Steel market conditions have been improving gradually in most regions since late 2015, although it is uncertain how long the momentum can continue. Over the short and medium term, important headwinds include the increase in trade actions, the rising number of new capacity investments, the presence of distortive government support and subsidisation, and downside risks to world GDP growth once fiscal and monetary policy stimuli are withdrawn.

This document provides an overview of recent steel market developments, the latest developments in global steelmaking capacity and a brief overview and outlook for regional markets, based on information available until June 2018. It also includes an update of the financial situation of publicly listed steelmaking companies, as well as a section discussing the extent of speculative trading on steel prices. To summarise, the following key developments are discussed in this report.

The economic recovery seems to have broadened and is more synchronised across countries. The OECD projects world GDP growth to reach 3.8% in 2018 and 3.9% in 2019, but notes that the recovery has until very recently been sustained by an accommodative fiscal and monetary stance.

Market data released in 2018 suggest that steel demand continues to recover after reaching 1 587.4 million metric tonnes (mmt) in 2017. However, the recovery in demand looks rather fragile given the extent and persistence of structural imbalances.

Global steel exports declined by about 9% year-on-year (y-o-y) in the first three months of 2018. The decline varied significantly across regions, with a marked 27% decline in the People’s Republic of China (hereafter “China”), 35% in India, and less significant declines of 1% in the European Union (E.U.), 4% in Japan, and 3% in the United States (U.S.).

Steel prices continued to increase in 2018, a trend that started in 2016. A more in depth analysis suggests that it is possible that speculative trading in futures markets has been impacting current steel spot prices. Iron ore, coking coal and ferrous scrap prices have only moderately decreased since the beginning of 2018, after strong increases in 2017.

The financial situation of steelmaking companies has improved, but important downside risks remain. Deleveraging should continue and the closure of inefficient production units would help ensure the long-term sustainability of the industry.

Forecasts by the World Steel Association (worldsteel), released in April 2018, suggest that global steel demand will continue to grow in 2018 and 2019, albeit at a decreasing pace (1.8% in 2018 and 0.7% in 2019). The next world steel forecast will be released in October 2018. Steel demand is expected to increase in all regions in 2018, with considerable differences across jurisdictions.

According to the May 2018 OECD Economic Outlook, world GDP growth is forecast to be around 4% in the coming years (3.8% in 2018 and 3.9% in 2019, see Table 1 for the latest available OECD GDP growth forecasts). Nevertheless, economic growth is benefiting largely from accommodative monetary and fiscal policies, whereas in most economies the implementation of necessary structural reforms has stalled (OECD, 2018[1]). There are therefore significant downside risks to the GDP growth forecast due to the inevitable phasing out of central bank and government fiscal support.

In the euro area, GDP growth is projected to remain above 2% in 2018 and 2019, with a broadbased recovery driven by both domestic and external demand — private consumption and investment are being supported by the accommodative monetary and fiscal policy stance. A high level of indebtedness in both the household and the corporate sector, as well as a large stock of non-performing loans in some economies still have the potential to negatively affect future growth. Brexit is also a downside risk for E.U. countries should a workable trade agreement not be found prior to the United Kingdom leaving the European Union.

In the U.S., the economy has felt the effects of a substantial fiscal boost. Employment growth remains robust which, coupled with buoyant asset prices and strong consumer confidence, is sustaining income and consumption growth. Business investment is projected to strengthen as a result of major tax reforms and supportive financial conditions. GDP growth projections stand at 2.9% in 2018, and 2.8% in 2019. The main downside risks are a correction in asset prices, including in the housing sector, high leverage in the corporate sector and trade frictions that could jeopardise the growth-inducing effects of global value chains, and result in further tensions and increase in trade measures.

In Japan, economic growth is projected to be 1.2% both in 2018 and 2019, supported by exports, business investment and private consumption. The level of government debt (224% of GDP) is extremely high and poses serious downside risks. A loss of confidence in Japan's fiscal sustainability could destabilise the financial sector and the real economy, with potentially large negative spill-overs to the world economy. The escalation of trade actions is also a significant risk, although the recently signed Comprehensive and Progressive Agreement for Trans-Pacific Partnership (TPP-11) could help mitigate it.

Economic growth in emerging economies varies depending on the degree of exposure to commodity markets, progress in the implementation of structural reforms, the extent of financial vulnerabilities, and the different demand-side policies being implemented. In China, economic growth should soften as export and investment growth rates slow. GDP growth is projected at 6.7% in 2018 and 6.4% in 2019. Monetary policy has been tightened in order to curb excessive financial risks, while fiscal policy remains accommodative but should become tighter because of better scrutiny over unauthorised local government investments. The Belt and Road Initiative is expected to keep infrastructure investment and exports strong. Potential headwinds to economic growth going forward include the risks of a real estate market downturn, the rise of non-performing loans due to a high level of corporate indebtedness (particularly amongst state-owned enterprises) and increased trade actions.

In India, investment and exports have become major growth engines, supported by adjustments in how the new goods and services tax (GST) is implemented.1 Private consumption was negatively affected by the confidence and employment shocks associated with demonetisation (a measure to reduce the black market economy), but the recovery seems well underway. Nevertheless, job creation in the formal sector is expected to remain sluggish, leaving the vast majority of workers in low-productivity, low-paid activities. The OECD forecast points to GDP growth rates of 7.4% in 2018, and 7.5% in 2019. In the longer run, the new GST should continue to sustain corporate investment, productivity and growth by creating a single market and reducing the cost of capital equipment. Private investment is likely to accelerate, as deleveraging by corporations and banks continues to incentivise investors and infrastructure projects mature. Exports will strengthen thanks to competitiveness gains resulting from the implementation of the GST.

In the Russian Federation (hereafter “Russia”), the economy is projected to continue growing at a modest pace: 1.8% in 2018 and 1.5% in 2019. Private consumption and investment should benefit from a confidence boost from higher oil prices and macroeconomic policies that have improved financial conditions. Modest income growth is nevertheless keeping inequality and poverty at high levels. Oil price uncertainty, international sanctions and a decreasing workforce are likely to continue weighing on economic activity.

In Brazil, the recovery is projected to continue to strengthen and GDP growth is expected to reach 2.0% in 2018 and 2.8% in 2019. Solid investment growth reflects improving confidence due to recent reforms, particularly in financial markets. Downside risks include high corporate indebtedness, with a possible deterioration in loan quality, as well as fiscal sustainability that absent pension reforms could jeopardise investor confidence.

World industrial production growth, which picked up from its 2015 lows (1.2%) and reached 3.7% in June 2016, has remained around this level since then; in March 2018 growth stood at 3.9% (Figure 1, left hand-side). World industrial production growth has not only become more stable, but is now also more even across economies: the gap, observed for many years, between the growth rate in emerging and developing economies on the one hand and the growth rate in advanced economies on the other has declined significantly over the last few years, remaining within a 0.5-1 percentage point range since mid-2017.

After a rapid increase in 2016 and 2017, the rates of increase in global trade and export prices have decelerated in recent months, with annual growth in export volumes (measured in terms of the three-month moving average) falling from 5.0% end of 2017 to 2.7% in March 2018.

Steel market sentiment has continued to improve since January 2017, possibly reflecting the increase of steel prices and improvements in steel demand. The global Steel Purchasing Managers’ Index (PMI), compiled monthly by Markit Economics, has been gradually rising since August 2015. In March 2018, it stood at 52.3 points, thus above the threshold reading of 50 that separates contraction from expansion (Figure 2, panel A). However, the series has experienced high volatility over the last two years, and should be interpreted with caution. Since mid-2016, Markit Economics' steel PMIs have been stronger for Europe than the U.S. and Asia, but the U.S. PMI recently experienced a larger increase than Europe’s PMI, and the two now stand at approximately the same level (Figure 2, panel B).

Demand for steel products around the world has been recovering gradually since 2015 (Figure 3). Global steel demand in 2017 reached 1 587.4 million metric tonnes (mmt), exceeding the previous peak attained in 2014 (1 545.8 mmt). This represents a 4.7% increase compared to 2016.2 The increase in global steel demand was supported by China (which recorded an 8.3% growth rate)3, the North American Free Trade Agreement (NAFTA) region (6.3%), the Commonwealth of Independent States (CIS) region (6.2%), Central and South America (3.8%) and the E.U. (2.5%). On the other hand, steel demand remained almost unchanged in the Middle East (increasing by only 0.4%), and decreased in Africa (6.6%) and Oceania (5.9%).

Figure 4 presents the y-o-y percentage change in the combined consumption of hot-rolled products for nine of the world’s largest steel-consuming economies in Asia, the CIS region, Europe, North America and South America, which together account for approximately 73% of global steel demand. Consumption growth generally accelerated during the course of 2016, and remained relatively strong in 2017; in the first ten months of 2017, consumption of hotrolled steel products in these nine economies increased by 6.7% relative to the same period in 2016.

After contracting by 13.6% in 2016, steel demand in Latin America has partially recovered, reaching a level of 40.9 mmt in 2017, i.e. a 3.8% increase compared to 2016. According to the regional steel association Alacero, consumption of finished steel products in Latin America increased by 3% in January-April 2018 compared to the same period in 2017 (Alacero, 2018[3]). Brazil registered consumption growth of 13% during the first four months of 2018. Large increases were also registered in Argentina (27%) and Panama (51%). In contrast, Uruguay, Peru and Bolivia saw their domestic steel consumption decrease by 33%, 21% and 18%, respectively, in the first four months of 2018. In North America, U.S. steel demand increased by 6.3% in 2017. Modest growth in housing and non-residential construction is expected to continue and contribute to the recovery of U.S. steel demand (Platts, 2018[4]). Steel demand in Mexico and Canada increased by 3.9% and 10.7% in 2017 respectively.

The reported 8.3% growth in Chinese apparent use of finished steel in 2017 includes the oneoff statistical effect resulting from the closure of induction furnaces in China that were previously operating in the informal sector, without which the growth rate would have been 3.0% (World Steel Association, 2018[5]). Apparent use of finished steel products in China, which accounts for around 46% of global steel demand, has increased for two consecutive years, and reached a level of 736.8 mmt in 2017. The recent recovery in Chinese steel demand has benefited from stimulus measures provided to boost construction activity (World Steel Association, 2018[5]). Steel demand in India, the third largest steel consuming economy, has remained strong, increasing by 4.3% in 2017 compared to 2016. The implementation of government-driven large-scale infrastructure projects contributed to the solid growth of steel demand (Metal Expert, 2018[6]).

In the ASEAN (Association of Southeast Asian Nations) region, apparent steel consumption contracted by 4.2% in 2017 compared to 2016 according to a Metal Expert report (Metal Expert, 2018[7]). Steel demand in Viet Nam is estimated to have decreased slightly in 2017 due to the slowdown in construction of factories and warehouses. Steel demand in Thailand, Malaysia and Singapore is also estimated to have declined significantly in 2017. On the other hand, steel demand levels in Indonesia and the Philippines are expected to have moderately increased in 2017, supported by the implementation of government-driven infrastructure projects (SEAISI, 2018[8]).

Apparent use of finished steel products in Japan increased by 3.5% in 2017, benefitting from strong activity in the construction sector, mainly driven by civil engineering activity. Manufacturing sectors, especially the automotive and machinery equipment industries, also contributed to Japanese steel demand growth in 2017 (JISF, 2018[9]). In Korea, steel demand decreased by 1.2% in 2017 compared to 2016. According to the Korea Iron and Steel Association (KOSA, 2018[10]), this decrease was attributable to a slowdown of the shipbuilding industry.

Steel firms in the E.U. benefited from strong growth in steel-using sectors in 2017, evidenced by the 5% increase in the so-called Steel Weighted Industrial Production Index (SWIP).4 The tube sector registered high growth rates (+7.2% in 2017), as a result of temporarily high demand for pipelines. Mechanical engineering was another driving force owing to an upswing in capital expenditure. Real steel consumption grew by 3.8% y−o−y in Q4 2017, resulting in an annual growth rate of 4% in 2017.5 Preliminary estimates for real steel consumption in the first quarter of 2018 suggest y−o−y growth of 2.4%. Apparent steel consumption grew by 1.3% in 2017 and is estimated at +1.6% y−o−y for Q1 2018 (Eurofer, 2018[11]). 6

The recovery in steel demand in the CIS region in 2017 (growth of 6.2%) was driven by Russia (5.2%) and Ukraine (4.7%). The increase in Russia was mainly supported by the recovery of investment activities due to credit expansion and easing monetary policy (World Steel Association, 2018[5]; Russian Steel, 2018[12]).

Steel demand in Turkey increased by 5.9% in 2017, supported by strong consumption of both long and flat products (Platts, 2018[13]). In the Middle East, steel demand remained almost unchanged in 2017 (with growth of 0.4%), reflecting strong demand growth in Iran of 4.7% which balanced weaker developments in other parts of the region. In Africa, steel demand fell by 6.6%, led by decreases in Egypt and South Africa of 6.0% and 12.8%, respectively.

Growth in world crude steel production has maintained momentum in 2018, with a solid 4.6% expansion, y-o-y, during the first five months of 2018. All regions experienced positive production growth during this period, with the strongest growth observed in the Middle-East (14.0%) and Oceania (13.4%). Africa (6.8%), China (6%) and Other Europe (5.1%) also experienced strong y-o-y growth (Table 2).

Total crude steel production in the North America region was up 3.1% in Jan-May 2018, y-o-y, with Mexico registering the strongest pace of production growth (4.8%), followed by the U.S. (2.8%) and Canada (2.0%).

In the E.U., steel production maintained its upward momentum, increasing by 1.8% in JanMay 2018, in y-o-y terms. Steel output in the United Kingdom (U.K.) continued to contract (1% in Jan-May 2018, in y-o-y terms). The largest increases in steel production were experienced in Italy (3.9%), Spain (1.9%), Poland (1.9%) and France (1.8%), whereas German production grew by a mere 0.4%, y-o-y, during Jan-May 2018.

In the “Other Europe” region, steel output increased by 5.1% y-o-y during the first five months of 2018, while economies in the CIS region experienced more modest steel production growth (2.8%). Growth patterns differed significantly between countries in these regional groupings; for example, Turkish steel output expanded by 4.3%. In the CIS region, Russian output increased by 2% during the period, while Ukrainian production has recovered by 0.4%, but continues to suffer from instability in the country.

Asian crude steel production increased by 5.0% in Jan-May 2018, y-o-y, with China's steel production growing by 6.0%, India’s by 4.7%, and Korea’s by 3.7%. Japanese steel production increased modestly (+0.7%), whereas Chinese Taipei's decreased by 12.5% during the period after its sharp increase of 6.9% in 2017.

In South America, the steel industry is still recovering from its previously sharp decline, albeit at a much slower pace than in 2017, with steel production growing at a rate of 3% in Jan-May 2018, y-o-y. The largest increase was in Argentina, with production growth accelerating to 22%, whereas Brazil, grew at a more subdued pace of 1.4% in the first five months of this year.

In the Middle East, steel production increased by 14.0% in Jan-May 2018, y-o-y, mainly led by Iran (24.3%). Saudi Arabia’s steel production, on the contrary, contracted by a slight 1.5%. African steel production increased by 6.8% during Jan-May, y-o-y, still driven by the very strong, albeit decelerating, rebound in Egypt (14.4% in Jan-May 2018 compared to 35.0% in 2017). In South Africa, steel production decelerated to a 1.1% growth rate in Jan-May 2018, in y-o-y terms.

Monthly data from the International Steel Statistics Bureau (ISSB), taking into account internal E.U. and other inter-regional trade, point to global steel exports averaging around 35-36 million tonnes per month during the first three months of 2018, down from around 37-39 million tonnes in 2017. The world export ratio, i.e. exports as a share of crude steel production in 2018 (Figure 5.A), has been declining slightly when compared to levels in 2017. The world export ratio stood at 25.7% in March 2018, falling to the same level as in the beginning of 2014. Excluding intra-E.U. trade, monthly global steel exports have been declining slightly from around 27-28 million tonnes during 2017 to around 26 million tonnes during the first three months of 2018. The export ratio (excluding intra-E.U. trade) has also been declining, falling to 20.8% in March 2018, down from 22.7% in March 2017 (Figure 5.B).

Table 3 presents recent data on trade developments in the seven largest steel-producing economies and the rest of the world. Exports from China have declined by 27.3%, y-o-y, in the first three months of 2018 (Jan-Mar 2018). Exports from the E.U. (external trade) and Japan have also declined, by 1.3% and 4.3% y-o-y, respectively, during Jan-Mar 2018. Exports from India, which had recorded a significant increase in 2017 (60.7%), declined by 35.4% y-o-y in Jan-Mar 2018. Steel exports from the U.S. and Korea also started to decrease, declining by 3.2% and 2.3%, respectively, during Jan-Mar 2018. Russian steel exports increased slightly, climbing 1.2%, y-o-y, in the first three month of this year.

Turning to steel imports, the E.U., the largest steel-importing economy, saw steel imports increase by 3.9% in Jan-Mar 2018, compared to the corresponding time period one year earlier. The U.S., which had recorded a significant increase in steel imports in 2017 (14.7%), posted an import decline of 3.8%, y-o-y, during Jan-Mar 2018. The volume of imported steel products in Korea decreased significantly in the first three months of 2018, falling by 30.0% relative to a year earlier. Japanese imports decreased by 6.6%, y-o-y, in Jan-Mar 2018. On the other hand, China and Russia recorded increases in steel imports in the first three months of this year, amounting to 7.4% and 9.7%, respectively, in y-o-y terms.

The uptick in steel demand from 2016 onwards has supported a rebound in steel prices from their 2015 lows (Figure 6). World hot-rolled coil (HRC) and rebar prices have both climbed back to their 2012 levels, although they remain below their 2011 levels. The dispersion across regions for both rebar and flat products prices has increased sharply since mid-2017 after a period of convergence. This can be explained by a recent increase in the differences between U.S. steel prices and steel prices for other economies (Figure 7).

Steel prices have been increasing more rapidly in the United States than in other jurisdictions in 2018. While the world price index increased by 13% for flat steel products and 9% for rebar from 1 January 2018 to 1 July 2018, U.S. flat steel prices increased by around 44% and U.S. rebar prices by 24% over the same period. The increase in Chinese prices has reduced the gap in Chinese prices relative to those in other markets, but without eliminating it. As can be seen in Figure 7, the price for flat products in China still remains significantly below comparable prices in other regions.

Prices of key steelmaking raw materials declined between early 2011 and the beginning of 2016, contributing significantly to lower steel production costs during that period. Nevertheless, this trend seems to have reversed in 2016, with raw material prices slowly climbing back towards their 2011 levels. Prices of steelmaking raw materials continued to climb in 2017, albeit at a slower pace. During the first half of 2018, those prices even declined slightly. Figure 9 shows the prices for the three main inputs used in steel-making, i.e. iron ore, coking coal and scrap.

Iron ore prices stabilised at around USD 66 per tonne in June 2018, down from USD 73 in January 2018 and below their high of USD 86 per tonne in March 2017. Coking coal prices have been more volatile, increasing rapidly in the second half of 2016 before falling sharply in early 2017, and then bouncing back again in the latter part of the year. Poor weather conditions, engineering problems and port congestion in Australia helped pushing coking coal price higher, to USD 235 per tonne in the beginning of 2018 (Hume, 2018[14]), but coking coal prices have come down since then, falling to USD 198 per tonne (FOB Australia) in June 2018. Scrap prices increased steadily during the course of 2017, reaching USD 323 per tonne (FOB Rotterdam) in December. Scrap prices increased slightly further in early 2018, but have receded more recently, falling back to USD 323 per tonne in June 2018, i.e. back to their December 2017 level.

Between 2013 and mid-2016, the margin between steel prices and the price basket of key steelmaking raw materials (OECD, 2016[15]) increased significantly (see Figure 10). This was followed by a sharp drop in this margin during the second half of 2016, as steelmaking raw material prices increased, driven notably by the spike in coking coal prices mentioned above. Since then, margins have recovered, due to a stabilisation in raw material prices and a continued increase in steel prices.

The average operating profitability ratio (EBITDA to sales revenues) of the steelmaking industry, which had rebounded to 12.4% in 2016 from its 2012 record low of 8%, stabilised around that level during 2017 at 12.2% (Figure 11). Operating profitability for the steel industry remains well below its 2004 peak, when the average profitability of steel companies (weighted by total sales) reached 20%. Median profitability was also much lower than the (weighted) average profitability in 2017, standing at around 7.5%. This suggests that the average is being driven upwards by large steel firms, and/or that profitability is skewed to the right by a few firms making much larger profits than their peers. Profitability is probably still below sustainable levels for a large number of firms. Indeed, the long-dashed line in Figure 11 indicates that 50% of the companies have operating profitability levels below 7.5%, while the bottom dashed line shows that almost 25% of the steelmaking companies are operating with profitability lower than 3.7%, and are thus coping with a particularly challenging financial position. More than 16% of the firms in the sample were making operating losses in 2017.

Net profit is derived from operating profit by deducting all expenses incurred by firms, including taxes, interest paid on debt, depreciation and amortisation. The net profit margin is then simply the ratio of net profit over sales. Figure 12 shows that the (weighted) average net profit margin of steel companies fell to 2% in 2015 from a peak of 10% in 2004. In 2016, net profit margins rebounded, with the average increasing more than the median and reaching 5% that year. The pace of the rebound slowed down in 2017, with net profits increasing only marginally to 5.5%. Nevertheless, the gap between the first and fourth quartile of the net margins distribution, which had widened considerably in 2015, and narrowed during 2016, continued to narrow in 2017. This can be attributed to the continued increase in the net profits of the least profitable firms — the 1st quartile of the distribution reached -0.8% in 2017, much higher than the -2.5% value observed in 2016. This nevertheless implies that 25% of steel companies still make losses that are larger than 0.8% of their total sales revenues. More than a quarter (26%) of the firms in the sample were making net losses in 2017.

Overall, net operating profit margins still differ greatly across the different quartiles of the distribution: 25% of the companies in the sample at the higher end of the distribution (the upper dashed line in Figure 12) are making net profits amounting to 5.5% or more of their sales revenue, whereas 25% of companies at the lower end of the distribution are making net losses amounting to 0.8% or more of their sales revenue, as noted already above. The financial performance of the remaining steel firms ranges from net losses of 0.8% to net profits of 5.5% of their sales revenue.

Figure 13 shows the evolution of the distribution of net profits across steelmaking companies between four selected years (2004, 2008, 2012 and 2017). It is clear that there was a strong shift in the distribution towards the left (i.e. lower profitability) between 2004 and 2012: the reduction in average profitability was felt across the board. Nevertheless, in 2017 the distribution started to move back towards positive values. This suggests that in 2017, profitability has generally improved compared to 2012, but for most firms remained lower than in 2004 or 2008.

After several years of low profits, steelmaking companies had, until recently, rapidly accumulated high levels of debt. However, financial data for 2017 suggest that steel companies continue to slowly deleverage (Figure 14). Steelmakers seem to have been using the space provided by improved net profitability to reduce debt. A more cautious approach taken by banks and other financial institutions towards their lending to steel firms, as well as efforts to deleverage the corporate sector and deal with non-performing loans in some economies such as China and India, may also explain part of the deleveraging of steel companies. The average share of debt on total assets has decreased from 41% in 2014 to around 34% in 2017, but is still higher than levels seen for several years prior to 2008.

Nevertheless, the reduction in indebtedness indicated in Figure 14 should be interpreted with caution, since only debt of publicly listed companies is included in the Reuters Eikon data used for this report. Moreover, the maturity of the debt and the average interest rate paid are two other very important aspects to consider for assessing corporate financial conditions. A decrease in average debt maturity and increase in average interest rate has been documented for steel companies in some jurisdictions, which means that steel companies pay more to borrow for shorter periods of time (Financial Times, 2018[16]). Moreover, in some large steel-producing economies, debt has been reduced through the use of debt-for-equity swaps that are not necessarily market-driven and lack clarity concerning losses in cases of bankruptcy (Ren, 2017[17]).

In a context of very fragile balance sheets, a sustained recovery is needed to avoid debt defaults, with possible implications for the financial sector as well as other parts of the economy. Removing barriers to exit by restricting direct and indirect forms of support, ensuring adequate bankruptcy regulation is in place, allowing market-driven bankruptcy and debt-restructuring as well as by actively deploying measures to address specific closure costs (e.g. preparing effective worker programmes to minimise social costs), would help reallocate resources to the more efficient steel firms and ultimately ensure the viability and sustainability of the sector as a whole.

There have been some concerns that steel prices have recently been affected by speculative trading in commodity and financial markets, rather than being a reflection of the balance between supply and demand (Financial Times, 2016[18]). Indeed, prices for several steel products have increased particularly rapidly in certain markets. This section examines the extent of speculative trading in steel commodity and financial markets through futures contracts (see Box 1 for definitions). More specifically, it investigates whether steel future contract prices (hereafter futures prices) have the potential to influence steel spot prices, or whether steel spot price information enables a better forecasting of steel future prices. This will shed some light on whether speculators could influence steel (spot) prices by positioning themselves on the financial markets.

According to the arbitrage principle, futures prices should converge, at their maturity, towards the current spot prices.7 But are futures prices drawn towards a current spot price that has its own, independent dynamics, or is the bidding taking place on the future market also influencing the spot price?

Future contracts remain the preferred instrument used by investors and speculators to take a position in steel. In order to position themselves to benefit from a possible increase of steel products prices in the future, investors and speculators are left with three possibilities: i) to directly stockpile steel products – that is, withdrawing steel from the spot physical market in the hope of selling it at a higher price later; ii) to buy shares in steel firm(s); or iii) to buy a future contract on an exchange (see Box 1). Investors who, on the contrary, believe that steel prices are going to decrease can sell a future contract to investors, accepting to make delivery, for a given price and at a later time, of a specified quantity of a steel product. Consequently, speculators bring liquidity to the market on both the sell and buy side.

A steel futures contract is a binding legal contract to buy a particular quantity of a steel product of standardised specifications at a predetermined and agreed price at a specified time in the future. Futures contracts are standardised for quality and quantity to facilitate trading on a futures exchange. The buyer of a futures contract is taking on the obligation to buy the underlying asset when the futures contract expires. The seller of the futures contract is taking on the obligation to provide the underlying asset at the expiration date.

The main differences of a futures contract compared to a forward contract, which is also an agreement to buy a given quantity of steel product at a specified time at a given price are that i) futures contracts refer to standardised quantities whereas forward contracts are fully customisable; and ii) futures contracts are traded on exchanges that limit counterparty risks through the use of central clearing counterparties (CCP) and margin calls.

There are four major exchanges worldwide that allow for trade in steel futures:

The London Metal Exchange (LME) proposes two future contracts related to steel: the LME Steel Rebar and the LME Steel Scrap contract, for delivery up to 15 months ahead. Orders are matched through an electronic platform (LMESelect), or through inter-office telephone between members of the exchange. LME plans to launch a HRC contract in 2019 (Kallanish, 2018[19]).

The New York Mercantile Exchange (NYMEX) proposes a future contract for HRC for delivery up to 12 months ahead, the U.S. Midwest Domestic Hot-Rolled Coil Steel Index, with matching of orders occurring through the ME Globex electronic trading platform, and where off-exchange transactions can be submitted for clearing via the NYMEX ClearPort (CME Group, 2014[20]).

The Dubai Gold & Commodities Exchange (DGCX) proposes a Rebar contract for delivery up to 12 months, matching buyers and sellers through a platform used by India’s Multi Commodity Exchange of India (MCX), a minority shareholder in DGCX, and cleared through DGCX own clearing house.

The Shanghai Futures Exchange (SHFE)8 offers steel wire rod and steel rebar contract.9 It settles in Renminbi.

Futures markets are the most convenient way to take a position in steel markets, in line with what happens in other commodity market segments. Stockpiling requires large operational capacity and involves high costs, unattainable for investors not actively participating in the physical steel market, and the price of steel firms’ shares is subject to various other firm-specific risks that go beyond steel price dynamics — e.g. operational efficiency and firm-specific shocks. Hence, it is more convenient for asset managers, pension funds, banks and other institutional investors that want to invest in steel, to do so through futures markets. Because these types of investors prefer to avoid physically holding steel, they roll out or sell their future contracts before expiration.

Futures are usually assumed to increase price transparency in the market they are concerned with and to benefit price discovery by i) having larger liquidity, ii) allowing investors to also short-sell the commodity (selling a future contract without having the underlying physical steel), and iii) being traded for standardised quantities on international exchanges. The selling of futures contracts is also an important instrument for producers, helping them hedge against a potential drop in the future price of steel — the alternative is a bilateral contract between a steel producer and a steel user (buyer) whereby the user agrees to buy a certain amount of steel products at a later date at a price decided at present.10

Both DGCX and SHFE exchanges use physical delivery, to help ensure that contract prices converge towards steel spot prices. Hence, market participants that have not closed their contract position are obliged to make a delivery or take a delivery of the product underlying the contract, which has to be of a minimum and specified quality grade. For example, delivery for the DGCX contract occurs at the Jebel Ali freetrade zone in Dubai.

LME and NYMEX exchanges use cash settlement: there is no physical delivery of the underlying product, but the final settlement (following the termination of the trading at the maturity date of each specific contract) is based on a price index. For the LME those are the Monthly Average Index Price of the "Platts Steel Rebar FOB Turkey"11 for the rebar contract and the Monthly Average Index Price of the "Platts TSI HMS 1/2 80:20 CFR Turkey" for the scrap contract12. For NYMEX it is the "CRU U.S. Midwest Domestic Hot-Rolled Coil Steel Index"13. Cash settlement for steel prices also ensures price convergence between spot and future prices, but requires a widely accepted and reliable steel price index.

A short econometric analysis is performed on three different markets to assess whether future prices drive spot prices. Regarding futures prices, the analysis uses the daily price series of the US HRC market (NYMEX U.S. Midwest Domestic Hot Rolled Coil Steel Commodity Future), of the Chinese HRC market (SHFE Hot Rolled Coil Future) and of the Chinese Rebar market (SHFE Rebar Commodity Future), which are retrieved from Thomson Reuters EIKON. Spot prices are sourced from Platt’s.

Figure 15 shows the evolution of the average spot price for US HRC, as well as the evolution of two futures of different maturities. For example, given the contract closing in June 2018, the data show that half of the time the future contract price is above the spot price, and half of the time below it, reflecting investors' mixed anticipations about the future June 2018 spot prices.

Figure 16 and Figure 17 show the evolution of the average spot price for China HRC and China Rebar, as well as the evolution of futures prices for different maturities. Futures prices appear to be consistently below spot prices, suggesting that investors had lower expectations about the future spot prices during the period of time considered.

For each of the three steel futures markets described above, data were collected from Platts on the daily high and low spot price of the product considered, in order to calculate the average between the high and low spot price for each day (hereafter average spot price).15 The daily closing prices of these future contracts are compared to the average spot price of the following day for the corresponding steel product.

Granger causality tests comparing the price variations of these daily series yield similar results for the three markets: the null hypothesis that changes in futures prices do not Granger-cause spot price changes is rejected, but not the reverse (see Annex for the test statistics). This means that the daily change of future prices seems to be leading the daily changes of the spot prices, and not the other way round.

It is common in futures markets to consider, at a given time t, the values of future contracts of different maturity and to represent those on a graph. The resulting curve is called a forward curve. An upward sloping curve is described as normal (or as backwardation), while a downward sloping curve is defined as contango. For example, Figure 18 represents five forward curves for the SHFE Rebar Commodity Future, taken on five different dates. For each forward curve/date, the future prices of contracts of different maturities form a downward sloping curve: steel for a closer delivery is always more expensive than for delivery farther in the future. Steel and other metals with high storage fees are understandably more prone to be in contango (downward sloping curve). However, the main driver of future price dynamics is likely to be price expectations, rather than the relatively fixed storage fees and the benefit of holding the steel product. Notwithstanding, pure demand-supply dynamics could also play an important role on the future market.

To sum up, daily changes in futures prices have the potential to impact (current) spot price changes. While these findings are a necessary condition for the existence of independent speculative activity impacting current steel prices, it is not a sufficient condition for it. Further analysis to confirm the existence of speculative activity affecting current steel prices would require a full-fledged model containing not only spot and future prices but also all relevant market variables, and is therefore beyond the scope of this short study.

The price of a futures contract of a given maturity in time T reflects, to a large extent, the market’s anticipation of what spot prices will be at that time T in the future. Nevertheless, future prices and market expectations might not necessarily be fully aligned. Two main factors could explain why future prices may differ from expectations.

On the one hand, there are storage costs for holding physical steel. Consequently, a buyer that does not need the steel immediately or a speculator betting on a steel price increase can find it useful to buy a future contract, rather than to pay the storage costs of holding the steel himself. It is the seller of the future contract which will have to bear the storage costs in case he owns the steel — or alternatively the risk of later spot price volatility in case the seller plans to buy the steel at a later date to execute the delivery. Those costs or risks might in some circumstances16 need to be compensated by a premium for the seller of the future contract, and thus push the future prices up, higher than the pure expectations about spot prices at period T. The longer the maturity date T, the larger the joint effect of uncertainty of price dynamics and storage fees.

On the other hand, there are advantages in holding physical steel. The holder of physical steel could use it to collateralise a loan,17 or simply sell it in the spot market in the hope of buying it back later at a lower price. These benefits constitute what is called a "convenience yield". Convenience yields push the price of futures contracts down, below the expected steel price. For example, during a temporary shortage of physical steel, the convenience yield will rise, creating an inverted forward curve (or contango).

Finally, a disproportionate number of sellers compared to buyers (or the reverse) in the future markets may push future prices away from anticipated spot prices in either direction. Note that these imbalances can be quite different from the spot steel market or the forward market.18 For example, if buyers of futures are much more numerous than sellers, they may accept to pay a premium to position themselves in the steel futures market.

Ultimately, price convergence between the spot price and the futures price is ensured when the contract nears delivery, through emerging arbitrage opportunities for market players ready to take or make a physical delivery of the steel.

Global steelmaking capacity has decreased for two consecutive years in 2016 and 2017 due to capacity reductions and slower capacity growth in both OECD/EU economies and nonOECD/EU economies. However, the latest available information (as of June 2018) suggests that global steelmaking capacity (in nominal crude terms) is expected to increase in 2018 for the first time since 2015 (Figure 19). The OECD has revised its 2017 figure for world steelmaking capacity from 2 251.2 million metric tonnes (mmt) to 2 244.9 mmt, to incorporate closures and investments that were not taken into account previously. The net capacity change, taking into account new capacity investments underway and closures during the first half of 2018, brings current global steelmaking capacity up to 2 290.1 mmt, representing a 2.0% increase from the 2017 level.

Even though global steelmaking capacity is expected to increase in 2018, the gap between global capacity and production is likely to narrow because the latter is increasing strongly; global crude steel production expanded by 4.3% in the first five months of 2018, compared to the corresponding time period a year earlier. Currently, the gap between capacity and production is estimated at around 540.0 mmt (Figure 20.A). The ratio of global production to capacity is expected to increase from 75.3% in 2017 to 76.4% in 2018 (Figure 20.B).

While global steelmaking capacity has decreased in 2016 and 2017, there have been concerns that the capacity reduction efforts by some economies might be offset by outward investments that shift capacity to other regions via foreign direct investments. In order to monitor this phenomenon and estimate its magnitude, the Secretariat has recently started collecting information on cross-border capacity investments. The map in Figure 21 illustrates the current information available to the Secretariat on where planned or underway capacity additions entail foreign direct investment or joint ventures with foreign participation.

The last Short Range Outlook released by the World Steel Association in April 2018 foresees global finished steel demand reaching 1 616.1 million metric tonnes (mmt) in 2018, which would represent a 1.8% increase over 2017 (see Table 5). This growth rate is expected to slow down to 0.7% in 2019, when global finished steel demand is projected to reach 1 626.7 mmt (World Steel Association, 2018[5]).

The previous forecasts, released in October 2017, had indicated an increase in steel demand of a similar order of magnitude for 2018 (a 1.6% increase compared to 2017). The World Steel Association highlights that the positive momentum benefits from strong investment levels in advanced economies, high confidence and a broader recovery in commodity prices. However, this could be eroded by a possible escalation of trade tensions, a probable U.S. and E.U. monetary policy tightening, as well as rising inflationary pressures. Overall, the World Steel Association noted in its April 2018 Short Range Outlook that the “upside and downside risks to this forecast are mostly balanced”.

Eurofer forecasts apparent steel consumption to grow by 2.3% in 2018 and 1.4% in 2019, while real steel consumption is expected to increase by 2.1% and 1.3%, respectively. (Eurofer, 2018[11]) In 2017, the E.U. steel industry benefited primarily from demand growth in the mechanical engineering and steel tubes industries, which registered a production increase of 6% and 7.2%, respectively. After this temporary boost in the demand for steel tubes, production in 2018 is currently expected to stabilise at the same level as in 2017, with a slight increase of 0.7% projected for 2019. Demand in mechanical engineering, which is predicted to rise by 4% in 2018 and 2.3% in 2019, is expected to provide some impetus for overall steel demand growth. The construction sector is expected to continue growing, albeit at slower rates going forward. Residential construction demand is supported by higher wages, strong consumer confidence as well as favourable financing costs. After high growth rates in recent years, the E.U. car industry is expected to continue growing on a stable but more moderate path. The sector’s output is projected to increase by 1.8% in 2018 and 0.8% in 2019. Regarding the E.U. steel trade balance, Eurofer notes the heightened risk of trade measures targeting car imports in main E.U. automobile export markets. Domestic appliances is the only steel-using sector projected to register higher growth in 2018 than in 2017, with a growth rate of 4.2% in 2018 compared to 3.2% in 2017, driven by real income growth, while the sector is expected to increase its output by 2.1% in 2019 (Eurofer, 2018[11]). Downside risks include the current strength of the euro and possible protectionist measures which could weigh on exports.

With respect to corporate consolidation in the E.U., the European Commission (EC) announced on 7 May 2018 that it cleared ArcelorMittal's acquisition of Ilva, after the former had agreed to follow the EC’s requirement to divest several steel plants, which was deemed necessary to prevent market domination and the resulting higher prices for flat carbon steel products (European Commission, 2018[22]). According to the European Commission’s press release, the extensive package of divestitures involved will preserve effective competition. The same document states that “(…) The Commission will assess whether the buyer(s) has/have the ability (i.e. expertise, financial resources etc.) and incentives to continue operating and developing the production assets in order to replicate Ilva as an active competitor of the merged entity on a lasting basis. In other words, the sale of a plant to a buyer, which would plan to subsequently close it down, would not be an acceptable solution.”. Furthermore, the Commission has noted that its decision on the acquisition does not affect its previous decision that two loans granted in 2015 to Ilva involved illegal State aid and the request that the authorities recover the undue benefit. (European Commission, 2018[22]).

The long planned 50:50 joint venture between Tata Europe and ThyssenKrupp was signed in late June 2018. Subject to approval by the EC, the new entity, second in size only to ArcelorMittal, is expected to be established in late 2018 or early 2019 (Reuters, 2017[23])This is another example of consolidation in the steel sector and further analysis by the OECD Steel Committee could provide additional insights on its effects on steel markets.

In its April 2018 Short Range Outlook, the World Steel Association revised downward its expected growth for the “Other Europe” regional category from 5.2% to 4.5% in 2018 and projects a similar performance in 2019 with growth reaching 4.4%. While steel demand growth is expected to ease back slightly in Turkey compared to 2017, it is still expected to increase by 5% in both 2018 and 2019 (World Steel Association, 2018[5]), driven by major infrastructure projects (ERAI, 2017[24]). Amid concerns about rising trade tensions (AMM, 2018[25]), Turkish flat steel producers expect to increase their production thanks to strong local and export demand (Metal Bulletin, 2018[26]).

Steel demand growth in the CIS region is expected to ease back to 2.3% in 2018 and 1.8% in 2019, after having reached 6.1% in 2017. The region’s largest steel-consuming economy, Russia, is expected to increase its steel demand by 2.1% and 1.4% in 2018 and 2019, respectively. This marks a continuation of its recovery after steel demand declined in 2016, albeit at lower levels than in 2017 when demand rebounded by 5.1%. Growth is expected to benefit from improved levels of business and consumer confidence and monetary easing (World Steel Association, 2018[5]).

Central and South American economies are expected to increase their steel demand growth to 6.2% in 2018 and 4.9% in 2019, according to the World Steel Association's April 2018 Short Range Outlook. This represents an upward correction compared to the October 2017 outlook which expected an increase of 4.7% in 2018. After the sharp drop in consumption in 2016, the predicted growth rates imply a recovery to pre-crisis levels of consumption in 2018 for the region (World Steel Association, 2016[27]; World Steel Association, 2018[5]). Nevertheless Brazilian steel consumption is only expected to reach its 2013 peak level of consumption in 2028 (Aço Brasil, 2017[28]). Alacero expects steel consumption in 2018 to increase by 7%, 5.3% and 4% in Brazil, Argentina and Colombia, respectively (Metal Expert, 2018[29]). According to Alacero, the Latin American steel industry as a whole is likely to benefit from a strong world economy. Depending on the implementation of economic reforms, the outlook for the steel market could improve further (Metal Expert, 2018[29]). In that context, the result of upcoming elections in many Latin American economies will be important.

Regarding the NAFTA region, the World Steel Association expects steel demand to grow by 3.0% in 2018, which marks an upward revision compared to its October outlook. In 2019, growth is projected to slow to 1.6%. After a strong performance in 2017, when steel demand growth reached 6.4% compared to 2016, the U.S. is expected to further increase its steel demand in 2018 by 2.7% to 100.3 mmt. For 2019, growth is predicted to moderate to 2.0%. While the relatively low external value of the USD and increasing investment following the tax reform could provide some support for the manufacturing sector, growth in automobile demand is likely to slow down due to already high levels of car ownership. Expected tighter monetary policy contributes to the projected decrease of steel demand growth rates. Mexican steel demand growth is expected to ease as well, from a projected 3.5% in 2018 to 1.5% in 2019 (World Steel Association, 2018[5]), partly because of a moderation of the U.S. car market (World Steel Association, 2017[30]). Alacero expects Mexican steel consumption in 2018 to increase by 3% (Metal Expert, 2018[29]). Trade policy developments represent a downward risk to the outlook, and NAFTA renegotiations continue to be important to follow.

In the Middle East, steel demand is projected to grow by 4.6% in 2018, followed by slightly lower growth of 3.7% in 2019, according to the World Steel Association. Steel demand in the region could benefit from stabilising oil and commodity prices, and would further improve should geopolitical tensions ease (World Steel Association, 2018[5]). Gulf Coast Conference (GCC) economies are financing important infrastructure projects and public works that could support steel demand going forward. In the United Arab Emirates (UAE) and Qatar, the construction sector should benefit from improved demand in the wake of preparations for the 2020 Expo in Dubai and the 2022 Football World Cup in Qatar. In Saudi Arabia, the government is supporting the construction and modernisation of infrastructure, which would be an important driver of future steel demand growth (Djoudi, 2017[31]). Steel demand in Iran is likely to be influenced by the withdrawal of the United States from the Joint Comprehensive Plan of Action (better known as Iran Deal) and its ensuing reintroduction of sanctions, which are expected to also affect the steel sector (Financial Times, 2018[32]). Pakistani steel demand is projected by some observers to reach 10 mmt within 2-3 years from its current level of 7.5 mmt (Pakistan & Gulf Economist, 2018[33]). The economy’s steel sector is also likely to benefit from infrastructure projects in the framework of the Belt and Road Initiative (see also Box 5).

The April 2018 forecast by the World Steel Association estimates that steel demand in the Asia and Pacific region should grow by 1.1% in 2018, followed by a stagnation in 2019 (-0.2%). As steel demand in China is expected to remain stable in 2018, India is likely to drive the projected increase in steel use in the region (World Steel Association, 2018[5]).

Chinese steel demand is expected to stagnate in 2018 and decline by 2.0% in 2019, due to a slowdown in construction activity and the Chinese government’s effort to shift to a more consumption-driven growth path (World Steel Association, 2018[5]).19 At the same time, the China Iron & Steel Association (CISA) indicated that Chinese steel consumption could continue to increase in 2018, by 0.8 %, supported by demand from the construction, manufacturing and energy sectors (Platts, 2018[34]). Steel demand growth in China will likely continue to be supported by infrastructure investment projects, such as construction of roads, bridges and subways. Nevertheless the rate of growth in investment in infrastructure (fixed-asset investment in infrastructure, excluding electric power, heat power, gas and water) started to slow down during the first five months of 2018, registering a 9.4 % increase y-o-y, which is three percentage points lower than that in the first four months of 2018, according to the National Bureau of Statistics of China (National Bureau of Statistics of China, 2018[35]). Possible risks to the outlook include, among others, high corporate leverage, although the World Steel Association does not believe this risk will materialise in the near future (World Steel Association, 2018[5]). Efforts to deleverage companies through debt-to-equity swaps with money from recently announced cuts of reserve requirements for banks (Bloomberg, 2018[36]) can only be effective if they are market driven, if the changes in ownership are used to sustainably improve a firm’s viability and if the intervention is not used to continue the operation of non-viable firms. In the long run, steel exports might benefit from infrastructure projects within the framework of the Belt and Road Initiative (see Box 5).

First announced by Xi Jinping in 2013 as the “Silk Road Economic Belt” (the Belt) and the “21st Century Maritime Silk Road” (the Road) aimed at promoting a land-based and a maritime connection between Asia and Europe, the “Belt and Road Initiative” (BRI) has been clarified in an action plan released in 2015 and has been further extended and given form during the “Belt and Road Forum” in March 2017.

The BRI is a comprehensive strategy of which infrastructure investments are only one part. Nevertheless, infrastructure investments are a central pillar of the BRI, and those investments have the potential to increase steel demand in participating economies, according to some sources. Quantifying the size of this possible impact is difficult, and existing estimates vary widely. BHP expects up to 150 mmt of additional steel demand through BRI projects (BHP, 2017[37]), Bloomberg sees total potential additional demand of 272 mmt (Bloomberg, 2018[38]), and Dr. Chang-do Kim from the POSCO Research Institute puts the number at 30 mmt annually (Kim, 2017[39]). The BRI aspect of capacity cooperation to help emerging economies meet their increasing steel demand has also been highlighted as a possibility to ease steel production overcapacities (Zhang and Su, 2018[40]). Nevertheless, with the global capacity-production gap currently estimated at around 540.6 mmt, the abovementioned potential demand increase through BRI projects cannot be expected to provide a significant relief to the overcapacity situation.

At the same time, Chinese firms are encouraged to relocate production to ASEAN economies to help them “meet the local need of infrastructure development”, as outlined during a speech delivered by Premier Li Keqiang (Li, 2014[41]). Hebei Province reportedly plans to move 20 million tonnes of steelmaking capacity abroad by 2023 (Global Times, 2014[42]). Efforts towards reducing overcapacity can only be effective if domestic closures are not compensated by new investments abroad.

While Japanese steel demand has benefitted from a government stimulus package in 2017, it is forecast to remain stable in 2018 (increase by 0.1%) and increase slightly in 2019 (by 0.6%) (World Steel Association, 2018[5]). According to the Japan Iron and Steel Federation (JISF), active investments associated with the Tokyo 2020 Olympic and Paralympic Games could have a positive effect on steel demand in Japan (JISF, 2018[43]). In Korea, steel demand is expected to increase by only 1.0% in both 2018 and 2019, affected by high consumer debts, weakening construction and a depressed shipbuilding sector (World Steel Association, 2018[5]).

According to the latest Short Range Outlook by the World Steel Association, steel demand in India is expected to grow by 5.5% in 2018 and by 6.0% in 2019, mainly driven by the construction sector (World Steel Association, 2018[5]). The Indian government has decided to accelerate infrastructure projects such as the development of rural areas.20 The automotive sector is also likely to be a key driver of solid steel demand, as it is expected to grow by 8-10% in the financial year of 2018-2019 (April 2018 – March 2019) according to the projection of the Society of Indian Automotive Manufacturers (SIAM) (ET Auto, 2018[44]).

According to a report by SEAISI, steel demand in the ASEAN-6 region (Indonesia, Malaysia, Philippines, Singapore, Thailand and Viet Nam) is forecast to show a steady growth rate around 5-6% per year over the next few years and apparent steel consumption in the region could surpass 80 mmt in 2019 (SEAISI, 2018[45]). Steel demand in Viet Nam and Thailand is expected to increase again in 2018 (Metal Expert, 2018[7]). The Philippines continues to enjoy a gradual increase of steel demand driven mainly by numerous government-led infrastructure projects under the “Build Build Build” program.21 Indonesia might also keep its positive growth momentum due to solid demand from the construction industry (Metal Expert, 2018[7]).

The usual Granger causality tests were applied. Non-differentiated price series are all integrated of order 1, but are not co-integrated. Therefore, a Vector Autoregressive Model (VAR) without error-correcting term is the correct way to model price change interactions. Two lags for each variable were chosen, but robustness tests indicate that a different number of lags did not alter the results. Granger causality tests are then derived immediately from the VAR specification by jointly testing whether the coefficients are statistically different from zero.

Please note that when changes of future prices at close are instead compared to the changes of spot prices of the same day (rather than to changes in spot prices of the following day), it is found that each series may Granger-cause the other (that is, we cannot reject any null that one of the series is not Granger-causing the other). This is perfectly understandable, as the change of the current spot price of a given day occurs before the future closing price and thus partially explains it.

The p-value of 4.6% below indicates that we can reject the null hypothesis that the future price variations do not Granger-cause the spot price variations at a 5% confidence level. On the contrary, because 94% is high, we cannot reject the null hypothesis that the spot price variations do not Granger-cause the future price variations at any usual significance level.

The p-value of 0% below indicates that we can reject the null hypothesis that the future price variations do not Granger-cause the spot price variations at a 5% confidence level. On the contrary, because 83% is high, we cannot reject the null hypothesis that the spot price variations do not Granger-cause the future price variations at any usual significance level.

The p-value of 0% below indicates that we can reject the null hypothesis that the future price variations do not Granger-cause the spot price variations at a 5% confidence level. On the contrary, because 38% is high, we cannot reject the null hypothesis that the spot price variations do not Granger-cause the future price variations at any usual significance level.