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The Determinants of Profitability of large Steel Companies



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Introduction

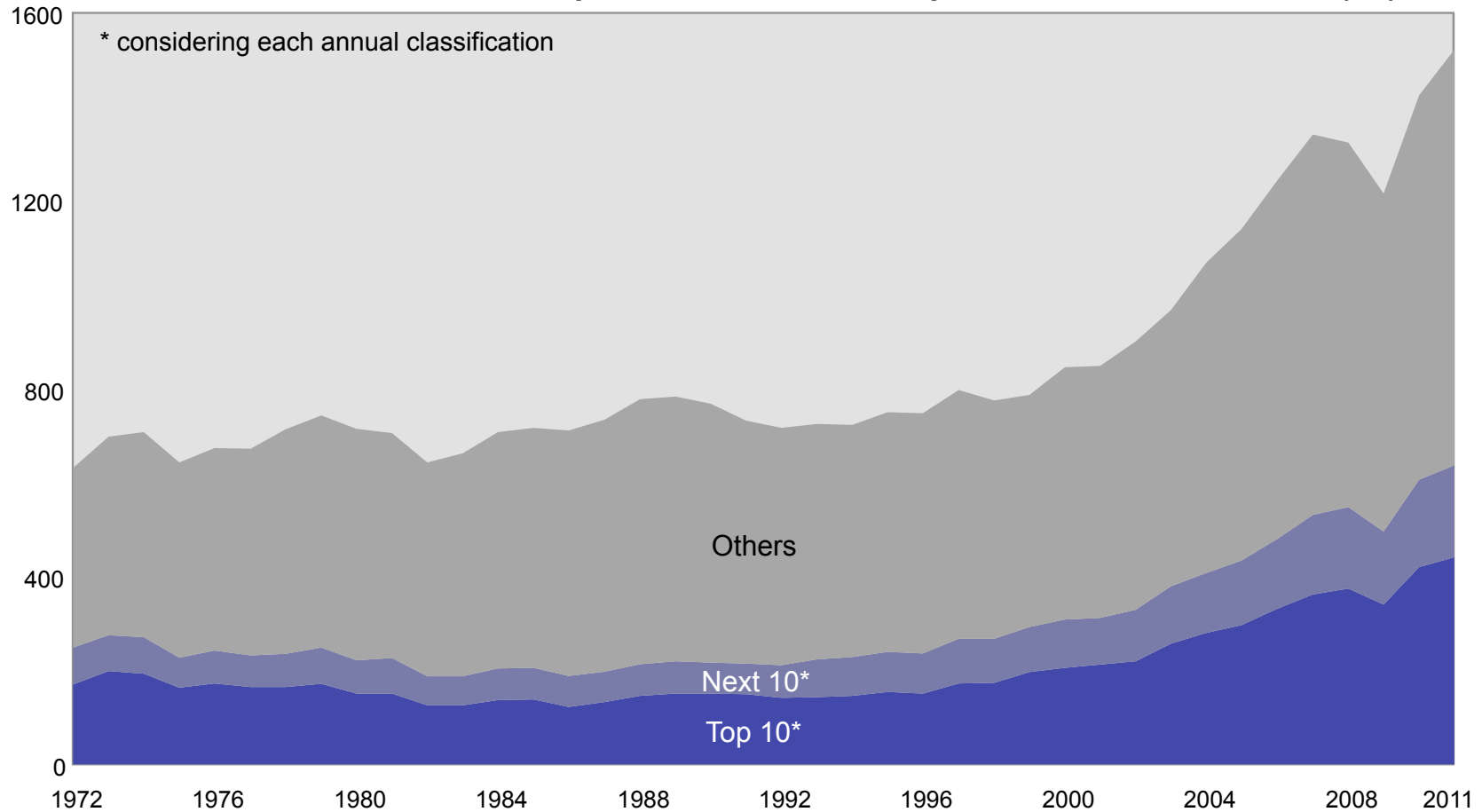
- Laplace Conseil has analyzed a large database of the performance of the main publicly traded steel companies over the period of 2000 – 2012.
- We have also looked at the IISI data base of crude steel production of the largest steel companies. A total of 82 steel companies, representing 85% of the largest steel mills (ranked by crude steel production) is part of the sample. Many other publicly available data sources have also been consulted.
- The purpose of the analysis is to search for the determinants of success (primarily measured by gross profit margin, market cap per sales and market share growth) and test the effectiveness of well known strategies (choosing growing market to compete, M&A, moving to higher value products and integrating upstream into mining).

List of companies in the sample

| | | | | | |
|--|---------------|---|-----------|---|-----------|
| Bluescope Steel Ltd. | AUSTRALIA | Siderar S.A.I.C. | ARGENTINA | Ezz Steel Co. S.A.E. | EGYPT |
| voestalpine AG | AUSTRIA | Companhia Siderurgica Nacional | BRAZIL | Bhushan Steel Ltd. | INDIA |
| Rautaruukki Oyj | FINLAND | Metalurgica Gerdau S.A. | BRAZIL | Jindal Stainless Ltd | INDIA |
| Salzgitter AG | GERMANY | CAP S.A. | CHILE | Jindal Steel & Power Ltd. | INDIA |
| Aichi Steel Corp. | JAPAN | Angang Steel Co. Ltd. | CHINA | JSW ISPAT Steel Ltd. | INDIA |
| Daido Steel Co. Ltd. | JAPAN | Anyang Iron & Steel Inc. | CHINA | JSW Steel Ltd. | INDIA |
| Godo Steel Ltd. | JAPAN | Baoshan Iron & Steel Co. Ltd. | CHINA | Steel Authority of India Ltd. | INDIA |
| JFE Holdings Inc. | JAPAN | Beijing Shougang Co. Ltd. | CHINA | Tata Steel Ltd. | INDIA |
| Kobe Steel Ltd. | JAPAN | Chongqing Iron & Steel Co. Ltd. | CHINA | Krakatau Steel | INDONESIA |
| Kyoei Steel Ltd. | JAPAN | Daye Special Steel Co. Ltd. | CHINA | Lion Corp. Bhd (Megasteel) | MALAYSIA |
| Nakayama Steel Works Ltd. | JAPAN | Gansu Jiu Steel Group Hongxing I&S Cc | CHINA | Inner Mongolia Baotou Steel Union Co. I | MONGOLIA |
| Nippon Steel W/O Sumitomo Metal Corp | JAPAN | HangZhou Iron & Steel Co. Ltd. | CHINA | Societe Nationale de Siderurgie S.A. | MOROCCO |
| Nippon Yakin Kogyo Co. Ltd. | JAPAN | Hebei Iron & Steel Co. Ltd. | CHINA | Empresa Siderurgica del Peru S.A.A. | PERU |
| Sanyo Special Steel Co. Ltd. | JAPAN | Lingyuan Iron & Steel Co. Ltd. | CHINA | Chelyabinsk Metallurgical Enterprise | RUSSIA |
| Tokyo Steel Manufacturing Co. Ltd. | JAPAN | Liuzhou Iron & Steel Co. Ltd. | CHINA | EVRAZ PLC | RUSSIA |
| Yamato Kogyo Co. Ltd. | JAPAN | Maanshan Iron & Steel Co. Ltd. | CHINA | Magnitogorsk Iron & Steel Works | RUSSIA |
| Dongbu Steel Co. Ltd. | KOREA | Nanjing Iron & Steel Co. Ltd. | CHINA | Mechel OAO | RUSSIA |
| Dongkuk Steel Mill Co. Ltd. | KOREA | Sansteel Minguang Co. Ltd. Fujian | CHINA | Novolipetsk Steel OJSC | RUSSIA |
| Hyundai Steel Co. | KOREA | SGIS Songshan Co. Ltd. | CHINA | Severstal JSC | RUSSIA |
| POSCO | KOREA | Shandong Iron & Steel Co Ltd | CHINA | China Steel Corp. | TAIWAN |
| Aperam S.A. formerly part of Arcelor | LUXEMBOURG | Shanxi Taigang Stainless Steel Co. Ltd. | CHINA | Feng Hsin Iron & Steel Co. Ltd. | TAIWAN |
| ArcelorMittal SA | LUXEMBOURG | Wuhan Iron & Steel Co. Ltd. | CHINA | Yieh Phui Enterprise Co. Ltd. | TAIWAN |
| TERNIUM S.A. ADS | LUXEMBOURG | Xining Special Steel Co. Ltd. | CHINA | Sahaviriya Steel Industries PCL | THAILAND |
| Industrias CH S.A.B. de C.V. | MEXICO | Xinjiang Bayi Iron & Steel Co. Ltd. | CHINA | Alchevsk Metallurgical Plant PJSC | UKRAINE |
| Acerinox S.A. | SPAIN | | | Azovstal I&S Works PJSC (Metinvest) | UKRAINE |
| SSAB AB | SWEDEN | | | | |
| Schmolz + Bickenbach AG | SWITZERLAND | | | | |
| Eregli Demir ve Celik Fabrikalari T.A.S. | TURKEY | | | | |
| AK Steel Holding Corp. | UNITED STATES | | | | |
| Allegheny Technologies Inc. | UNITED STATES | | | | |
| Nucor Corp. | UNITED STATES | | | | |
| Steel Dynamics Inc. | UNITED STATES | | | | |
| United States Steel Corp. | UNITED STATES | | | | |

Despite intense M&A activity, the steel industry is no more concentrated than it was in the seventies

Worldwide distribution of steel production between top steelmakers and others (Mt)

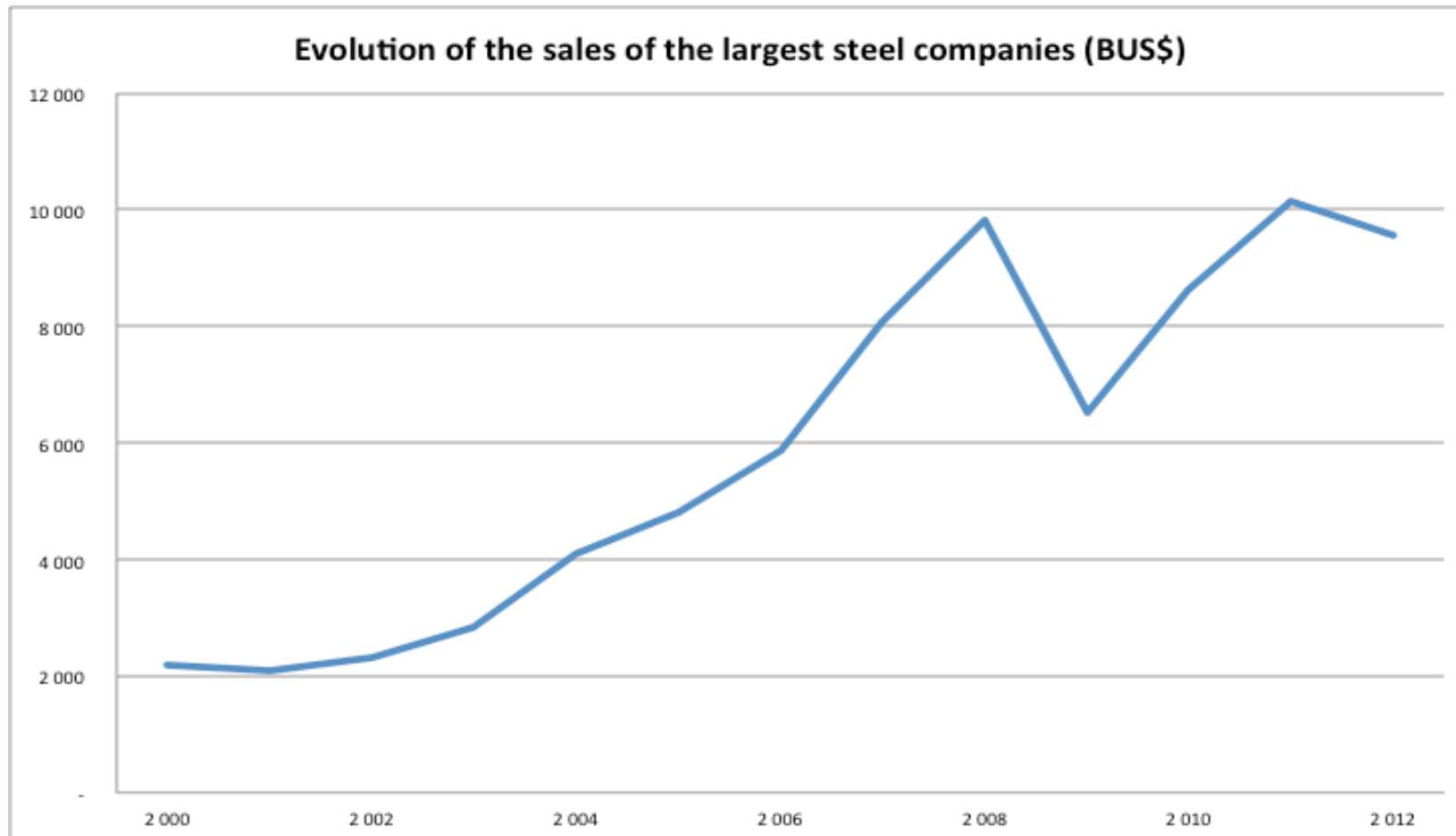


Source: OECD, WorldSteel, Factset, Laplace Conseil analysis



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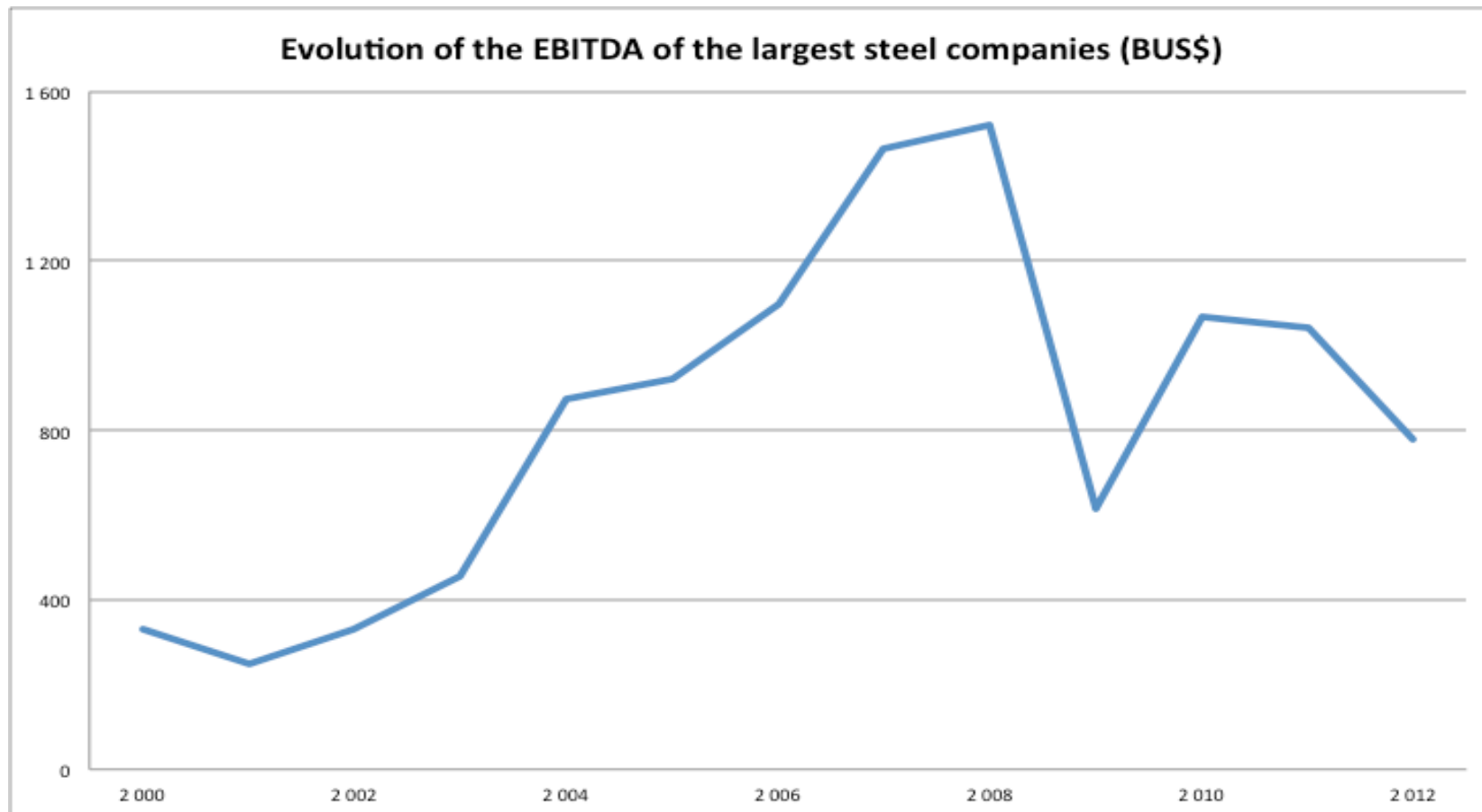
Sales of the largest quoted steel companies have increased fivefold since 2000



Source: OECD, WorldSteel, Factset, Laplace Conseil analysis



EBITDA peaked in 2008 at 5 times its 2000 level, but has slumped back at twice the 2000 level.

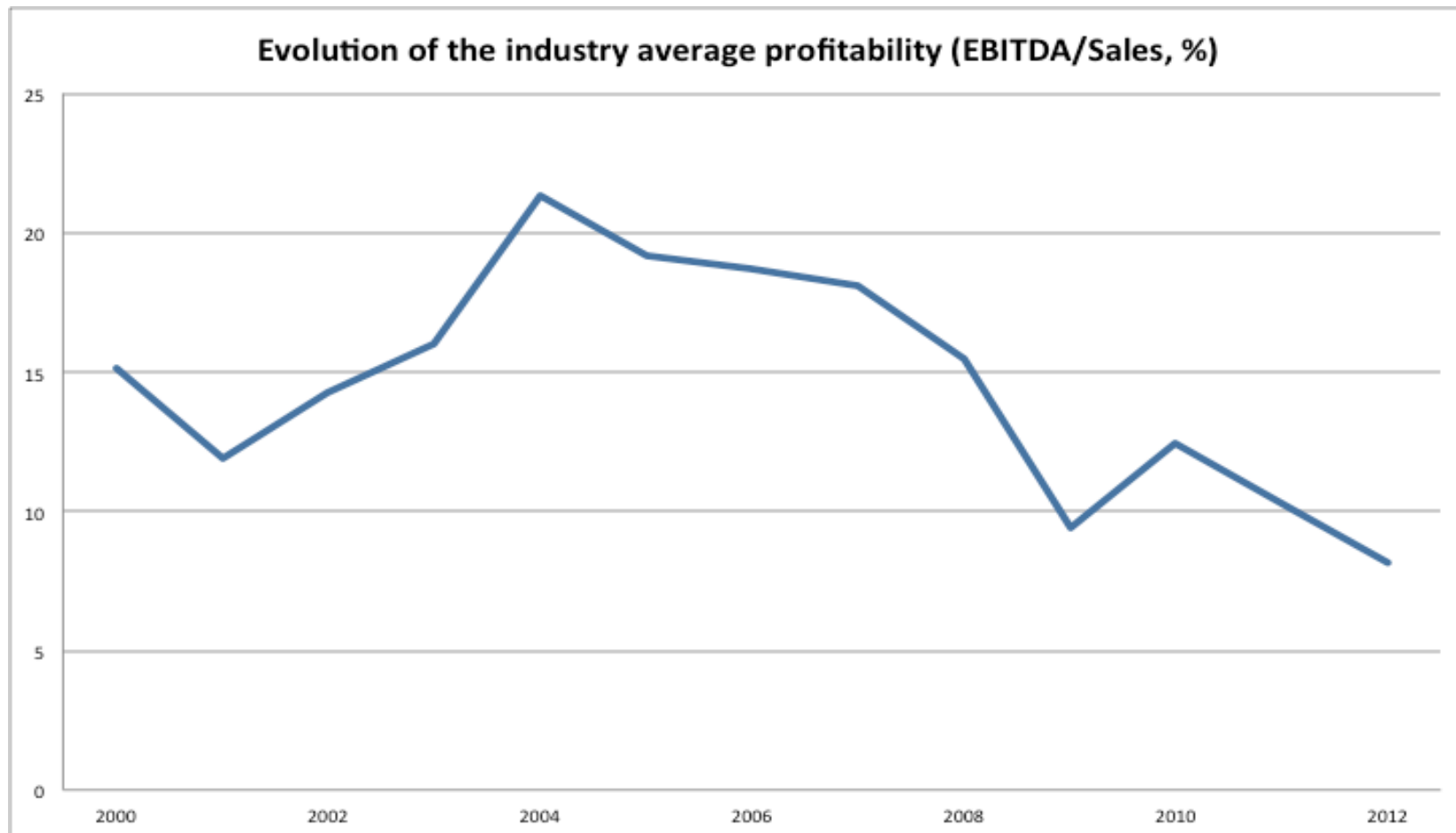


Source: OECD, WorldSteel, Factset, Laplace Conseil analysis



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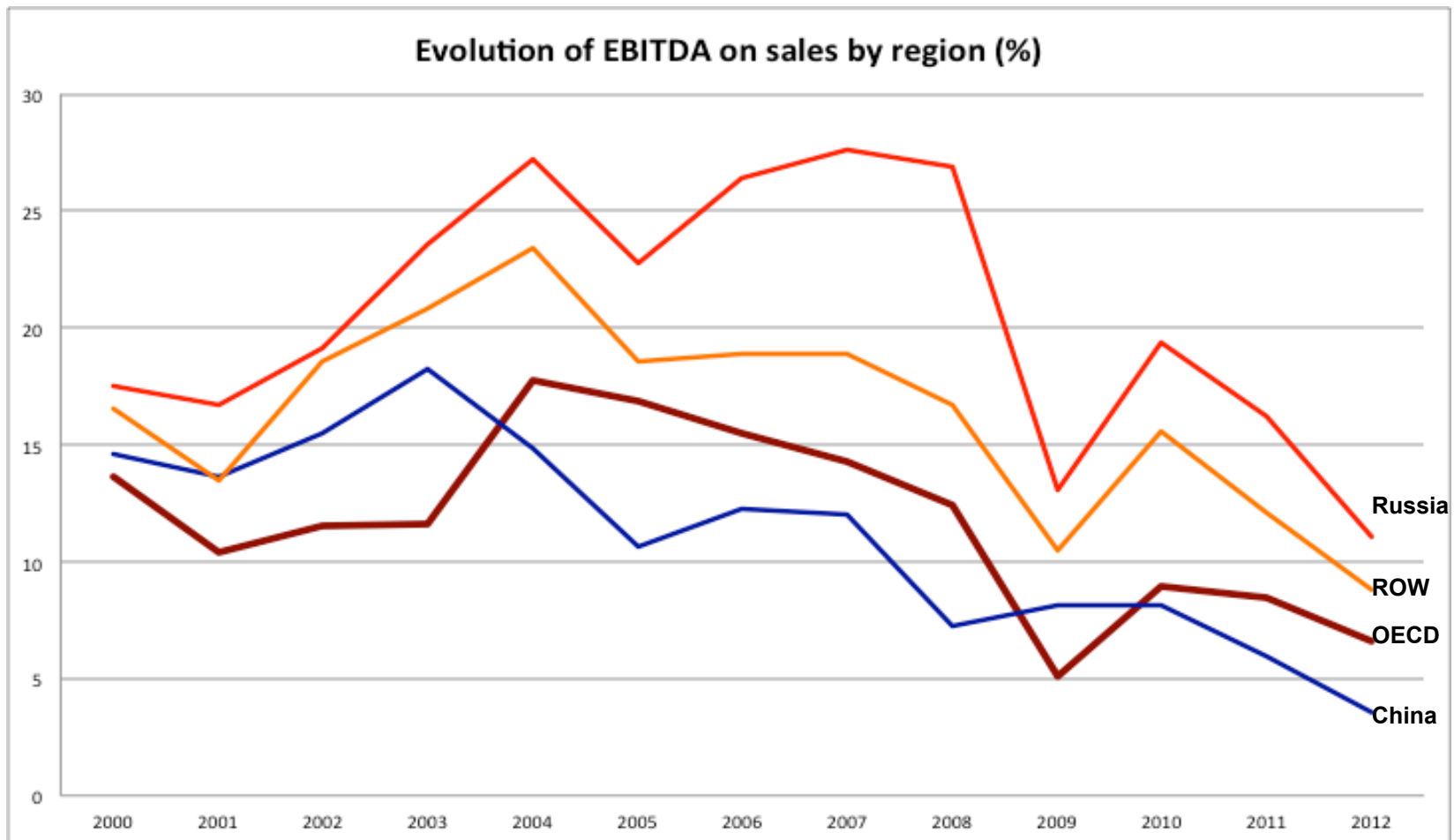
EBITDA return on sales peaked in 2004 and has declined to less than 10% in 2012



Source: OECD, WorldSteel, Factset, Laplace Conseil analysis



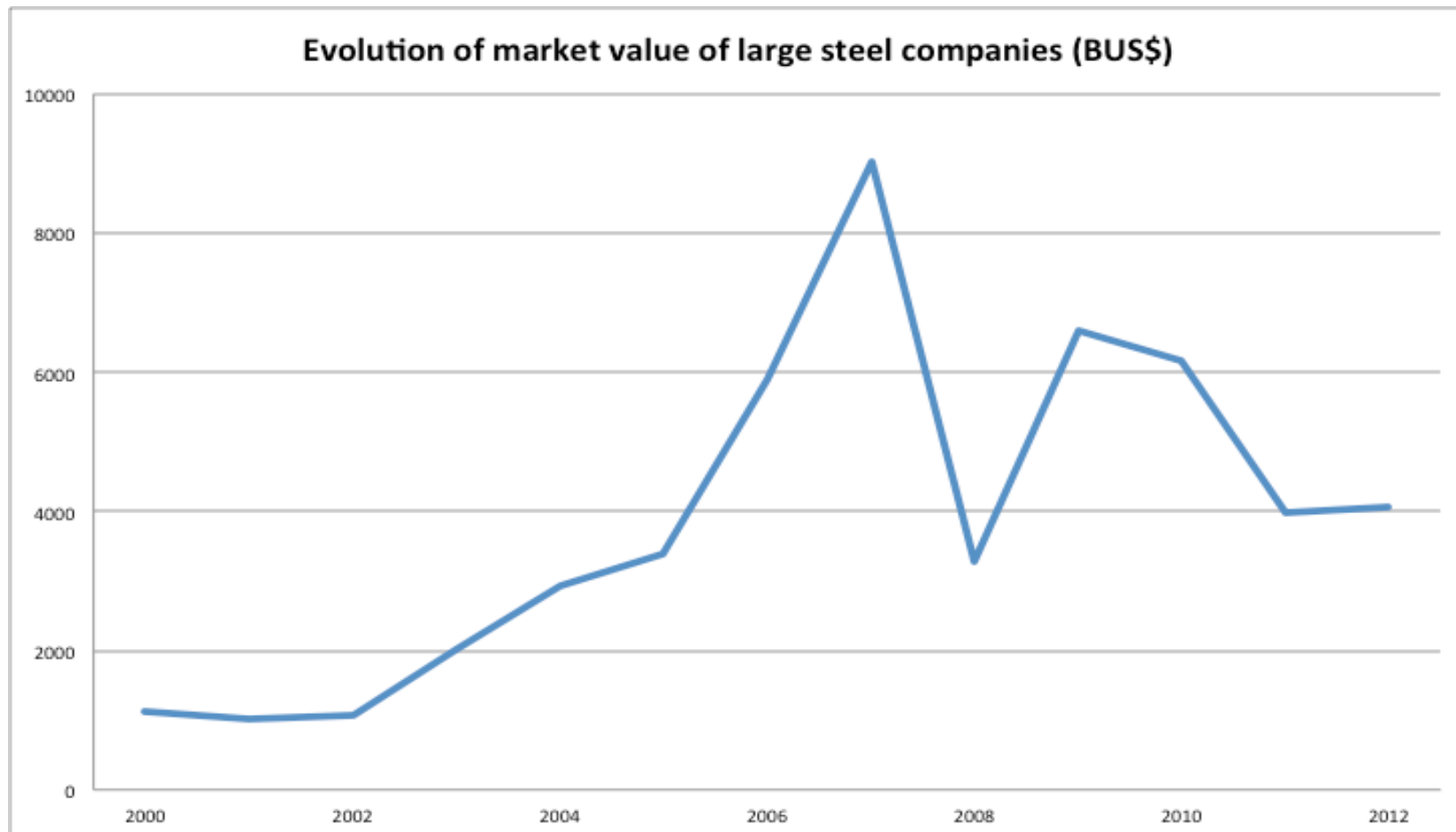
Russian mills have consistently been the most profitable and Chinese mills the least



Source: OECD, WorldSteel, Factset, Laplace Conseil analysis



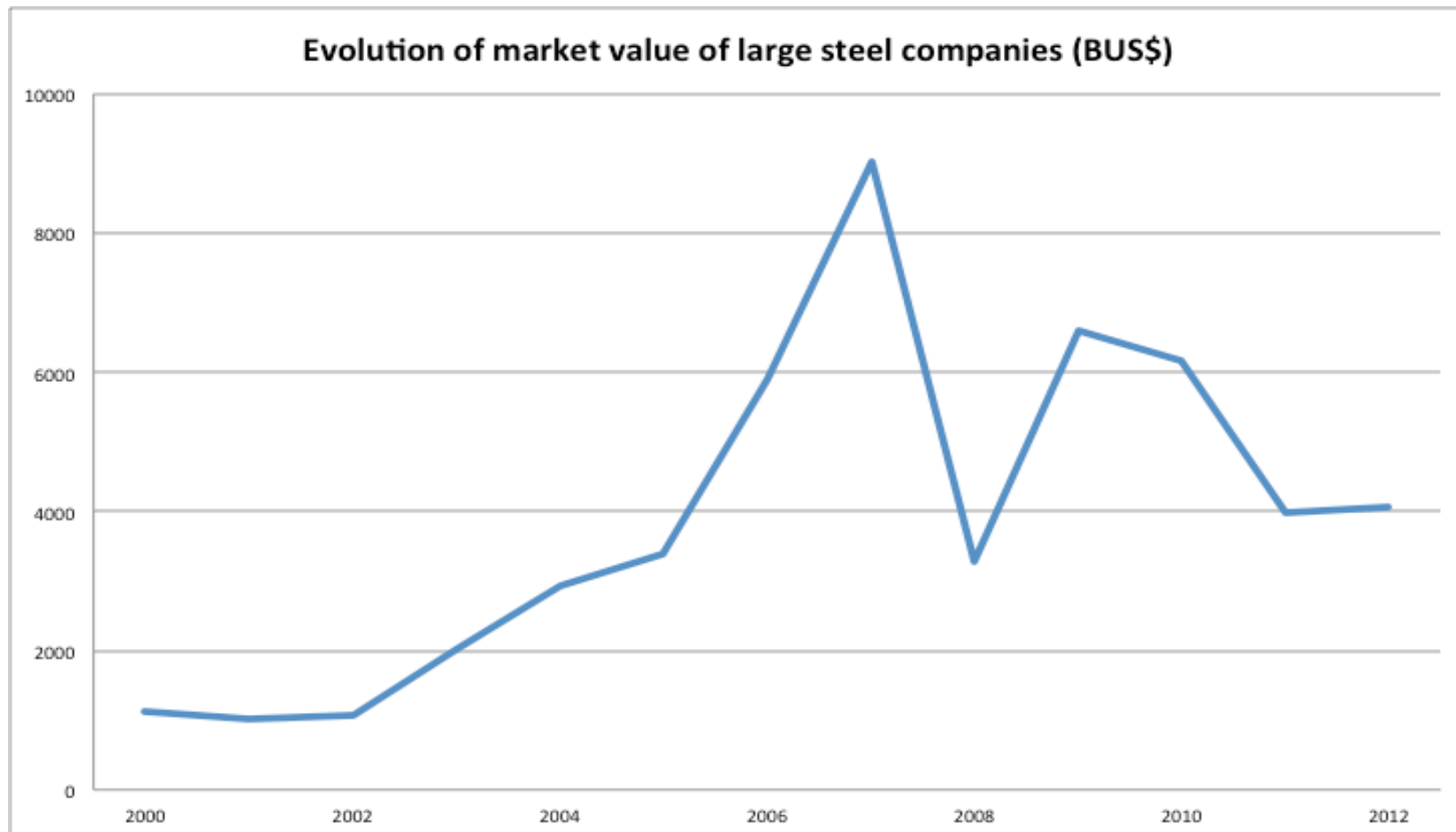
Market capitalization exploded until 2007, but was halved thereafter.



Source: OECD, WorldSteel, Factset, Laplace Conseil analysis



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Source: OECD, WorldSteel, Factset, Laplace Conseil analysis



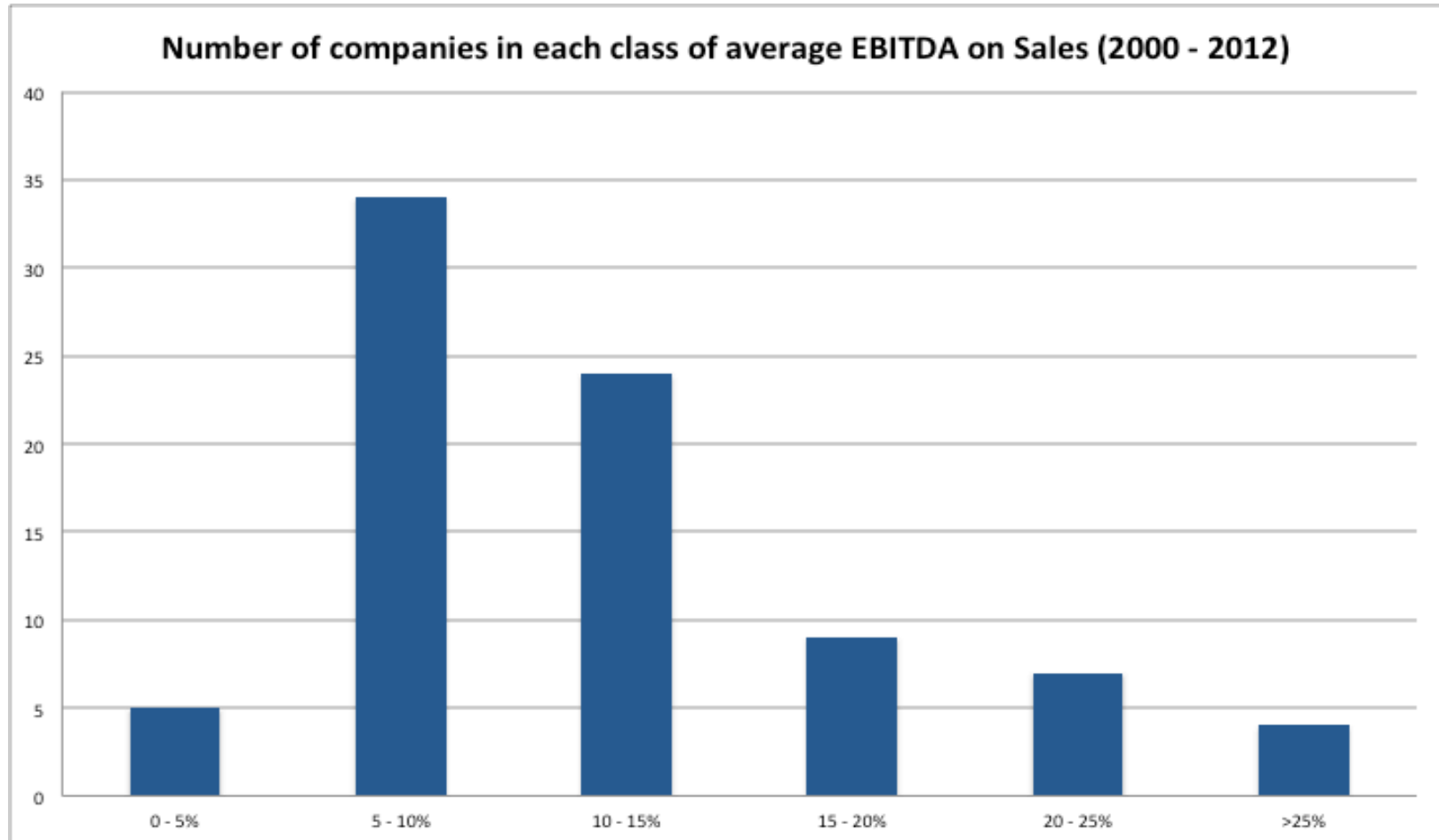
The average market price in the sample is still close to 4 times EBITDA



Source: OECD, WorldSteel, Factset, Laplace Conseil analysis



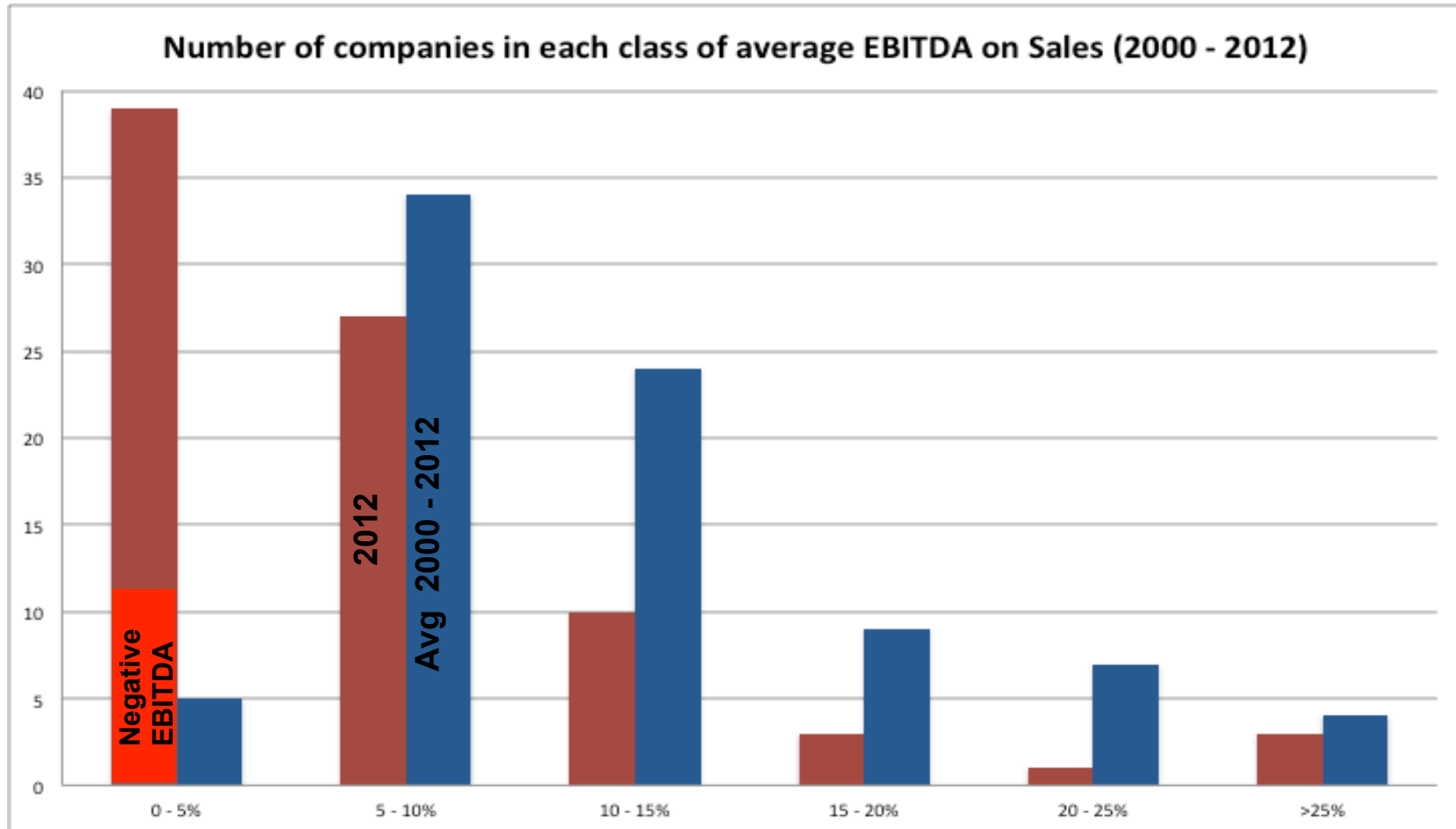
While macro-economy impacts overall result over time, individual performances vary greatly



Source: OECD, WorldSteel, Factset, Laplace Conseil analysis



Performance in 2012 was way below the average of the last 13 years



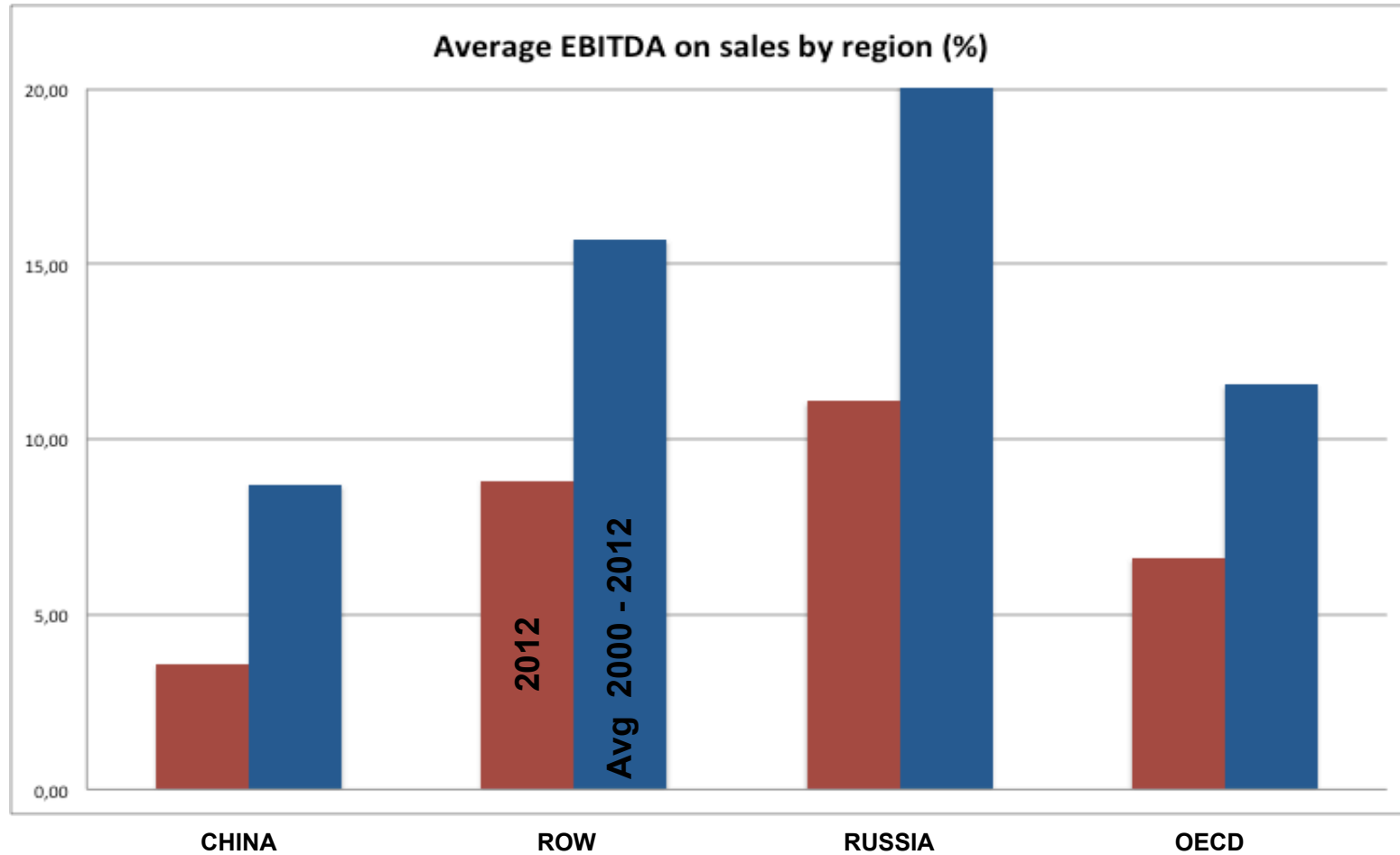
Source: OECD, WorldSteel, Factset, Laplace Conseil analysis



Many reasons are put forward by steelmakers to explain better performance and justify strategy

1. *“Market demand is generally stagnant in mature economies and “growing in emerging economies. It is therefore advisable to target “faster growing markets to seek better results”*
 - Market growth attracts new capacity even faster and lead to overcapacity that depress profits. China has increased capacity much faster than demand and fierce competition has hampered profits. Brazil and India are in a similar situation.
 - Russia is a special case. The high profits generated largely derive from a specific, non reproducible situation, of *captive* raw materials and energies that are transferred to the steelmakers at cost plus a nominal profit, while most other steelmakers have to buy their raw materials at much higher market price. If they are “integrated upstream”, usually with mines in different countries, they have to transfer their raw materials at market prices as well.
 - Growing markets are preferred since capacity addition is an “easier” decision than a capacity reduction with its high and controversial social cost.
 - In fact, many strategic errors stem from excessively optimistic market assessment and desire to “seek greener pastures”.

China, the fastest growing market, had the lowest economic result, Russia the best



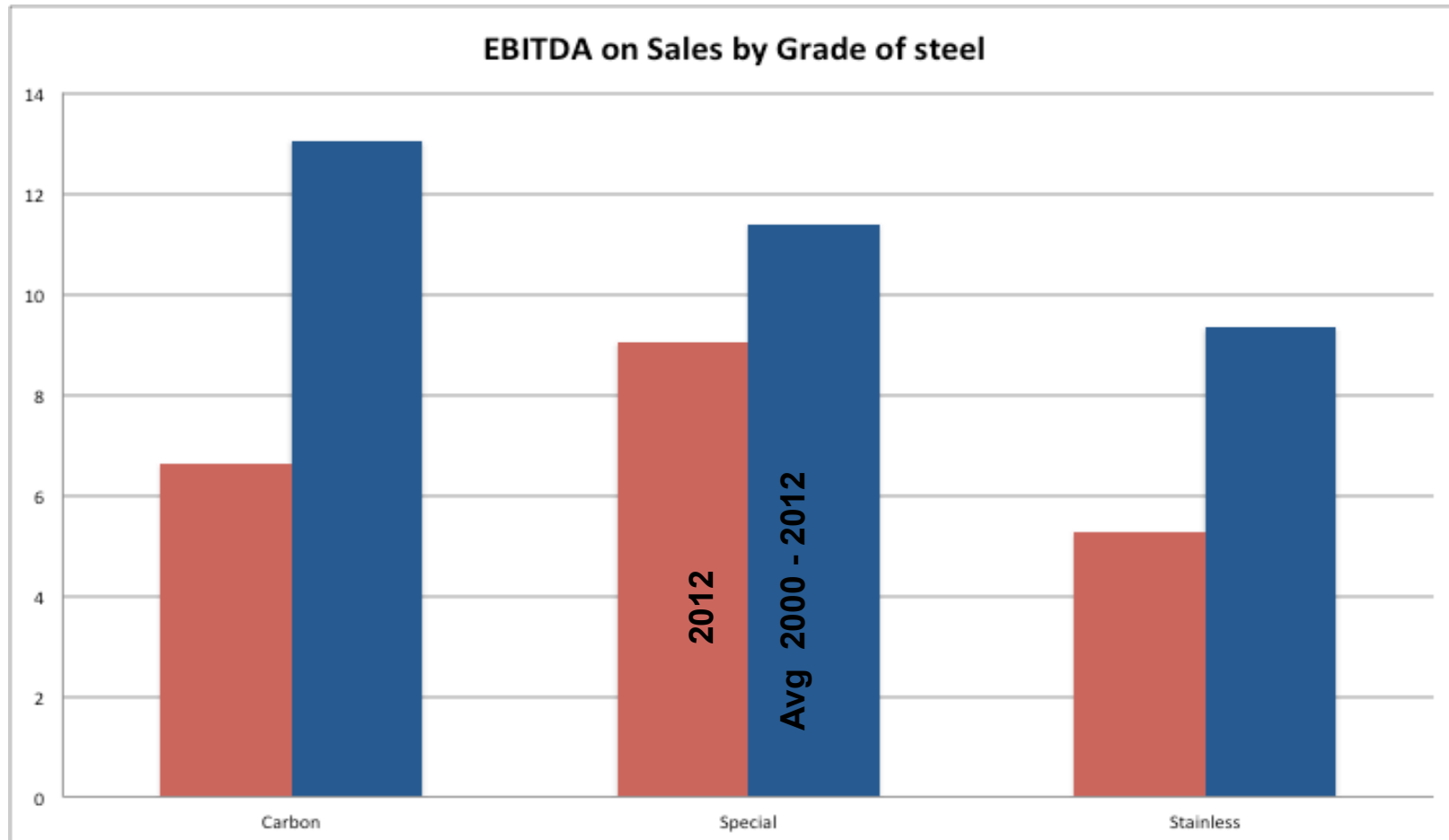
Source: OECD, WorldSteel, Factset, Laplace Conseil analysis



The strategy of increasing “High Value added” steel is shared by almost steel companies

2. *“Nearly all steel companies attempt to increase the share of their “high value added” steel due to a perception of higher profitability. “This has led to numerous attempt to enter in the special and “stainless as well in the automotive and other “sexy” steel segments”*
 - The analysis of the last 13 years show that the profitability of the high grade segments is not different than the profitability of the commodity grade segments.
 - There are several reasons for that counter-intuitive result:
 - The high grade segments are much smaller than the commodity grades : stainless steel represents 2% of world consumption; special steel 4%, automotive 6% and other high-end grades 2 to 3% (depending on definition). Commodity grades account for 85% of total production, hence overcapacity and overproduction is much more likely in the high value added segments, leading to lower margins.
 - Most high value added steel are sold to large, powerful buyers, such as automotive OEM’s or aerospace companies. They are able to extract value from the steel companies much more easily than the buyer of commodity steel who are much smaller and rely on merchant and steel service centers.

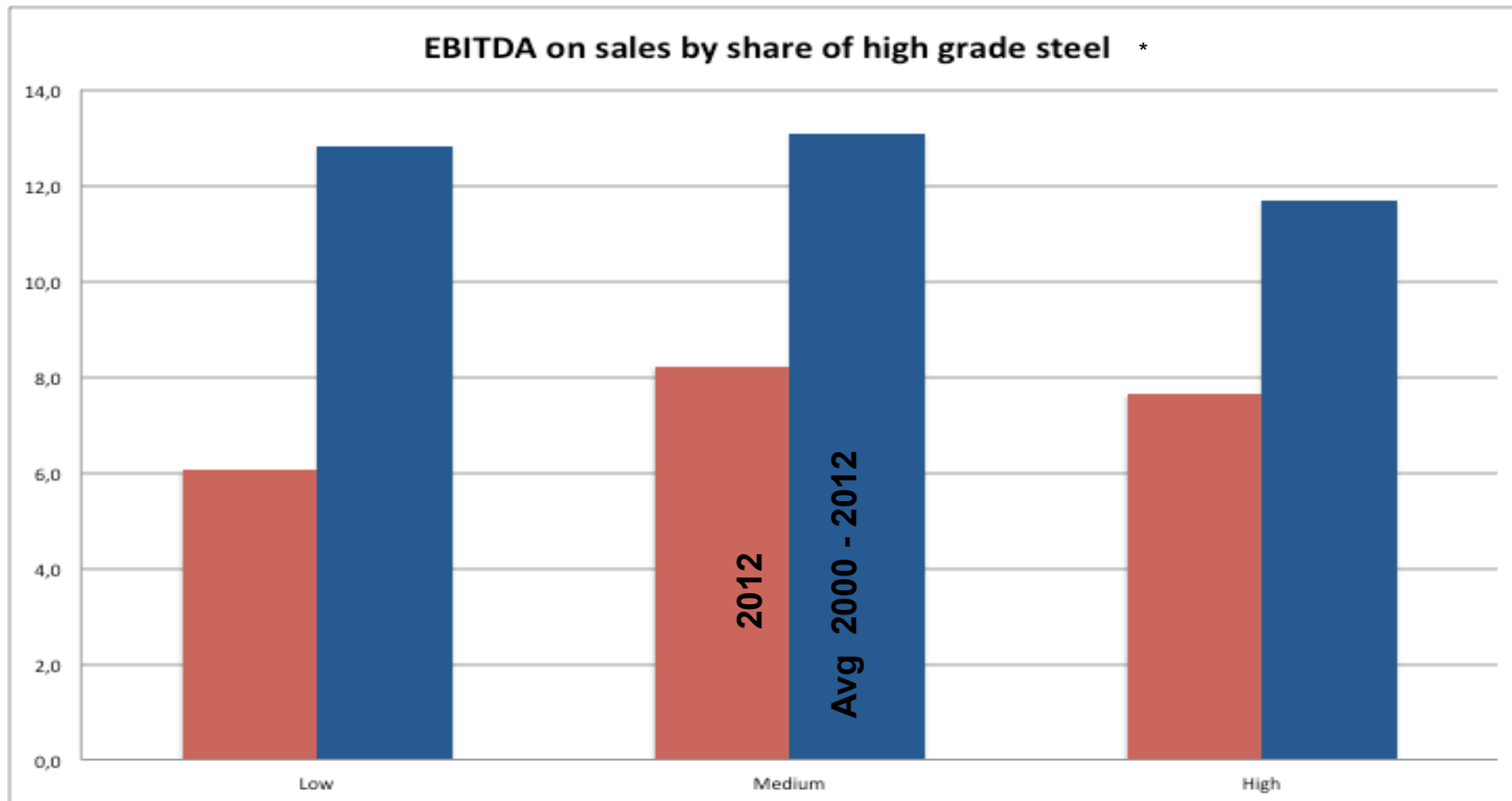
On average, carbon steel was more profitable than special and stainless steel



* The special steel sample is small and do not include the many small companies that are specialized in that sector
Source: OECD, WorldSteel, Factset, Laplace Conseil analysis



On average, a company priority on high value added steel did not lead to a better profitability



Source: OECD, WorldSteel, Factset, Laplace Conseil analysis

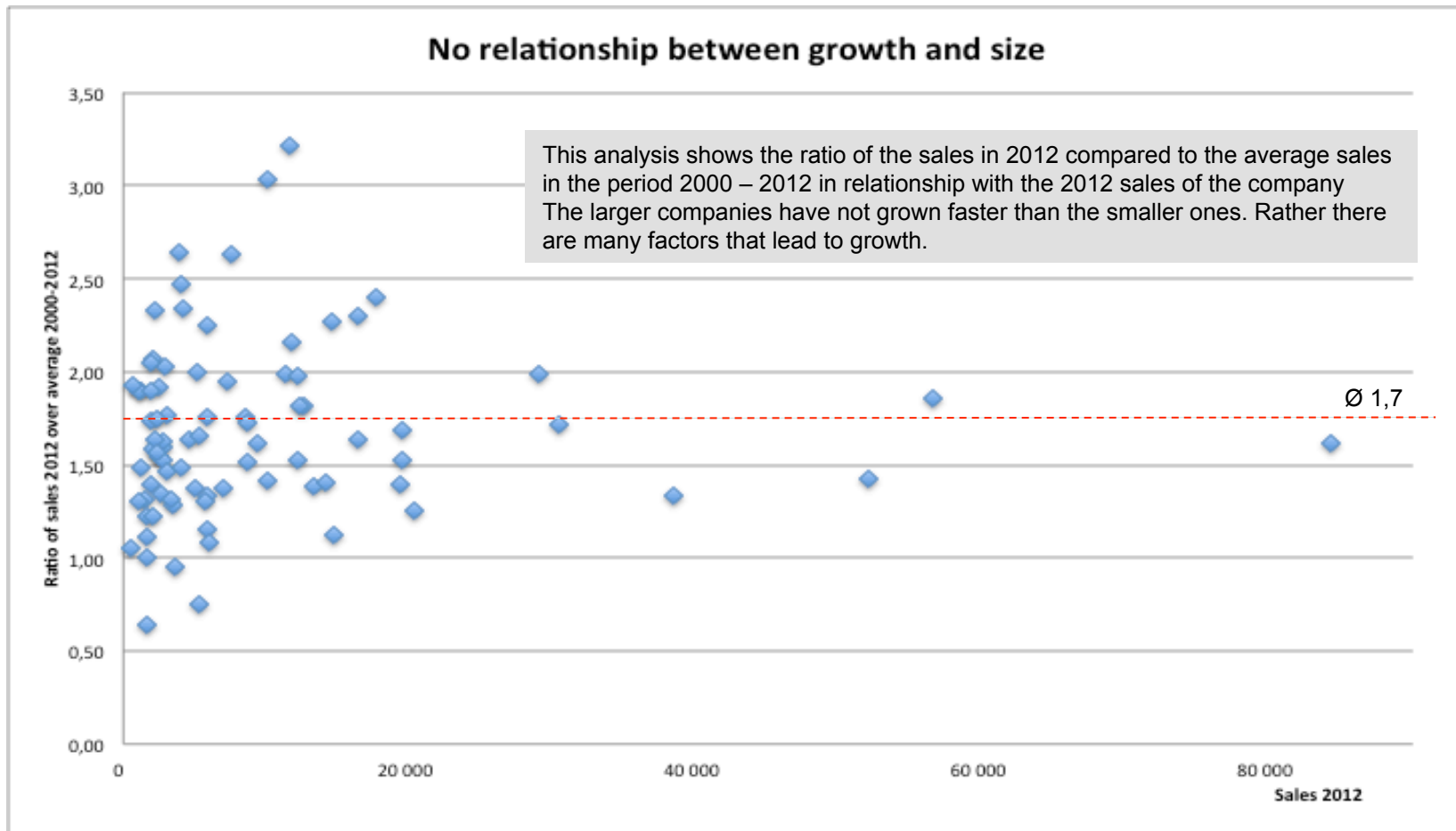
- Nearly all steel companies mention their strategy to increase the share of high value steel and some do succeed however, there are no indications that this strategy leads to better profitability



Most steel companies tries to increase their size; M&A has been very important in the last 12 years

3. *“M&A will need to greater economies of scale, greater synergies, “larger purchasing power, more effective R&D, greater pricing “leadership and many more benefits.”*
- In fact, the data of the last 13 yrs do not support the claim of a benefit of greater size.
 - Growth of the larger companies was somewhat less than the smaller ones
 - EBITDA on sales of larger steel companies was average at best, over the period, in 2012 and 2011, in good years such as 2007 and in bad years such as 2009.
 - The market capitalization relative to sales of larger mills was usually below the ratio of smaller companies and so was the capitalization relative to total assets.
 - ROCE data are not fully comparable but show a lower return for larger companies
 - There are many explanations for the equal or lower performance of larger companies, but it seems that the scale advantage is more than offset by complexity, bureaucracy and remoteness from daily operations.
 - The price paid for acquisition or greenfield investment is often above above the long term P/E of the industry, particularly is decisions are made at the peak of the cycle.

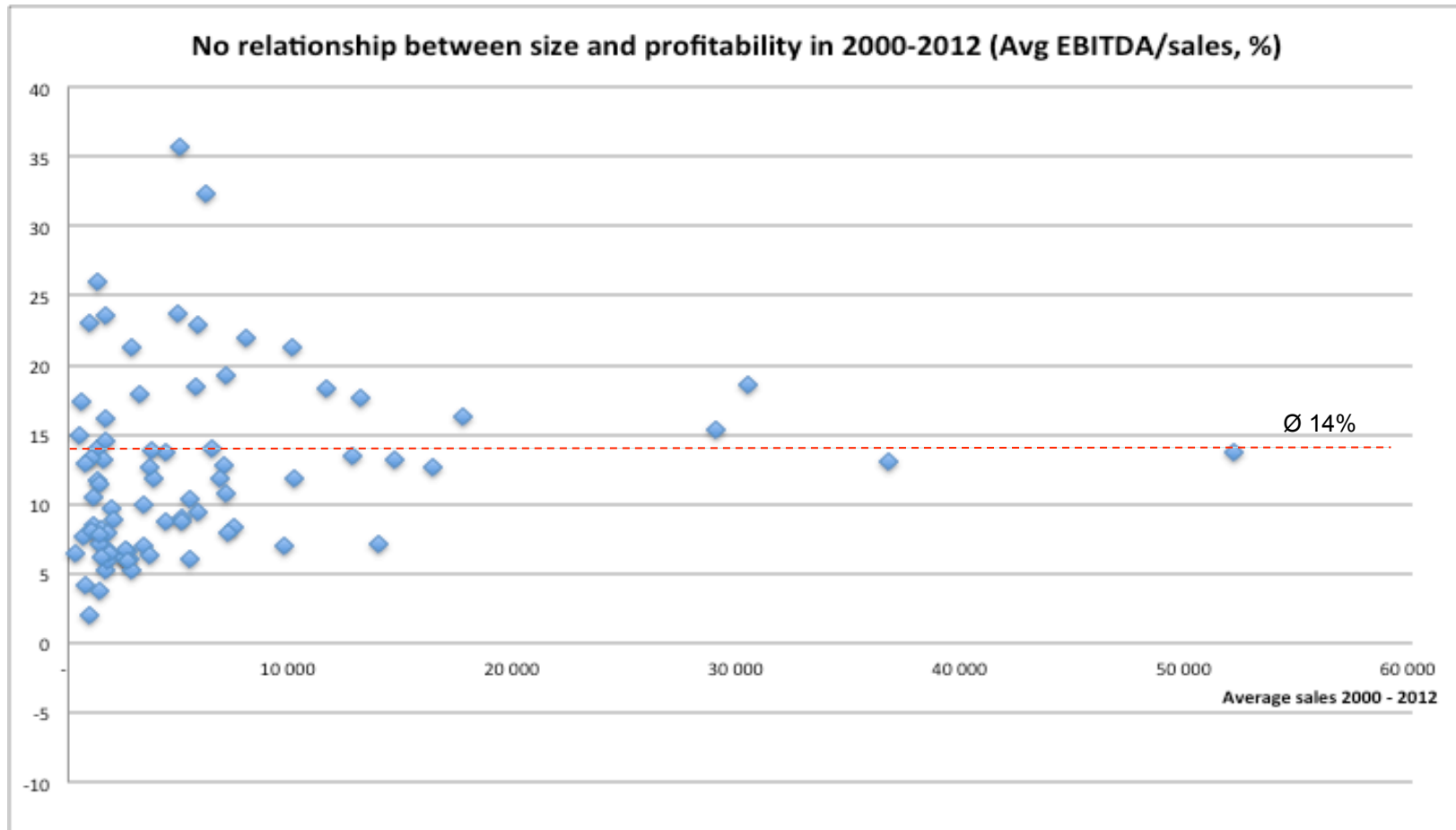
The data of the 83 largest steel companies show no relationship between growth and size



Source: OECD, WorldSteel, Factset, Laplace Conseil analysis



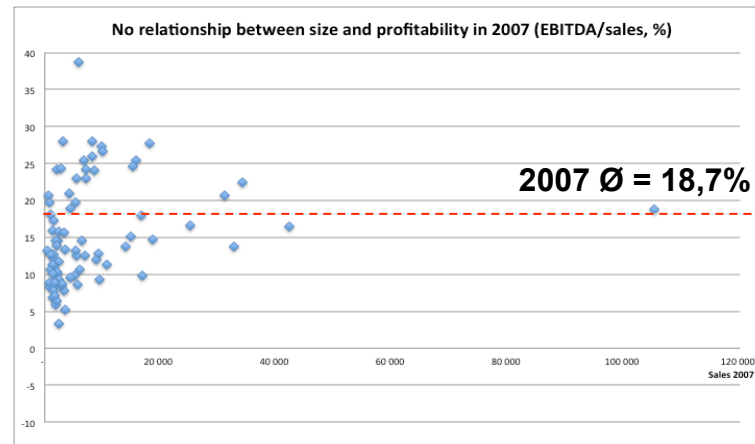
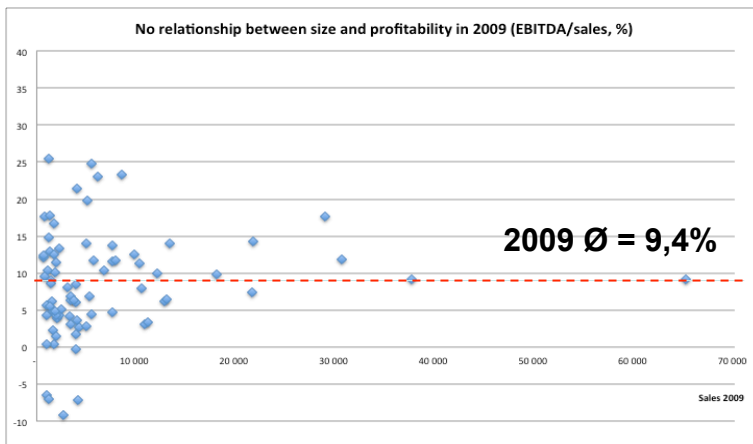
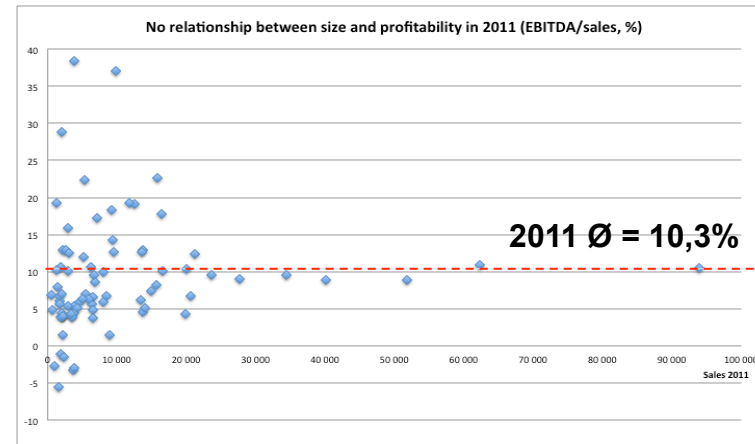
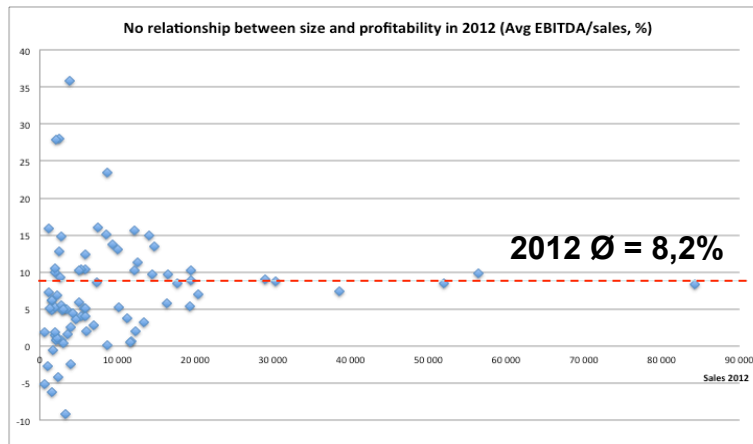
Over the last 12 years, larger companies were not more profitable than smaller ones



Source: OECD, WorldSteel, Factset, Laplace Conseil analysis



No relationship between size and profits in 2012, 2011, 2009, 2007, in very different markets



Source: OECD, WorldSteel, Factset, Laplace Conseil analysis

Iron ore and coking coal vertical integration are the current graal of the industry

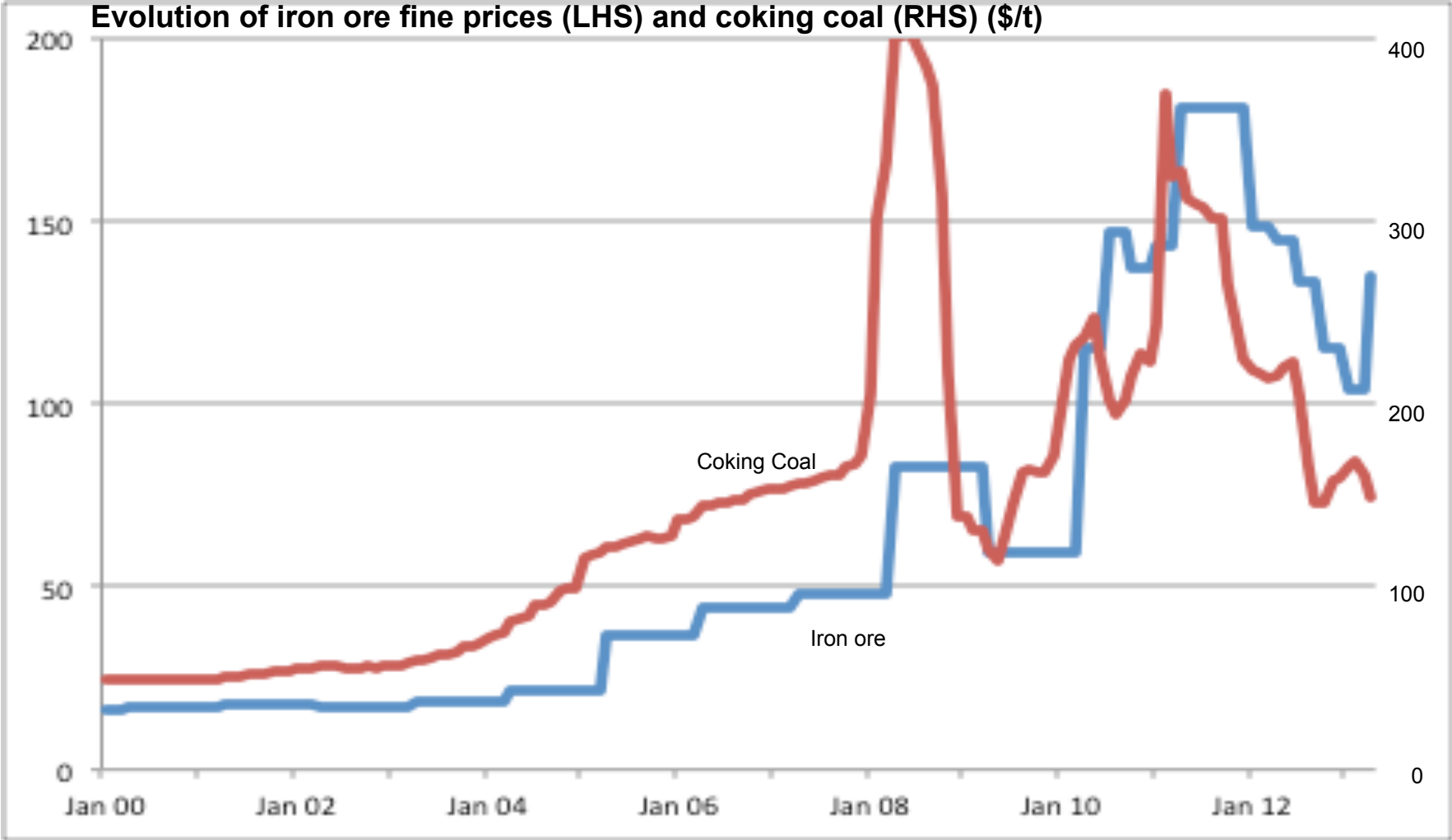
4. *“Vertical integration in raw material is key to profitability. We want “to become a “mining and steel” producer*
 - Between 1975 and 2000, the demand for iron ore, coking coal and ferro-alloys grew slowly if at all. Steelmakers dominated the relationship with miners and captured most of the profits in the chain from ore to finished products.
 - Up to 2003, most steelmakers had retreated from mining and focused on their “core” steel business, often trying to integrate downstream (steel service centers, blanking, primary transformation, automotive components, etc.
 - The fast growth of raw material demand from China after 2000 totally changed that dynamic: miners were able to push large price increases to fund massive capacity expansion. On average, raw material prices were multiplied by 4 to 5.
 - This situation created huge rents for mine owners. Low cost mines were extraordinary profitable while marginal mines made a modest profit since they were needed at the margin to equilibrate global supply and demand.
 - After 2003, steelmakers changed their minds and started again to value mining assets, but for most companies it was too late. (see below)



Iron ore and coking coal vertical integration are the current graal of the industry (cont.)

- Iron ore mines are classified as either “captive” or market”. *Captive mines* are located far away from ice free oceans and generally consist of lower grade ore that is not commercially demanded. Quite often a local steel mill has been build to process these resources and the relationship between the mine and the mill is symbiotic. *Market mines* are located near oceans or enjoy good rail access and consist of high grade ore (62 to 66% Fe) that can be traded in the *seaborne market*. The situation is similar for coking coal.
- Most CIS iron ore and coal are held captive and are owned by large steel companies. The transfer price of these raw materials is based on a “cost plus system”, which means that the mining rent is transferred to the steel company. This is the main reason of the competitive advantage of the Russian producers and their high EBITDA on sales ratios.
- Most other iron ores, in particular Brazilian and Australian ores, are sold in the seaborne market at a considerably higher market price.
- Integrated steel companies fall into one of four situations :
 - Companies with good captive mines: they generally outperform other steel companies
 - Companies with market mines owned before 2003: they enjoy the rent in their consolidated results
 - Companies with market mines acquired after 2003: they enjoy the rent, but usually had to pay dearly for the asset
 - Companies without mines : they have no rent, but lower fixed costs, hence are more flexible and profitable
- Larger steel companies usually combine two or three of the four models with mixed results

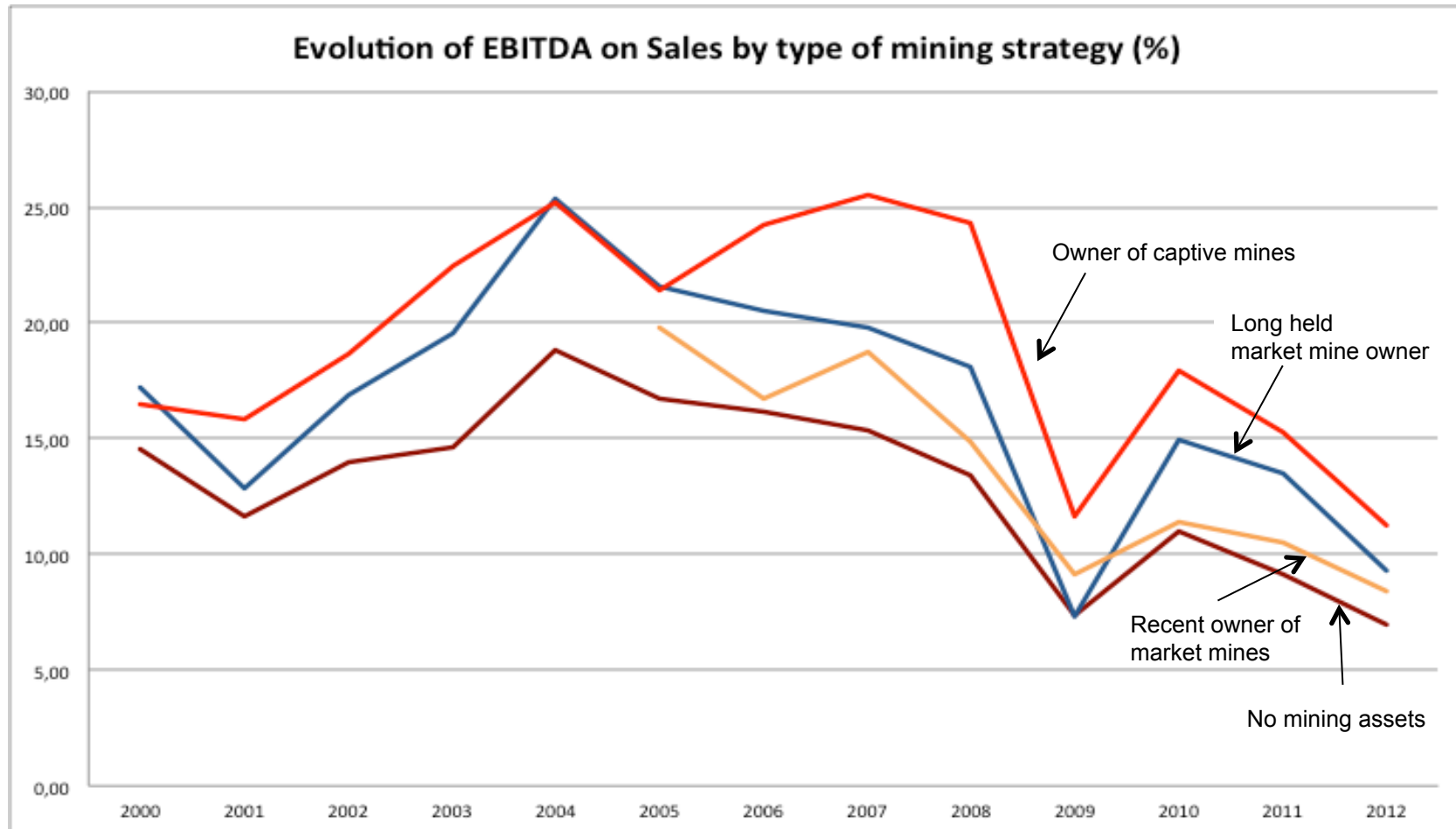
Raw material prices started to increase dramatically after 2003 and are currently slowly subsiding .



Source : Steel Business Briefing, Bluescope, Laplace Conseil analysis



Owners of captive or long held market mines had a better result. New mine acquisition not decisive



Source: OECD, WorldSteel, Factset, Laplace Conseil analysis



Summary : generic strategies have not worked

In retrospect, over the last 13 years, generic strategies have not worked

1. Moving to growing demand markets has not improved result
2. Increasing share of high value added products has not improved result
3. Growing by merger and acquisition has not improved result
4. Integrating into iron ore or coking coal mining has not improved result

But what has, and probably will, lead to better result ?

For OECD producers, three elements distinguish the most profitable companies from the rest.

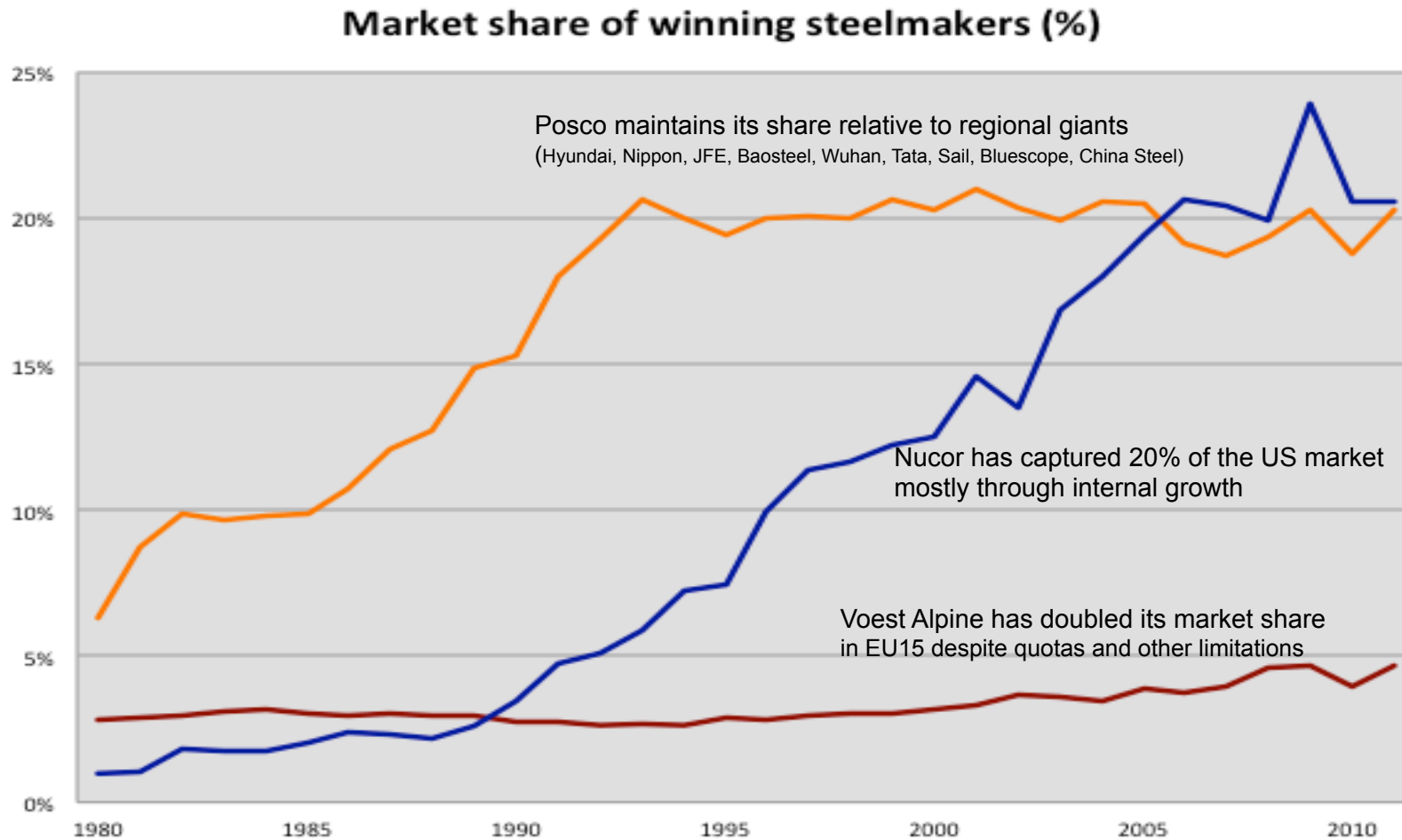
1. *Genuine* commitment to new ideas and rapidly switching to best available technology for the available raw material resources.
2. *Genuine* commitment to customers and staying close to them.
3. *Genuine* commitment to employees and staying close to them.

Nearly all steel companies profess adhering to these values, but those few who *genuinely* practice them stand out of the pack

Three companies, among the most successful, share common characteristics in different cultures

- **Nucor** : US leader in growth and profitability
 - World leader in EAF for flat products, thin slab caster and shale gas DRI
 - Network of autonomous US minimills responsible of regional markets
 - 11900 highly motivated and incentivized, non union “teammates”
- **Voest Alpine** : EU leader in growth and profitability
 - Inventor of LD steelmaking, first in EU to build a shale gas DRI in US
 - 2 integrated mills highly specialized and network of value adding plants
 - 43 000 employees fully participating through “mitbestimmung”
- **Posco** : Asian leader in growth and profitability
 - Inventor of Finex steelmaking process; CEO is former head of R&D
 - 2 large integrated steel mills : clear emphasis on Korean and regional market
 - Smart Work Place Initiative; leading social engineer in Korea

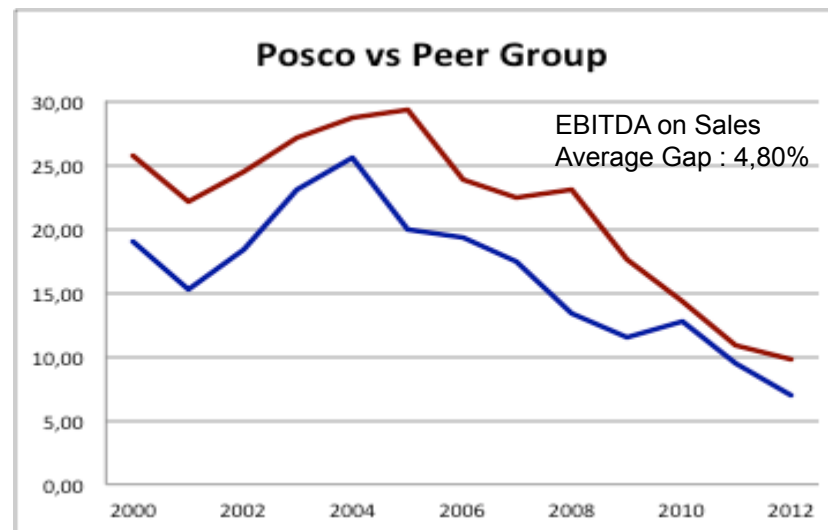
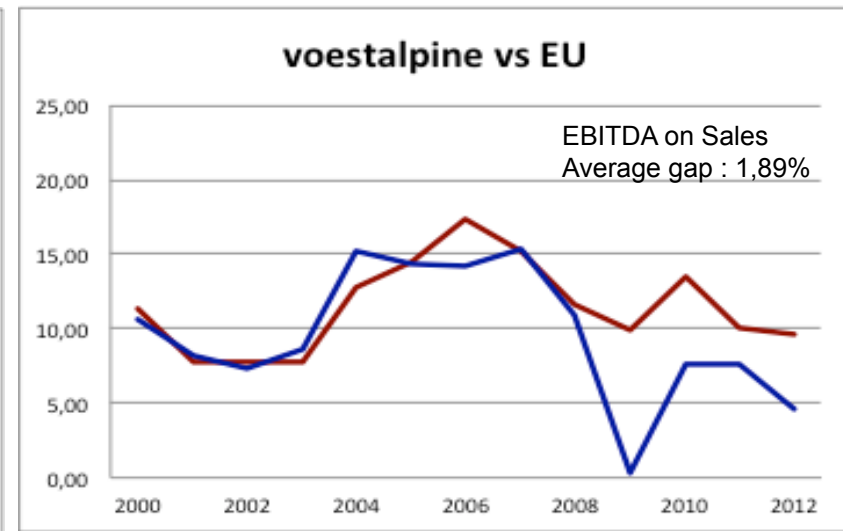
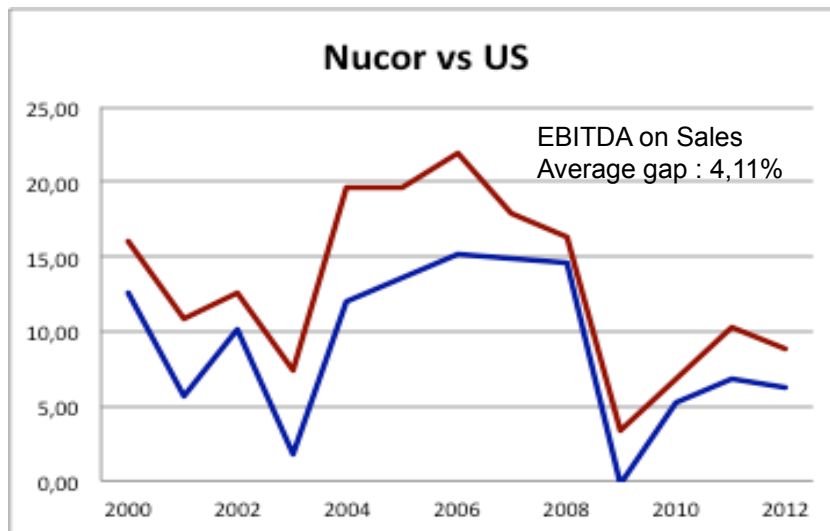
Without merger or major acquisitions, the leaders have steadily grown their market share



Source: OECD, WorldSteel, Factset, Laplace Conseil analysis



The three leaders have had consistently higher EBITDA/Sales than their peer group.



Source: OECD, WorldSteel,
Factset, Laplace Conseil analysis

Conclusions

- The steel industry is characterized by a volatile and generally low profitability. The good years are few and far apart.
- The industry generally tries a number of “generic strategies” :
 - Moving to high growth markets
 - Merging with or acquiring competitors to gain benefit of scale
 - Increasing the share of “high value added” products
 - Integrating upstream into coal and iron ore mining
- In the last 12 years, these “generic strategies” did not work
- Successful results seem to come from superior execution :
 - Genuine commitment to rapidly switching to best available technologies
 - Genuine commitment to superior customer services
 - Genuine commitment to superior employee co-management

Thank you for your attention



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