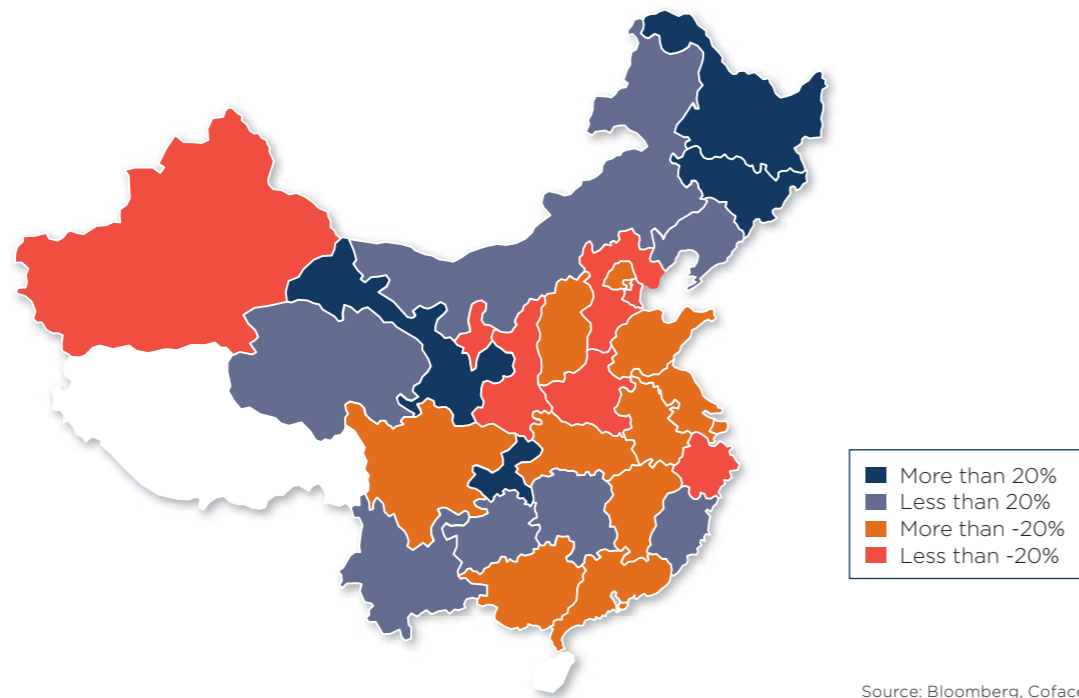
Graph 5:
Industrial prices and profits for global metal sector companies



* Producer Price Index
† 3-Month Moving Average

Source: Datastream and Coface

Graph 6:
Change in steel production by province (Sep 2016 vs. Feb 2018)



2 FACTORS THAT WILL IMPACT THE METAL SECTOR GOING FORWARD

A rise in global protectionism and continued high levels of geopolitical risk

The US administration has taken several protectionist measures since Q1 2018 - including in the metal sector...

On the 8th March 2018, and following the Section 232 investigation, US President Donald Trump signed an executive order imposing duties on many imported steel and aluminium products, in order to “protect American jobs” as promised during his electoral campaign. Duties amount to 25% for steel products and 10% for aluminium. After granting many temporary exemptions toward US allies, China became one of the few major exporters to the US to be targeted by this measure. In addition, the Trump Administration decided to sanction China for intellectual property theft by imposing extra tariffs on Chinese exports, lodging a World Trade Organisation dispute, and restraining US company takeovers by Chinese counterparts. These tariffs would affect, following a two-month public consultation, around USD 50 billion of goods. This decision triggered a series of tit-for-tat retaliations between the two economies, creating fears of diminishing globalisation.

At the time of writing, the two superpowers appear to have come to an agreement, although the details are not yet fully known. The deal currently includes

the fact that China has committed to increase its imports from the US. In exchange, and as part of the deal, the US will remove the ban on the telecommunications giant ZTE, which is likely to be replaced by a fine of USD 1.3 billion, as well as by a reshuffling of ZTE’s board and the provision of “high-level security guarantees”¹⁷.

In Russia, the United States’ sanctions on selected Russian companies and individuals, including Rusal owner Oleg Deripaska, have already started to put upward pressure on metal prices.

...but Europe has taken metal protectionist measures in the recent past as well

Since many years, both European and US authorities have inflicted antidumping tariffs on Chinese steel products to protect their domestic producers from subsidized imports. Steelmaking is a politically-sensitive matter, meaning that stakeholders are quick to put on pressure when their interests are at risk. At the time of writing, 27 of the European Commission’s 53 measures on steel and iron products specifically target China. US authorities have targeted 94% of Chinese steel product exports, putting the alloy in a risky position. However, the measures have had a muted impact on Chinese metal producers, as they have refocused their production away from international markets and towards the domestic market – especially for steel and aluminium.



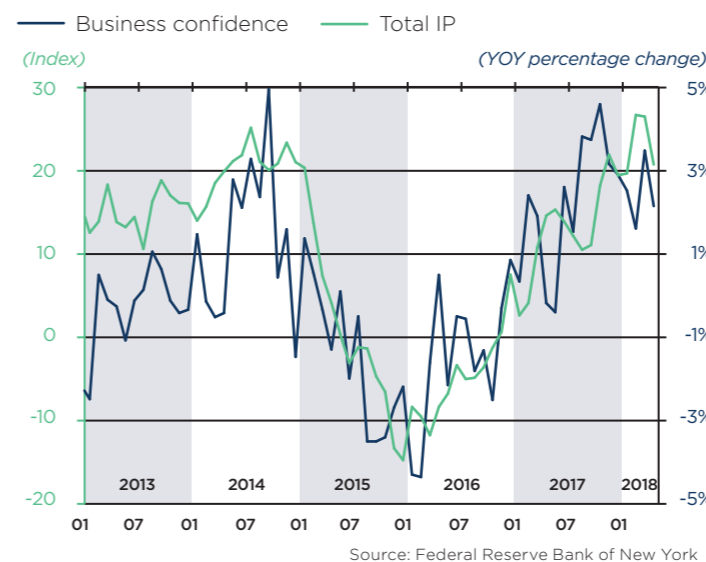
¹⁷ Bloomberg, 2018. China’s ZTE to Pay \$1.3 Billion Fine to Re-Open, Trump Says. [Online] Available at: <http://fortune.com/2018/05/26/zte-fine-donald-trump-china/> [Accessed 29 May 2018].

A climate which will impact business confidence...

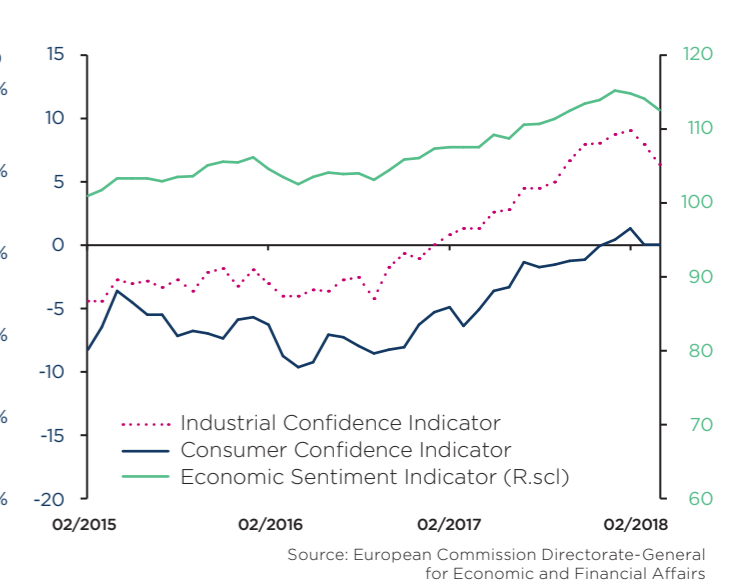
These measures have yet to hinder economic growth per se, as less than 1% of each country’s GDP is at stake, but an all-out trade war would definitely impact companies’ credit risk. Investment is a major contributor to economic growth, and inward-looking policies would impose hurdles to flows of both goods and capital, limiting confidence in the short-term and lessening appetite

for investment. We expect business confidence to be impacted by this context of rising protectionism this year (Charts 7 & 8), and have already perceived a drop in business confidence globally via the PMI index evolution in the first quarter of 2018, following the successive protectionist measures announced by the US administration¹⁸. As for business confidence, major economies experienced a drop at the beginning of 2018.

Graph 7:
USA business confidence and industrial production



Graph 8:
Eurozone confidence indicators



...as we look at the economic outlook beyond the peak of global economic growth

The Coface global economic outlook scenario, as outlined in our Q1 2018 Barometer, is that the end of the virtuous cycle is looming, and we forecast a softening of global growth. Furthermore, rising protectionist reflexes and higher political risk spreading into emerging economies will continue to put pressure on growth. As we maintain our baseline forecast for global trade growth at 3.7% for 2018, we continue to monitor trends in capital expenditures and business confidence figures in an era of high volatility. It is worth noting that passenger vehicle registrations in the European Union decelerated to +0.6% in the first quarter of 2018, the slowest pace since the second quarter of 2013. Overall, in car composition output, steel accounts for 13% of the material used. As a consequence, a lower demand in the automotive sector will have negative knock on effects for steel activities prices and margins.

Increasing protectionism has consequences on metal prices and supply chain performance

Regarding metals, Chinese retaliatory tariffs to the US administration’s measures were put on steel pipes, planes, and cars. Cars are mainly made of steel and aluminium, as well as other industrial metals like zinc and copper. According to the Census Bureau, the United States exported USD 10.5 billion of used and new cars in 2017. It is worth noting that the United States exports luxury and iconic cars to China – products for which consumers are less sensitive to changes in price. The United States is clearly making a surplus in trading with China, contradicting the Trump administration’s claim that the difference in tariffs generated imbalance in trade. The recent spat is unlikely to negatively affect the automotive industry in either country because they depend heavily on domestic trends than on trade. The only segment that might suffer a tiny loss and may have to act swiftly is Original Equipment Manufacturers (OEM). A rise in metal prices, sourcing difficulties, and supply chain reorganisation would theoretically impact cost margins, and could squeeze OEMs who are unable to adapt to the new configuration.



¹⁸ Coface Economic Research Department, 2018. Protectionism risk – more to come. In: *Barometer Q1 2018, beyond the peak of global growth*. Paris: Coface, pp. 6-8.

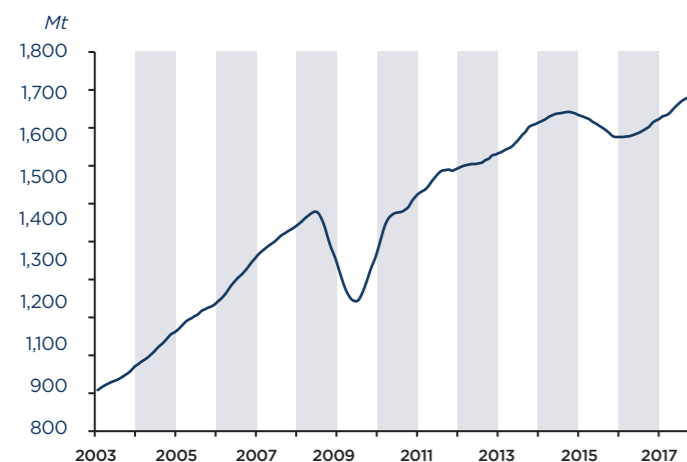
Renewed commercial tensions between the two superpowers could have knock-on effects for metals via other sectors, such as agri-food. Among the Chinese retaliation to the US tariffs imposed in March 2018 was the decision to implement tariffs of 25% on US soybean imports¹⁹. This may cause US soybean exports to China to dwindle and damage the whole supply chain. Chinese soybean imports have drastically shifted since the beginning of 2018 from being exclusively comprised of US soybean towards a more balanced composition. Other suppliers should gain more market share as time goes by, thus hampering US farmers' development. These farmers are therefore likely to postpone or cancel renewals of agricultural machinery, including tractors, harvesters, and grain silos, which are made

of various alloys. A drop in demand could undermine the development of some companies operating in small sub-segments, such as metal wholesalers, whose margins are thin (despite high sales volumes) and who depend on good financing.

It would be unwise to underestimate the turbulent trade relationship between the United States and China, particularly given the impact the two super powers can have on "consumer-reliant" sectors, like automotive and agri-food. Such situations usually exacerbate feelings of "nationalism", which can lead to the boycott of certain products. This was the case in China, when consumers boycotted Japanese cars during the geopolitical feud with Japan in 2014.

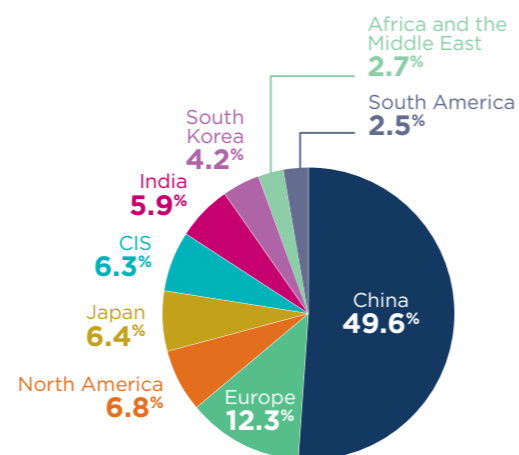
Overcapacity and debt concerns weigh on the outlook for ferrous metals

Graph 9:
Global steel production spiked in 2017 thanks to rising prices



Source: World Steel Association, Coface

Graph 10:
Global steel production by country/region (%)



Source: DataStream, Coface

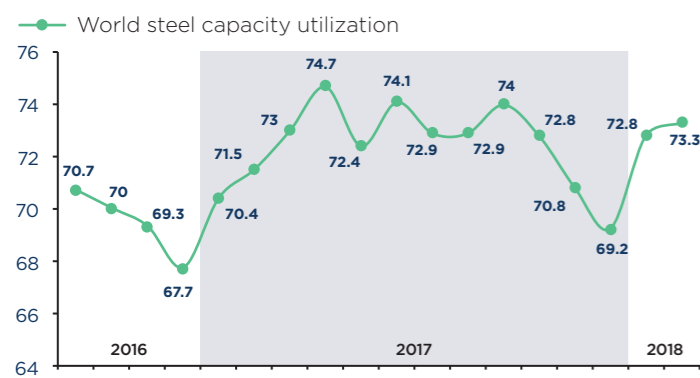
Overcapacity issues impact ferrous metals more than non-ferrous metals

Overcapacity concerns are another important driver underpinning pricing trends in the sector. This does not impact non-ferrous metals as much as ferrous metals, as former is subject to a supply

deficit, while the latter continues to struggle with excess capacity. Global steel production increased in 2017 (**Graph 9**), supported by a rebound in steel prices. The pickup in prices was underscored by a series of supply-side reforms in China, by far the largest producer of this commodity (**Graph 10**).

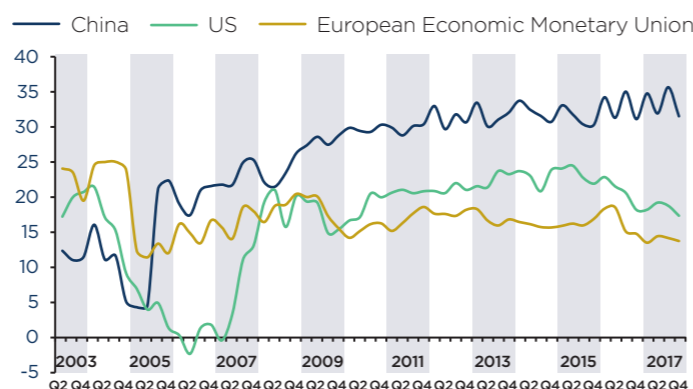
Focusing on global steel production outlook

Graph 11:
Capacity Utilization (%)



Source: Worldsteel

Graph 12:
Steelmakers' net debt ratio



Source: DataStream, Coface

¹⁹ Recent negotiations suggest that China will likely significantly reduce this tariff.

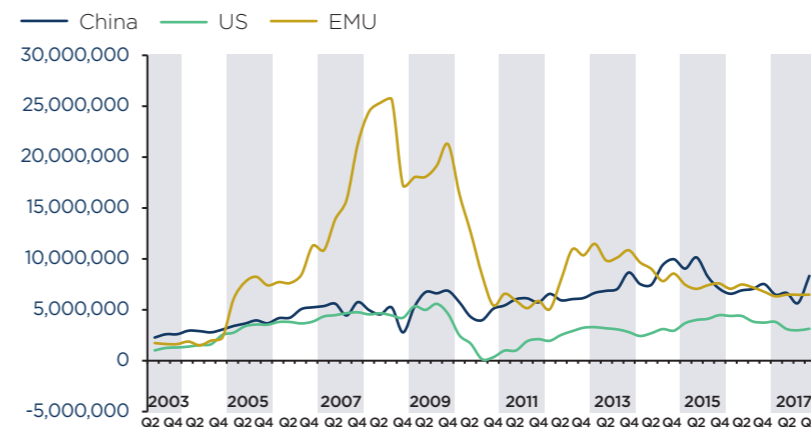
Capacity cuts in China helped to drive up utilization rates slightly in 2017 and in early 2018. According to figures from the World Steel Association, the crude steel capacity utilization ratio of the 64 major producers was 73.3% in February 2018 (**Graph 11**). This constitutes a 2% year-on-year (YOY) improvement relative to February 2017. However, this figure remains low and below the 80% threshold, meaning marginal costs are likely lower than average costs²⁰. While about 1.67 billion tonnes of steel were made worldwide last year, there was enough capacity to make a further 737 million tonnes, according to OECD estimates. The OECD forecasts global steel oversupply to drop below 700 million tonnes this year, due to increasing demand and developments in China. However, we need to remain cautious about this assessment as industrial policies in China remain subject to change.

Global crude steel production rose by 4% percent in March 2018, as top Chinese producers' mills ramped up output following the lifting of winter restrictions on activities by the Chinese authorities. Crude steel output from China rose to 74.0 million tonnes, up 4.5% YOY from March 2017. This is higher than February's 64.9 million tonnes (5.9%) pointing to strong growth in production in the first quarter of 2017. There has been a rise in steel production in the United States as well: producers appear to be taking advantage of import tariffs and higher prices to churn out more metal.

Metal sector companies are highly indebted overall

Metal companies' indebtedness is understandable in the context of better profitability and cash flows. Earnings improved quite significantly in the fourth quarter of 2017, which has triggered many producers to increase production and, in some cases, capacity.

Graph 13:
Cash-flow evolutions for Chinese, European and US iron and steel companies



Source: DataStream, Coface

²⁰ OECD, 2002. *Glossary of Statistical Terms*. [Online]

Available at: <https://stats.oecd.org/glossary/detail.asp?ID=3209> [Accessed 16th May 2018].

²¹ Hume, N., 2017. *Nickel rebound gathers pace on electric car boom*. [Online]

Available at: <https://www.ft.com/content/38cb62fc-b8c8-11e7-8c12-5661783e5589> [Accessed 16th May 2018].

N.B. This exercise is indicative, and depends on many evolving factors in a highly uncertain area.

²² Lithium will see its use surging as well.

²³ Nickel is mainly used for producing stainless steel, which saw an increase in its prices as demand from China recovered.

²⁴ They account for nearly 25%-30% of all mined nickel.

²⁵ Australia is the fifth-largest nickel producer after Indonesia, the Philippines, Canada, and New Caledonia.

The latter is worrying as the sector remains subject to high debt levels (**Graph 12**). Net debt ratios are especially high in China, where the sector is dominated by large state-owned enterprises (SOEs), which benefit from access to cheap state financing. However, at 15%, debt ratios remain elevated in the United States, where companies are much more exposed to a potential correction in cash flows (**Graph 13**). This will most likely be the case if the global environment to become less supportive in 2018 - i.e. steel prices fall and global demand tapers down (our baseline scenario).

New technology's impact on metal demand going forward: mixed trends

On the positive side, base metals in particular will benefit from a pickup in demand for critical components of electronics and batteries. The consultancy group Wood Mackenzie forecasts sales of passenger electric vehicles (EV) to increase from 2.4 million in 2016 to 14.2 million in 2025²¹. This will likely result in a surge in nickel and cobalt demand²², as these metals are major constituents of electric vehicle batteries.

Demand for EVs will similarly impact other specialty metals. Nickel will see its demand grow from 40 kilotonnes in 2016 to 220 kt in 2025 (+450%) thanks to growing EV sales alone. Factoring in the industrial applications of this metal (an important component of other consumer electronics), demand could reach 275 kt in 2025 (+590%), according to Wood Mackenzie²³. Coface calculations, based on estimates from the office of the Chief Economist of the Australian Department of Industry, show total consumption for EVs accounting for 7.2% of all nickel consumption in 2025 (2% in 2016).

While demand factors will be the major driving force behind nickel, it will likely suffer from supply constraints. Supply is growing in some big producers, such as Indonesia and the Philippines²⁴, which have resumed exports again after banning them for a number of years. Moreover, there are large stockpiles of nickel briquette in London Metals Exchange inventories, which may exert downward pressure on prices. Projections by the Australian Department of Industry indicate an increase of nickel production of 26% from 2008 to 2023, thanks to mines in Australia and Asia. Australian mines²⁵ more than doubled their expenditure on nickel exploration in 2017: 49 million Australian dollars (approx. USD 37 million) in the fourth quarter of 2017 against AUD 18 million (approx. USD 13 million) a year before.



For McKinsey²⁶, the demand coming from the EV segment will amount to 570 kt in 2025, from 33 kt in 2017. The company forecasts 31 million EV sales in 2025, up from 1.9 in 2015, which will help nickel tremendously. However, the kind of nickel consumed is different than the lower-grade one used in stainless steel. There is a consensus among experts on the fact that this upswing is underpinned by automotive sector development, including power generation. While EV's future is expected to be bright, it would be wise to remain cautious about this issue, as the rate of adoption

is quite low: charging infrastructures are lacking, and battery ranges are still lower than those of motor fuel vehicles. Moreover, cobalt is generally a by-product of nickel or copper (50% of all the cobalt produced comes from nickel mining, 35% from copper). As cobalt is sought for its application in EV batteries (Insert 4), consumer electronics (e.g. smartphones), and storage batteries, producing more cobalt results in an abundance of nickel, which may put downward pressure on prices as more and more supply is poured onto the markets without real demand.

INSERT 4:

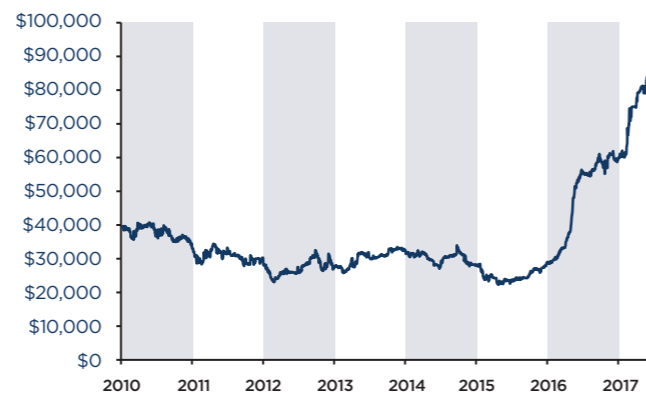
The Cobalt Case

Cobalt experienced exponential growth as its use is associated with longer battery life and facilitates the development of longer range EVs such as the new Tesla²⁷. One of the main risks affecting global metal supply chains is a potential shortage of cobalt²⁸. This ore is highly dependent on the mining of other metals (nickel, copper, platinum), which are subject to reductions in capacity in 2018. The resulting supply shortage will exert significant upside pressure on cobalt prices.

The majority of cobalt mines are based in the Democratic Republic of Congo (DRC): according to the USGS²⁹, the DRC accounted for 58% of world cobalt production in 2017. Cobalt price changes are therefore dependent on developments in the DRC³⁰, which currently suffers from political instability, child labour³¹, and a lack of mine safety. The DRC implemented a new mining code in 2018, allowing the state to gain more from the ever-increasing price environment by rising the royalties rates from 2% to 3.5%, or 10% if the metal is considered "precious" by the government. Cobalt (and coltan) is considered strategic by the DRC authorities. If a metal price exceeds 25% of the price agreed upon during the feasibility study, the mining company will be under a 50% tax rate on exceeding profits. The new code also obliges mining companies to spend 0.3% of their turnover on local development needs, and to open 10% of their capital to Congolese citizens. Miners are lining up to

ask for a revision that would take care of their interests, and have threatened to stop investing in mines if the Congolese authorities continue to ignore their requests. If the threats are effectively rolled over, supply will be constrained for both cobalt and copper, and prices will definitely increase.

Graph 14:
Soaring cobalt prices (USD/t)



Source: London Metal Exchange (LME)

26 Campagnol, N., Hoffman, K., Lala, A. & Ramsbottom, O., 2017. *The future of nickel: A class act*, New York: McKinsey&Company.

27 Cobalt enables energy to be stocked in a battery in an efficient fashion, permitting weight reductions in vehicles.

28 Olivetti, E. A., Ceder, G., Gaustad, G. G. & Fu, X., 2017. *Lithium-Ion Battery Supply Chain Considerations: Analysis of Potential Bottlenecks in Critical Metals*. Joule, Volume 1, pp. 229-243.

29 US Geological Survey, 2018. *Mineral Commodity Summaries*, Washington, D.C.: US Department of the Interior.

30 Coface's business climate assessment for the DRC is E, our lowest rank.

31 Amnesty International, 2016. *Exposed: Child labour behind smart phone and electric car batteries*. [Online] Available at: <https://www.amnesty.org/en/latest/news/2016/01/Child-labour-behind-smart-phone-and-electric-car-batteries/> [Accessed 16th May 2018].

Constrained supply and trade disputes may push prices higher in the near future

Mining companies are trying to avoid the same mistakes made during the super-cycle, when investment was spurred by strong prices, resulting in supply exceeding demand when the downward cycle began. Their new strategy is to favour value over quantity: spend less on capital expenditure and give good returns to their stakeholders³².

Geopolitical uncertainties will certainly push prices up for another round of rallying in the near term. The recent spat between the United States and China over the trade deficit in goods seems more likely to dampen the rise of the latter as an advanced manufacturing powerhouse.

In 2015, Premier of the People's Republic of China Li Keqiang promoted a plan that would allow the country to be the leading nation during the fourth industrial revolution. The plan targets ten industries³³ in which China must be globally competitive by 2025, a prelude to becoming dominant, in an effort to avoid the "middle-income trap". To become such a powerhouse, China would need to secure enough raw material supplies - notably mineral ones: cobalt, lithium, etc. - and has begun doing so, signing a three-year agreement earlier in 2018 with Glencore, the world's leading

cobalt producer. Glencore will sell one third of its cobalt output to Chinese companies, allowing them to swallow a large share of its supply. Global carmakers are lagging in their race to source these highly strategic raw materials.

Additionally, since 2014, China has been the leading Asian country in terms of exporting high-value technology exports³⁴. The American's response to China's dominance is a means to force the country to curtail its focus on the Information and Communication Technologies (ICT) sector (which is technology-intensive by definition), and was expressed as such during negotiations after China was accused of intellectual property theft by the US Department of Commerce in March 2018.

Rising tensions will inevitably result in higher commodity prices, notably for metals, which are included in valued technologies. This will benefit miners, smelters, and refiners, but will force end-users to find other materials in case of scarcity or higher prices. Competition in these industries between the two superpowers could trigger a price rally impacting end-users like battery and car makers.

3 COFACE METAL PRICES MODEL FORECAST**Main Results**

We expect prices of major base metals (aluminium, copper, nickel, and zinc) to increase gradually towards the end of 2019. Aluminium is set to grow by a mere 2% between December 2017 and December 2019. Copper should follow the same trend, growing by 2.4% over the same period. Nickel and zinc prices will likely increase by 18% and 14% respectively.

In contrast, steel prices will probably decrease by 19% between December 2017 and December 2019. We expect overcapacity to strengthen as economic conditions become less supportive. Moreover, as Chinese steelmakers lack discipline in capping production during periods of decreasing prices, a "snowball effect" - with steelmakers continuing production even if demand stagnates in order to reach a minimum of capacity utilisation and win market share - will likely impact prices. This phenomenon was observed between 2013 and 2015, and resulted in high steel product exports, which further depressed prices.

Insights on Statistical Methodology

Our model includes several covariates, and for each base metal a lasso regression to take into account collinearity, as this technique shows some robustness toward high correlation. The major hypothesis made to obtain these results was the deceleration of global growth, which can be attributed to several causes: peak in activity, frictions in global trade, and (in China's case) credit constraints via social financing channels.

Although not included in the statistical model, the market flooding of supply in case of steel, aluminium, and copper will nevertheless play a role in pressuring prices. As mentioned earlier, nickel is used in batteries in conjunction with cobalt (or can replace it) - therefore, we expect prices to increase accordingly, even though economic activity will soften over the upcoming months. Another factor that puts pressure on prices is that there is an ongoing supply shortage of zinc, whose demand is set to increase due to the boom in the EV and hybrid vehicles segment - meaning higher prices are very likely.

32 The same mantra seems to be underway in the oil industry in the tight oil segment in the United States.

33 Robotics, new-energy vehicles, biotechnology, aerospace, high-end shipping, advanced rail equipment, electric power equipment, new materials, new generation information technology and software, and agricultural machinery.

34 Bloomberg News, 2018. *How 'Made in China 2025' Frames Trump's Trade Threats*. [Online] Available at: <https://www.bloomberg.com/news/articles/2018-04-10/how-made-in-china-2025-frames-trump-s-trade-threats-quicktake> [Accessed 15 May 2018].

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