

Applied Value Steel Quarterly Report – Q1 2019



Q1 2019

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Applied Value is a professional services firm that supports clients develop and implement strategies that impact bottom line financials.



Applied Value Publishes the Quarterly Report for the Benefit of our Clients in Steel Consuming Industries

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Applied Value has 15+ years of experience working with clients in numerous industries involved in various facets of steel purchasing.

Client Annual Consumption, tons		Data Control	Fact-based Negotiations	Leverage Creation	Manage Steel Component Costs	Risk Management	Macroeconomic Factors on Global Steel Trade	Game Changers	
10M	Automotive OEM	✓	✓	✓	✓	✓	✓	✓	
	White Goods OEM	✓	✓	✓		✓		✓	
1M	Automotive OEM		✓	✓		✓			
	Global Engineering		✓	✓					
	Global Construction	✓				✓		✓	
	Industrial Products		✓			✓			
	4 Food Producers		✓				✓	✓	
	Heavy Truck OEM		✓	✓	✓				
	Defense/Heavy Truck	✓	✓	✓	✓				
	Security Solutions	✓	✓	✓			✓		
	Heavy Truck OEM	✓	✓	✓	✓	✓			
	Truck Tier 1	✓	✓	✓		✓			
0.1M	Lifting OEM	✓	✓	✓	✓	✓		✓	
	Global Engineering	✓	✓	✓		✓			
	Consumer Goods OEM		✓	✓				✓	
	EU Turbine Manufacturer	✓	✓	✓	✓	✓			
	0.01M	Automotive Tier 1	✓	✓		✓	✓		
		Scand. Engineering	✓	✓	✓			✓	
		Scand. Construction	✓	✓	✓				



Applied Value supports clients and investments globally from three offices.



■ Countries where Applied Value has performed case work over the last ten years

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Global steel prices declined across the board in Q4 '18 including a correction in the US from the inflated 232 run-up. Overall demand & economic uncertainty are continuing to drag prices down into 2019.

Executive Summary

- **North America Summary:**

- US Flat prices plummeted 13% in Q4 and have now reached pre-232 price levels as the market continues to correct
- US prices are projected to see additional decreases going into 2019 as prices re-align globally and economic uncertainty hits demand

- **Europe Summary:**

- EU flat prices decreased 6% in Q4 2018 as inventories increased and buyers awaited decisions on newly announced safeguard tariffs
- Economic driven demand factors will keep EU prices lower in H1 '19 but supply consolidation and safeguard measures will maintain a floor

- **China Summary:**

- China flats prices saw a major decline of over 11% in Q4 2018 before leveling off slightly in December
- Trade uncertainty coupled with falling demand will likely put pressure on lower Chinese prices in H1 2019

- **Raw Materials Summary:**

- Q4 saw an increase for Coking Coal (+15%) and US Scrap (+9%) while other raw materials mostly declined, largely on account of growing uncertainty around Chinese production



Global Steel Price & Trend Summary.

Commodity		Latest Price (Dec)	Last 3 Months	Trend (Forward)	Major Individual Market Drivers
Flat	US	\$836/MT	-13%		▲ Raw Material Prices; Infrastructure; China Auto Tariffs ▼ Auto Ind.; Market Correction; PMI; Import Levels
	EU	€543/MT	-6%		▲ Safeguard Quotas; Power Prices; HR Consumption ▼ High Inventories; PMI; Auto Manufacturing
	CN	\$530/MT	-15%		▲ Trade Environment; Currency Depreciation ▼ Unstable Trade; Excess Capacity; Low Demand
SS	US	\$2,745/MT	-8%		▲ Natural Gas Prices ▼ Surcharge Pricing; Nickle Prices; Chromium Prices
	EU	\$2,669/MT	-12%		▲ Safeguard quotas; Natural Gas Prices ▼ Surcharge Pricing; Nickle Prices; Chromium Prices
	CN	\$2,146/MT	-5%		▲ Trade Environment; Currency Depreciation; Gas Prices ▼ Seasonality; Nickle Prices; Chromium Prices; Low Demand
Plate	US	\$1,098/MT	-1%		
	EU	\$671/MT	-10%		▲ Ship Building & Repairs; Defense Spending ▼ OPEC Oil Production; Baltic Dry Index; Automotive Demand
	CN	\$536/MT	-17%		
Bar	US	\$843/MT	0%		
	EU	\$654/MT	-4%		▲ Surcharge Quotas; US Scrap Prices ▼ Ferrochrome; Nickel; Surcharge Pricing; CN Scrap Prices
	CN	\$557/MT	-16%		
Welded Tube	US	\$1,264/MT	-6%		▲ Crude Oil; Rig Count; Natural Gas ▼ Hot Rolled Prices; OCTG Imports
OCTG	US	\$1,185/MT	-19%		

Overall Market Drivers

- ▲ US Infrastructure
- ▲ EU Safeguard Tariffs
- ▲ China Suspends Auto Tariffs for US
- ▲ Chinese Currency Depreciation

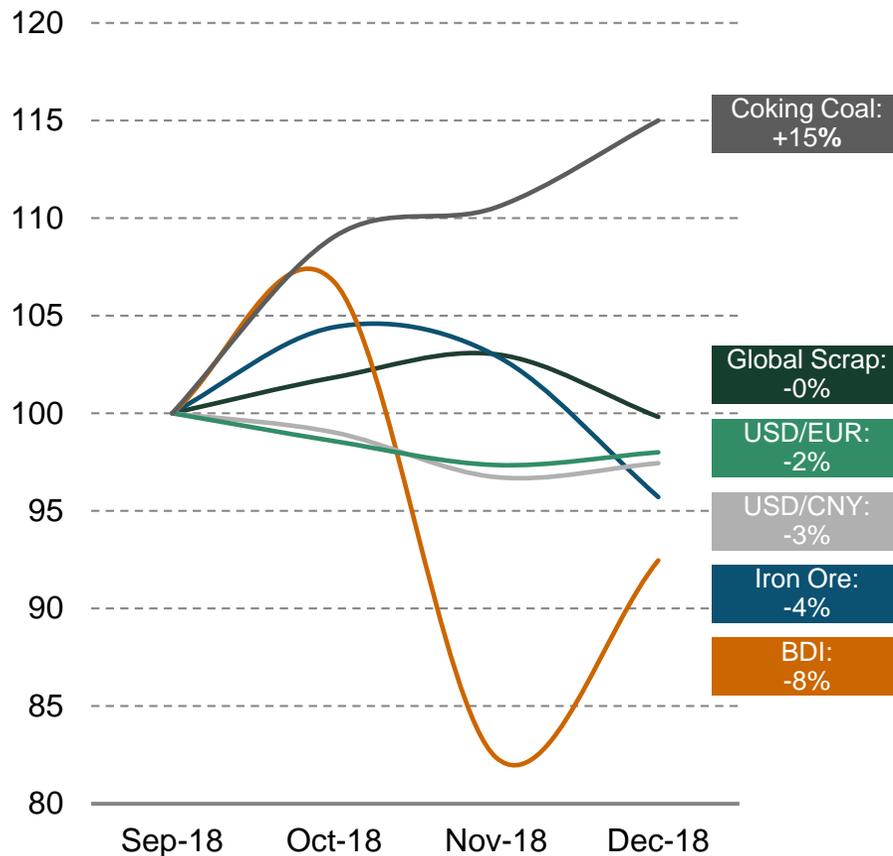
- ▼ Market Correction
- ▼ High Inventories
- ▼ Purchasing Managers Index
- ▼ Automotive Slowdown
- ▼ Global Economic Uncertainty
- ▼ China Steel Demand



Global hot rolled flat steel prices dropped in Q4, while input costs remain relatively unchanged albeit an uptick in Coking Coal.

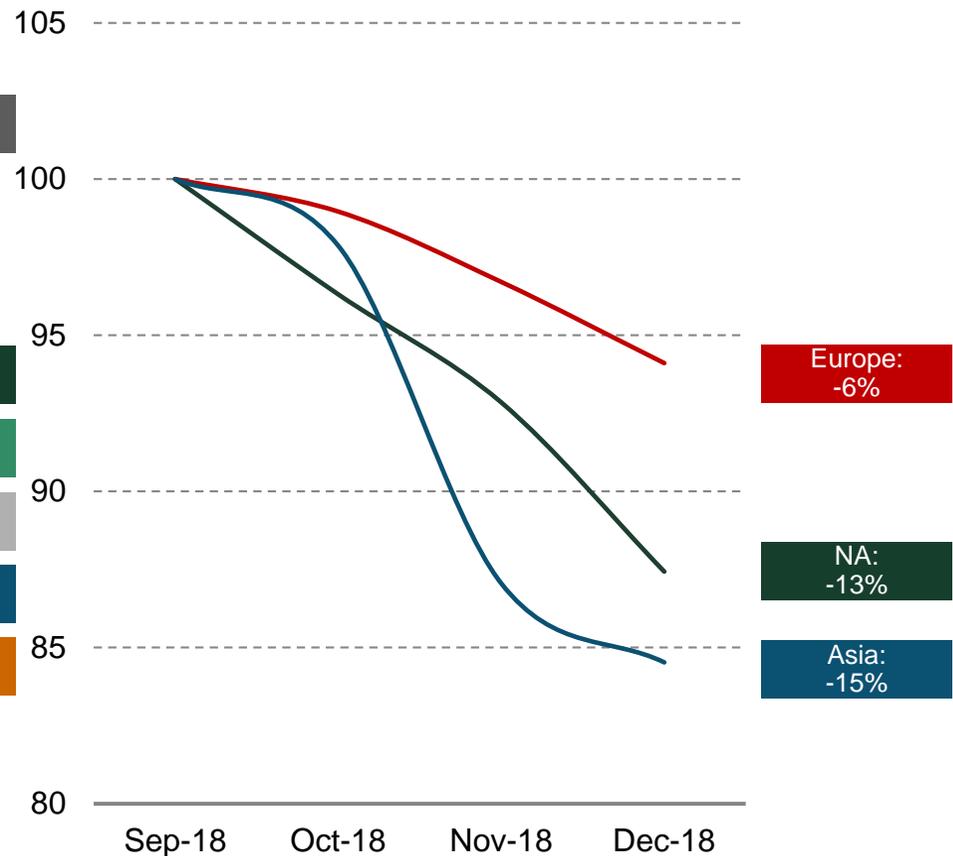
Indexed Input Costs

September 2018 – December 2018



Indexed HR Flat Steel Prices

September 2018 – December 2018



Market Conditions by Region

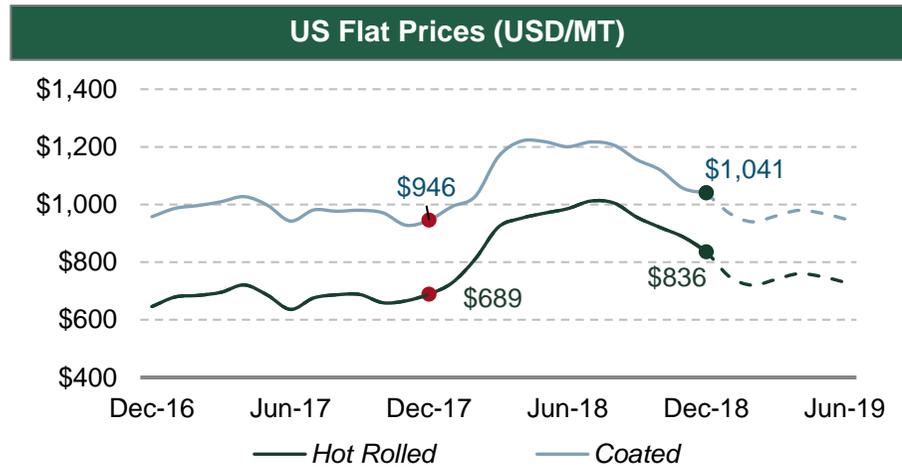
Special Section: 232 Impact on 2019 Negotiations

Steel Production Costs

Stock Price Development of Major Steel Companies

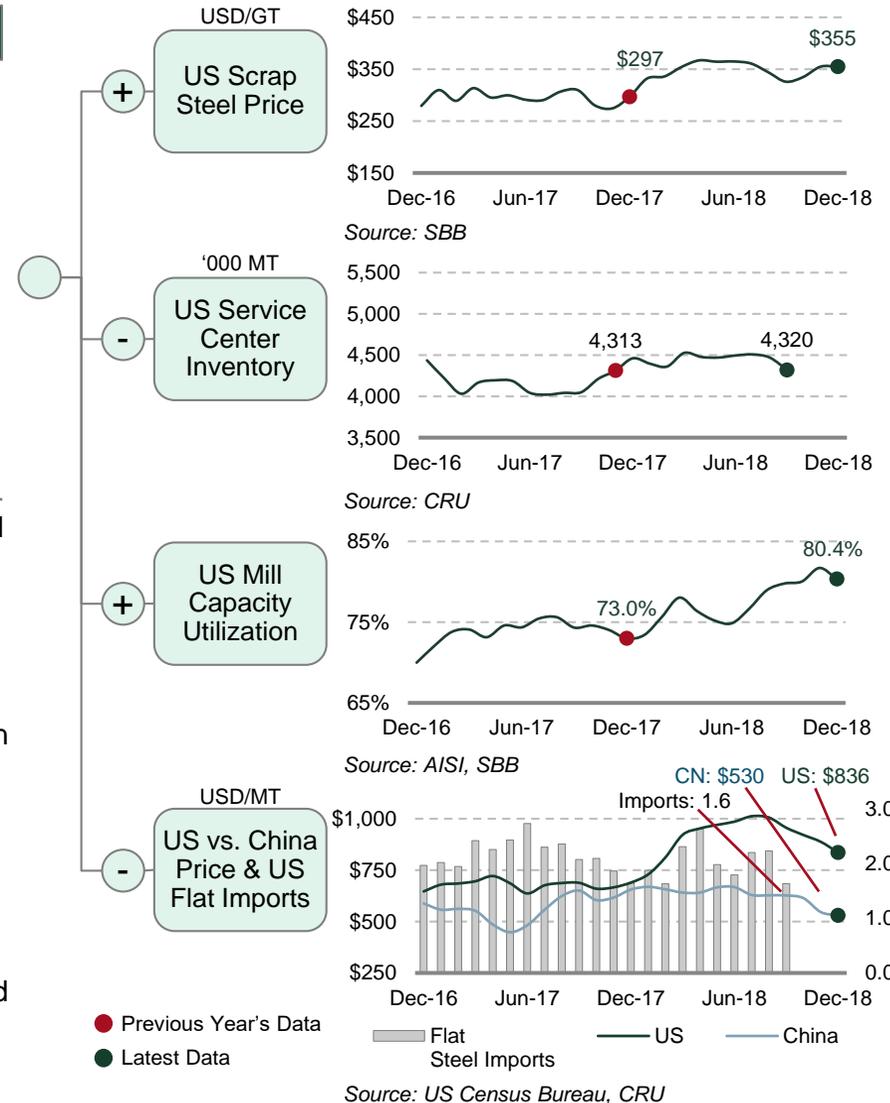


US Flat prices plummeted 13% in Q4 and have now reached pre-232 price levels as the market continues to correct.



Source: CRU, Applied Value analysis

- US Flat prices plummeted in Q4 with both HR and Coated material decreasing 13% and 10%, respectively. Hot roll prices are down more than 17% from their peak in July of 2018 as the market continues correcting from the uptick caused by the implementation of Section 232 earlier this year. This is the first time HRC prices have returned to pre-tariff values.
- Scrap prices increased by 9% in Q4 and are likely to keep rising in Q1 2019. Scrap prices have held strong while the Flat market turned sharply downwards.
- Though US Mill Capacity Utilization stayed around 80% in Q4, it dropped for the first time since June, indicating the production boost inspired by 232 has started to level off. Utilization is expected to drop as existing capacity comes back online.
- Due to market uncertainty, the spread between Chinese prices and US prices has reduced by 7% from Q3. Both prices have gone down, but US prices had a sharper decline following their rapid uptick. Chinese prices have gone down while China had its weakest factory growth in 28 months.



● Previous Year's Data
● Latest Data

Source: US Census Bureau, CRU



US prices are projected to see additional decreases going into 2019 as prices re-align globally and economic uncertainty hits demand.

Upward Drivers

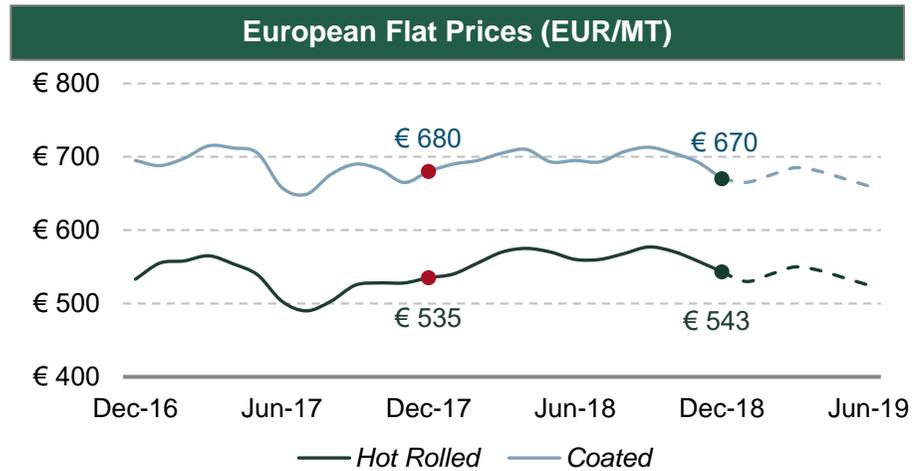
- **Raw Material Price Increases:** Coking coal increased 15% in the last quarter and is expected to be in tight supply in 2020 and 2021. The increase in demand is coming from US mills preparing to increase blast furnace output in the next two years.
- **Infrastructure Demand:** The 2019 US government budget includes a 200 Billion USD initiative for repairing and expanding American infrastructure. Demand will be on the rise due to the construction of rail tracks, bridges, tunnels, and pipelines. This increase in demand is likely to be long term as Trump plans for this infrastructure injection to be annual. Additionally, a potential wall in the Southwestern boarder with Mexico is budgeted to cost about 5 Billion USD, which would boost demand.
- **China Suspends Auto Tariffs:** China has lowered tariffs on automobiles and auto parts coming in from the US from the original 40% to 15% due to a 90 day truce with the US which will likely increase US steel exports to China. Overall, the US - China Trade War has become more favorable to the US, as exports to the US fell 3.7% in 2018 (YoY comparison).

Downward Drivers

- **Market Correction:** After the volatile year steel prices saw in 2018, market corrections have been visible starting in Q4 and likely lasting through H12019. Hot Rolled Coil prices have returned to their pre-Section 232 prices, and regular supply and demand behavior is expected to reappear this quarter likely lasting throughout the year. CME futures have dropped to \$679/NT for 2019 and are expected to stay in decline.
- **Automotive Industry Slow Down:** OEMs & Tier 1s have been decreasing their demand due to increases in material costs, coupled with decreases in sales, which are expected to drop between 1.2 % to 4% in 2019. Auto sales could fall below 17 million for the first time since 2014. In addition, the new USMCA deal will stop tariffs in NA and should decrease costs.
- **Purchasing Managers' Index:** As of December, the US Manufacturing Purchasing Managers' index reached a low of 50.2, down from 54.7 in August, and from 55.3 in July. This is the slowest expansion of activity since last November and the short term outlook has not been positive. Operating margins due to rising material costs are a key driver of the decline.
- **Buyer Expectation:** As the decline in prices continues through Q4, buyers are waiting out until the bottom has hit. Futures for Hot Rolled Coil indicate a 10% decrease for Q12019 further contributing to buyers waiting to purchase. The expectation of lower prices coupled with the mills' need to fulfill December capacity is a key downward driver.
- **Import Levels Return to Pre-Tariff Amounts:** As the price of domestic mills increased over the year, service centers once again began purchasing from foreign steel manufacturers. Currently, US steel imports are only 2-3% below pre-tariff levels, creating some pressure for domestic mills, specially with global demand expected to drop, as China manufacturing is slowing down. Chinese manufacturing PMI fell to 49.7, down from 51.5 in January 2018.

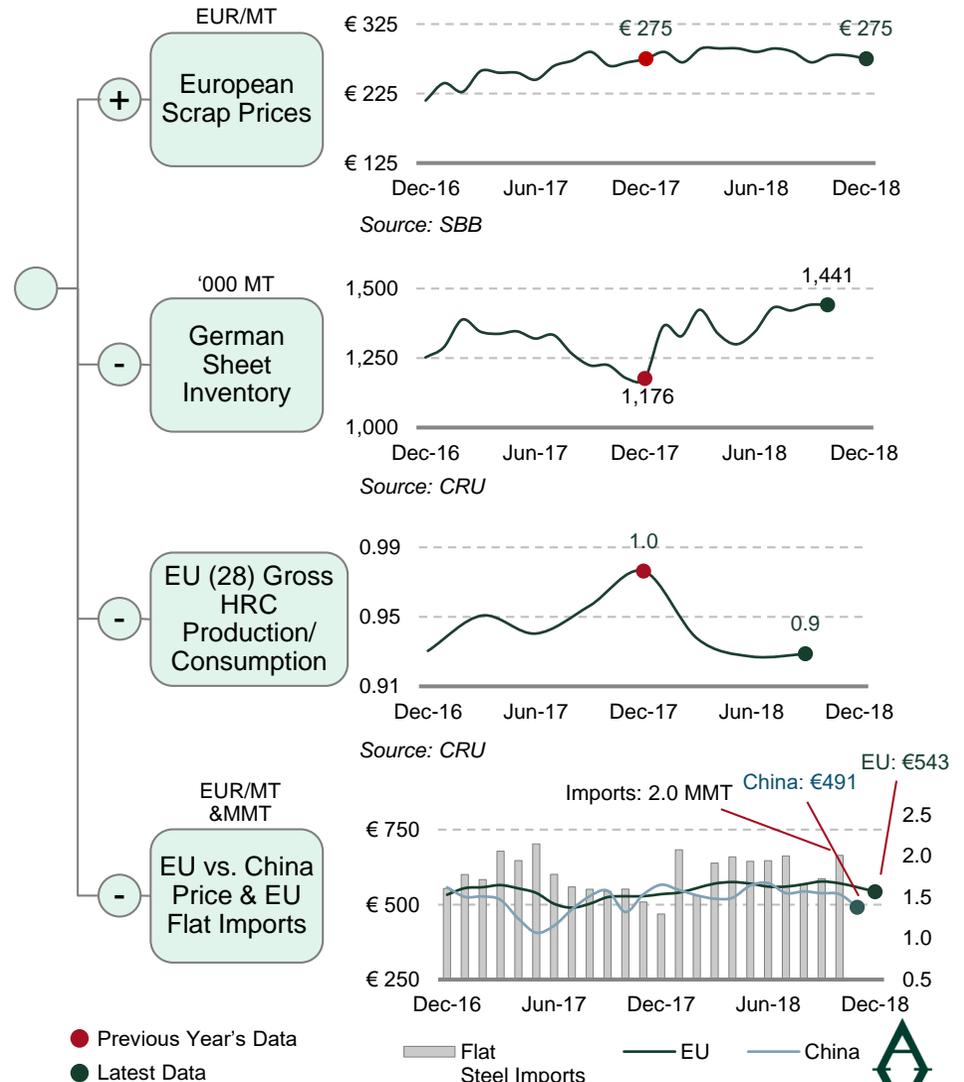


EU flat prices decreased 6% in Q4 2018 as inventories increased and buyers awaited decisions on newly announced safeguard tariffs.



Source: CRU, IHS Markit, WSJ, Applied Value analysis

- Both EU HR and Coated prices have fallen by 6% in Q4. As prices have yet to pick up and high inventories in markets such as Germany continue, there could be further pressure on prices in the near future. Additionally, as the European Commission's provisional safeguard measures come to an end, the EC has formally announced the ratification of the safeguard tariffs, which will apply a 25% tariff on top of established import quotas.
- Scrap prices increased 10 EUR in Q4, a 4% increase and opposite trend relative to flat prices. These increases are largely due to strong buying from Turkish mills.
- After a large increase in Q3, German Sheet inventory has climbed upwards again in Q4, reaching 1.6MMT, the highest levels since 2014 and indication of strong buying activity.
- With safeguarding measures under consideration, cumulative import volume increased by over 16% between September and October.
- Chinese production flooding the market and 232 tariffs in the US are expected to push flat prices down.



● Previous Year's Data
● Latest Data

Source: CRU, Eurofer.



Economic driven demand factors will keep EU prices lower in H1 '19 but supply consolidation and safeguard measures will maintain a floor.

Upward Drivers

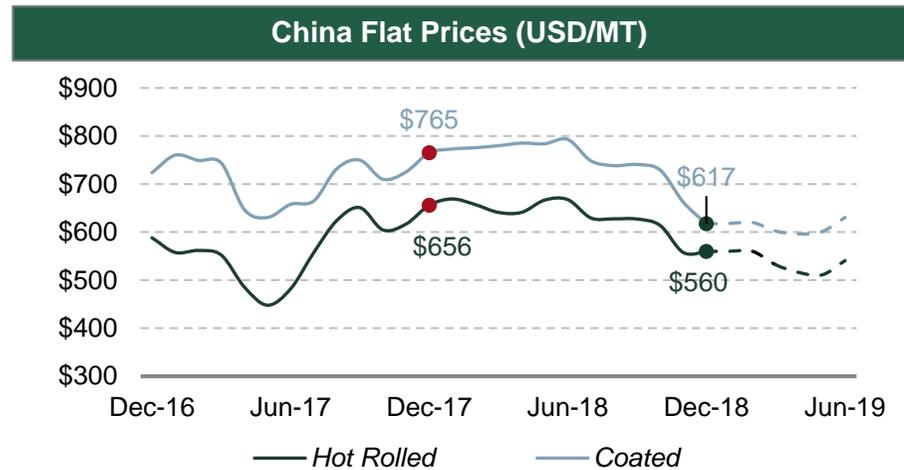
- **Safeguard Tariffs:** The first 6 months of the implementation of Europe's temporary safeguard measures passed and the steel market is becoming more cautious about importing. As of mid-December, the wire rod and rebar quota allowances have reached just 4% and 10% respectively. As quotas begin to fill up, exporters are obliged to deposit a 25% bank guarantee with customs. This temporary relief from imports surging is due not only to U.S. actions but also Chinese production overpowering global markets and producers.
- **Supplier Consolidation:** In order to meet regulatory approval for the acquisition of Ilva, ArcelorMittal is selling four mills to Liberty House Group. The four mills are - ArcelorMittal Piombino (Italy), ArcelorMittal Galati (Romania), ArcelorMittal Ostrava (Czech Republic) and ArcelorMittal Skopje (Macedonia). Liberty has acquired steel assets from Tata Steel, Caparo Industries and ArcelorMittal USA in recent years. This Arcelor Mittal asset sale to Liberty is expected and rumored to close by mid-2019.
- **HR Consumption and Construction Manufacturing:** As of October, EU Apparent Consumption of steel is forecasted to rise by 2.2% in 2018 with a total apparent consumption of ~163mMT. Additionally, the hot rolled production to consumption ratio has dipped down in Q4 '18, meaning consumption is outpacing production. Seasonally adjusted data showed a 4.6% increase of production in the construction sector year over year.

Downward Drivers

- **High Inventories:** Flat steel inventories in key markets such as Germany have risen to the highest levels since 2014, putting pressure on European prices.
- **Manufacturing Purchasing Activity:** In October, the EU Purchasing Managers' Index (PMI) fell to a two-year low of 52, down from 53.2 in September, indicating continued slow growth.
- **Automotive Manufacturing:** Due to the introduction of the new WLTP emissions test, registrations of new passenger cars continue to decline across the EU, posting a 7.3% fall year on year as of October.
- **Global Demand Drop:** Global prices are past the peak and are expected to decline as global steel demand, in particular China, are expected to see significant drops in 2019.

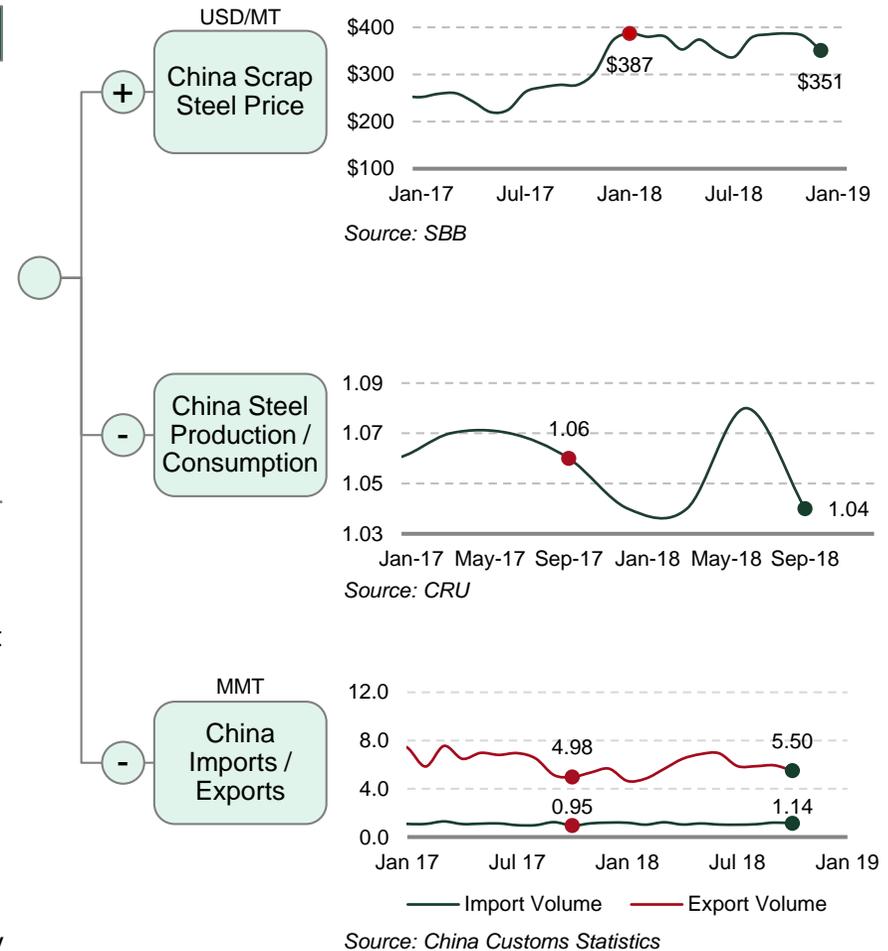


China flats prices saw a major decline of over 11% in Q4 2018 before leveling off slightly in December.



Source: CRU, Applied Value analysis

- China's steel price saw significant decline in Q4 2018 due to ongoing turmoil involving the US-China trade conflict. Hot Rolled coil dropped 11% QoQ while Coated Coils saw 17% decline. Price lifted slightly in December as temporary ceasefire is negotiated but full resolution to the trade situation remain unlikely.
- China scrap price largely remained stable in Q3 2018 with a slight price decline of 4% QoQ. Scrap price increased in early 4Q2018 due to increased scrap usage by steel mills followed by a mild price correction as demand stabilized.
- The Production / Consumption ratio was down to 1.04 in the fourth quarter of 2018 with large domestic consumption increase.
- China's steel export dropped by 6% in Sep and Oct of 2018 largely due to slow down in global demand and increased production from the United States. In the same period, steel imports increased by 7%.



● Previous Year's Data
● Latest Data



Trade uncertainty coupled with falling demand will likely put pressure on lower Chinese prices in H1 2019.

Upward Drivers

- **Reversal of Deleveraging Campaign:** China has temporarily suspended its deleveraging campaign and loosened both fiscal and monetary policies as worsening external conditions begin to make an impact. PBOC has announced an additional CNY 500 billion of monetary injection starting Q3 2018 on top of the central government's CNY 1.2 trillion in business tax cuts. Also, as policy loosens, shadow lending for infrastructure and real estate will likely increase accordingly, causing an influx of capital for construction projects driving steel demand up.
- **Trade Conflict Ceasefire:** US and China agreed on a temporary 90-day ceasefire in Dec 2018, suspending the planned 25% tariff raise. This agreement provides a brief window to provide short term upward pressure, lifting significant burden for China and providing a jolt to the economy. However, despite the ceasefire, US and China remain far apart on many key trade issues and the likelihood of full resolution and trade deal before ceasefire ends is low.
- **Currency Depreciation:** The RMB has depreciated against the USD by 14% from a high of 6.28 to 6.90. This depreciation has mitigated majority of the impact on tariff thus far, and if the low exchange rate continues, could help increase Chinese export and steel demand.

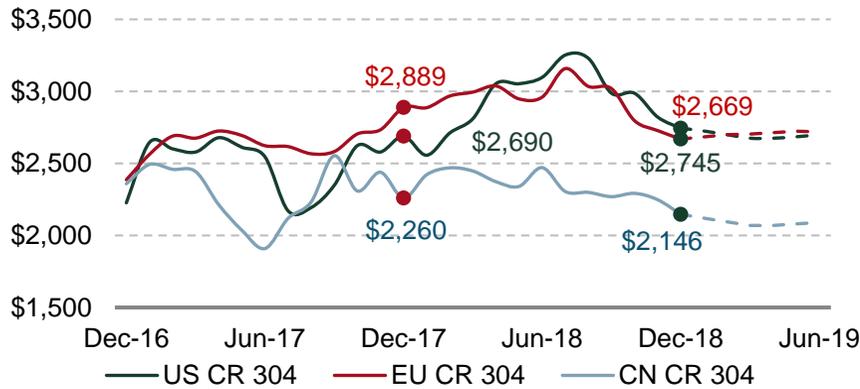
Downward Drivers

- **Unstable Trade Situation:** despite the recent agreement of ceasefire, the US and China remain far divided on many key trade issues such as intellectual property protection, industrial policies, and foreign directed investments. At the current pace, it is unlikely any breakthrough progress could be made within 90 days of negotiation that could resolve the trade situation completely. In the likely event that tariffs continue, China's economy could suffer short to mid-term decline with estimated 2019 GDP growth slowing down to sub 6%.
- **Excessive Capacity:** despite China's stout efforts to close excessive steel mill capacity and consolidate the fragmented steel industry, large overcapacity in the range of 160 MTPA still exists.
- **Illegal Production:** China has strengthened efforts to replace older induction blast furnace with electric-arc furnace to meet tougher environmental regulations. However, many old mills that are supposed to be closed are still operating illegally and will likely overproduce in H1 2019 before eventual shutdown, which could potentially flood the supply market and cause short-term price plunge.



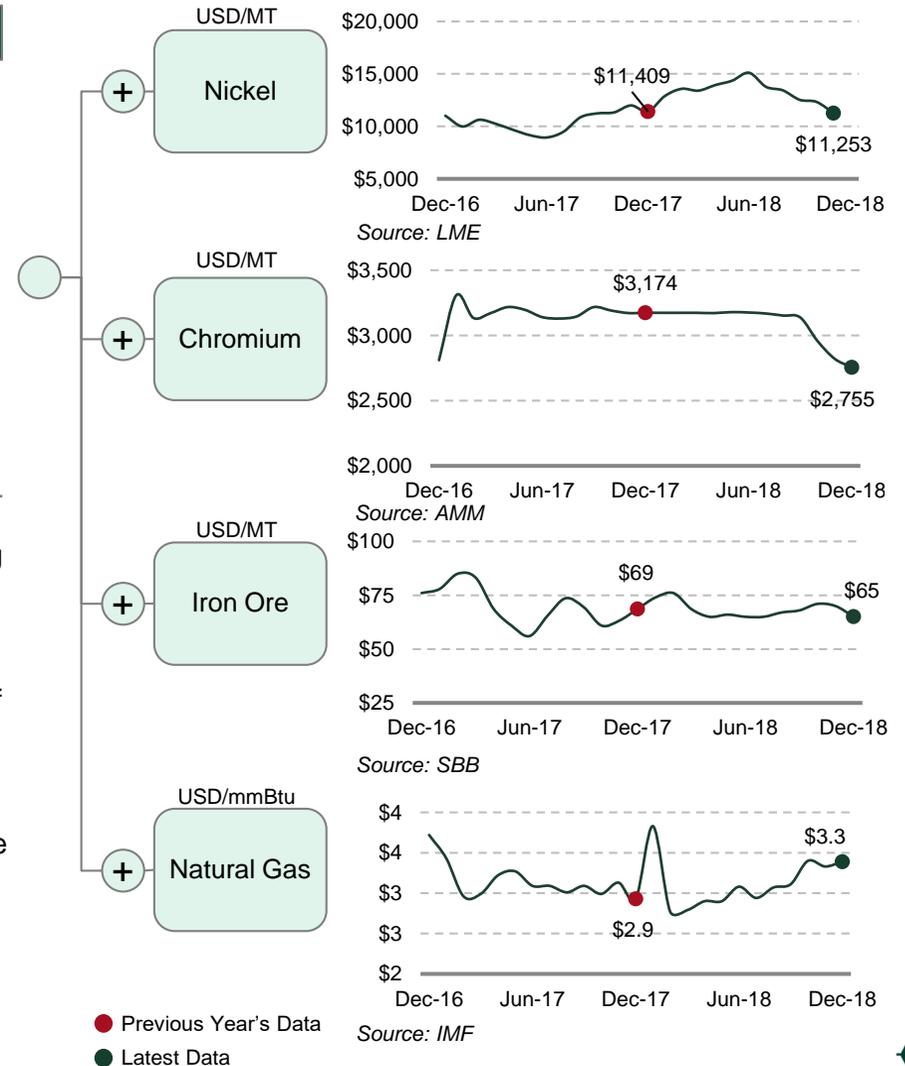
Stainless prices had sharp declines in Q4 across US, EU, and China, driven by large decreases in nickel and other base metals.

Stainless Steel Prices – US / Europe / China (USD/MT)

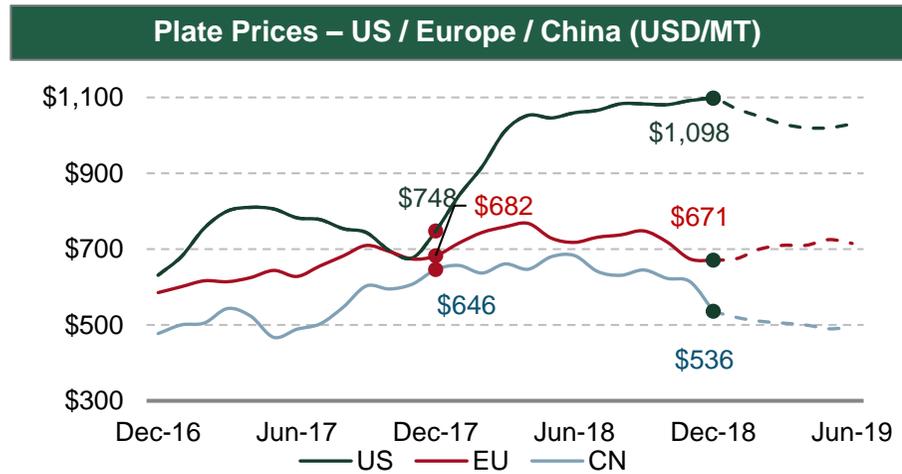


Source: SBB, Applied Value analysis, Metal Bulletin

- Q4 '18 US stainless prices dropped by approx. 8%. This decrease in price is likely linked to price reductions for base metals including nickel, chromium, and iron ore. Additionally mills have been offering lower surcharges for Type 304 in the US market.
- Similarly, European stainless prices dropped approx. 10% since Q3 '18, with EU 304 surcharges hitting a 9-month low in the end of November as well as Nickel prices reaching a low for 2018.
- Chinese stainless prices decreased by approx. 5% in Q4 '18, in line with falling domestic nickel and chromium prices as well as a weakened Chinese domestic market in a winter lull. In addition, the devaluation of the Chinese Yuan has also seen lower acceptance from buyers in mainland China.

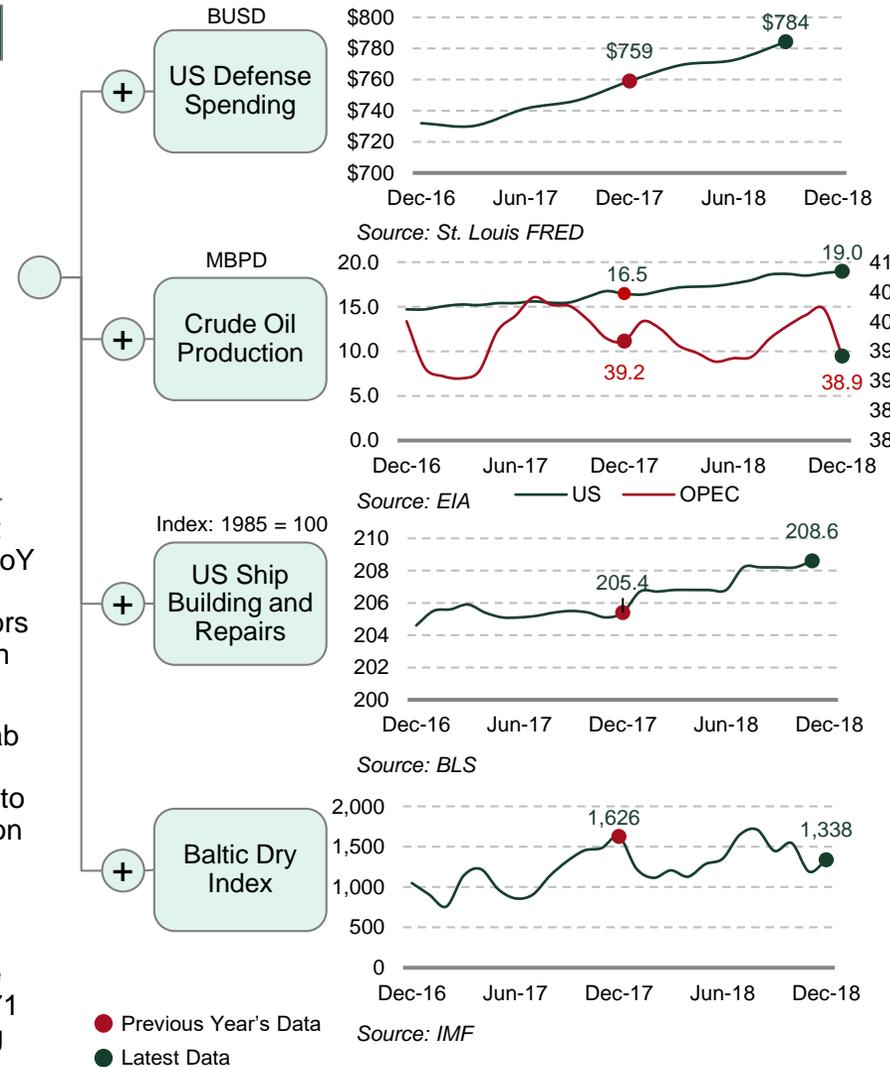


In stark contrast to the Flat market, US Plate prices have held steady in Q4, even while EU and CN prices fell 10% and 17%, respectively.



Source: SBB, Applied Value analysis

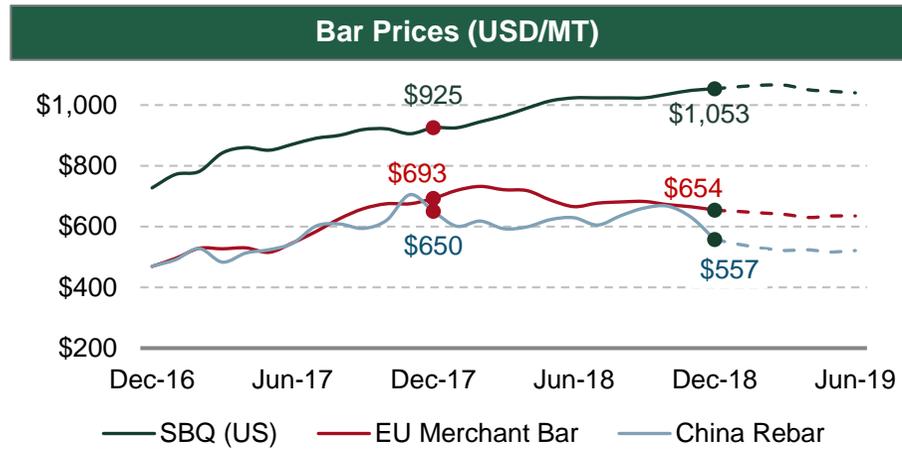
- US plate prices have seen a sharp increase YTD, a sharp contrast from EU and CN plate prices. US Defense Spending has seen a YoY increase of 18 Billion USD, and US shipbuilding and crude oil production have both increased as well, all being contributing factors to the high plate price. The construction of Nucor’s new plate mill in the Midwest will be a future downward factor.
- EU plate prices decreased by 10% in Q4 as a result of cheaper slab prices and decreased demand in the auto sector. Mill lead times halved from six weeks to three weeks and have discounted prices to ex stock creating a surplus of inventory. The recent OPEC reduction of 1.2 million barrels per day will result in a decrease in European plate demand in the crude oil sector further driving prices down.
- In China, the steel hub province of Tangshan has ordered 32% of output reductions to occur between Q42018 and Q12019. Chinese plate mills have increased their output in Q4 to a record high of 2.71 million tn/day, likely to mass produce before the reductions, driving prices down. As the deadline for the output reduction approaches, plate mills will have to pull back on output in Q12019 which will likely help the price rebound.



● Previous Year's Data
● Latest Data

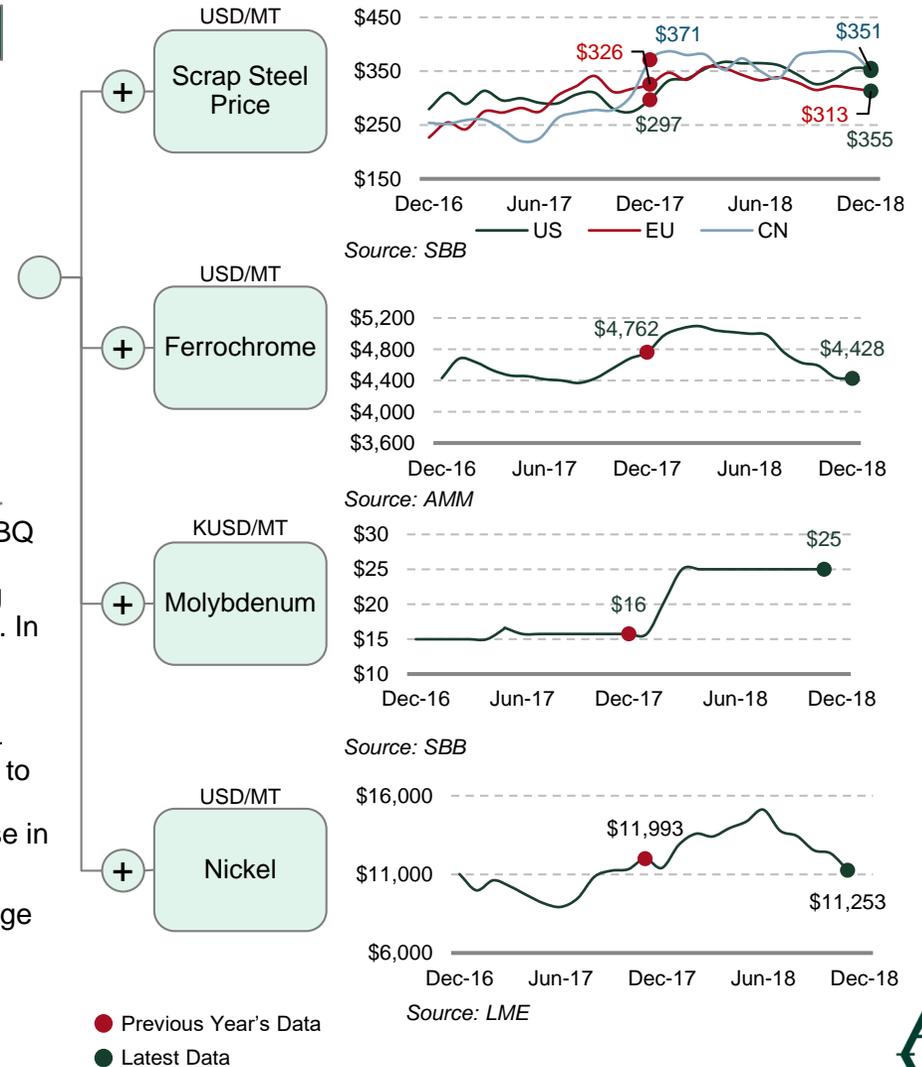


Q4 Bar prices saw increases in the US and decreases in EU and CN mostly due to changes in scrap, ferrochrome, and nickel prices.



Source: SBB, AMM, Applied Value analysis

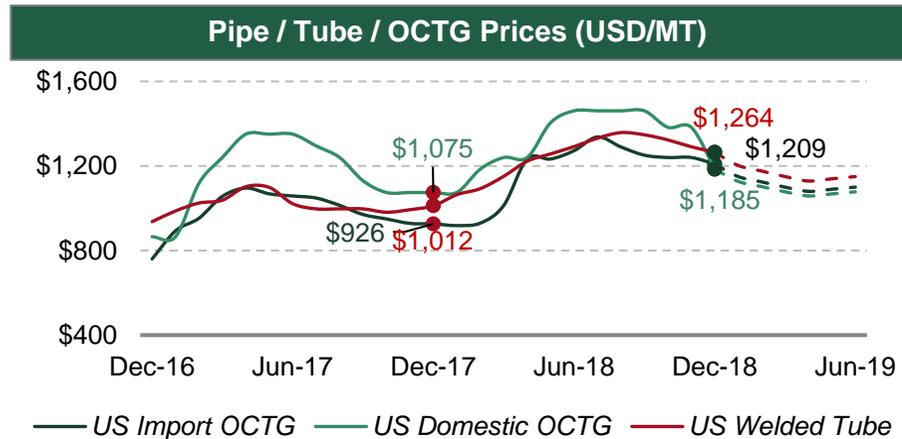
- As US scrap market prices have increased by 9% since Q3, US SBQ prices have also remained strong, rising 3% in Q4 '18. Although Molybdenum prices have remained stagnant in Q4 '18, decreasing Ferrochrome prices have partially offset increasing US scrap rates. In addition to increasing raw material costs, market participants are eyeing an early 2019 mill hike.
- EU merchant bar saw prices reverse trend and decrease 3% in Q4 after an increase throughout Q3. The decrease attributed primarily to declining ferrochrome and nickel prices. Additionally, most mills announced surcharge decreases, slightly offsetting the 1% increase in European scrap steel prices.
- In China, domestic rebar prices dropped by almost 16%, due to large decreases in raw material prices as well as economic factors. As China scrap prices have fallen by almost 9% in December and are expected to continue falling, China rebar prices are expected to continue tumbling with it. Additionally, adding to the downward pressure is the slow down of construction work and piling up inventories.



● Previous Year's Data
● Latest Data

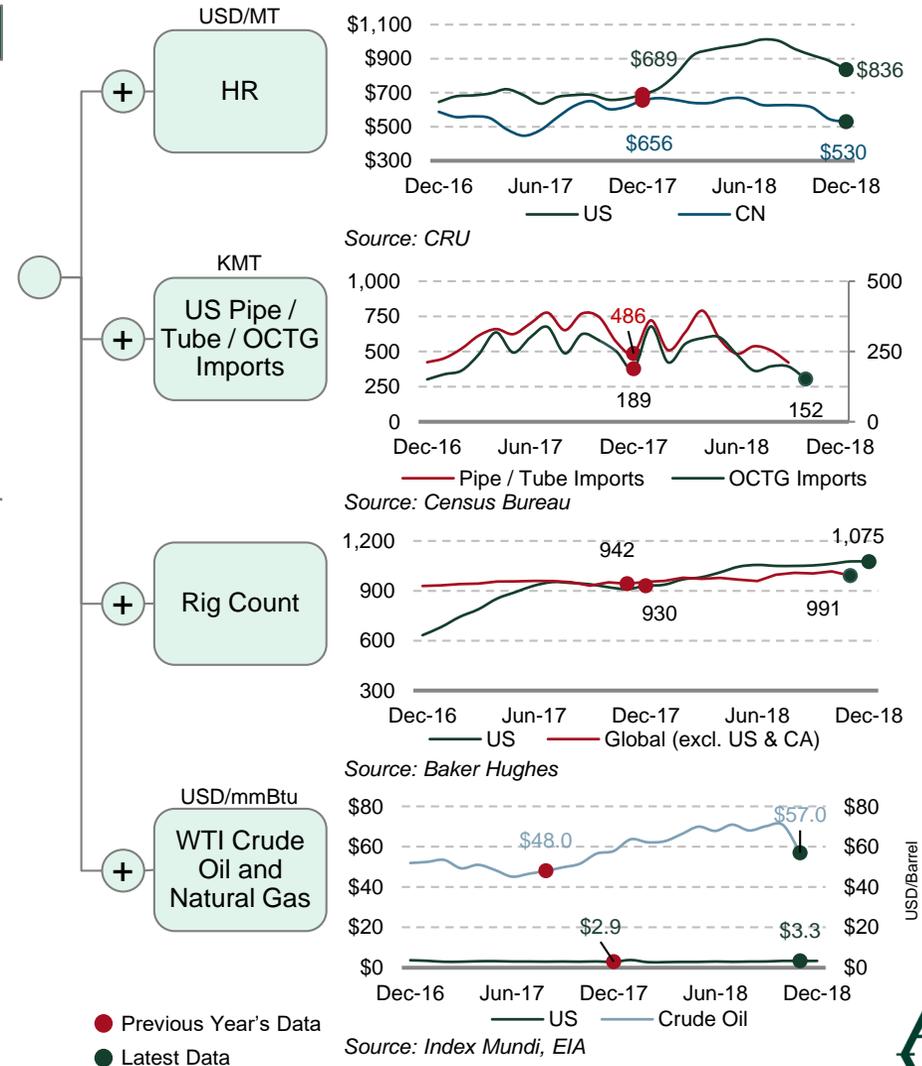


US Domestic OCTG prices have tumbled by ~19% in Q4, mostly due to huge price drops in hot rolled steel, OCTG imports, and crude oil.

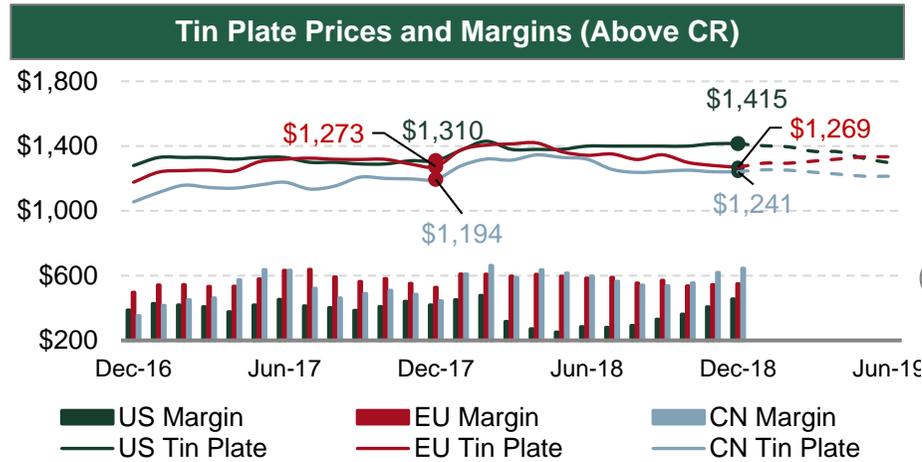


Source: AMM, SBB, Applied Value analysis

- US Domestic OCTG prices decreased by almost 19% in Q4 '18, largely due to falling hot rolled prices, crude oil prices and OCTG import prices. The US Rig Count increased by 2% in Q4 while OCTG import volume fell by a dramatic 23% between September and October. Crude oil has plummeted by 19% from October to November and hot rolled steel prices have fallen by 13%.
- US Welded Tube prices declined in Q4 6.2%, ending the upward trend seen in Q1, Q2, and Q3. This signals that demand for both the construction and machinery sectors are slowing down possibly due to tariffs imposed by 232.
- In other news, the US Department of Commerce has recently lowered tariffs on imports of OCTG from Turkey. As a result, exports from Turkey will now be subject to a dumping margin of 1.59%, rather than the previous margin of 35.86%. These lowered tariffs will likely result in increasing US Domestic OCTG prices to stay competitive with exporters.

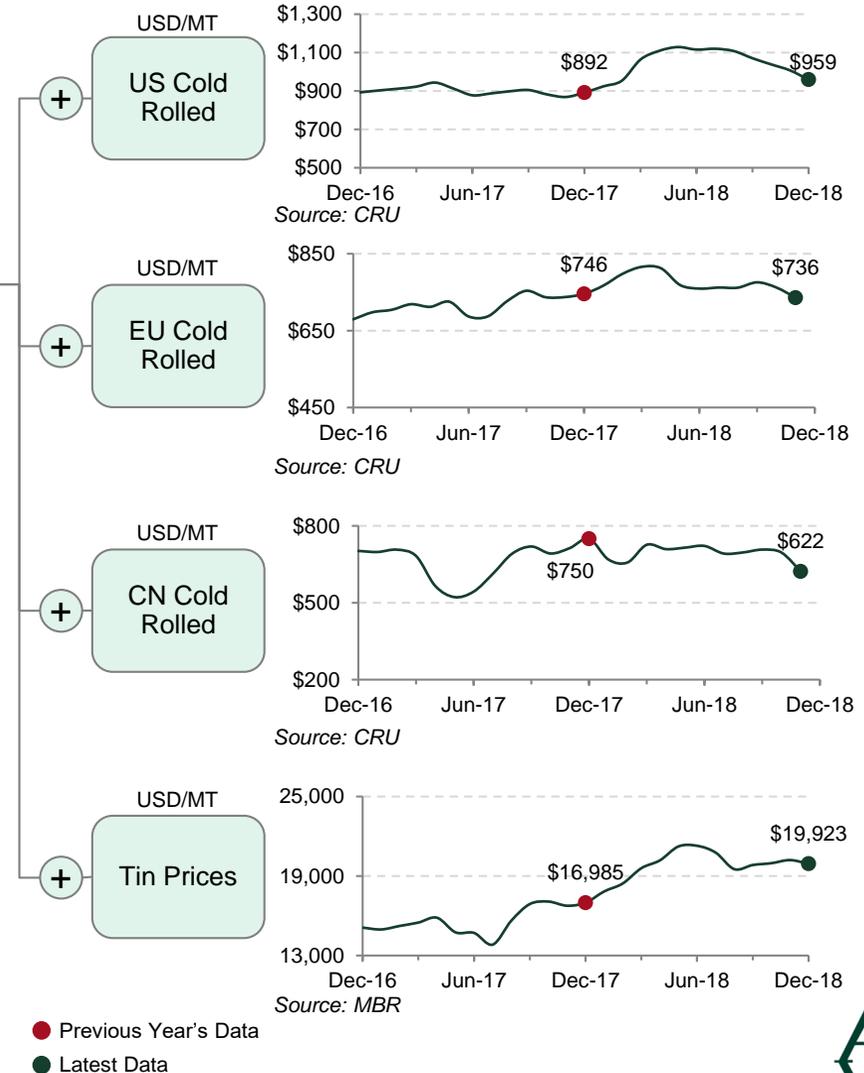


Global Tin Plate prices stayed relatively flat in Q4, except for EU, in which it fell 5.7%; US Tin Plate margins went back to Jan-18 levels.

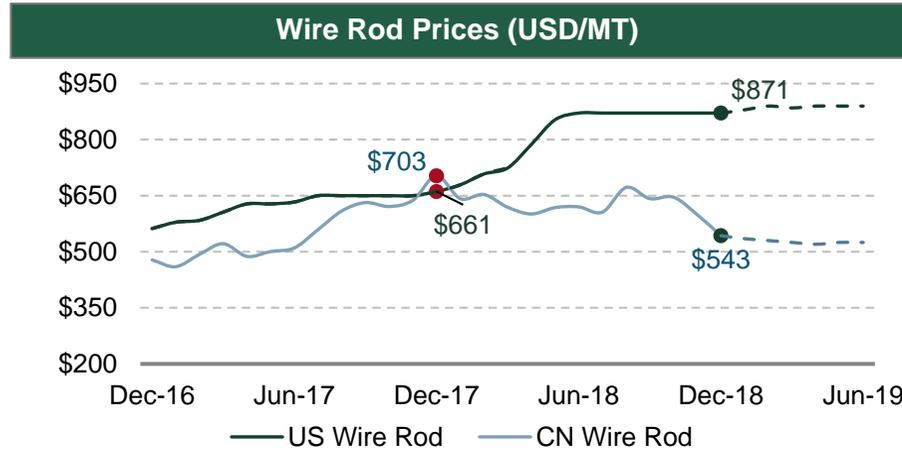


Source: MBR, CRU, SBB, Applied Value analysis

- Global Tin Plate started to reflect the slowdown seen in the steel market. Over the course of Q4 '18, US prices rose 1.1%, EU prices fell by 5.7%, and CN prices remained stable at 0.2% increase over the same period.
- US Cold Rolled prices dropped by 10% in Q4, continuing the downward trend that started in Q3. Margins rebounded and further stretched after being squeezed to an all-time low in May (Tin Plate over Cold Rolled) of \$251/MT, pushing it to \$456/MT by December. This recovery, brought the US margin back to its 2018 starting point, 1.0% higher than the starting point in January. The EU and CN margins went in different directions as the margin decreased 9.7% and increased 6.0% over 2018, respectively.
- Tin plate prices in Q1 are expected to decrease in the US as the market recovers from a tariff-driven scenario and the US economy starts to signal a slowdown. Yet, prices in EU should rise as the market recovers from a year of decreasing prices, while prices in China are likely to avoid any drastic fluctuations.

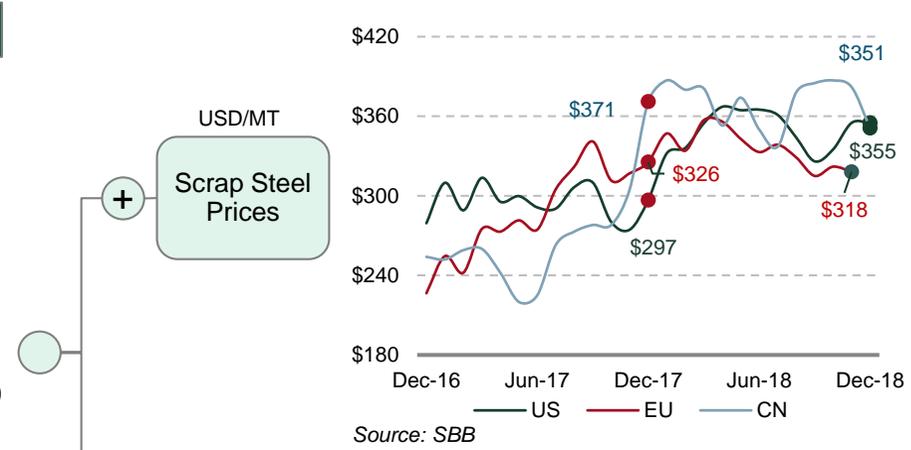


CN wire rod prices have been fluctuating based on changes in scrap prices, while US wire rod prices have remained stagnant since Q2.

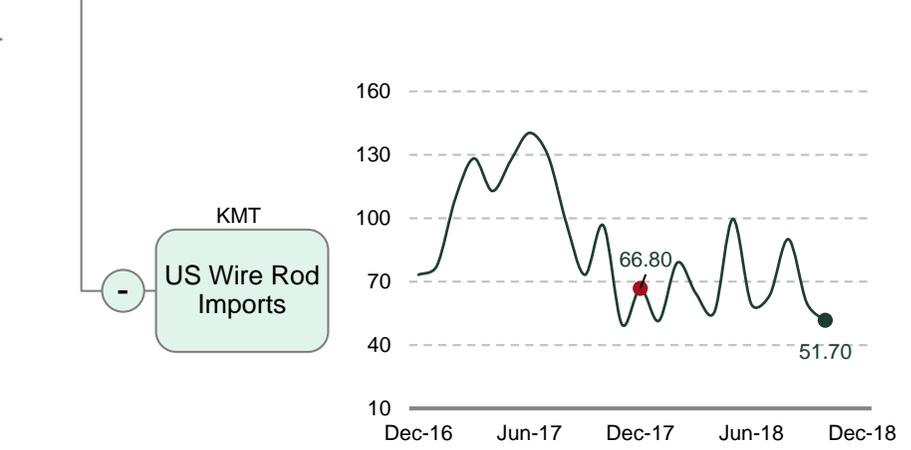


Source: SBB, Applied Value analysis

- Despite changes in US wire rod imports and scrap prices, US wire rod prices seem to have completely normalized since Q2 '18. Some consumers are expecting US wire rod prices to increase in January '19, largely due to increases in US scrap prices during Q4 '18 which have yet to be reflected in the price.
- As the future of EU safeguard tariffs must be decided by the beginning of February, many questions are being raised about the current European supply of materials. At the moment, EU wire rod import quotas have reached critical levels and it is almost certain that the quotas will be exhausted by the time the commission announces its decision. As quotas begin to fill, EU wire rod prices are expected to increase due to limited import supply.
- Chinese wire rod prices have seen a decrease of 7% overall in Q4, likely due to a 9% decrease in China scrap steel prices. To add to the downward pressure of Chinese wire rod, Kobe Steel's Chinese JV is planning on increasing production capacity in Q1 '19. While other Chinese mills are cutting rod export prices to stimulate sales amid a declining domestic demand.



Source: SBB



Source: Census Bureau

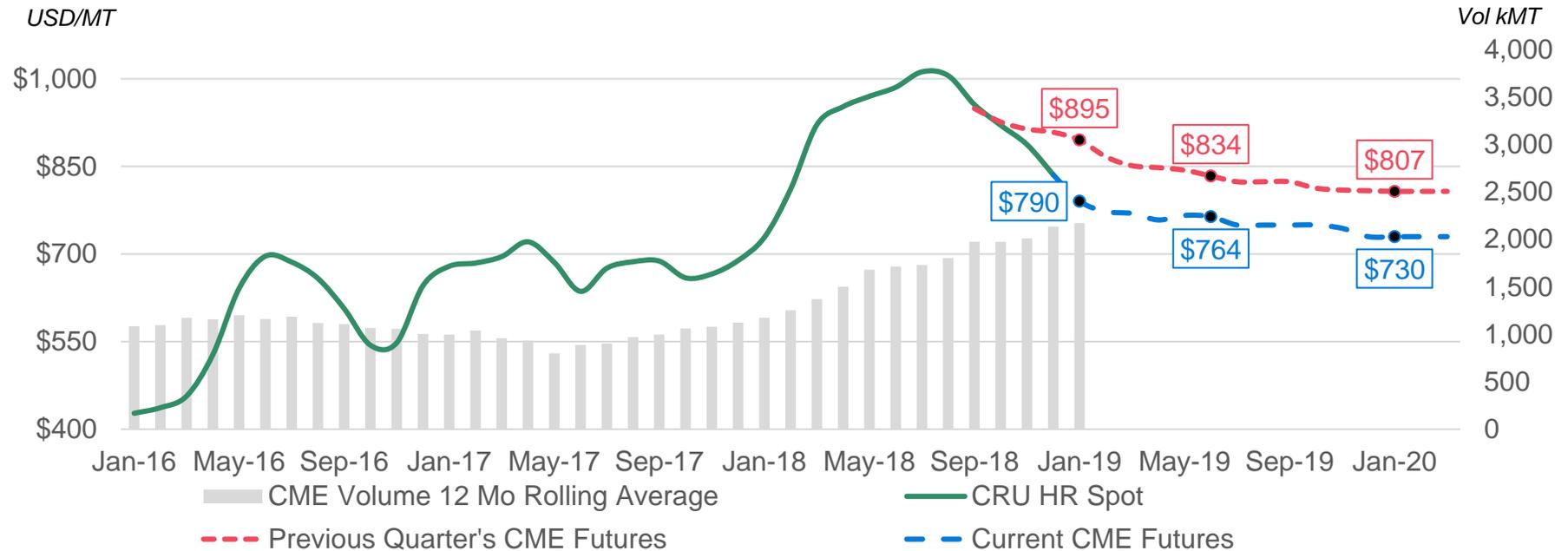


● Previous Year's Data
● Latest Data



The current forward curve for Hot Rolled steel futures is in backwardation with CY19 currently quoting at ~\$758/MT.

Hot Rolled Historical Pricing and Contract Volume & Futures CME Pricing



- The CME HRC Futures Curve implies that prices will decline throughout the end of 2019. However, the dramatic decline is expected to level off by February and decrease more gradually in the following months, ending the year 13% below current Spot. This movement corroborates the argument that the recent spike in pricing was not driven by fundamentals.
- Participation in the futures market through the CME exchange has increased rapidly throughout 2018, one of the more volatile years on record for the steel market. The average annual volume traded over the CME exchange is just over ~2.1mMT, nearly doubling from the average of ~1.2mMT last year.

Note: Volumes are traded volumes cleared by CME, i.e. they exclude the “off exchange” OTC (over-the-counter) volumes not cleared by CME Prices pulled for CME futures Apr 6th, 2018
 Source: CME, CRU



Market Conditions by Region

Special Section: 232 Impact on 2019 Negotiations

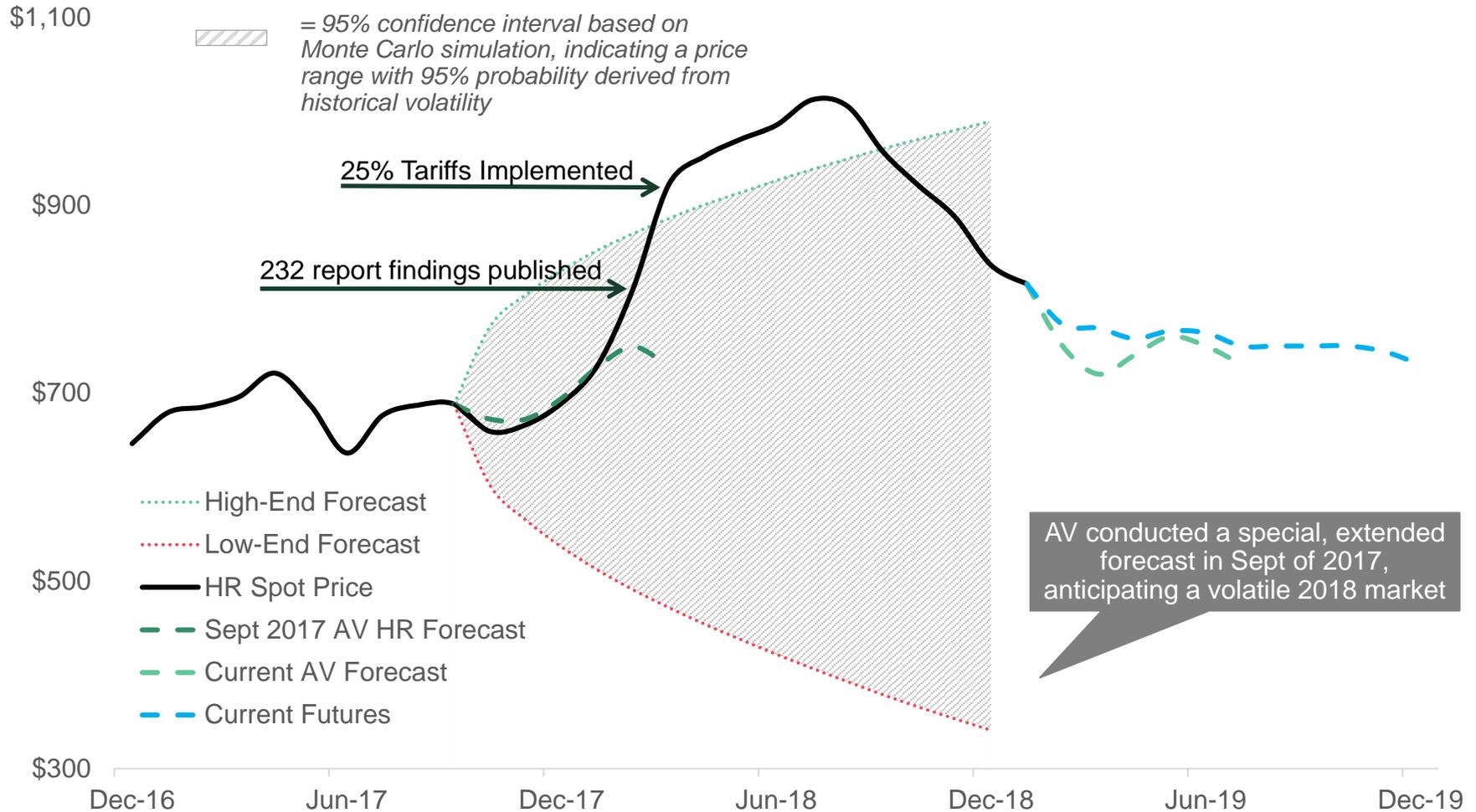
Steel Production Costs

Stock Price Development of Major Steel Companies



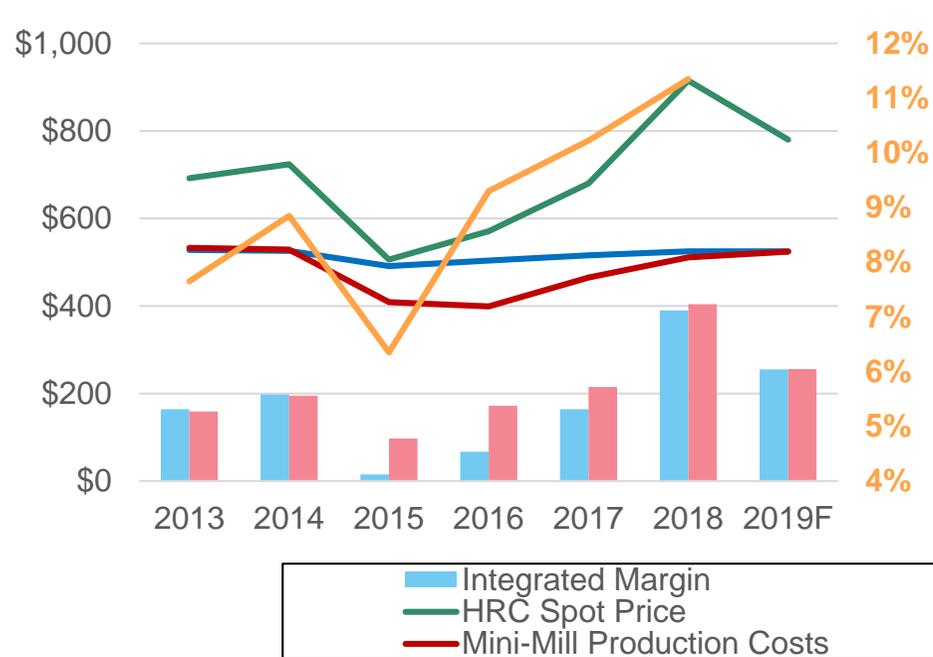
In 2018, US flat prices soared past even the most aggressive forecasts, creating substantial margin issues for steel buyers.

US Hot-rolled Forecast
(USD/MT)

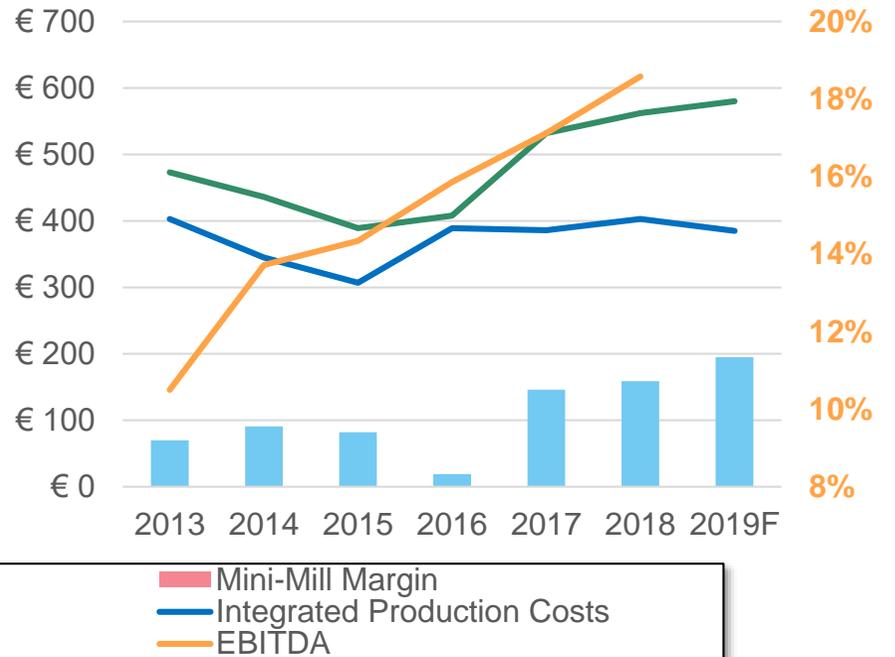


The 2018 price rally was merely supply-driven based on 232 speculation and ultimately went straight to steel mill margins.

US Avg. Annual HRC Spot vs. Production Costs and EBITDA, USD/MT

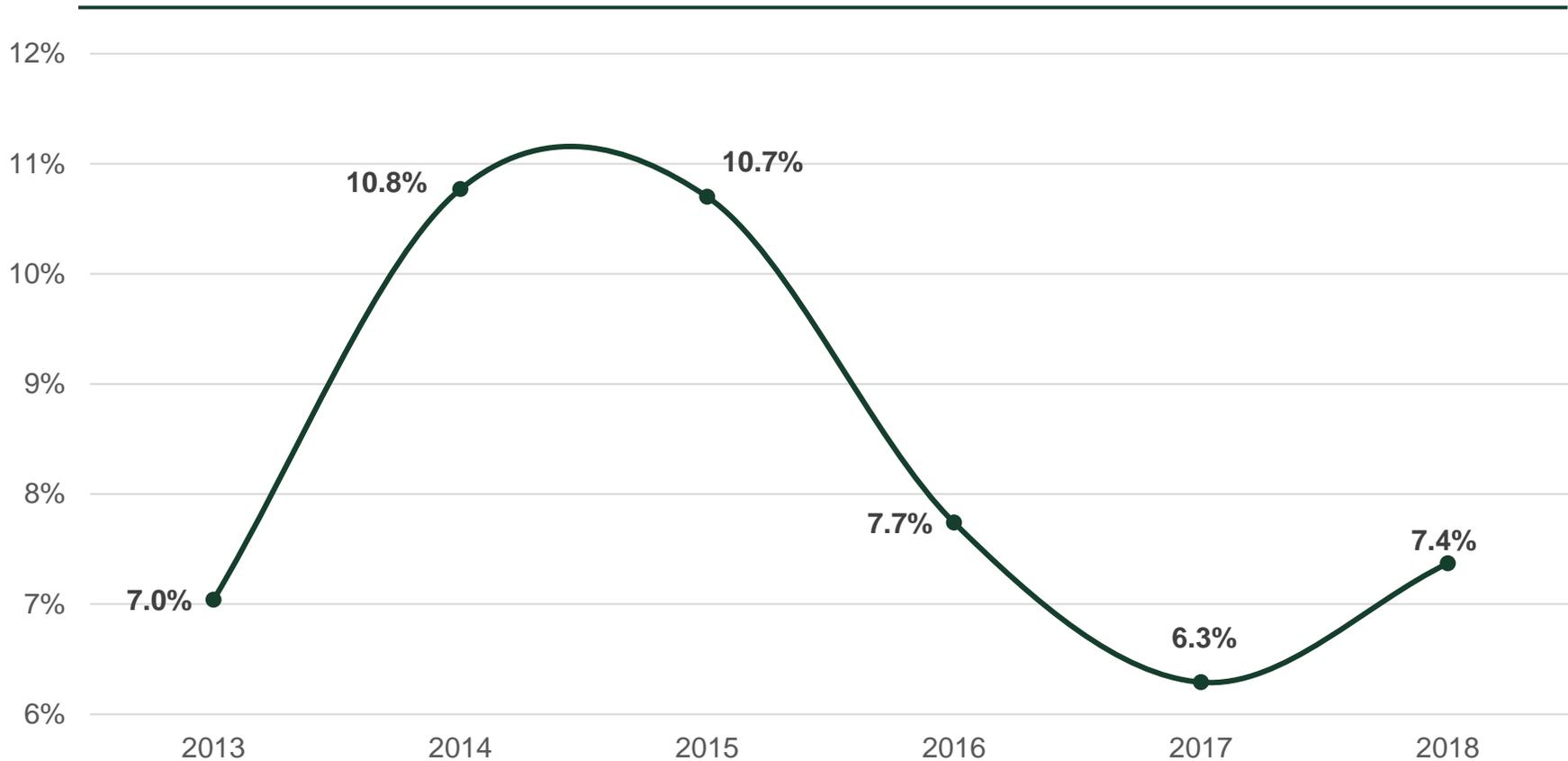


EU Avg. Annual HRC Spot vs. Production Costs and EBITDA, EUR/MT



A common justification for the swift price hikes was constrained supply due to imports blocked by 232...

% US HR Imports vs US HR consumption

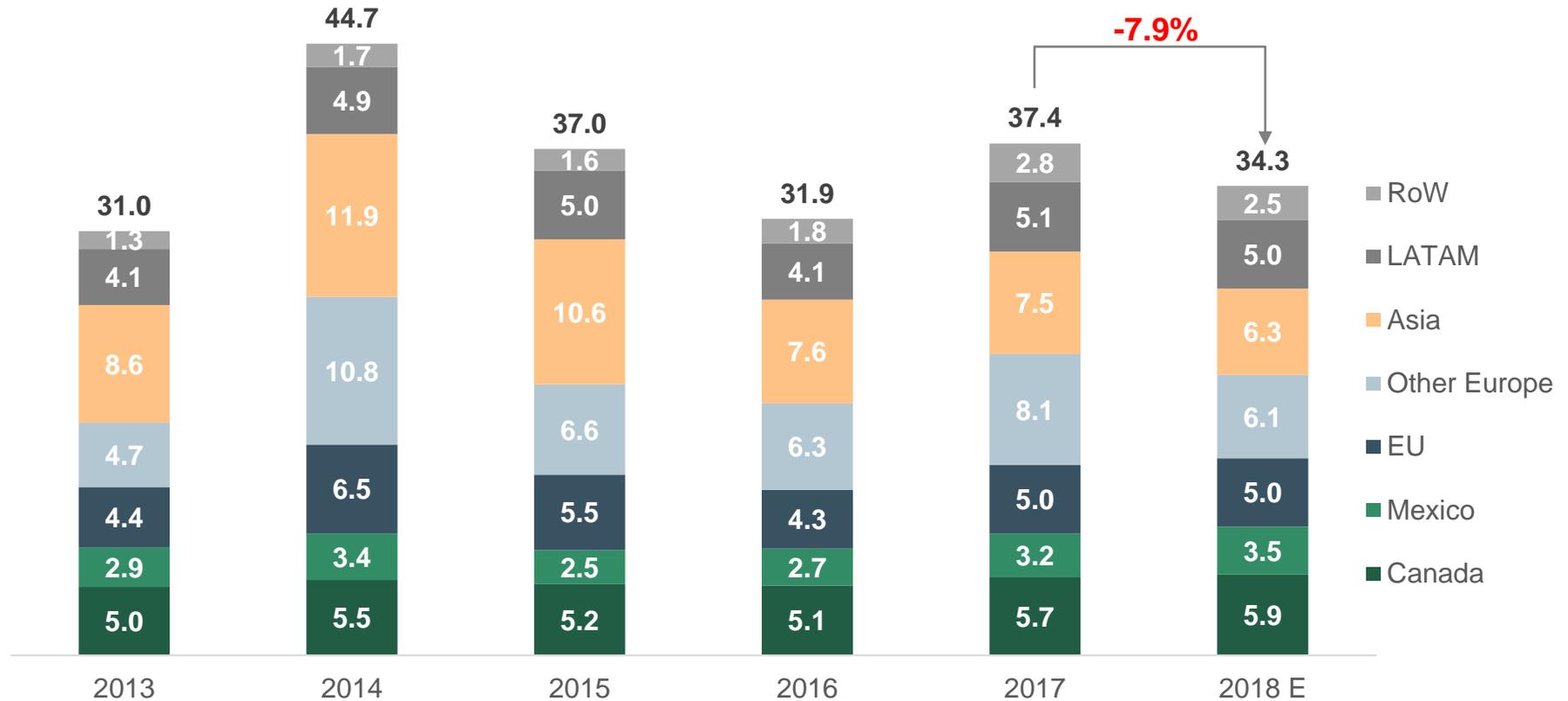


...However, total 2018 US consumption of HR included a higher percentage of imports than 2017 consumption.



Despite the sweeping 25% tariffs, section 232 only reduced US total steel imports by 8%, impacting two specific regions...

US Imports of Steel Products by Country, mMT

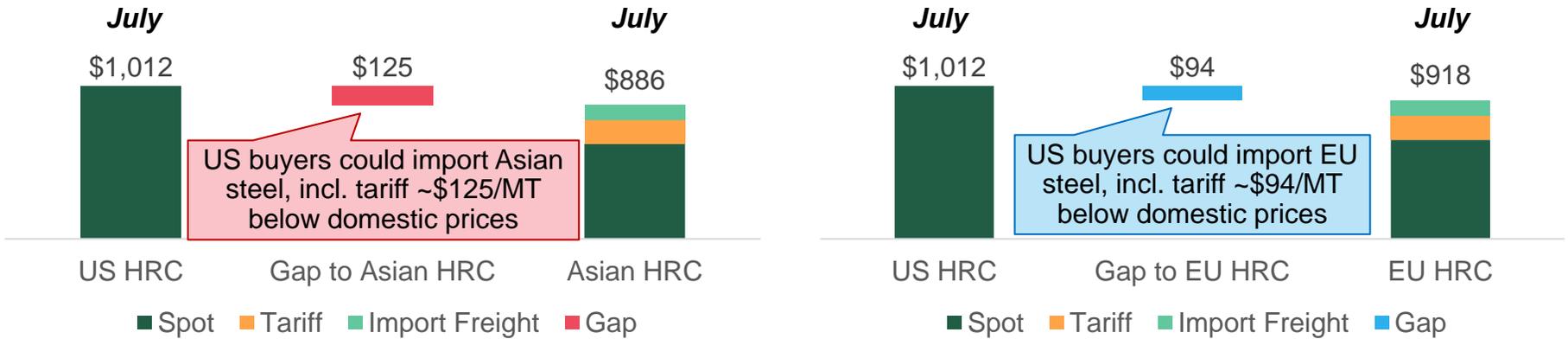


...nearly all of the reductions were observed in Other Europe (mostly Russia) and Asia (mostly Korea).

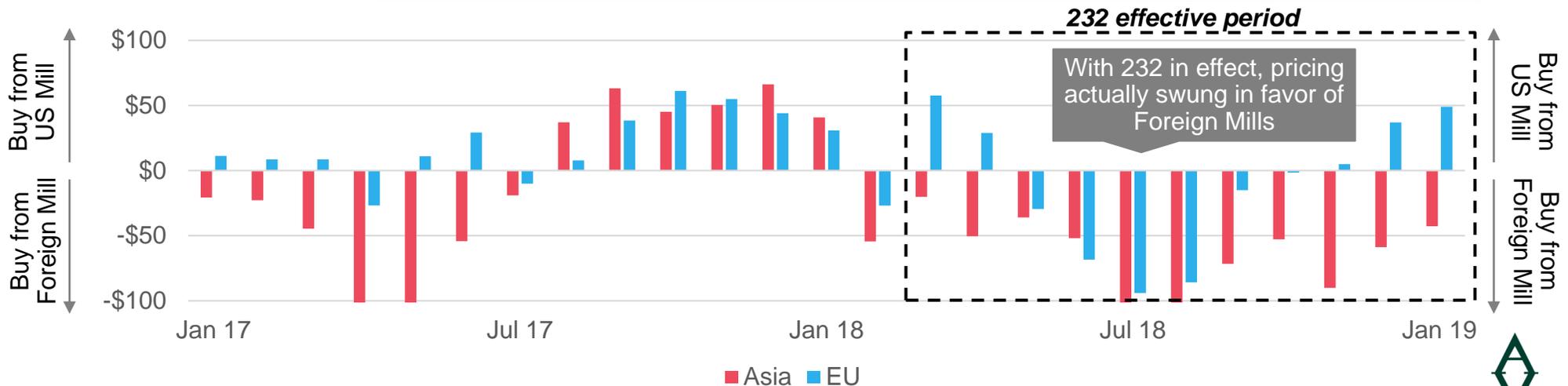
Source: CRU, SBB, Applied Value Analysis

As US domestic prices soared, US buyers had a strong business case to continue importing including tariff costs.

Regional Steel Price Gaps at peak of the market in July, from perspective of Steel Buyer in the US, USD/MT



Regional Steel Price Gaps Jan '17 - Present, from perspective of Steel Buyer in the US, USD/MT



Many steel buyers experienced cost increases between +8% & +20% for 2019 vs 2018 flat steel prices, implying significant implications on company EBIT performance.

Steel Buyers' Margin Erosion due to increases in steel cost

		AV Observed Range of Contractual Steel Price Increases		
EBIT Margin	Steel Spend as percentage of revenue	+8%	+10%	+20%
4%	4%	-8%	-10%	-20%
4%	5%	-10%	-12%	-25%
4%	6%	-12%	-15%	-30%
4%	7%	-14%	-17%	-35%
4%	8%	-16%	-20%	-40%
8%	4%	-4%	-5%	-10%
8%	5%	-5%	-6%	-13%
8%	6%	-6%	-8%	-15%
8%	7%	-7%	-9%	-18%
8%	8%	-8%	-10%	-20%
12%	4%	-3%	-3%	-7%
12%	5%	-3%	-4%	-8%
12%	6%	-4%	-5%	-10%
12%	7%	-5%	-6%	-12%
12%	8%	-5%	-7%	-13%

For company with xx EBIT Margin...

And Steel spend as yy % of revenue

A zz increase in steel costs would reduce EBIT by this amount

These margin swings have forced buyers to react & re-evaluate supply chain flexibility, optimization and buying practices.



Market Conditions by Region

Special Section: 232 Impact on 2019 Negotiations

Steel Production Costs

Stock Price Development of Major Steel Companies



Q4 saw an increase for most raw material prices, largely on account of growing uncertainty around Chinese production.

Current Market Update

Q1 Forecast

• Scrap

- **US Scrap** prices resumed the upward trajectory that prevailed for most of 2018, despite a temporary drop in Q3, reaching \$355/MT in December. With an uptick in demand from Turkish mills, import prices mirrored this climb in early November, though Turkish manufacturers began to resist higher prices in the second half of the month, turning to European material instead, and causing the global average to flatten somewhat. Market prices for ferrous imports are generally expected to remain stable over the following weeks, though may be influenced by limited cargo availability and tightening supply / production stoppages. 
- **EU Scrap** prices also recuperated somewhat in Q4, climbing 4% from Q3, and settling at €280/MT in November, following a period of global uncertainty. Though Germany saw relatively stable pricing during December, some scrap merchants reported markdowns of between €3-5/MT, amidst mounting pressure from national oversupply coupled with lower export prices and US import restrictions. 

• Iron Ore

- **Iron Ore** prices fell once again, with a 4% decline countering the previous quarter's spike of the same magnitude, reaching \$65/MT in December. Seaborne prices rose earlier in the quarter, reacting to expected transportation delays from BHP operations and bolstering the port stock markets. However, this was countered by the weak Chinese market and expectations of further steelmaking restrictions. 

• Coking Coal

- **Coking Coal** prices jumped up 15% from a low in Q3, resuming February's high of \$229/MT in December. Growing demand from Chinese buyers may prolong this trend, depending on the severity of production cuts over the winter. 

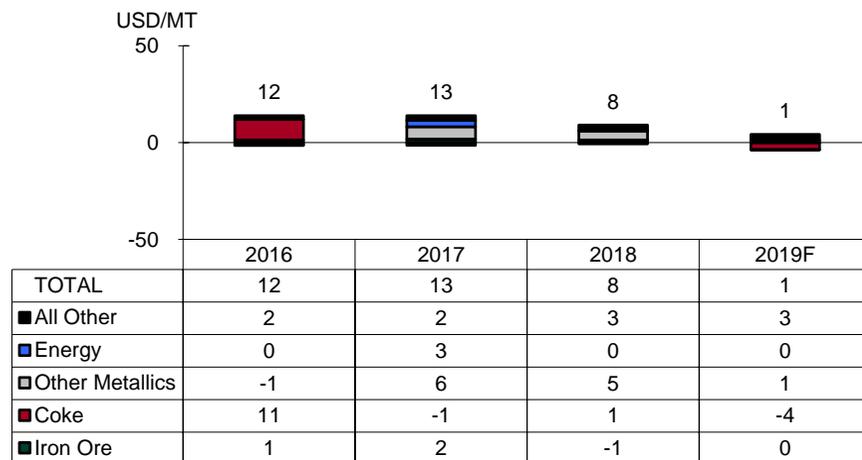


2019 US HR production costs are projected to increase by \$13/MT for mini-mills and by \$1/MT for integrated mills.

2016 – 2017 Annual Changes	2017 – 2018 Annual Changes	2018 – 2019F Annual Changes
– Iron Ore: +2%	– Iron Ore: 0%	– Iron Ore: 0%
– Coking Coal: -1%	– Coking Coal: +1%	– Coking Coal: -3%
– Scrap: +30%	– Scrap: +17%	– Scrap: +4%
– Natural Gas: +19%	– Natural Gas: +1%	– Natural Gas: -1%

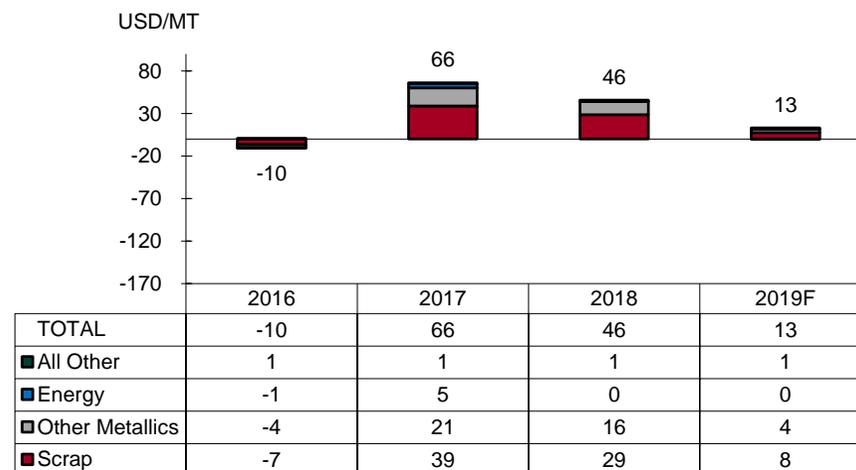
US Integrated Mill Cost Changes YOY (HRB)

80% self-sufficiency of Iron Ore and Coking Coal



US Mini-Mill Cost Changes YOY (HRB)

Mini-mill

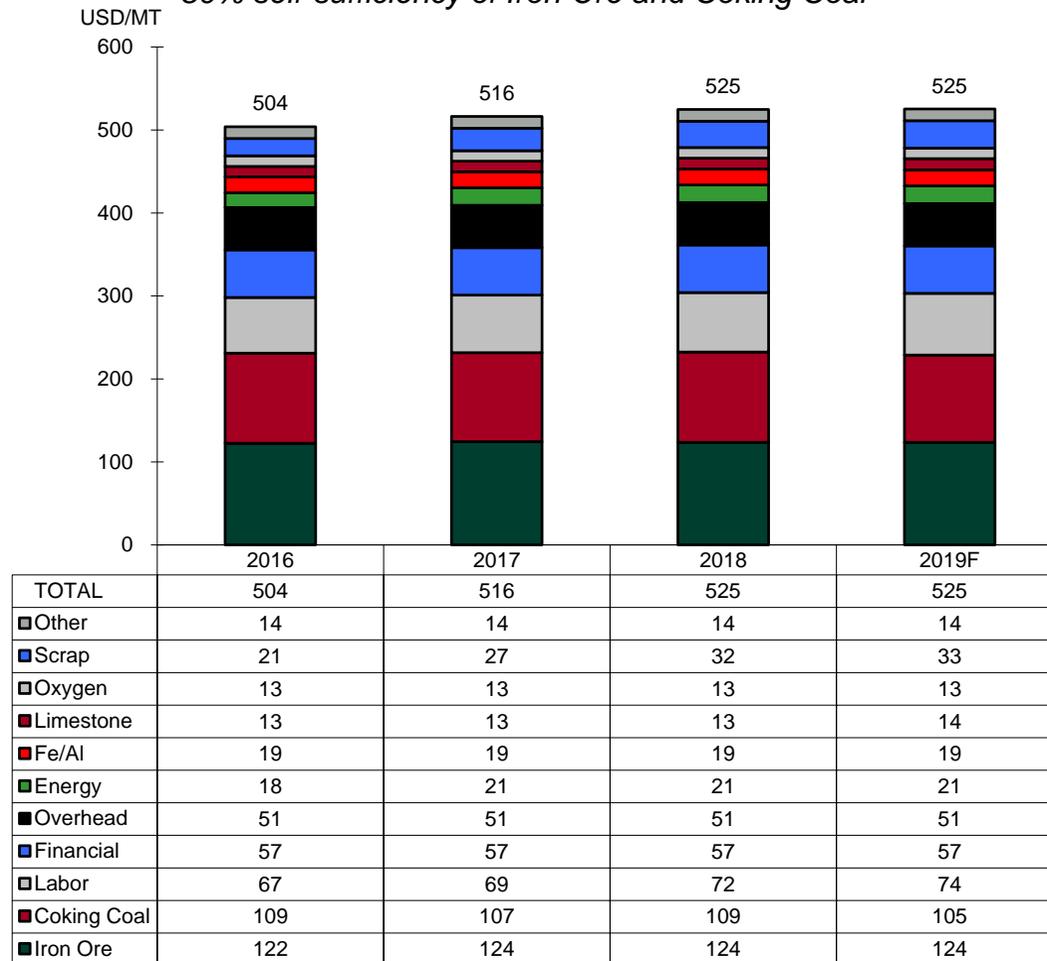


Source: Applied Value analysis, SBB, WSD, Goldman Sachs, Morgan Stanley, Australian Treasury
 Note: Other Metallics includes Pig Iron (purchased), Scrap and Direct Reduced Iron

US HR production costs for integrated mills are expected to stay flat in 2019, with decreases in coal prices offset by increased labor.

US Integrated Mill Hot-Rolled Annual Production Costs

80% self-sufficiency of Iron Ore and Coking Coal



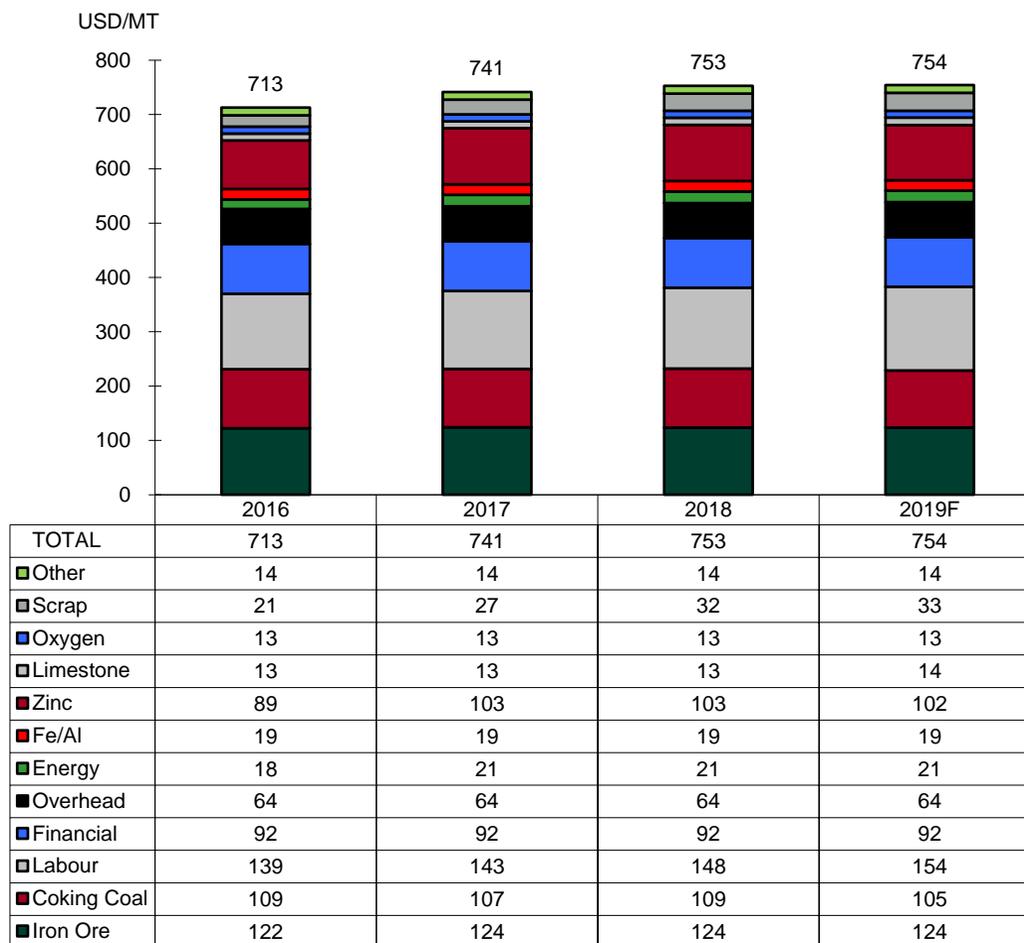
Source: Applied Value analysis, SBB, WSD, Goldman Sachs, Morgan Stanley, Australian Treasury



Increasing labor costs and decreasing coal prices are expected to increase US HDG production costs by \$1/MT for integrated mills.

US Integrated Mill HDG Annual Production Costs

80% self-sufficiency of Iron Ore and Coking Coal



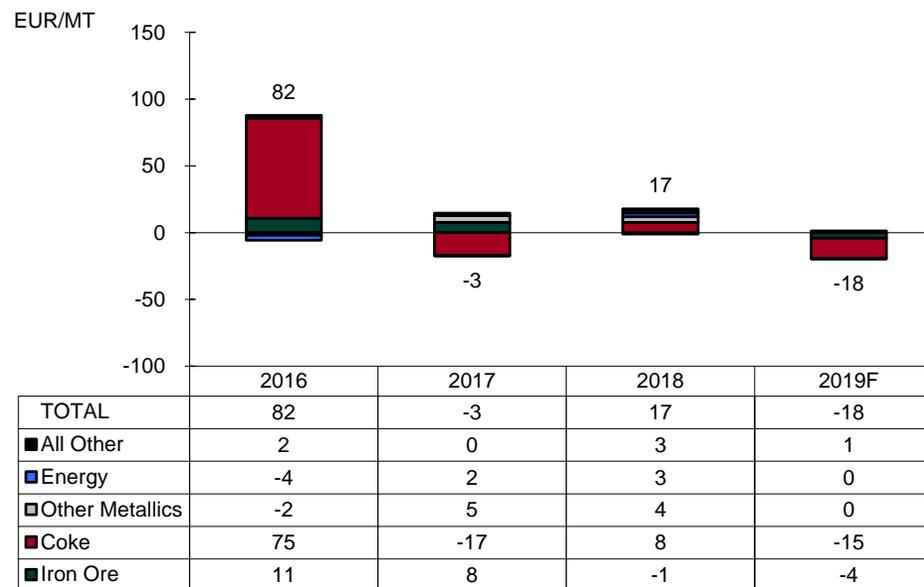
Source: Applied Value analysis, SBB, WSD, Goldman Sachs, Morgan Stanley, Australian Treasury

EU HR steel integrated production costs are projected to decrease by €18/MT in 2019 due to falling coking coal and iron ore prices.

2016 – 2017 Annual Changes	2017 – 2018 Annual Changes	2018 – 2019F Annual Changes
– Iron Ore: +10%	– Iron Ore: -1%	– Iron Ore: -5%
– Coking Coal: -13%	– Coking Coal: +7%	– Coking Coal: -13%
– Scrap: +40%	– Scrap: +17%	– Scrap: +4%
– Natural Gas: +22%	– Natural Gas: +28%	– Natural Gas: +3%

Integrated Mill Cost Increases YOY (HRB)

100% external purchase of Iron Ore and Coking Coal

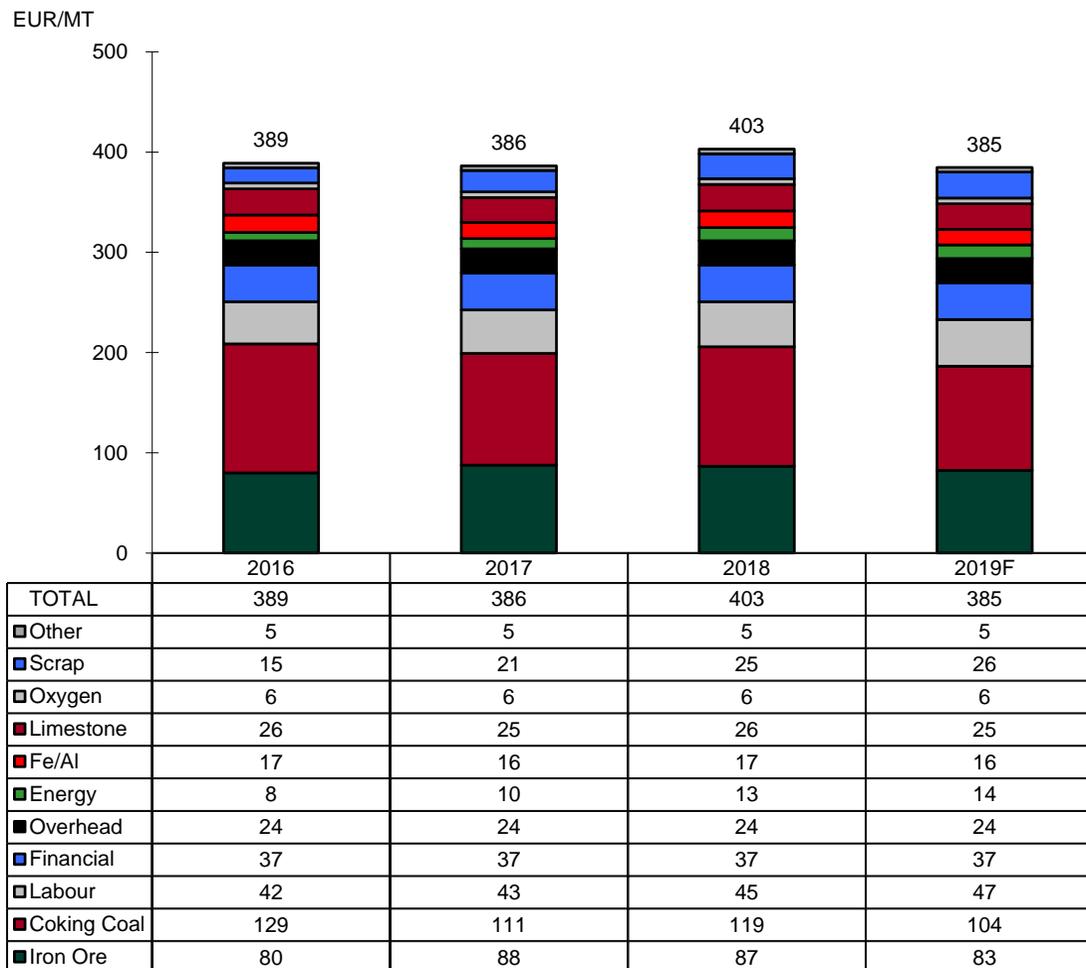


Source: Applied Value analysis, SBB, WSD, Goldman Sachs, Australian Treasury, Credit Suisse
 Note: Other Metallica includes Pig Iron (purchased), Scrap and Direct Reduced Iron

EU HR production costs are expected to decrease by €18/MT in 2019, mainly due to falling coking coal and iron ore prices.

EU Integrated Mill Hot-Rolled Annual Production Costs

100% external purchase of Iron Ore and Coking Coal

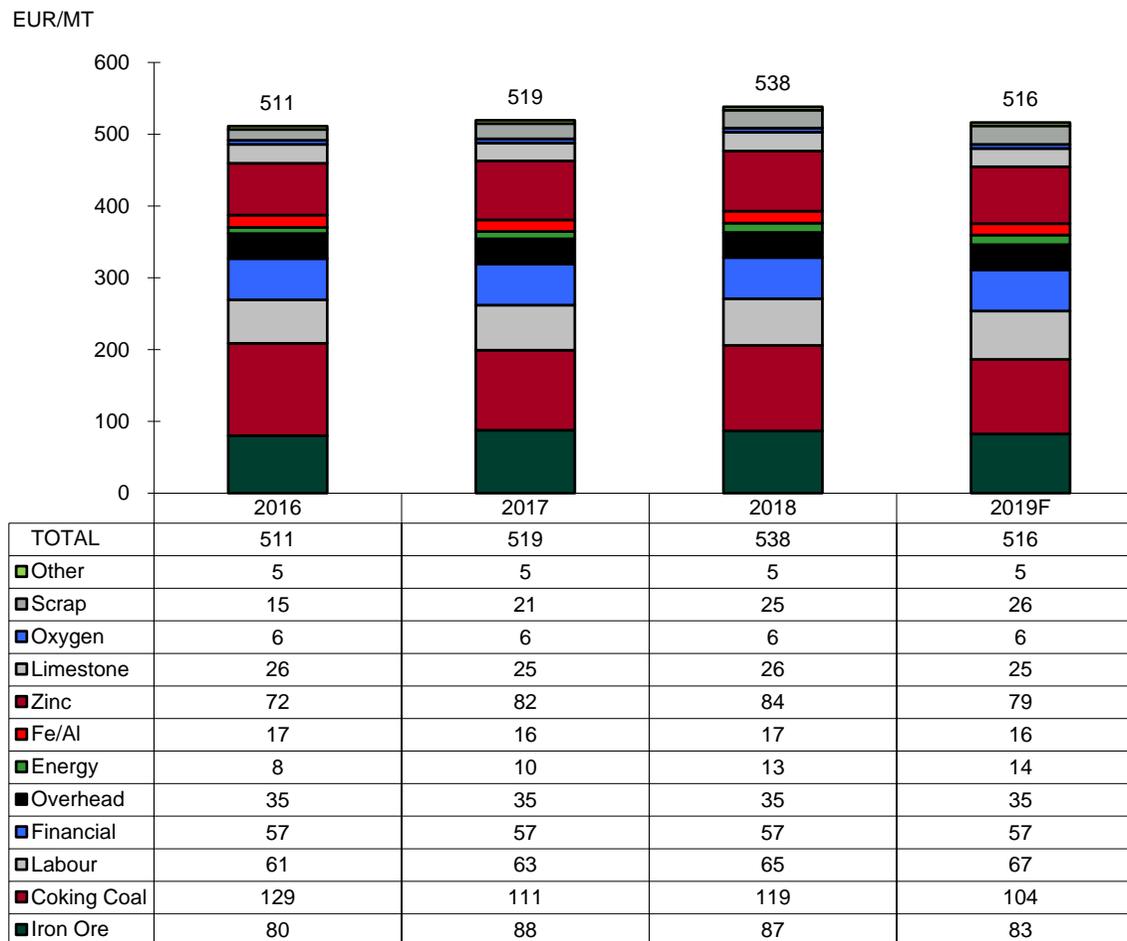


Source: Applied Value analysis, SBB, WSD, Goldman Sachs, Australian Treasury, Credit Suisse

EU HDG production costs are expected to decrease by €22/MT in 2019, mainly caused by decreasing zinc and coking coal prices.

EU Integrated Mill Hot-Dip Galvanized Annual Production Costs

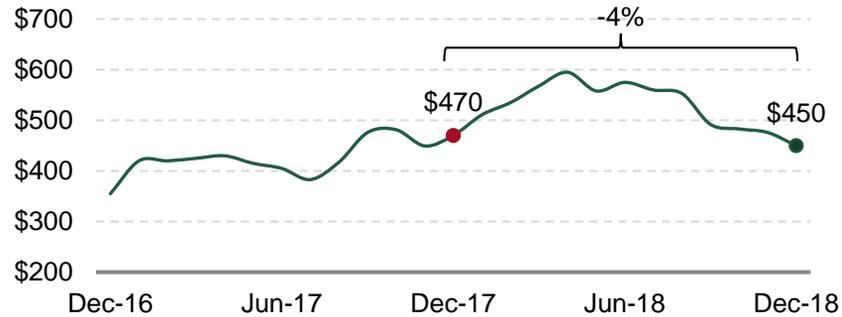
100% external purchase of Iron Ore and Coking Coal



Source: Applied Value analysis, SBB, WSD, Goldman Sachs, Australian Treasury, Credit Suisse

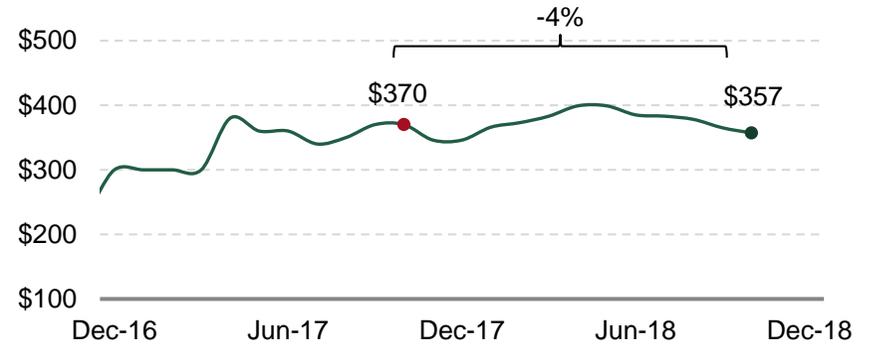
Slab and pig iron prices in the US fell since the beginning of 2018 while both US and EU scrap prices have increased.

Slabs USD/MT



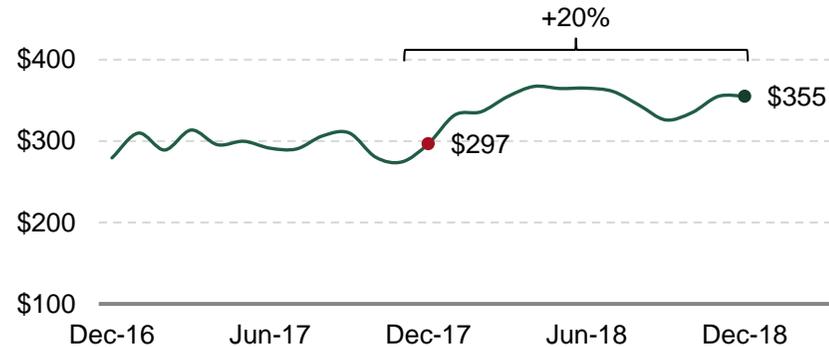
Source: SBB (Semi-Finished / Slab / Latin America export FOB LA)

Pig Iron USD/MT



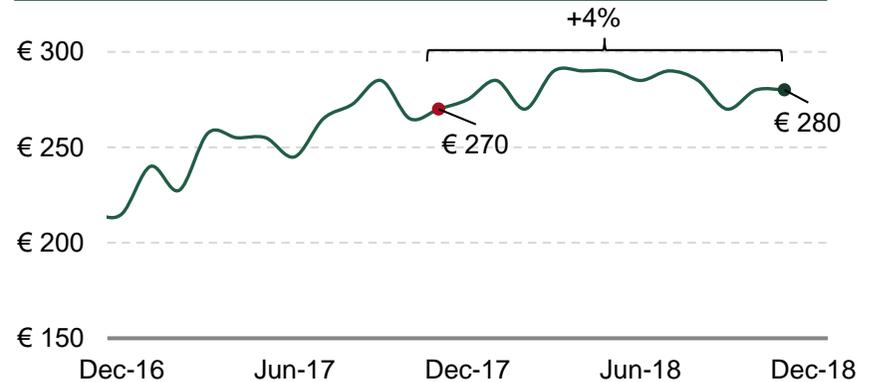
Source: SBB (Brazil export FOB Ponta da Madeira)

Ferrous Scrap US USD/GT



Source: SBB (Ferrous Scrap, US Domestic - Shredded)

Ferrous Scrap Europe EUR/MT



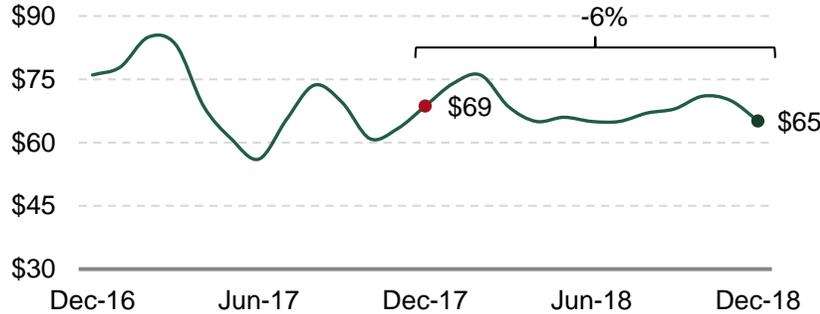
Source: SBB (Scrap / Shredded / N.Europe domestic delivered)

● Previous Year's Data
● Latest Data



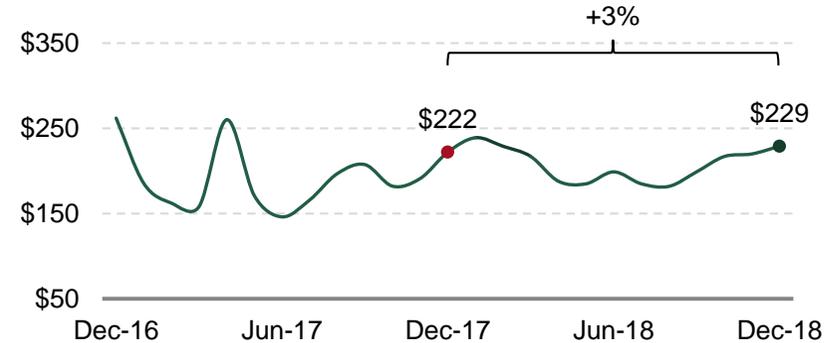
Coking coal prices have increased by 15% in Q4 '18, while zinc prices have dropped 16% since the beginning of the year.

Iron Ore USD/MT



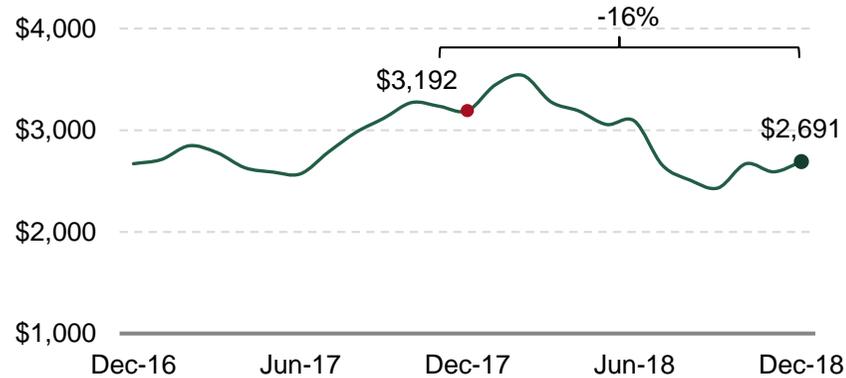
Source: SBB (SGX 62% Fe Iron Ore cash-settled swaps - CFR Tianjin port)

Coking Coal USD/MT



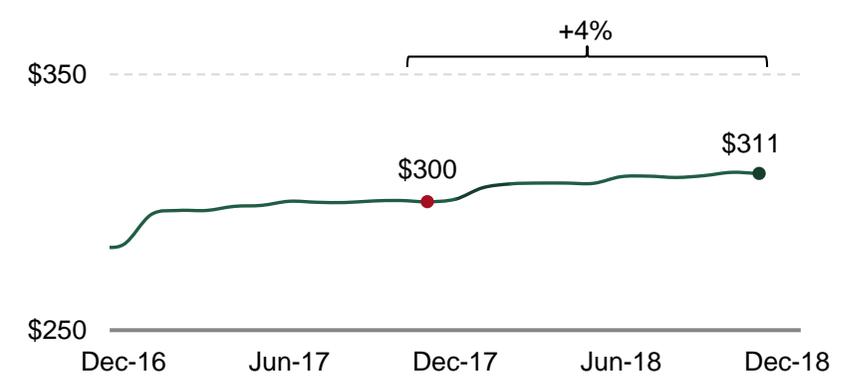
Source: SBB (Hard Coking Coal/Australia export FOB)

Zinc USD/MT



Source: SBB, London Metal Exchange

Limestone – Producer Price Index



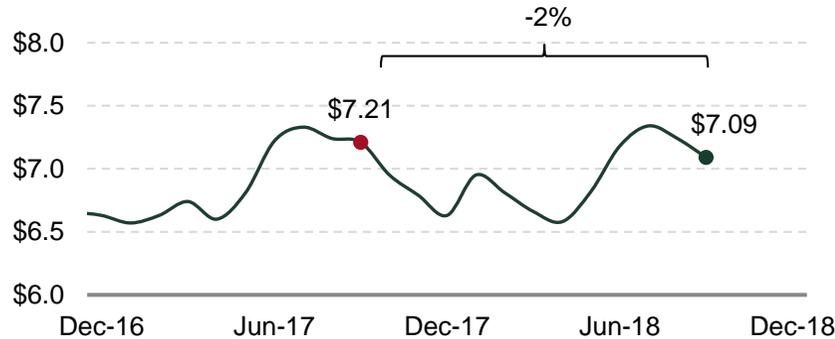
Source: BLS PPI. 1983 = 100

● Previous Year's Data
● Latest Data



EU electricity prices have climbed significantly since the beginning of 2018 with both EU and US natural gas prices climbing with it.

Electricity US
US cents/KWH



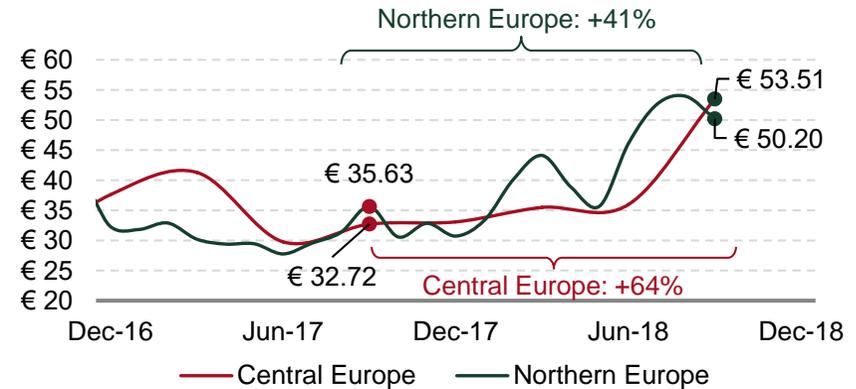
Source: US Energy Information Administration (Industry retail price)

Natural Gas US
USD/mmBtu



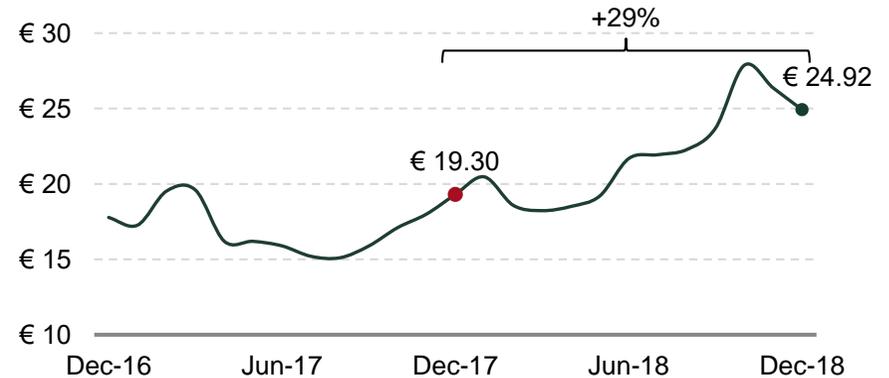
Source: EIA (Natural Gas spot price at the Henry Hub terminal in Louisiana)

Electricity Europe
EUR/MWH



Source: EEX (KWK-Index Germany), Nordpool

Natural Gas Germany
EUR/MWH



Source: EEX (EGIX Germany)

● Previous Year's Data
● Latest Data



Market Conditions by Region

Special Section: 232 Impact on 2019 Negotiations

Steel Production Costs

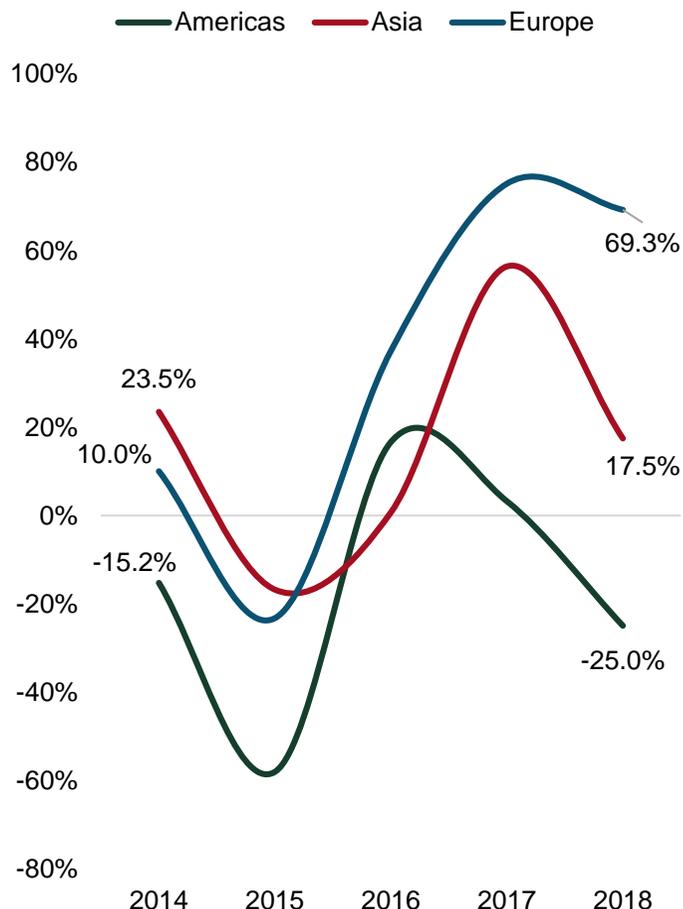
Stock Price Development of Major Steel Companies



If Jan '14 is set as base year, EVRAZ and Baosteel have seen the largest stock price growth while AK Steel seen the largest decline.

Regions	Mills	Indexed Stock Movement				
		2014	2015	2016	2017	2018
Americas	AKSteel	-6%	-65%	63%	-9%	-59%
	GERDAU	-49%	-75%	-42%	-34%	-19%
	NUCOR	-5%	-22%	18%	25%	6%
	(UoS)	-1%	-70%	28%	31%	-27%
APAC	ANSTEEL	18%	-44%	-18%	27%	1%
	BAOSTEEL	64%	34%	51%	108%	63%
	JFE	14%	-20%	-25%	13%	-21%
	TATA STEEL	-3%	-38%	-5%	77%	26%
Europe	ArcelorMittal	-23%	-67%	-41%	-24%	-46%
	EVRAZ	55%	-28%	122%	246%	371%
	Severstal	-4%	-11%	61%	66%	53%
	ThyssenKrupp	26%	7%	33%	41%	-9%
	voestalpine	-4%	-17%	10%	47%	-23%

Regional Stock Movement 2014-2018



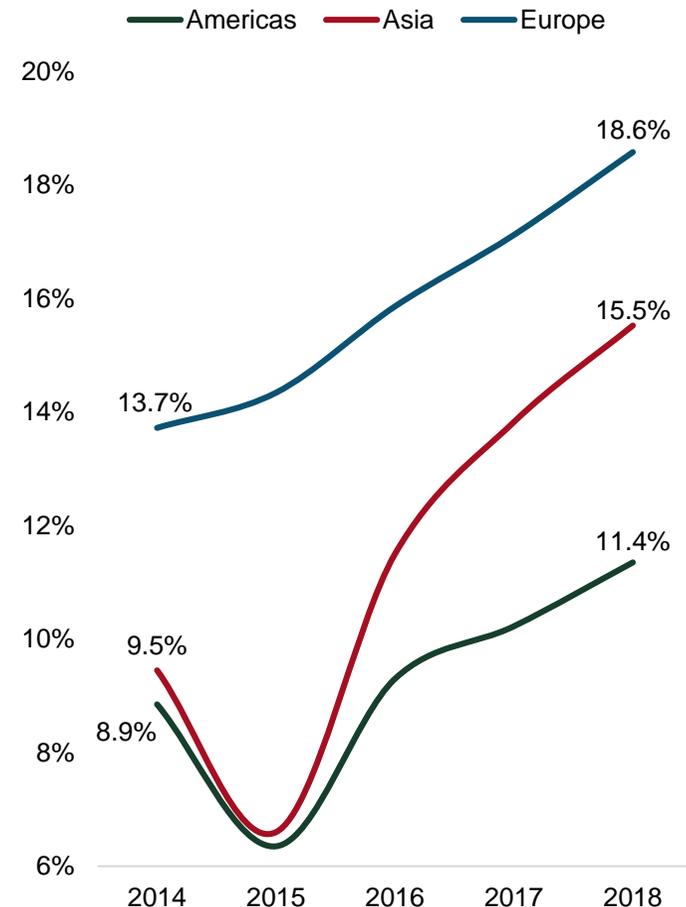
Sources: Cap IQ, Analyst Reports, Applied Value Analysis



Steel mills in each region have seen margin improvements in the past five years with European mills having relatively better EBITDA.

Regions	Mills	EBITDA				
		2014	2015	2016	2017	2018
Americas	 AKSteel	5.8%	7.2%	10.2%	8.8%	7.1%
	 GERDAU	11.0%	9.8%	9.9%	10.8%	13.2%
	NUCOR	9.8%	8.2%	13.3%	13.0%	15.1%
	(Uss)	8.8%	0.2%	3.8%	8.3%	10.0%
APAC	 ANSTEEL	8.3%	1.9%	10.2%	11.7%	15.3%
	 BAOSTEEL	10.1%	9.1%	13.4%	15.1%	17.0%
	JFE	10.4%	7.8%	8.4%	11.0%	11.2%
	 TATA STEEL	9.0%	7.6%	14.0%	17.5%	18.6%
Europe	 ArcelorMittal	8.5%	5.3%	10.2%	11.7%	13.4%
	 EVRAZ	17.5%	15.7%	19.2%	23.7%	27.5%
	 Severstal	26.5%	32.4%	31.8%	32.4%	35.3%
	 ThyssenKrupp	4.1%	5.4%	5.1%	2.7%	2.8%
	voestalpine	12.0%	12.9%	13.0%	15.1%	13.9%

Regional EBITDA 2014-2018



Sources: Cap IQ, Analyst Reports, Applied Value Analysis

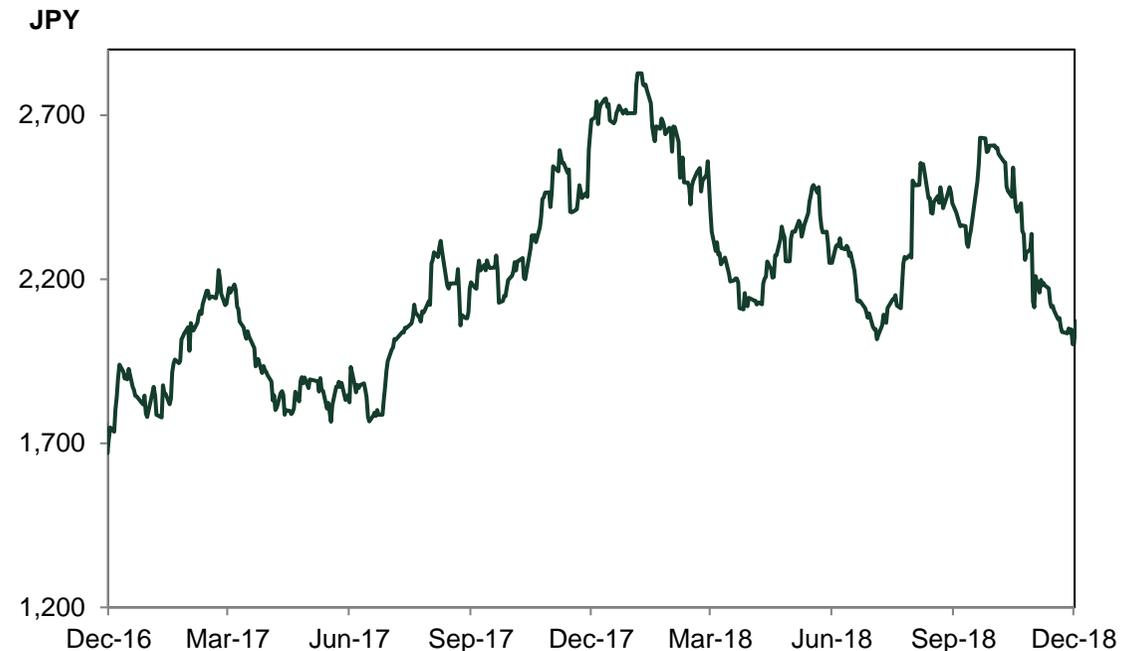


JFE offers high-performance and energy-efficient products which utilizes gaseous fuel to replace powder coke and reduce costs.

Recent Headlines:

- JFE Steel Corporation announced production of recently developed “GI JAZ” steel sheet, which offers improved press formability for automobile bodies and allows automobile manufacturers greater freedom in vehicle structure design.
– *JFE Official Nov/15/2018*
- JFE Steel Corporation announced the successful development of EXPAL, a process that doubles the paint life of conventional carbon steel for bridges, construction machinery, and industrial machinery. This process significantly reduces the lifecycle costs of steel structures located in corrosive environments.
- *JFE Official Sept/26/2018*
- JFE Steel announced the launch of the updated thread joint “High-Mech-Neji 1”, which connects steel-pipe piles using a much more compact design. The new joint is expected to offer shorter construction time and reduced labor for mechanical joints.
- *JFE Official Sept/18/2018*

JFE Holdings (5411): Two-Year Stock Price



Source: Capital IQ



Baosteel formally signed the fourth round of strategic cooperation agreement with TEBA.

Recent Headlines:

- Baosteel announced the start of “Blast Furnace System” project, which produces cold-rolled ultra-high strength coils, high-strength high-surface grade plate, automotive outer plate, and hot-rolled high-strength steel.
- *Securities Times Dec/7/2018*
- Baosteel formally signed the fourth round of strategic cooperation agreement with TEBA. The cooperation aims to utilize oriented silicon products and technical solutions to develop and improve steel for use in the power transmission field.
- *Baosteel Official Oct/16/2018*
- The 1580 Hot Rolling production line of Baoshan factory achieved consecutive five months of precision control of coil temperatures. This automatic control system help to increase production efficiency by avoiding manual intervention, thus reducing cost-loss caused by trail rolling, and improve adaptability and versatility of rolling lines.
- *Baosteel Official Sept/10/2018*

Baosteel Group (600019): Two-Year Stock Price



Source: Capital IQ



Ansteel successfully produced and delivered 7,164 tons of European Standardized R260 Rail for export in 2018.

Recent Headlines:

- The first production batch, comprised of 7,164 tons of European Standardized R260 heavy rail, were successfully produced and delivered by Ansteel. This marked the first successful production and export of this type of heavy rail by Ansteel.
- *Ansteel Official Oct/15/2018*
- The newly constructed Ansteel Seamless Steel Pipe Plant successfully signed the first large order of 625 tons of high-pressure seamless steel pipes to be used for fertilizer equipment.
- *Ansteel Official Oct/11/2018*
- The first batch, over 400 tons, of large-size rebar was successfully produced and delivered by Ansteel for the construction of Chengdu Tianfu International Airport.
- *Ansteel Official Oct/10/2018*

Ansteel (000898): Two-Year Stock Price



Source: Capital IQ

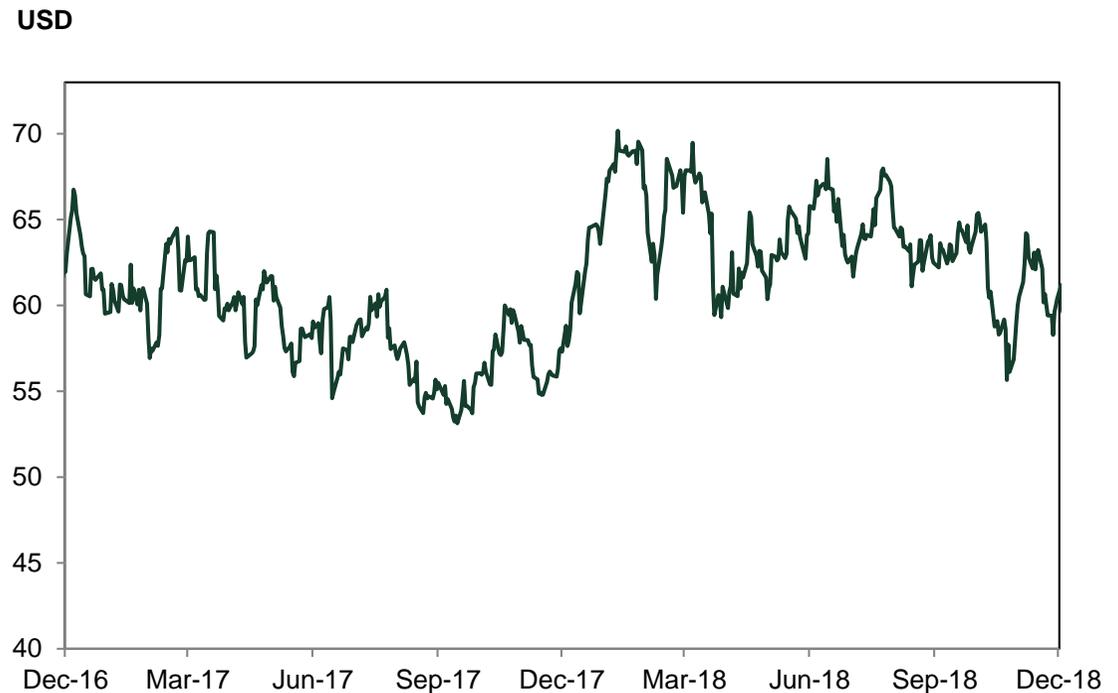


Nucor announced the acquisition of POK Corporation which produces integrated precision casting solutions.

Recent Headlines:

- Nucor Corporation announced today that it is acquiring Corporation POK, a fully integrated precision castings company with a facility in Guadalajara, Mexico. POK produces complex castings and precision machined products used by the oil and gas, mining and sugar processing industries.
- *Nucor Official Nov/29/2018*
- Nucor Corp posted a quarterly profit short of analysts' forecasts. Analysts worry that the Nucor's investments in new production plants, including a \$240 million rebar mill in Florida, and other steelmakers' plans to ramp up capacity will exacerbate oversupply.
- *Reuters Oct/18/2018*
- Nucor approved an investment of \$650 million to expand the production capability of Nucor Steel Gallatin. This investment approximately doubles the production capability. The expansion complements a \$176 million investment currently underway to construct a hot band continuous pickle galvanizing line at the same plant.
- *Nucor Official Sept/7/2018*

Nucor Corporation (NUE): Two-Year Stock Price



Source: Capital IQ



U.S. Steel Corp. plans to invest US\$750 million to upgrade its Gary Works steel plant in Indiana with State tax incentives.

Recent Headlines:

- U.S. Steel signed four-year agreement with steel workers union agreeing on a cumulative 14% wage increase over four-year period. This wage increase was largely result of US clampdown on imports which helped to drive revenue up at U.S. Steel.
–Reuters Oct/17/2018
- U.S. Steel Corp. plans to invest additional \$750 million to upgrade its Gary Works steel plant. In exchange for the investment, the State of Indiana will provide the company with up to US\$12 million in incentives, including tax breaks and worker training grants, as well as a 25-year incentive package of valued at US\$35 million.
- S&P Global Market Intelligence Aug/18/2018
- US Steel announced it will restart the second of two blast furnaces at its Granite City Works. The restart of the “A” blast furnace will support increased demand for steel manufactured in the US while allowing the Company to continue to support customers during planned asset revitalization efforts
- S&P Global Market Intelligence Jun/5/2018

US Steel (X): Two-Year Stock Price



Source: Capital IQ



AK Steel receives \$1.2 Million in award to explore the development of new steels for lightweight automotive applications.

Recent Headlines:

- Now as a new partnership between AK Steel and Bralco Advanced materials, the company will shift focus on developing specialty metal components additives for electromagnetic applications aimed chiefly at the industrial equipment, aerospace, electric mobility, and healthcare industry.
- *3D Printing Media Network Dec/7/2018*
- AK Steel announced today that it has accepted an award of \$1.2 million from U.S. Department of Energy under the Office of EERE. Advanced Manufacturing Office program to investigate novel low-density steels in the laboratory, which could ultimately be used in automotive structural applications.
- *AK Steel Official Oct/11/2018*
- AK Steel launched the new TRAN-COR X permeability grain oriented electrical steel product family for use in high and ultra-high voltage power transformers. The new version offers higher level of efficiency while reducing greenhouse emission due to energy loss in electricity distribution.
- *AK Steel Official May/30/2018*

AK Steel (AKS): Two-Year Stock Price



Source: Capital IQ

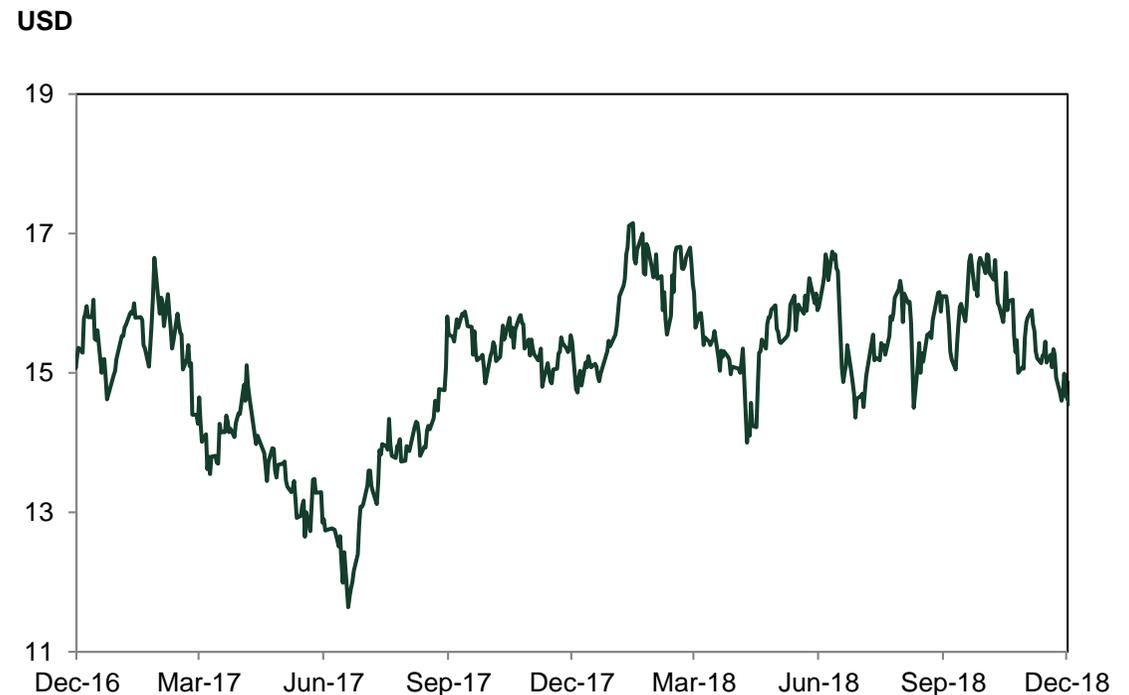


Severstal announces the launch of Severstal Technopark, a research center capable of magnitudes of advanced steel tests.

Recent Headlines:

- Severstal announces the launch of Severstal Technopark, a research center capable of performing full test cycles including: melting with volume of up to 250kg, hot and cold rolling for test samples, and all necessary tests for heat treatment applications.
- *Severstal Official Dec/13/2018*
- PAO Severstal, RUSNANO MC, and Windar Renovables S.L. have opened the production steel towers for wind-driven power plants. The steel wind turbine tower is a hollow structure made up of a set of conical–cylindrical sections, at the top of which is a gondola and the wind turbine rotor.
- *Severstal Official Dec/13/2018*
- PJSC Severstal presented a new vibration and sound absorbing damping steel, 01U5T, during a techno-breakfast organized by the ARSII. The properties of 01U5T steel include high elasticity and high vibration absorbency, making it suited to delivering structural rigidity and high damping.
- *Severstal Sept/24/2018*

Severstal (CHMF): Two-Year Stock Price



Source: Capital IQ

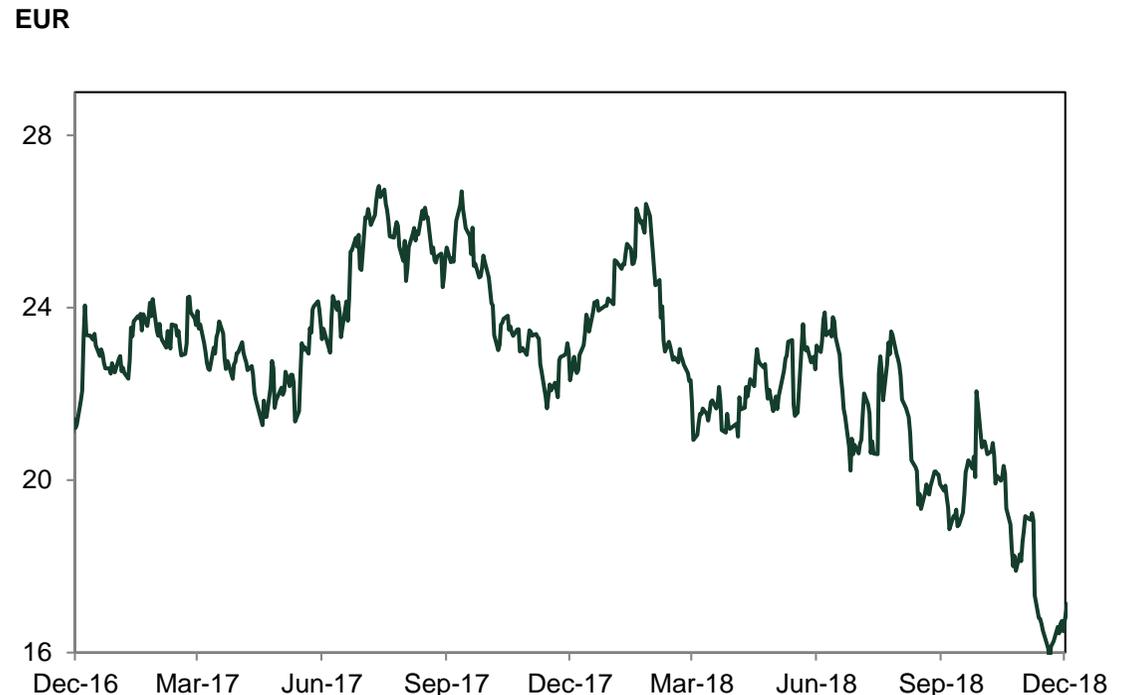


ThyssenKrupp successfully opened new steel ladle furnace in Duisburg with 265-ton capacity per smelting process.

Recent Headlines:

- The new ThyssenKrupp Steel Ladle Furnace in Duisburg successfully went into operation after one year of planned construction. The new double ladle furnace has an operational capacity of 265 tones per smelting process and is used to produce highest quality high-alloy steel with optimized degrees of purity.
- *Thyssenkrupp Official Nov/8/2018*
- ThyssenKrupp constructed a new state-of-the-art hot-dip galvanizing line at its Dortmund site. The new production line is on track to produce hot-dipped galvanized steel coil as early as 2021 pending district government granting permission.
- *Thyssenkrupp Official Aug/31/2018*
- ThyssenKrupp Steel Europe signed contracts for a joint venture to produce lightweight steel wheels for the auto industry in China. Its partners in the planned joint venture will be the leading Chinese steel wheel manufacturer Jingu and the steel producer Ansteel.
- *ThyssenKrupp Official Jun/22/2018*

ThyssenKrupp AG (TKA): Two-Year Stock Price



Source: Capital IQ

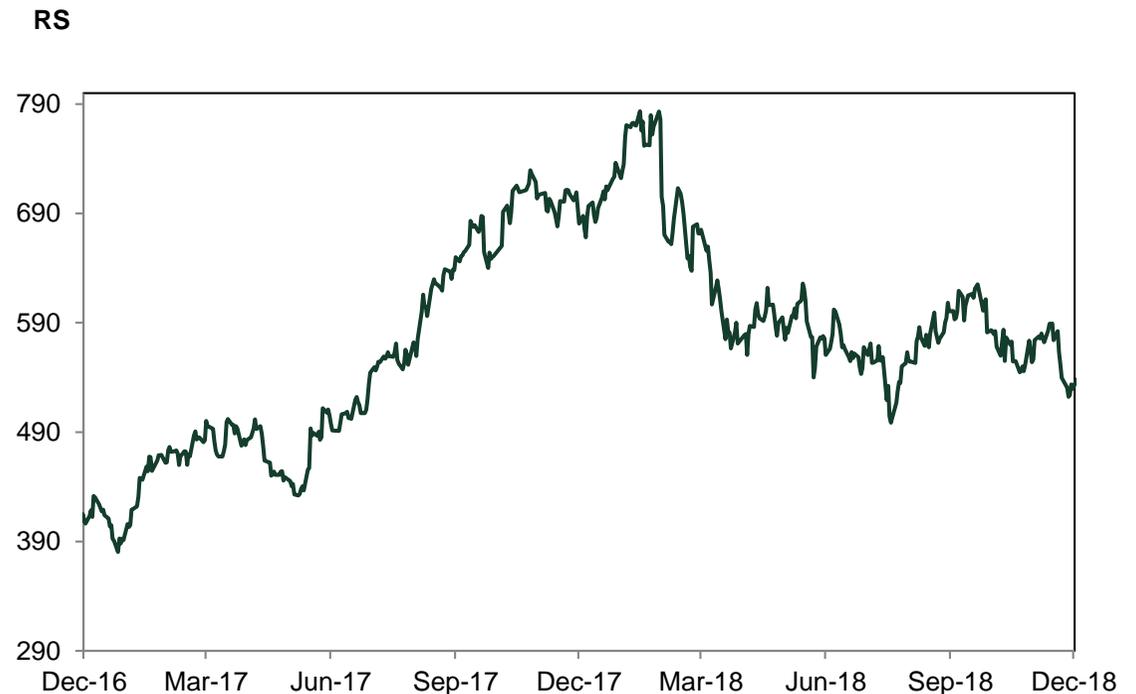


Tata Steel to continue discussions with the European Commission on the proposed joint venture with ThyssenKrupp.

Recent Headlines:

- Tata Steel and ThyssenKrupp is engaging in parallel discussions with the European Commission to provide information in regarding to the proposed joint venture between the two businesses.
- *Tata Steel Official Oct/31/2018*
- Tata Steel has developed different design concepts for the vacuum tube technology and is entering the prototyping stage. At this stage, Tata is inviting other metal technology companies to join the EHP for the development of innovative transportation system.
- *Tata Steel Official Oct/24/2018*
- Tata Steel Europe has announced a partnership with leading chemicals company Nouryon and the port of Amsterdam to develop the largest green hydrogen cluster in Europe. This project would help Tata Steel Europe to achieve its ambition of becoming carbon neutral by 2050.
- *Tata Steel Official Oct/19/2018*

Tata Steel (TATASTEEL): Two-Year Stock Price



Source: Capital IQ

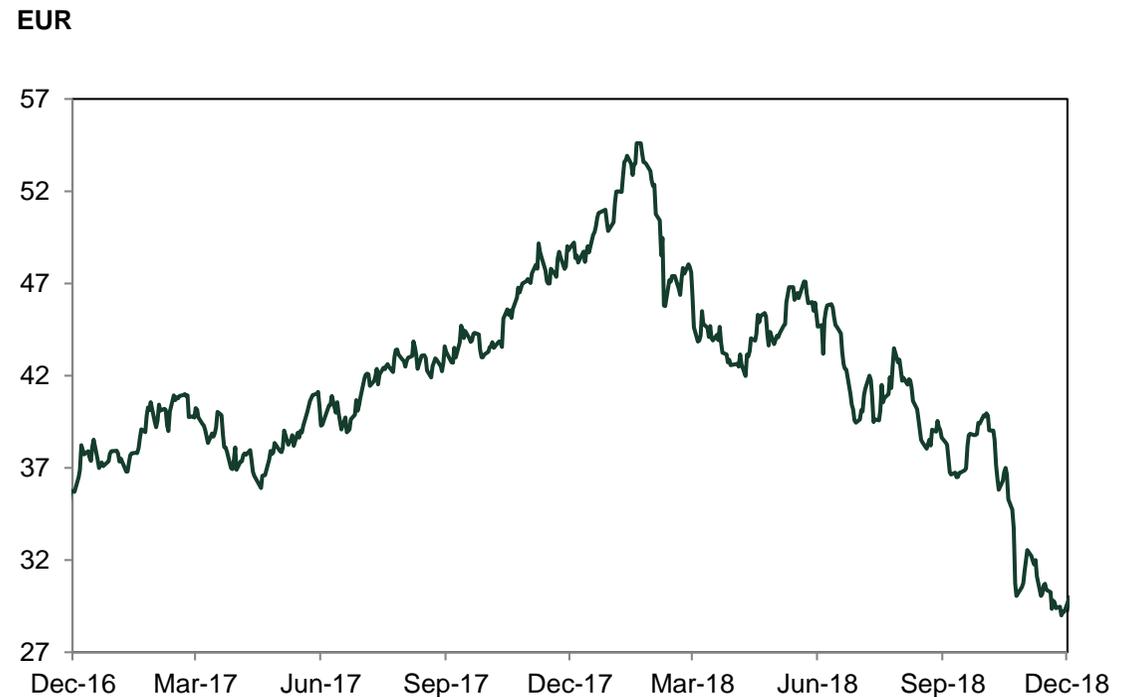


Voestalpine boosts aerospace business with startup of a new high-tech forge in Kapfenberg.

Recent Headlines:

- Voestalpine will invest around half a billion euros in technology development and digital transformation of its Kapfenberg site. Three major new facilities have successfully gone into operation in 2018.
- *Voestalpine Official Nov/23/2018*
- Voestalpine generated revenue of over one billion euros in the expanding Asian market during 2018. Railway infrastructure sector is the key sector in securing a portion of the booming Chinese urban traffic markets and Voestalpine is looking to secure turnouts through the founding of further joint ventures.
- *Voestalpine Official Oct/3/2018*
- Voestalpine has leveraged its global leadership in high-quality rail, high-tech turnout, and digital monitoring system and bundling those technologies together to form the new Railway Systems group.
- *Voestalpine Official Sept/12/2018*

Voestalpine (VOE): Two-Year Stock Price



Source: Capital IQ

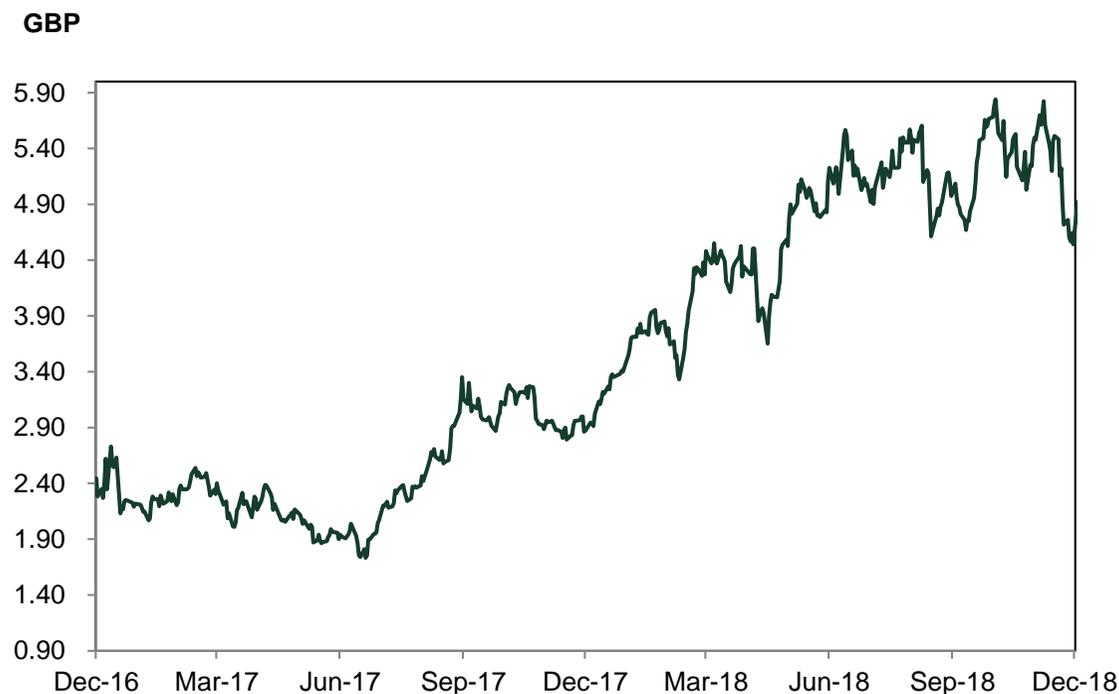


EVRAZ announced considerations of near \$1 billion of investments in four local projects between 2019 and 2022.

Recent Headlines:

- EVRAZ started upgrading the Tashtagol ore mine. The project will enhance the company's self-sufficiency in raw materials, increasing ore production at the mine from 2.2 mtpa to 3.25 mtpa. The total investment into the project is expected to reach RUB 6.8 billion.
- *EVRAZ Nov/13/2018*
- EVRAZ announced considerations into four major investment projects starting 2019 through 2022 in bid to increase sales of finished steel products to local Russian markets. The total investment spending for four projects would be between \$830 to \$990 million.
- *MarketWire Oct/19/2018*
- EVRAZ has launched an investment project aimed at increasing the production capacity of its wheel shop at the Nizhniy Tagil Steel Plant. The project aim to optimize the forging, inspection, and the machining lines. The output will increase by 78 thousand of wheels per year.
- *EVRAZ Oct/9/2018*

Evraz Group S.A. (EVR.L) : Two-Year Stock Price



Source: Capital IQ

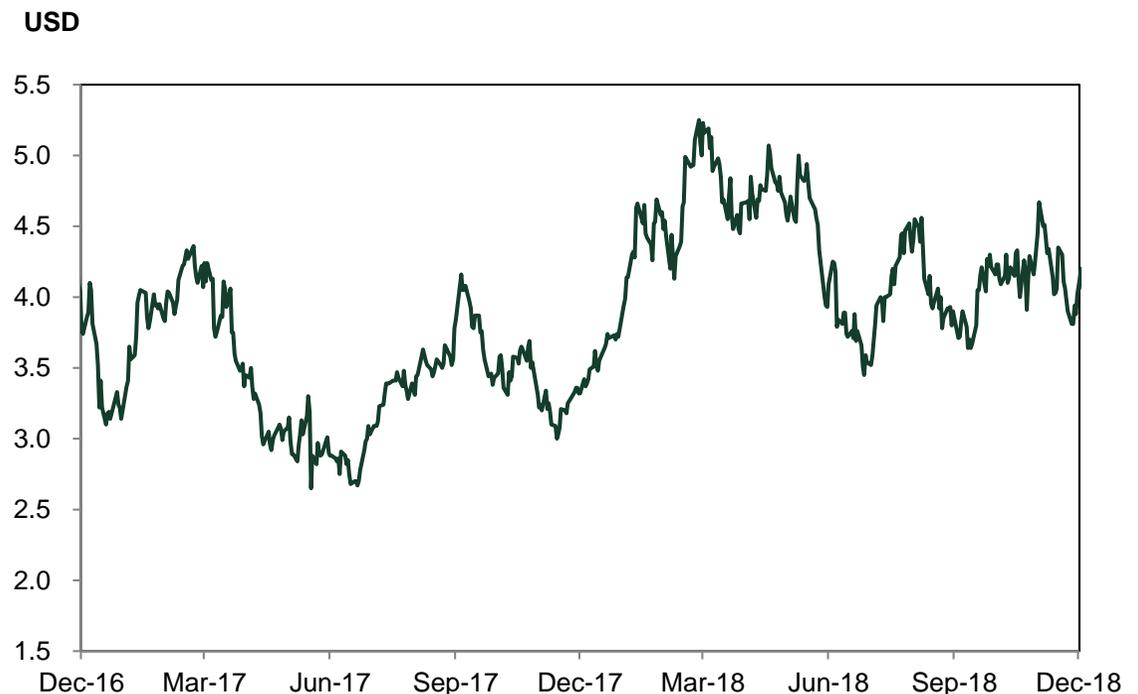


Gerdau announced investments of \$550 million to expand the production capacity of special steels in Pindamonhangaba plant.

Recent Headlines:

- Gerdau announced investment of \$550 million to expand the production capacity its special steels plant in Pindamonhangaba. With the new investment, the plant will be able to increase special steel production capacity from 600 ktpa to 1,000 ktpa.
- *Valor Nov/22/2018*
- Gerdau SA announces to that it has concluded the sale of four rebar mills. Gerdau has a strong presence in North America with 13 mills located in the United States and Canada and continues to be the leader in the production of structural profiles, bars and special steels, as well as rebar.
- *Gerdau Official Nov/5/2018*
- Gerdau signed a contract for the sale of its equity interest in its India subsidiary. The sale will allow Gerdau to focus on the management of strategic assets in the Americas to supply its main markets in Brazil and the United States.
- *Gerdau Official Aug/28/2018*

Gerdau S.A (GGB): Two-Year Stock Price



Source: Capital IQ

