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IMPACT FROM INPUT PRICE MOVEMENT

- There is a strict price competition in Vietnam steel market, making corporate production cost the most important matter. Currently, BOF steel producers have been taking the lead.
- **Input prices have sharply increased recently.** Iron ore and hard coking coal prices soared the most, indirectly forcing the prices of other materials and semi-products to increase as well. Therefore, the whole industry's production cost are boosted.
- **Ministry of Industry and Commerce (MIC)'s Decision 2968**, which imposed additional safeguard tariff on steel bar and billet, helped increasing sale volume and steel price. Thanks to this decision, there was a huge profit spreading through steel industry. However, only a few steel companies did have a sustainable growth.

STEEL MARKET OUTLOOK 2017

- **We expect a decrease in input prices.** Based on our forecast of demand and supply in 2017, we believe that prices of such raw materials as iron ore and coking coal may fall back due to ample additional supply from Australia and Brazil. However, the average material cost in 2017 should be higher than that in 2016. On the contrary, we expect the steel scrap price will increase, resulted from the higher demand in China and lagged impact of iron ore.
- **Civil steel market keeps on growing. Increasing public investment in 2017 should boost the steel demand.** Vietnam has the highest urbanization growth rate in the SEA area, which leads to the high demand for steel serving civil construction. Also, we believe that after the government has been stable, the pulic investment should rise again and steel producers have more chance to increase their sale volume.
- **Steel price is expected to increase.** We expect the average steel price to increase up to VND 10.8 mn per ton. This increase is majorly attributed to the rise in raw material price and domestic producers having completely consumed their low-cost inventories. Moreover, we believe that EAF steel producers would import more billet for their production because it is more expensive to produce billets from scrap.
- **Galvanized sheet producers will be impacted by trade barrier from some abroad markets.** Some countries have imposed safeguard tariff on galvanized sheet from Vietnam, such as US and Thailand. Although the export volume to these 2 countries are not huge, this situation can make the competition in traditional export markets worse. We strongly believe that domestic gavalnized sheet producers may seek for more shares in the domestic market.
- **Formosa temporarily has no direct impact on domestic market** because the complex is not producing construction steel yet. However, the main products from phase 1 of this complex are billets and slabs. If Formosa puts these billets on sale in domestic market, EAF steel producers will have one more low-cost and untaxed source of material, which lowers the production cost advantages of BOF steel producers

By the outlook of the steel market on 2017, we recommend HSG and HPG as an attractive investment.

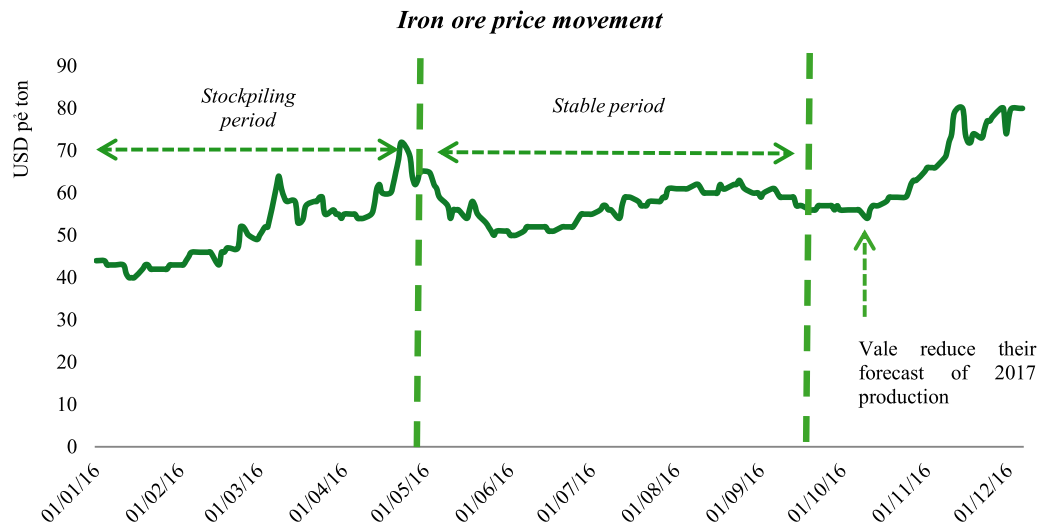
OVERVIEW ON VIETNAM STEEL MARKET

Iron ore and hard coking coal price soared due to the tightened supply.

1. Raw material price

a) Iron ore

In 1H2016, iron ore price has sharply increased from the all-time low USD 40 per ton in the beginning of 2016 to approximately USD 80 per ton. The price movement can be separated into 3 phases, including a sharp bounce in the 1H2016, sideways movement in the following months and another increase since late Q3.

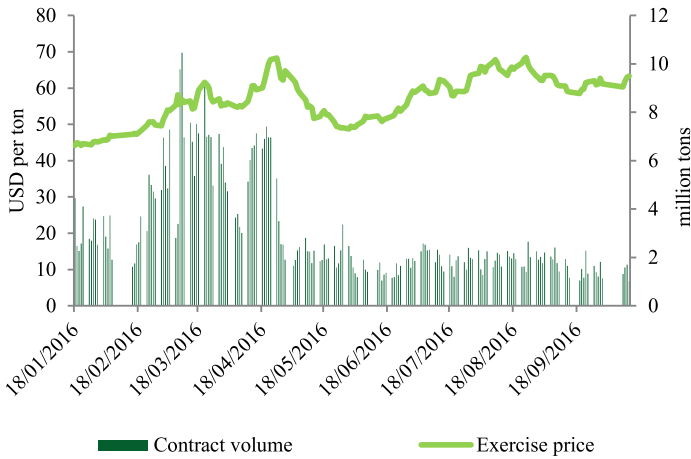


Source: Bloomberg, VCBS compiled

Sharply bouncing in 1H2016 thanks to stockpiling activities in the Chinese market. According to the data from the Dalian market, the trading volume of iron ore contracts dramatically increased to 500 mn ton per day in over 2 months from February to April. These trades boosted iron ore price from USD 44 per ton up to USD 66 per ton. The sharp increase in trading volume was attributed to (1) *investors closing their short position buy going long on another iron ore contract*, (2) *Chinese steel producers starting to buy materials for their new production period*, as illustrated by inventories index bouncing back from the trough in 2015. After the stockpiling activities ended, the iron ore price sharply decreased to USD 55 – 60 per ton, reflecting the real market condition.

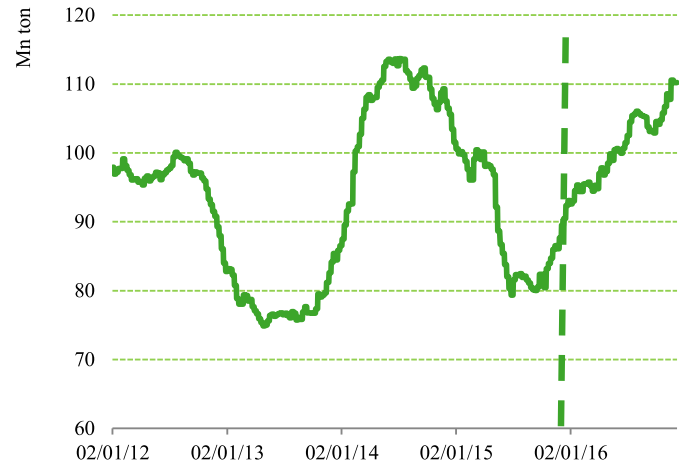
Continuing to rise in 4Q2016. After going sideways for a few weeks in the range of USD 50 – 55 per ton, the iron ore price increased thanks to the *new forecast announcement from Vale*, who lowered their forecast of 2017 production from 380 – 400 mn ton to 360 – 380 mn ton. As a result, the iron ore price soared up to USD 80 per ton. Moreover, as the year is about to end, China steel producers increased their raw material inventories for production in 1Q2017, which caused the inventories of iron ore in Chinese port to rocket to 4-year high of 110 mn ton.

**Iron ore future market index,
Dalian Exchange (China)**



Source: Bloomberg

China port inventories index

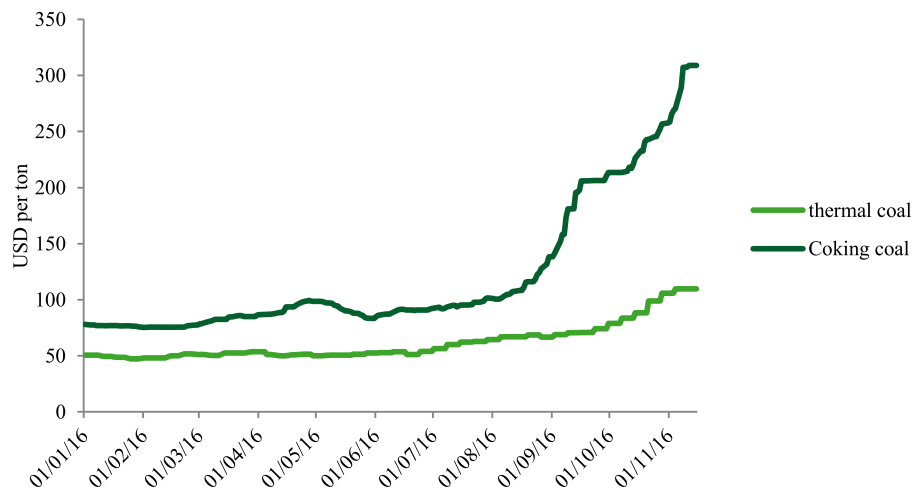


Source: Bloomberg, China Customs

b) Coal:

Lower supply helped increase coal price. In detail, from August to November 2016, hard coking coal prices have increased by 250%, up to USD 300 per ton, and thermal coal prices have risen from USD 50 per ton to USD 110 per ton. The reasons are as follow (1) **production cut from China**, which reduced coal mining day from 330 days to about 270 days per year. Also China is targeting to cut their production by 1 trillion ton per year until 2020, (2) **unfavorable weather condition, wet weather by La'nina effect** make it difficult for coal mining in Indonesia (thermal coal) and Australia (hard coking coal), (3) **production from the US fell** by 50% in 1H2016.

Australian coal price

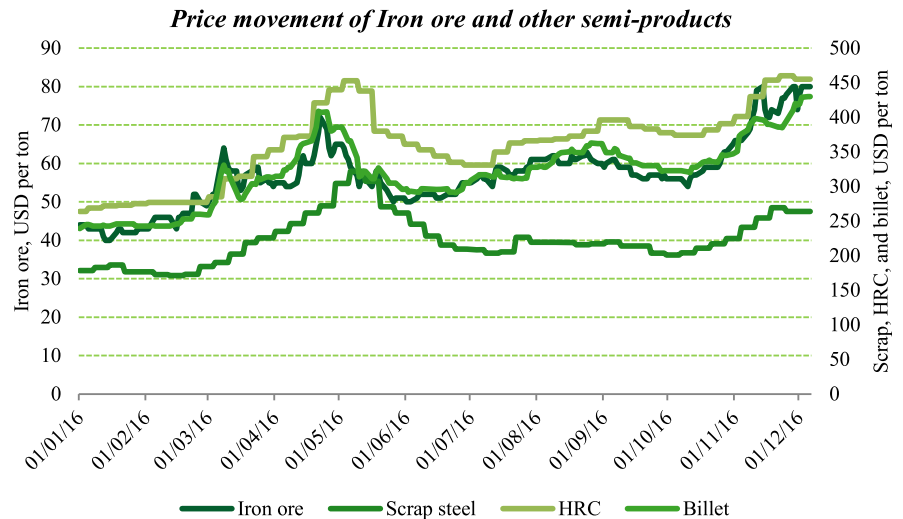


Source: Bloomberg

Domestic thermal coal prices have not changed much. As global coal prices sharply increased, Vinacomin (TKV) has slightly increased the domestic prices of several thermal coal dust types,

including 1, 2, 3, 6, 7a/b/c, by 6%. The reason for such a small change in coal prices is that domestic coal prices have already been much higher than global prices.

c) Other steel material and semi-product



Nguồn: VCBS compiled

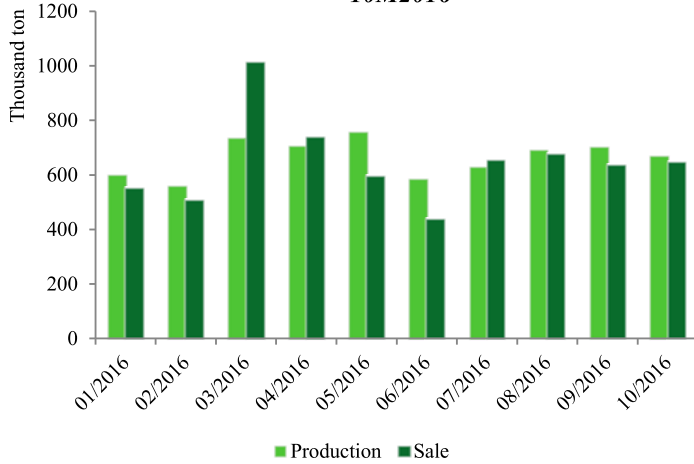
Price movement of other steel materials usually lag behind iron prices by 1-2 months, such as scrap price and HRC price. This lag is attributed to *steel producers' large amount of inventories*. All of these semi-products are made from iron ore and hard coking coal. Therefore, the price movements of these products directly depend on cost of producers' inventories, instead of current market prices of material. According to our observation, there are differences in the price movements among semi-products. In detail, *the closer the semi-product to finish-steel, the less lag-period*. As illustrated in the chart, the billet prices move closely to iron ore prices, while the HRC and scrap prices have longer lag-period.

The steel market is active in the 1H 2016 and cooldown by the end of the year.

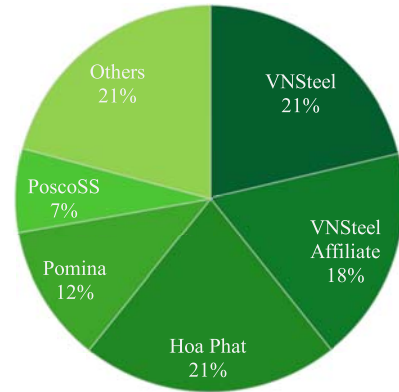
2. Steel market

There was a dramatic growth in both production and sale volume compared with in 2015, especially in March when the Decision 2968 (MIC) imposed additional safeguard tariff on steel bar and billet. Construction steel sales volume increased by 21.5% yoy (10M2016), reaching 6.44 mn ton. However, impacts of the safeguard tariff did not last long. The sales volume growth rate (yoy) gradually slowed down month by month. By October 2016, production volume rose by 12.2% yoy, but sales volume grew by 10% yoy only, and gross margin of industry in 3Q2016 fell. Therefore, we believe that *the dramatic growth in steel sale volume was mainly attributed to speculation of steel agents in respond to the issuance of the Decision 2968, but the real demand from market*. The clearest evidence is that sales volume of domestic producers gradually drop to the trough in June.

Production and Sale volume of domestic producers in 10M2016



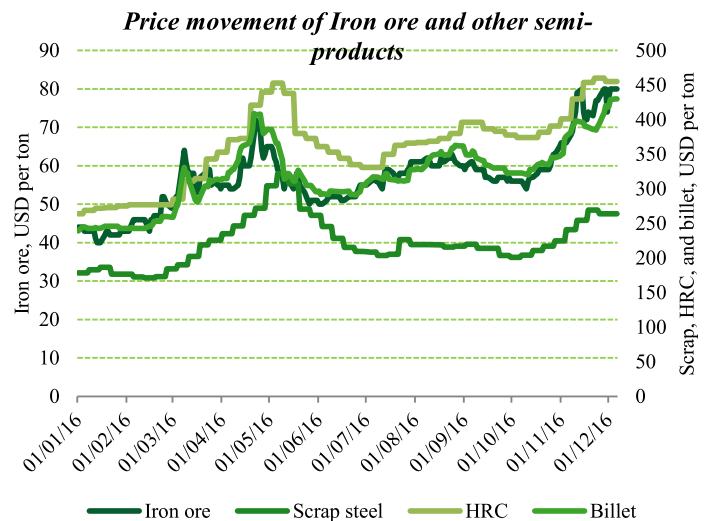
Steel market share in 10M2016



Source: VSA, VCBS complies

Steel price soared in 6T2016 thanks to (1) additional safeguard tariff up to 15% on steel bar and 24% on billet lowering the price advantage of steel imported from China, creating a room for domestic producers to raise prices, (2) higher production cost resulted from the sharp price increase in raw materials such as iron ore and hard coking coal. Despite the increase in steel price, sales volume is likely to grow at a slower rate. Domestic producers acquired more market share, especially such big firms as VNSteel, Hoa Phat Group (HOSE: HPG)

Product	Safeguard tariff (total)
Alloy billet	23.3%
Pure (non-alloy) billiet	28.3% - 33.3%
Alloy steel bar	25.4%
Pure steel bar	30.4% - 35.4%



Source: MIC, VCBS complies

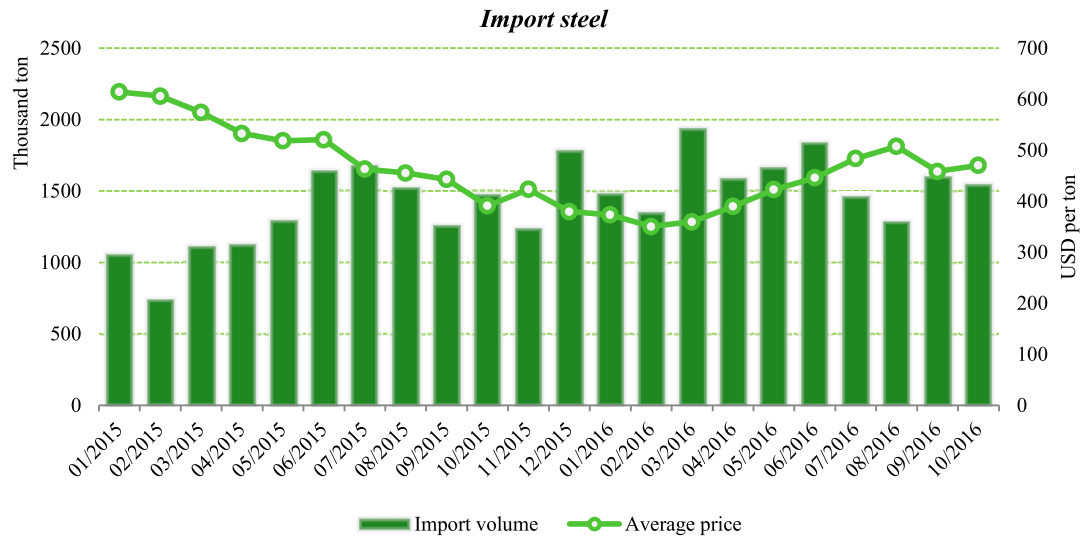
Source: Bloomberg

Sale volume of **steel pipe** increased by 31.7%yoy, reaching 1.52 mn ton. Steel pipe price tends to rise recently due to higher demand from industry, a large number of construction projects about to be

completed and the soar in HRC price.

Sales volume of galvanized sheets increased by 34.1% yoy, reaching 2.29 mn ton, 1mn ton of which was exported (+42.75 yoy). Most of the growth in sales volume came from the Southern market (+32% yoy) and export markets (42.7% yoy). The main export markets of Vietnam are ASEAN (43.8% share), and US (35.15% share). Especially, export volume to US in 9M2016 rocketed by 21 times yoy, reaching 707,700 ton. There was no change in market structure, HSG and NKG continued to take the lead with market share of 32% and 14% respectively.

Import volume of finished steel was high, but was growing at a slower rate. The safeguard tariff has impacted on imported steel. There was a slowdown in the growth rate of import volume. According to data from Customs, import steel volume in October was 1.5 mn ton (-3.3% mom, +18.8% yoy), and in 10M2016 was 15.4 mn ton (+24.2% yoy).



Source: Customs

Billet import volume bounced while scrap became less attractive. Billet, which was taxed sharply, was imported only 937.000 ton (-21.4% yoy), but the import volume began to increase again as the September volume increased by 148.6% mom, and 227% yoy. On the contrary, scrap steel volume started to fall. The scrap import volume in September decreased by -23.3% mom and -7.6% yoy. We believe that, the recent increase in scrap steel force EAF steel producers to import low-cost billet from China for their production.

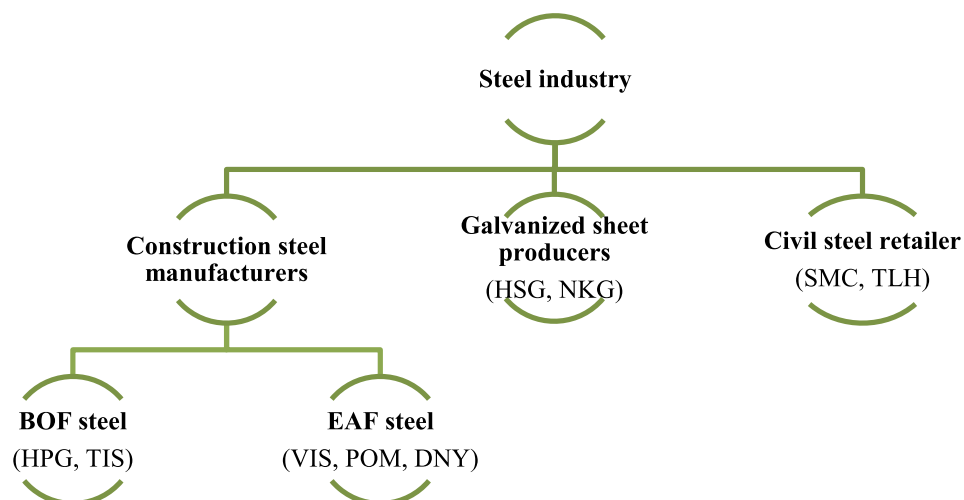
3. Steel companies’ performance in 9M2016.

Thanks to the recovery of the steel market, steel producers and retailers realized huge profit in 1H2016 (yoy). This sharp growth was attributed to (1) dramatic increase in steel prices, and large amount of low-cost inventories held by steel producers, (2) some steel producers enhancing their capacity, leading to higher sale volume, (3) performance in 2015 was too bad that an average performance in 2016 can surpass the previous year’s performances.

Code	Total assets (bn)	Shareholder's equities (bn)	Debt/Assets	NPM	ROA (ttm)	ROE (ttm)	EPS (ttm)	BVPS
HPG	28,468	18,068	36.5%	19.6%	18.3%	28.9%	6,192	21,439
VIS	2,112	637	69.8%	1.5%	0.4%	1.2%	156	12,942
TIS	10,894	2,824	74.1%	3.1%	3.3%	12.7%	1,262	9,944
POM	6,520	2,501	61.6%	1.9%	2.0%	5.2%	693	13,423
VGS	1,417	576	59.4%	2.0%	5.9%	14.5%	2,215	15,309
DNY	2,109	346	83.6%	1.1%	0.9%	5.4%	696	12,815
TVN	14,383	7,359	48.8%	3.8%	3.7%	7.1%	775	10,854
Median	9,415	4,616	62.0%	4.7%	4.9%	10.7%	1,713	13,818
Average	6,520	2,501	61.6%	2.0%	3.3%	7.1%	775	12,942

Data updated to Q3.2016

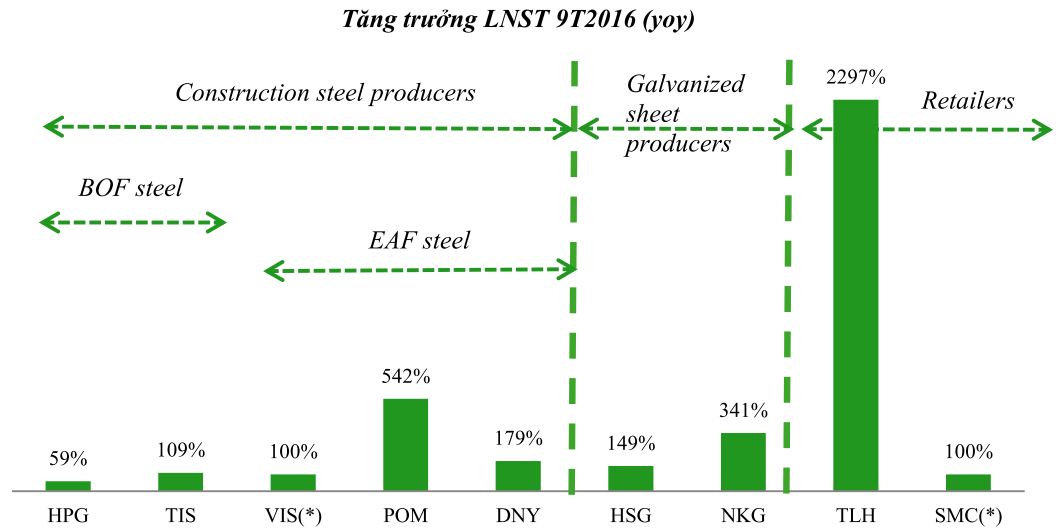
Listed steel companies are separated in 3 main groups, including construction steel manufacturers, galvanized sheet producers and civil steel retailers. The construction steel manufacturers group, which has the large scale and outnumbers the other 2 groups, is divided into 2 branches based on production technology, including EAF steel and BOF steel. The differences in technology lead to the gap between production costs of the two branches.



Source: VCBS compiled

EAF steel and retailers groups saw dramatic growth due to the plunge in 2015 performance. In 2015, the scrap prices decreased at a lower rate than iron ore, which *made production cost more expensive for EAF steel producers* than for BOF steel producers. During the long term downtrend of steel price (steel price is more sensitive to iron ore price), sales volume of EAF steel group sharply grew, but their net profit margin dropped. **Regarding steel retailers**, they did not change their inventories management policies, maintaining the day of inventories on hand up to 120 – 160 days,

which *caused a large amount of provisioning for declined inventories value*. Therefore, when the steel prices bounced in 1H2016, these 2 groups realized the highest growth rate in the industry. In general, *the worse the 2015 performance, the larger the growth rate in 1H2016*.



Source: VCBS compiled

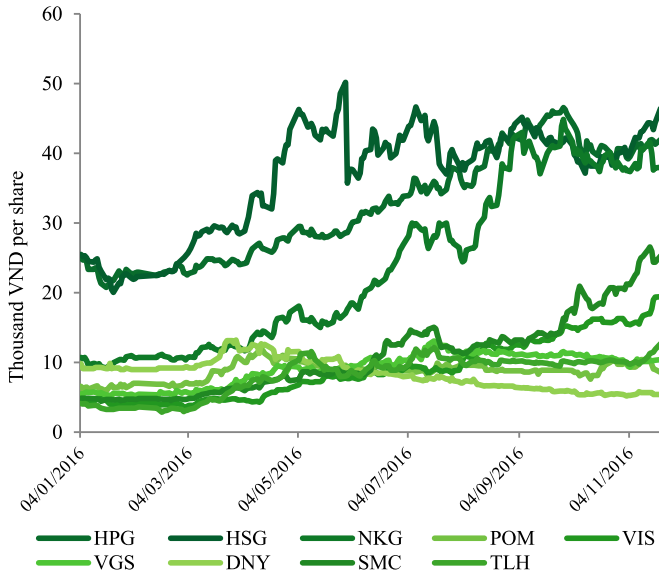
(*) Because VIS and SMC suffered from losses in 9M2015, we denote their growth rate as 100%.

BOF steel producers grew sustainably. As we have analyzed above, BOF steel producers have more advantage on production cost than EAF steel producers. Therefore, this group outperformed EAF group, realizing a positive profit in 2015. In 2016, the advantage is clearer, including (1) larger days of inventories on hand helped NPM to expand when the raw material price increased, (2) BOF technology provided lower-cost billet than EAF technology did, competing better against imported steel. Therefore, we concluded that *growth of BOF steel producers accurately reflected the current business condition*.

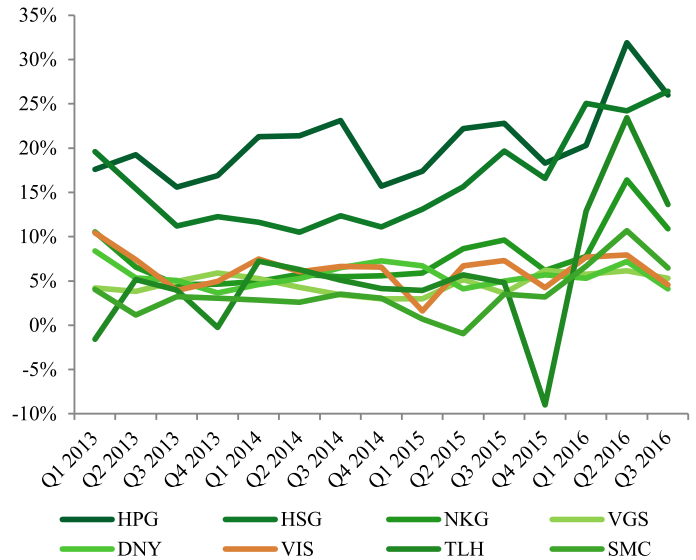
Despite receiving less benefit from Decision 2968, **top galvanized sheet producers** realized dramatic growth, as seen with HSG (+130% yoy), and NKG (+314% yoy), thanks to the flexible inventories management policies. Galvanized sheet producers can adjust their day of inventories on hand better than BOF steel producers who must maintain the length of their inventories period up to 3 months. Therefore, the gross margins of galvanized sheet producers rose gradually, in spite of the fluctuation of HRC prices. In addition, in 9M2016, galvanized sheet producers expanded their export market to new countries, especially to the US, where the export volume and price increased.

In the third quarter of 2016, although both steel and iron ore price increased compared with in Q2, gross margin of the construction steel group decreased. Therefore, *we should call into question the outlook of the construction steel group in 2017*.

Industry stock price



Industry gross margin, updated to Q3.2016



Nguồn: VCBS compiled

BOF steel producers enhance capacity and hedge by future contracts and

EAF steel producers flexibly change their source of billet

Galvanized sheet producers manage their inventories policies in respond with HRC price.

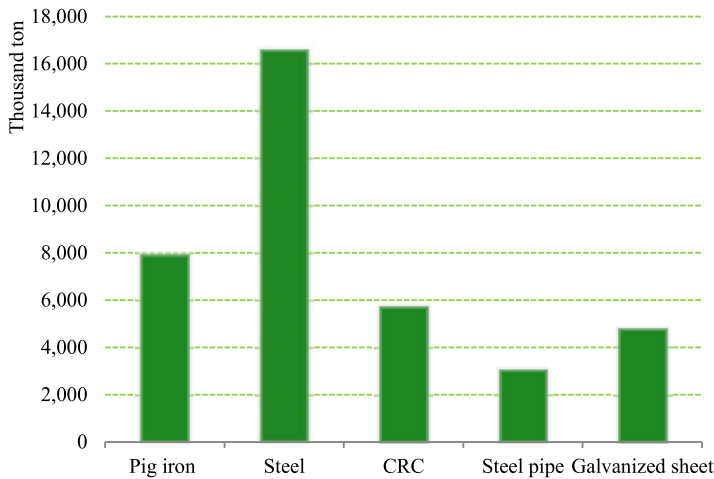
4. How construction steel producers react to the raw material price movement

In Vietnam, the construction steel market is divided into 3 groups, including BOF steel, EAF steel, and import steel (especially Chinese origin steel). However, the domestic producers could only control the market to a lesser extent, while the imported steel (mostly Chinese origin), which was quite cheap and good-quality, had more pricing power. It is quite obvious that Vietnam steel market competes mostly on price because (1) **their steel product portfolios were not diversified**, domestic producers focused on only a few types of products such as steel bar, wire rod, steel pipe and galvanized sheet, (2) China steel market is in excess supply condition. **Chinese government issued many policies supporting steel exporters** such as VAT refund (9% - 13%), and interest rate discount (~5% pa), (3) **customers can change their steel suppliers at a low expense.**

Meanwhile, irregular events such as safeguard tariff may not take place again in the next year, which means we cannot know if the steel producers may keep this grow rate to 2017. Therefore, we consider production cost as the main factor influencing the outlook of steel producers. And this factor is mostly based on the price movements of raw material price movement, including iron ore, hard coking coal and scrap.

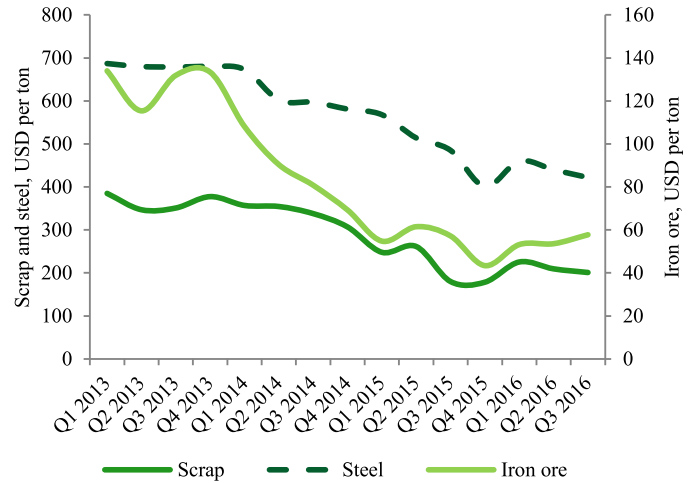
Regarding **the competition on production costs**, we assume that it is the difference between scrap and iron ore, hard coking core that directly affects the steel producers performance. In detail, the steel priced are expected to increase if all 3 commodities prices rise. In contrast, if the scrap price moves on an opposite direction against iron ore and hard coking coal, or all of them decreases, we expect the steel price to decrease, because there is a group of steel producers with low production cost maintaining low price to keep their competitive advantage and expand market share.

Additional production during 2011-2015



Source: VSA

Steel price movement



Source: VCBS compiled

Here are some plans which are used by steel producers in respond to the commodities price movement:

BOF steel producers prefer to hedge using derivative contracts or increase capacity. Due to the blast oxygen furnace characteristic which is not flexible and cash consuming to re-operate, it should be working continuously. In addition, unlike Chinese steel producers who can actively utilize their domestic raw material, Vietnamese steel producers have to import iron ore and hard coking coal from abroad (Australia, Brazil and Russia). Therefore, BOF steel producers have to reserve inventories for at least 3 months of production, being vulnerable to fluctuation in the raw material price as a result. To cope with this risk, BOF steel producers come up with some solutions as (1) hedging against the commodities price movement by using derivative contracts, (2) raise capacity to enhance the economies of scale, reducing the portion of fixed amount in production cost.

Stock code	Technology	Main products
BOF steel producer		
HPG	BOF technology, 3 furnaces with maximum size up to 700 m3 Billet capacity up to 1.7 mn ton per year	Construction steel, Steel pipe
TIS	BOF technology, furnace size is 308 m3 Billet capacity up to 400.000 ton per year	Construction steel
EAF steel producer		
VIS	EAF technology	Construction steel

DNY EAF technology
Continuous casting

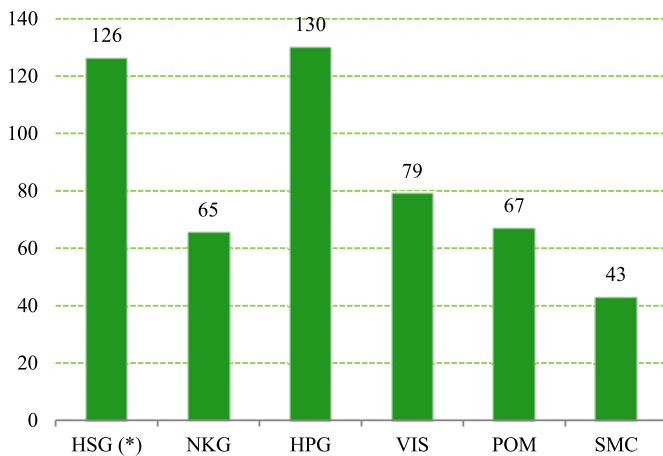
Construction steel

Companies import billet

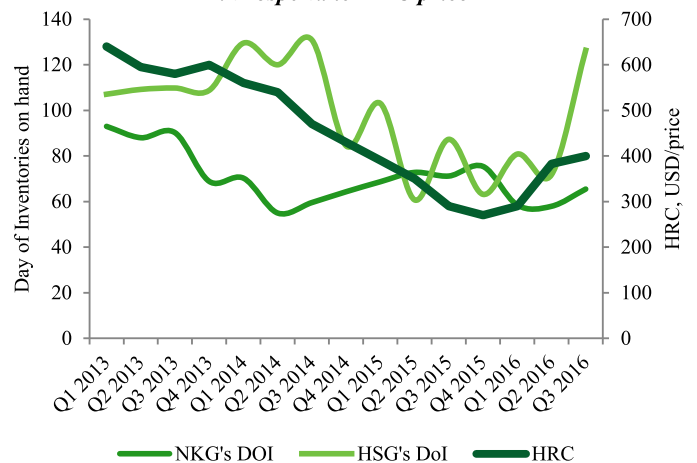
VGS Germany rolling technology
Steel pipe, galvanized sheet and construction steel

POM Pig iron: Consteel technology
Billet: EAF technology
POM is capable of making billet, but it has changed to import from abroad

Statistic of day of inventories on hand of steel producers



The change in Day of inventories (DOI) on hand in respond to HRC price



Source: VCBS compiled

(*) Recently, HSG has imported a huge amount of HRC at a low price, therefore sharply raising the value of inventories by the end of the 3Q2016. That's why the day of inventories on hand (TTM) increased from 80 days to 126 days in our calculation.

EAF steel producers can flexibly change their source of billet. The change in the billet production cost may lead to the change in production policy of EAF steel producers. In detail, thanks to the flexibility of the Electric arc furnace, when the imported billet price goes down, EAF steel producers may shut down the furnace and shift to the outside source of billet. On the contrary, when the billet price increases, they could produce billet from scrap on their own

Galvanized sheet producers can react flexibly. Profit margin of galvanized sheet producers is sensitive to HRC prices and days of inventories on hand. In detail, those producers with longer inventories reserve period should have a profit margin moving closer to HRC price (e.g HSG has always been maintaining its day of inventories on hand higher than NKG, thus correlation between HSG's margin is higher than that of NKG, the correlation coefficients were -67% and -53% for HSG and NKG respectively). Therefore, galvanized sheet producers should have a more flexible inventories management policy than construction steel producers. If HRC price dropped, this group producers tend

to reserve less raw material and vice versa. Therefore, we believe *competitive advantage of galvanized sheet producers lies in sale network and capacity.*

According to the analysis above, we predict how steel producers will react in accordance with the movement of raw material price.

		Iron ore							
		Down		Up					
		Slightly	Plunge	Slightly	Soar				
Scrap steel	Down	Slightly	Steel price slightly falls EAF firms produce billet Impact on BOF firms is not much.	Plunge	Steel price plunges EAF firms import billet BOF firms suffer from margin narrowing. However, they still have advantage over EAF firm	Slightly	Steel price slightly increases EAF firms produce billet and have advantage over BOF firms Profit margin of BOF firms is stable	Soar	Steel price soars EAF firms produce billet and have advantage over BOF firms BOF firms benefits from margin expansion
		Plunge	Steel price plunges EAF firms produce billet and have advantage over BOF firms	Plunge	Steel price plunges EAF firms produce billet BOF firms suffer from margin narrowing				
	Up	Slightly	Steel price slightly falls EAF firms import billet and suffer from margin narrowing. BOF firms benefit from low-cost production and margin expansion	Plunge	Steel price plunges EAF firms import billet BOF firms suffers from margin narrowing. However, this group can maintain advantage of production cost over the EAF firms	Slightly	Steel price slightly increases EAF firms import billet BOF firms maintain profit margin. However, they have advantage of production cost over EAF firms	Soar	Steel price soars EAF firms import billet BOF firms benefit from margin expansion.
		Soar		Soar					

STEEL INDUSTRY OUTLOOK 2017

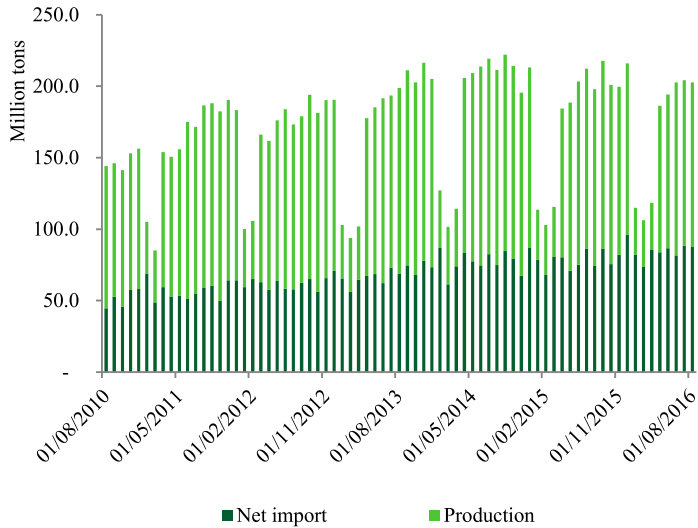
Iron ore and hard coking coal is expected to decrease while scrap price rises

1. Commodity price outlook

Iron ore prices are expected to decrease. As mentioned in our recent iron ore report, we keep our point of view that iron ore price should fall in 2017 due to the following reasons:

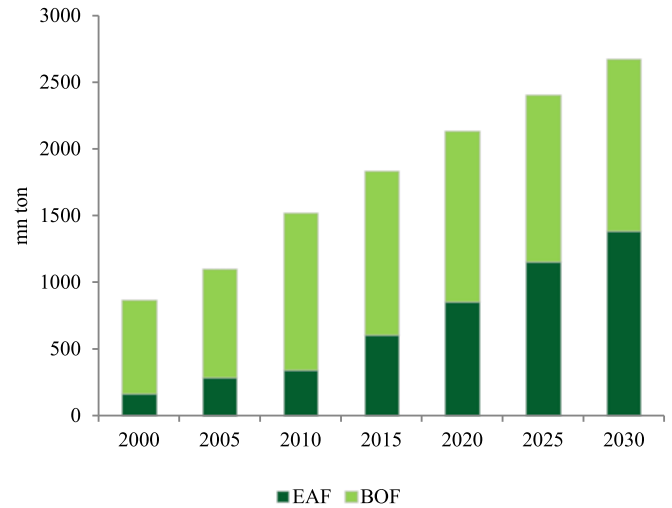
- (1) Iron ore consumption in China is expected to drop because the Chinese steel industry is in excess supply condition, and it is shifting from BOF technology to EAF technology (the EAF steel portion is expected to increase from 5% to 30% until 2020), which is more environment-friendly.

Source of iron ore for Chinese steel producers



Source: Chinese Customs

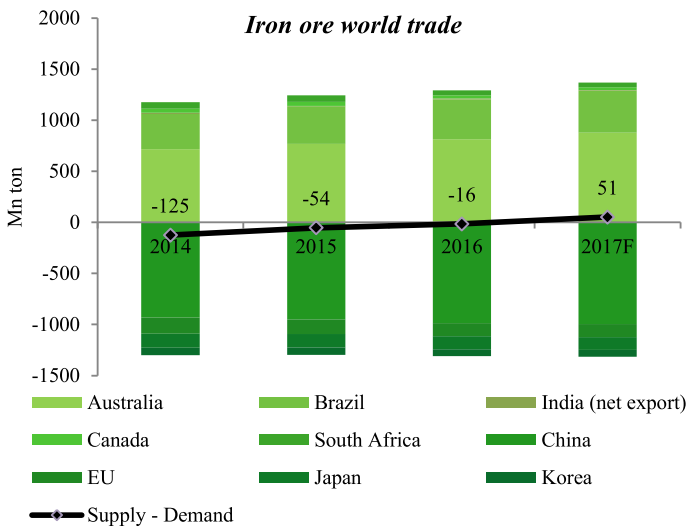
Classification of steel production



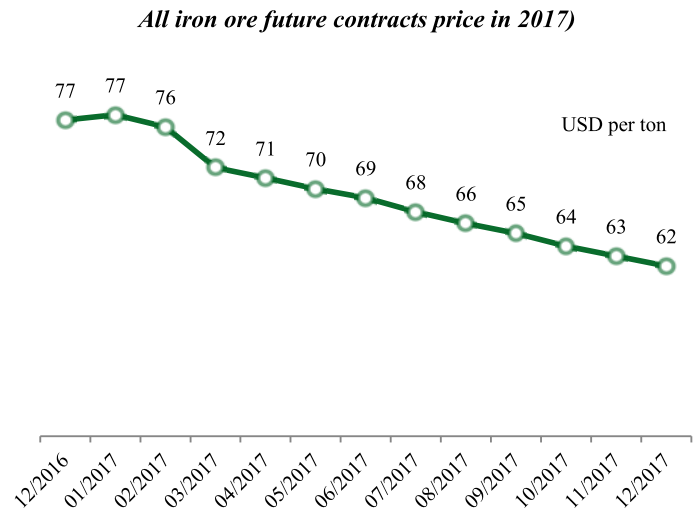
Source: Metal Bulletin, DRI & Mini-Mills Conference
(2013, LA, USA)

- (2) **Top iron ore producers in Australia and Brazil are increasing mining capacity in order to gain more market share.** Due to their low mining cost, we believe that these 2 countries are not likely to cut production to raise iron ore price. In detail, *Australian export volume is forecast to increase by 3% per year* in the next 5 years, as Rio Tinto expands its capacity and the start of Roy Hill project (55 mmt per year) and Hancock Prospecting project is started. Meanwhile, we expect the export volume in Brazil to rise by 5%, resulted from the expansion of S11D mine (90 mmt per year, low-cost) in Carajas complex by Vale. In addition, the Samarco project (BHP Billiton – Vale) might start again in 2017.
- (3) **Chinese iron ore inventories volume is close to the 5 years high.** Meanwhile, China is planning to cut its steel production capacity. We believe this information provides a signal of another downtrend in iron ore demand in 2017.

Based on forecast in supply and demand in the global market, we expect the iron ore price (62% Fe) to fall back to USD65 per ton in 2017. Currently, iron ore is being traded at the price of USD 74 per ton.



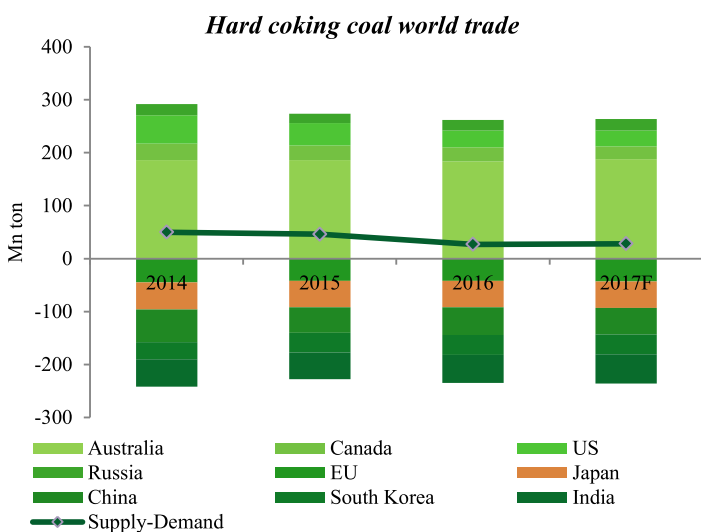
Source: The Ministry of Industry, Innovation and Science (Australia, Q3.2016)



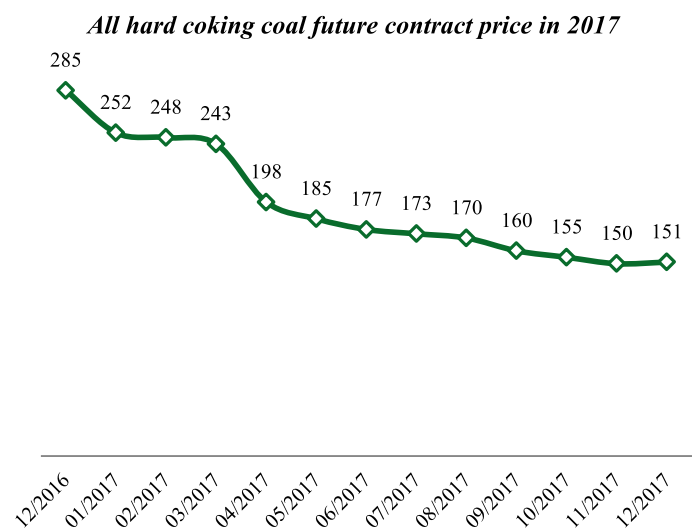
Source: CME group

Hard coking coal prices plunge. As in our recent **Coal report**, the hard coking coal prices should fall back to USD 175 per ton thanks to (1) Australian exporters increasing their capacity again after recovering from the mining accident and unfavorable weather conditions, (2) the fall in demand from China (along with the decreasing demand for iron ore).

Meanwhile, **thermal coal price should remain high** due to the plunge in production capacity in Indonesia (the top thermal coal exporter) because of weather-related disaster and increasing financial expense. Also, the biggest thermal coal producer in the US, the Peabody Energy went bankruptcy in April 2016. On the other hand, we expect there is no dramatic change in demand from China and India, narrowing the excess supply from 223 mn ton (2016F) to 192 mn ton in 2017.



Source: The Ministry of Industry, Innovation and Science



Source: CME group

(Australia, Q3.2016)

Scrap steel prices are expected to move in the opposite direction against iron ore prices and hard coking coal prices. Because scrap is after-used steel which was made from iron ore and hard coking coal a period ago. Therefore, the scrap price movement usually lags behind other 2 material prices. We believe that the soar in iron ore and hard coking coal price in this year may have positive impact on scrap price in the next year. On the other hand, as analysed above, demand for scrap should increase if China shifts its steel production technology from BOF to EAF. We expect the average scrap price next year to reach USD 280 per ton.

Higher production cost may raise the steel price to VND 10.8 mn per ton

2. Steel price forecast 2017

Based on our forecast for raw material price, we start a brief production cost calculation to figure out the expected steel producers' break-even point and steel price in 2017.

Production components	Assumption	Note
Iron ore (62% Fe, CFR)	USD 65 per ton	Estimated as the average price of iron ore future contract exercised in 2017
Hard coking coal (Australian, CFR)	USD 175 per ton	Estimated as the average price of hard coking coal future contract exercised in 2017
Hard coking coal (China, CFR)	USD 180 per ton	Hard coking coal in China is more expensive than in Australia due to higher production cost
Scrap steel	USD 280 per ton	Estimated as the average price of scrap steel future contract exercised in 2017
Steel transportation cost	USD 20 per ton	
Fixed cost per ton	EAF depreciation: USD 25	Estimated based on an USD500 mn EAF with 2 mn tpa capacity depreciating in 10 years
	China BOF depreciation: USD 20 Vietnam BOF depreciation: USD 30.7	Estimated based on an USD 2bn BOF with 5 mn tpa capacity depreciating in 20 years
	Vietnamese labor cost: USD 10 China labor cost: USD 12	VCBS compiled
	SG&A expense: USD 50	
Interest expense per ton	Debt/COGS ratio	Estimated based on cash flow from

China: 66% - rate 5%/năm
 BOF Vietnam: 93% - rate 11%/năm
 EAF Vietnam: 100% - rate 11%/năm

borrowing ratio / COGS * national borrowing rate.

China VAT refund	13%	Chinese steel exporters enjoy 9% - 13% VAT refund
Total tariff	Billet 31.3% Steel bar 33.3%	As stated in the Decision, the safeguard tariff will decrease by 1% - 2% in 2017.

Calculation table: Compare billet production cost in China and Vietnam

Production cost	Import billet		Billet made of scrap		
Source of billet	China		Vietnam		
	(BOF technology)		(EAF technology)		
	Material	Consumption Price	Material	Consumption	Price
Iron ore	1.7 ton	USD 65 per ton	Scrap	1.15 ton	USD 280 per ton
Coke (*)	0.4 ton	USD 205 per ton	Electricity	450 kWh	USD 0.07/kWh
Scrap	0.13 ton	USD 280 per ton	Others	1	USD 50 per ton
Gas	10 mmBTU	USD2.6/mmBTU			
Fixed cost	37 USD		Fixed cost	35 USD	
Material cost	USD 293.1 per ton		USD 438.5 per ton		
+ SG&A expenses	USD 302.8 per ton				
<i>Export to Vietnam</i>					
-13% VAT	USD 263.4 per ton				
+ transportation	USD 283.4 per ton				
+31.3% tariff	USD372.9 per ton		USD 438.5 per ton		
EAF Producers' decision	Import billet		Stop the EAF		

(*) 1 ton of coke is made of 0.6 ton of hard coking coal and 0.6 ton of thermal coal. We add USD40 of fixed cost to the production process.

According to the calculation table, if the scrap price remains at USD 280 per ton, **EAF steel producers should import more billet from China**. And, this trend may be reversed when the scrap price falls below USD 222 per ton.

Calculation table: Billet production cost by BOF technology in Vietnam

Components	BOF Vietnam	
Billet production	Consumption	Price
Iron ore	1.7 ton	USD65 per ton
Coke	0.42 ton	USD 205 per ton
Scrap	0.18 ton	USD 280 per ton
Electricity	550 kWh	USD 0.07 per ton
Fixed cost	1	USD 40.7 per ton
Total billet cost	USD 323.1 per ton	

We continue to estimate the steel production cost from billet. Some additional assumptions are:

- BOF and EAF producers have the same casting and rolling technology. The casting and rolling process consumes billet and electricity and an amount of fixed cost.
- Chinese steel exporters offer the price as low as possible, which is break-even point. The safeguard tariff in Vietnam is 33.9%
- EAF steel producers import billet from China at USD 372.9 per ton

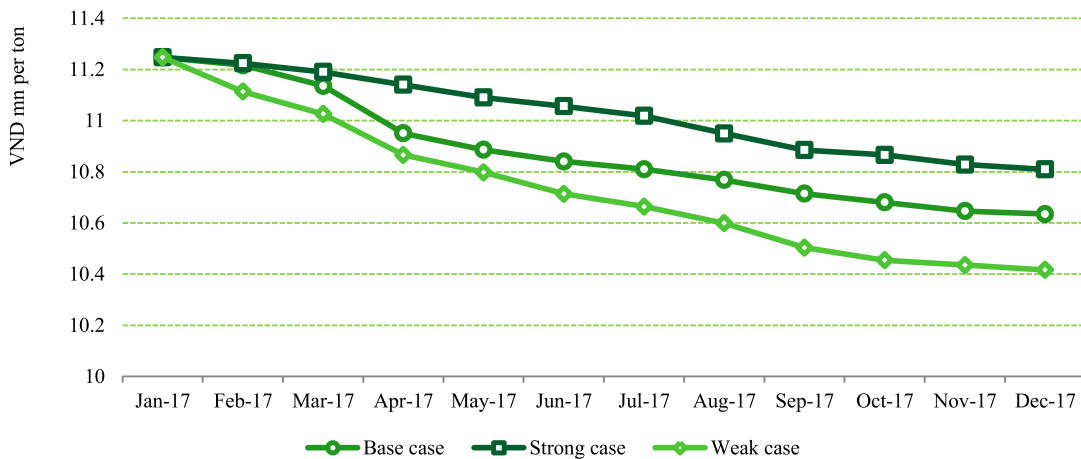
Calculation table: Steel production cost

Material	Consumption	EAF Vietnam	BOF Vietnam	BOF China
Billet	1.03 ton	USD 372.9/ton*1.03 ton	USD 323.1/ton*1.03 ton	USD 293.1/ton*1.03 ton
Electricity	100 Kwh	USD0.07/kWh*100kWh	USD0.07/kWh*100kWh	USD0.07/kWh*100kWh
SG&A expense	1	USD50	USD45	USD50
Interest expense		USD29.6	USD21.1	USD 7.1
Total production cost		USD 466.0	USD 409.0	USD 366.0
<i>Other cost (applied for China steel)</i>				
VAT refund -13%				USD 318.4
Transportation	USD 20 per ton			USD 338.4
Tariff	33.9%			USD 444.7
Break-even point	22.700 VND/USD	VND 10,579,156 per ton	VND 9,258,174 per ton	VND 10,095,062 per ton

(* In the calculation model, we exclude the case when the steel producers hedge their inventories using future contracts. Also we ignore the low-cost material in the warehouse.

According to our calculation, in order for EAF steel producers to keep profit margin at 1.5% - 2% as in 9M2016, **the average steel price should be at least VND 10.8 mn per ton**. Also, it is quite obvious that, **the increase in steel price is attributed to** (1) higher production cost resulted from increasing raw material prices, (2) the appreciation of USD.

Forecasting of steel price movement in 2017



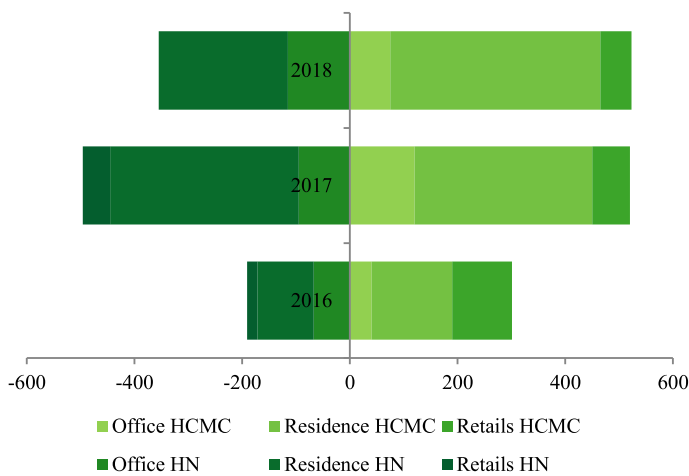
Sales volume is expected grow thanks to the demand from civil construction and public investment.

3. Industry outlook

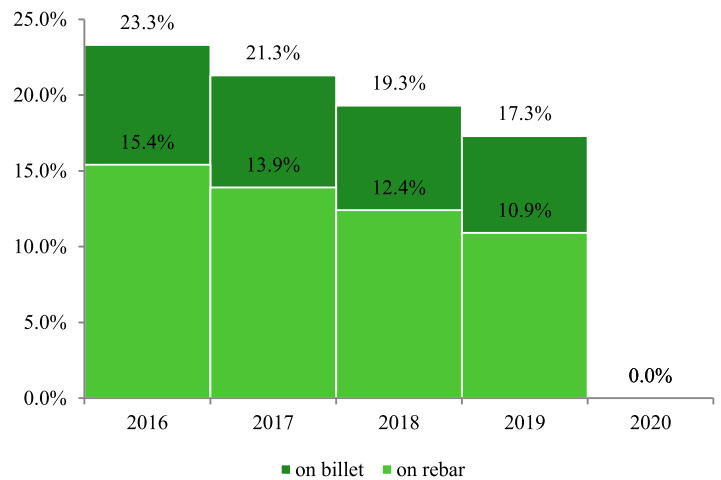
a) Construction steel

Construction demand remains high in 2017. According to Real estate report from JLL, a number of construction project in Hanoi and Ho Chi Minh city sharply increases in 2017. In detail, civil construction is growing resulted from higher demand for house in both 2 big cities. Under the current protective condition (from 2016 to 2020), we believe domestic steel producers will have room to grow.

Supply of Construction project in 2017



Additional safeguard tariff on steel



Source: JLL research, VCBS compiled

Source: Ministry of Industry and Commerce

(*) Project in Hanoi is denoted as negative

In addition, **public investment is expected to sharply bounced** after the government has settled down. According to WSA's forecast, demand for steel in the ASEAN5 group (including Thailand, Malaysia, Vietnam, Indonesia and Phillipines) will grow by 6% in 2017, despite being directly impacted by the deceleration in China. According to estimation of the Ministry of Industry and Commerce of Vietnam based on the national public investment plan, **Vietnam is in short of 15 mn ton of crude steel per year until 2020**, equivalent to the cumulative annual grow rate of 15% - 20% pa.

The impact of steel price increase is different among steel producer groups. According to our calculation, despite the expected decrease in material price, the steel price should increase due to:

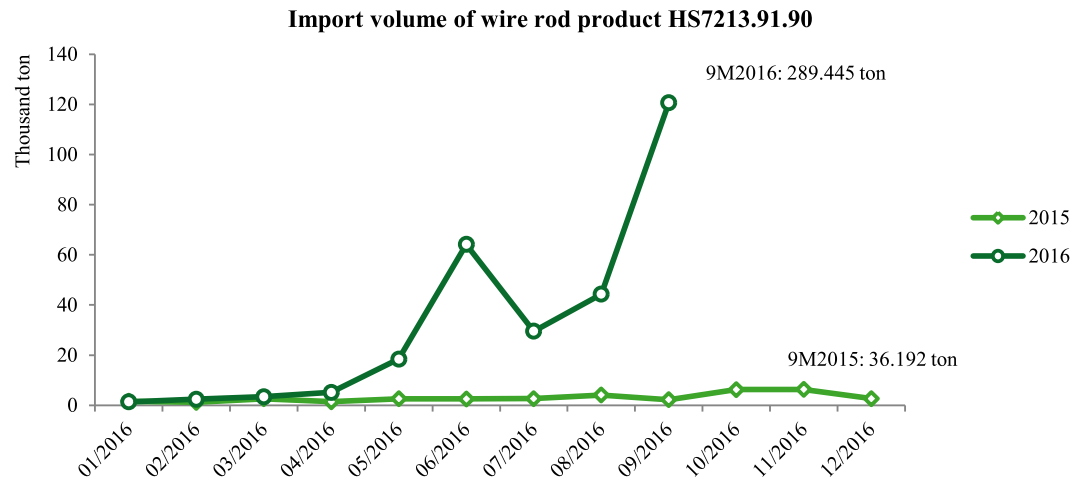
- (1) **Higher production cost.** The expected price of iron ore, hard coking coal are USD 65 per ton and USD 175 per ton , respectively, higher than the current average cost of domestic producers' inventories.
- (2) **Low-cost inventories make it difficult for steel price to rise.** We believe that the impact of increase in raw material price should be clearer next year. Therefore, despite the decrease in price of iron ore and hard coking coal, steel price should increase in 2017. According to our estimation, the production cost of steel producers will go up by 20% - 25%, the break-even point should be VND 9.2 mn per ton for BOF producers and VND 10.5 mn per ton for EAF producers. In conclusion, we believe the total steel price can rise up to VND 10.7 mn – 11.1 mn per ton next year.

Regarding the impact of the increase in steel prices on steel producers' performance, this increase may affect domestic steel producers in 2 ways, including sale volume and profit margin. Regarding **sales volume**, higher price should result in higher demand for stockpiling purpose of steel agents. Currently, the domestic steel prices are moving in a narrow range from VND 9 mn – 9.5 mn per ton due to low-cost inventories. However, when this amount of inventories is exhausted in the next year, the price is expected to increase, encouraging agents to reserve more steel in the Q4.2016 and Q1.2017.

Concerning **profit margin**, the EAF producers would be in more difficulty than BOF producers. In detail, as in reaction analysis matrix, the EAF producers would import more billet and bear the 31.3% safeguard tariff. Meanwhile, BOF producers enjoy the source of lower-cost billet than EAF producers. In conclusion, (1) sale volume soars in the beginning 2017 and then gradually decreases, (2) steel price increase as a result of higher production cost, (3) industry's gross margin falls by 2H2017, EAF take no profit, meanwhile BOF' profit margin moves around -10%.

VSA suggests Ministry of Industry and Commerce should impose safeguard tariff on imported HS -7213.91.90 wire rod. In accordance with steel bar, wire rod is also a main steel product line in Vietnam. However, the Decision 2968 cannot cover all the wire rod product, making a room for importer to cheat by coding their product as HS 7213.91.90 to avoid tariff. Currently, this kind of product is enjoy 3% tariff rate, which is much lower than 15% on HS 7227.90.00 product and 30% - 35% on HS 7213.10.00. Therefore, in 9M2016, the imported volume of this product rocketed .

The action of imposing additional tariff will spread a positive sentiment to steel market as higher protectionism is more favorable to domestic producers. In the **most positive scenario in which new safeguard tariff is officially imposed**, we think that the impact should not as significant as Decision 2968 because the portion of this wire rod in producers' sale volume is not big. However, **the tariff should bring better market sentiment, and support the increase in steel price.**



Source: VSA

Formosa complex is expected to operate in December 2016. The 1st phase of this complex starts its engine by the end of this year. The main product of this phase is semi-finished steel, including HRC and slab. Formosa has a 4,350m³ furnace, which far exceeds the biggest furnace of HPG, with 3 mn tpa capacity. Therefore, Formosa is expected to have the lowest production cost among domestic producers.

Product	Capacity	Material for	Relationship with domestic producers
Slab	5.3 mn ton	HRC	Supply for galvanized sheet producers
Billet	1.254 mn ton	Steel bar	Supply for EAF producers, competing against BOF producers
Bloom	0.97 mn ton	Shape steel	Supply for shape steel producers, and steel retailers

Source: VCBS complies

The main semi-product of Formosa 1st phase is slab, which is the main material of HRC. Formosa also produces billet which is competing against BOF producers such as HPG. In conclusion, we believe that Formosa is not a direct threat to domestic producers because it does not produce any finished steel. However, **if Formosa offers its low-cost billet to the domestic market, the EAF producers will have a new source of billet other than the taxed import one**, narrowing the gap in production cost among the steel producers.

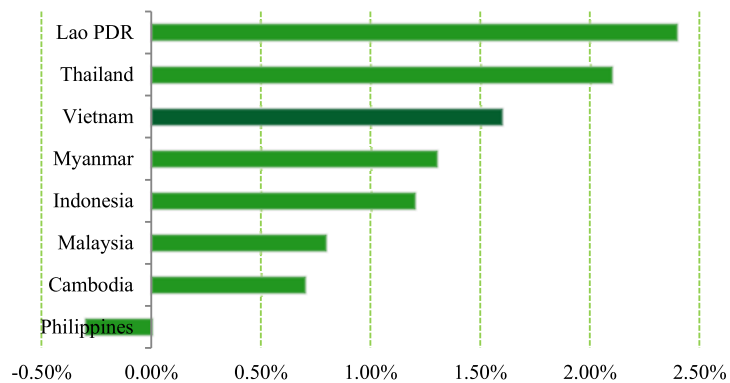
b) Galvanized sheet and Steel pipe

Steel pipe sector is potential, but its size is quite small. Steel pipe is considered the commentary good of construction steel thanks to its use in construction scaffold and ground work. Therefore, we think that steel pipe should increase as the construction steel demand expands. In addition, we believe steel pipe may grow at a higher rate than construction steel due to increasing demand from furniture industry. A number of construction project which were started in 2014-2015 will be completed in 2016-2017. The steel pipe can be used for interior decoration, to complete the utility system of the projects such as water

line and air ventilation system. Meanwhile, the total industry capacity of steel pipe is quite low, estimated to be 2 mn ton per year. The level of competition in this sector is not as high as in construction steel.

Galvanized sheet sector has room to keep on growing. As we have analysed in construction steel, the number of civil construction in Ho Chi Minh city should increase in the next year. The demand for houses expands as the urbanization growth rate increase. According to the National Housing Development Strategy, the housing area per capita in Vietnam should increase from 22m²/person (2015) to 29m²/person (+6% CAGR). Therefore, we believe the demand for galvanized sheet may gradually rise in the next few years.

Urbanization growth rate in ASEAN



Source: World Bank 2016

Moreover, the **anti-dumping tax imposed on galvanized sheet** (GI and GL product) from September 1st 2016 by Ministry of Industry and Commerce should build a barrier against Chinese original product and bring an opportunity to domestic producers to increase sale volume and market share. The applied anti-dumping tax varies from 4.02% to 38.34%.

The US market is not stable. The protectionism risk is significant, which makes the competition worse. Currently, the US government is investigating on the accusation of Chinese exporters' tax evasion. In detail, US government suspect Chinese producers avoid paying tax by exporting their HRC to Vietnam and quickly processing those HRC to galvanized sheets to hide the product origin and enjoy the lower tax rate as the Vietnamese producers are bearing. This suspicion make it more difficult for those Vietnamese producers having Chinese original HRC as their raw material. In addition, Thailand has officially imposed anti-dumping tax against GL products from Vietnam.

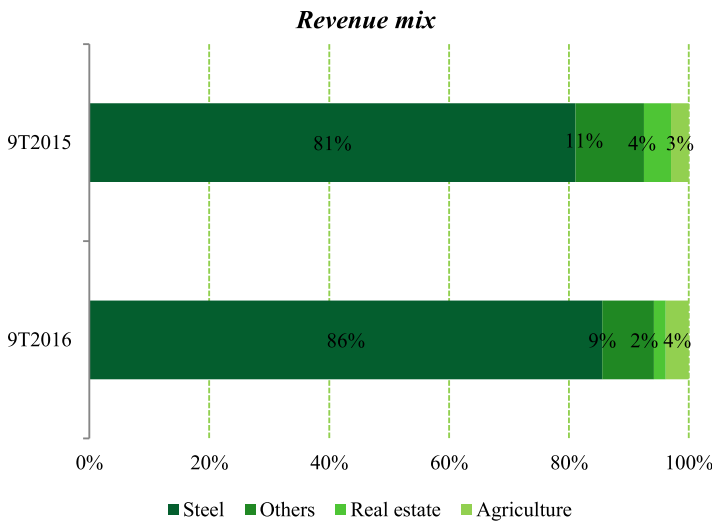
In the worst case when the US decides to impose tariff against Vietnamese products, we think that the direct impact is not too significant on the 2 listed galvanized sheet producers (including HSG and NKG) because their main export market is Indonesia and Malaysia. Their export volume to US and Thailand market is quite small, about tens of thousands ton. However, the indirect impacts are (1) the galvanized sheet producers lose 2 new potential markets, and the competition degree in traditional export market rises, (2) those FDI producers such as POSCO VN and CSVC may go back to compete in the domestic market. Therefore, we come up with a conclusion that galvanized sheet producers are likely to enhance their sale network to expand domestic market share, and their export volume is expected to grow at a slower rate than in 2016.

RECOMMENDATION

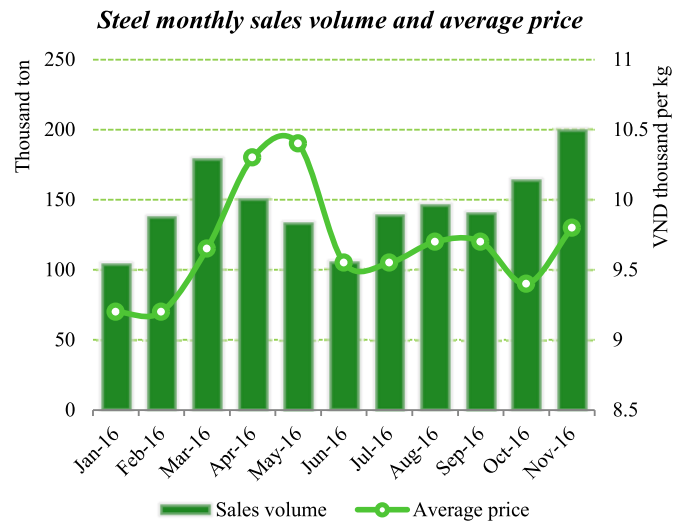
1. HOA PHAT GROUP (HOSE: HPG)

9M2016 Performance

In 9M2016, HPG generated VND 23,333 bn of net revenue (+15% yoy, 83% target), and VND 4,656 bn of NPAT (+58% yoy, 145.5% target). In detail, steel production sector is the core business, playing the key role in the performance of the group. In 9M2016, this sector generated VND 19,965 bn (+21.1% yoy). The net revenue from real estate sector fell by 50% as of 9M2015, reaching VND 453 bn (-50.6% yoy) because the revenue from Mardarin Garden project was exhausted. The agriculture sector grew at the highest rate, up to 49% yoy. However, this sector accounted for quite a small portion in the revenue mix of the group. The revenue of this sector reached VND 902.5 bn after the operation of Hung Yen Factory by the end of the Q1. 2016. Other sectors' revenue decreased by 13.5% yoy, reaching VND 2,011 bn.



Source: HPG



Source: VSA

The motivation in steel sector lies in 1H2016. In the first half of 2016, there were some favourable events occurring, including:

- Phase 3 of the Hai Duong complex started its operation in the beginning of 2Q2016.** This phase has the 700m3 furnace which is more efficient than the first 2 furnaces. The operation of the 3rd furnaces increased the production volume and sales of the steel sectors. The additional production from this furnace is estimated as 375.000 ton in the first 6 months of operations.
- Decision 2968 from Ministry of Industry and Commerce, which added additional safeguard tariff,** resulted in strong stockpiling activities of the steel agents, encouraging sale volume and increase steel price.
- HPG reserved a huge amount of low-cost raw material in its inventories by hedging with future contracts.** In 6M2016, as the iron ore price bounced, and the safeguard tariff was passed, HPG benefited from these factors and saw its profit margin expand to 32% in Q2.2016.

Sale volume in 11M2016 reached 1.6 mn ton (+21.8% yoy). **The average price** reached VND 9.7 mn per ton, which is 7.5% lower than the average price in 11M2015 (VND 10.5 mn per ton).

Low-cost inventories. HPG signed many long-term contract at a low price, and hedged with future contracts to keep the inventories cost at a low level.

2016 Forecast

In 2016, we strongly believe HPG can overcome their target sales volume of 1.7 mn ton. However, it is likely that the Q4.2016 margin should narrow due to the soar in hard coking coal price. For 2016, we expect HPG may generate VND 29.153 bn of net revenue (+6% yoy, 104% target), and VND 5,428.5 bn of NPAT (+55% yoy, 172.6% target), and EPS 2016 is estimated at VND 6,408.

2017 Prospect

Potential of the steel sectors. The phase 3rd of the Hai Duong complex will operate at its full capacity in the whole 2017, increasing the output up to 2mn ton of crude steel. In addition, by the middle of 2017, HPG will complete its capacity enhancement in Da Nang and Binh Duong – Long An, increasing its steel pipe production up to 900.000 tpa. We expect HPG's sale volume in 2017 of construction steel and steel pipe to reach 1.9 mn ton and 550.000 ton, respectively

Gross margin narrows. The increase in steel price is mainly attributed to (1) higher production cost, (2) the appreciation of USD against VND. Meanwhile, the low-cost inventories should be exhausted in 2017, which mean HPG cannot enjoy the margin expansion from the low-cost material and increasing steel price.

The new welding rod product is not expected to breakthrough. The new product of welding rod has been produced in Q3.2016. We think that this product should face some beginning difficulties such as:

- (1) The welding rod market is ruled by the cheap imported products. In addition, the Ministry of Industry of Commerce is currently imposing no tariff on the raw material of welding rod in 2017.
- (2) Demand for welding rod is not high. According to Viwelco's estimation, if the market consumes 10 mn ton of construction steel, it should consume 0.1 mn ton of welding rod only. Therefore, we think that welding rod contribution to HPG's sales is not too significant.

Animal feed factories begin to operate stably and effectively. In 2017, the Dong Nai factory and Phu Tho factory should start their engines as planned, and the Hung Yen factory should have been operating for 1 year. Currently, this sector is reaching its break-even point and generating a small amount of profit. However, HPG has to make more investment in their pig farms, and these 2 new factories need more time to operate at full capacity. Therefore, we keep our point of view that agriculture sector should not perform any better in the next 2-3 years.

Breakthrough in 2018. We consider 2017 a slow year of HPG because all new projects, which are under construction, are expected to run at full capacity in 2018, including (1) steel pipe capacity enhancement, (2) galvanized sheet production line, (3) Mandarin Garden 2 real estate project

- (1) **Steel pipe capacity enhancement.** By the middle of 2017, the expansion of Da Nang and Binh Duong- Long An factories should be finished as planned, improving the steel pipe production per year up to 900.000 tpa (+80%). Under the circumstance that sale volume accounts for 90% of production, the increase in capacity would create more room for revenue

of this product to grow. We expect the HPG's steel pipe sales volume to reach 550.000 ton in 2017, and 800.000 ton in 2018.

- (2) **Galvanized sheet factories project.** This factories with capacity of 400.000 tpa is expected to run in the beginning of 2018. We are quite doubtful about this project's potential because (a) HPG has had no experience in operating the galvanized sheet production line before, (b) the northern area of Vietnam is not in favour of galvanized sheet products. Therefore, we expect sale volume of galvanized sheet should reach 350.000 ton (~85% full capacity).
- (3) **Realize revenue from real estate project.** As planned by HPG, revenue from the Mandarin Garden 2 project should be realized in 2018. With the price of VND 25 mn per m2, HPG should generate VND 1,800 bn of revenue from the real estate project in 2018.

The USD 3 bn steel production project in Dung Quat industrial park. Recently, HPG has announced that they will not expand the Hai Duong Complex. Instead, they is going to acquire the Quang Ngai – Guang Lian project in Dung Quat industrial park. This project is expected to have 4mn tpa capacity. The 1st phase will start in 2017-2019, producing steel bar with 2 mn tpa capacity. And HPG plans to produce hot rolled coil and sheet in the 2nd phase of the project. In addition, HPG is suggesting the project should enjoy tax rate of 10% per year and rent exemptions in 18 years.

Forecasting in 2017, we come up with some assumptions including (1) steel sale volume reach 1.9 mn ton, (2) steel price reaches VND 10.9 per ton and gross margin reaches 24%, (3) other sectors grow by 10%. In conclusion, HPG should generate VND 37,365 bn of net revenue and VND 5,895 bn of NPAT. EPS forward is estimated as VND 6,958

We recommend **BUY** HPG stock with the target price of VND 53.707 per share.

2. HOA SEN GROUP (HOSE: HSG)

Fiscal year 2015-2016 Performance

In fiscal year 2015-2016, HSG generated VND 17,893 bn of net revenue (+2.4% yoy, 125.3% target) and VND 1,501 bn of NPAT (+129.9% yoy, 227.4% target). The gross margin sharply expanded from 14.9% up to 23.3%. The soar in gross margin was attributed to the flexible inventories management policies, by which HSG had increased the HRC imported volume since the beginning of 2015 at a low price.

SG&A expense sharply increased. The selling expense rose by 27.6% yoy while the general administration expense rocketed by 79.3% yoy. Therefore, the SG&A expense/net revenue soared from 7.9% to 11.3%. We believe this increase in these expenses was resulted from (1) slightly increase in net revenue due to the plunge in galvanized sheet price preventing the net revenue from growing, despite the soar in sale volume, (2) HSG continuously opening new agents, increasing the number of agents to 212 in 3Q2016.

Financial expense slightly decrease thanks to (1) the decline in interest expense, (2) less exchange rate loss.

2017 Prospect

Expansion in sale network. As we analyzed above, main competitive factors in galvanized sheet market are inventories management policies and sale network. HSG has the largest network with 212 agents (9M2016). In the next year, HSG plans to increase its number of agents up to 300 and expand to the Central and the Northern market. We believe that HSG consider export market less attractive than the domestic market. Therefore, they expand the domestic agents network to gain more market share in the Central and the Northern area.

Capacity enhancement in Ha Nam and Binh Dinh factories. In 2017, the new factory in Ha Nam which produces steel pipe and plastic tube and the factory in Nhon Hoi (Binh Dinh) which produces galvanized sheet will go into operation.

Product	Capacity	Factories
Galvanized sheet	270.000 tpa	Nhon Hoi
Steel pipe	250.000 tpa	Ha Nam
Plastic tube	39.000 tpa	Ha Nam

Source: HSG

Ha Nam factory's capacity up to 600.000 tpa of steel pipe, ranking 2nd in the market (following HPG with expected capacity of 900.000 tpa). On the other hand, its plastic tube capacity should reach 54.000 tpa, equivalent to 60% of BMP's max capacity. By locating these 2 factories in the Central and the Northern area, HSG may implement their strategies to expand market to these regions.

Large inventories reserve. By the end of 3Q2016 (4Q of fiscal year 2015-2016), HSG reported a huge amount of inventories, up to VND 4,500 bn. In detail, the raw material and on-the-way goods reached VND 2,714 bn. We believe that HSG has reserved a huge amount of low-cost HRC, up to 320.000 ton according to our estimation, equivalent to one quarter production. As the HRC price has increased by 22.6% recently, the first quarter of 2016-2017 fiscal year should realize a dramatic profit.

New growth catalyst from Ca Na complex. The first phase of this project is planned to start in 2017-2018. The project capacity is up to 1.5 mn tpa, using BOF technology. The total capital expenditure for this phase is USD 500 mn (VND 11,150 bn). We believe *the impact of this project is expected to be not significant in 1-2 years ahead*. However, the project may increase the financial leverage of the group. We currently exclude the project in our HSG valuation.

Forecasting in 2017, we believe the plan VND 21,495 bn of net revenue (+22% yoy) and VND 1,400 bn of NPAT (+4% yoy) is conservative because (1) HSG will expand their consumption market to the Central and the Northern area with 2 new factories. Additional 250.000 tpa of steel pipe, 39.000 tpa of plastic tube, and 270.000 tpa of galvanized sheet should result in VND 4,000 bn – 5,000 bn of net revenue in 2017 (assuming the new factories run at 80% max capacity), (2) the gross margin is expected to expand thanks to the low-cost HRC reserve in the first quarter. In conclusion, HSG may generate VND 22,300 bn of net revenue (+25% yoy) and VND 1,700 bn of NPAT (+15.4% yoy). Therefore, we recommend HOLD HSG with the target price of VND 48.000 per share.

-----End-----

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