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GLOBALISATION AND CONSOLIDATION IN THE STEEL INDUSTRY

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GLOBALISATION AND CONSOLIDATION IN THE STEEL INDUSTRY

Introduction

1. This paper is to address the issues of steel industry consolidation and globalisation over the recent past and into the medium term future. The terms of reference are as follows:

- Describe how the steel industry has consolidated and become more global in character since 1990, with reference to *(i)* the horizontal and vertical aspects, and *(ii)* the variation in the intensity of the phenomena amongst major product categories.

- Identify and analyse the factors driving the consolidation and globalization, including the roles that *(i)* growth in market-based economies, *(ii)* trade and *(iii)* the globalisation of key customer segments (like autos) have played.

- Describe the role that mergers and acquisitions and joint ventures are playing.

- Assess the implications of the consolidation and globalisation on competition and industry performance.

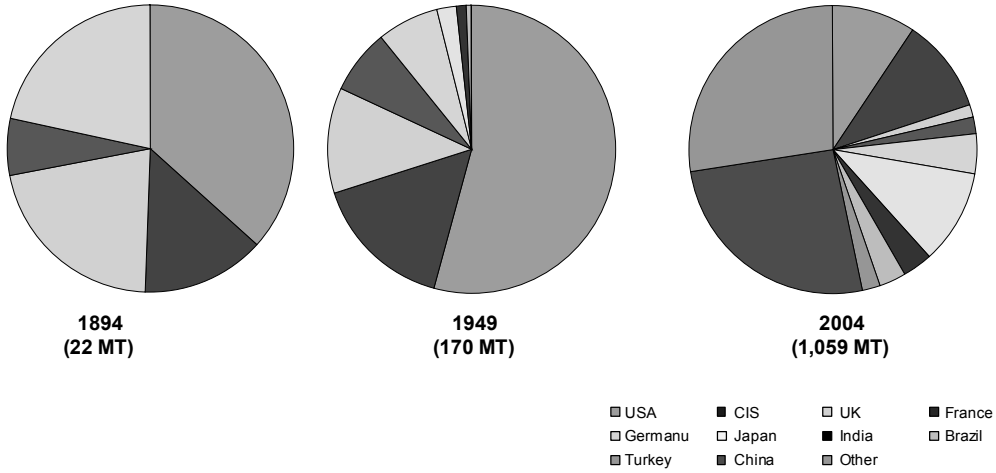
- Provide scenarios assessing the likely magnitude, extent and implications of any further expected consolidation and globalisation over the next 15 years.

2. In order to give the paper a truly historical context I shall in fact be referring back over a much longer period of time than 1990.

The growth of the steel industry

3. The growth of the steel industry has been substantial over the last one hundred years. Table 1 shows both the volume of this growth and its geographical location. The industry grew relatively slowly until the end of the 2nd World War. From that period to 1973 it grew at an annual rate of 6% per annum in volume terms until the first oil shock that caused the slowing down of the growth rate in the 1970s. From the mid '70s to the mid '90s growth averaged 1%-2% per annum until the impact of China began to be felt in the late '90s when again the growth rate expanded to 4%-5% per annum.

Table 1 – Growth and Location of Steel Production



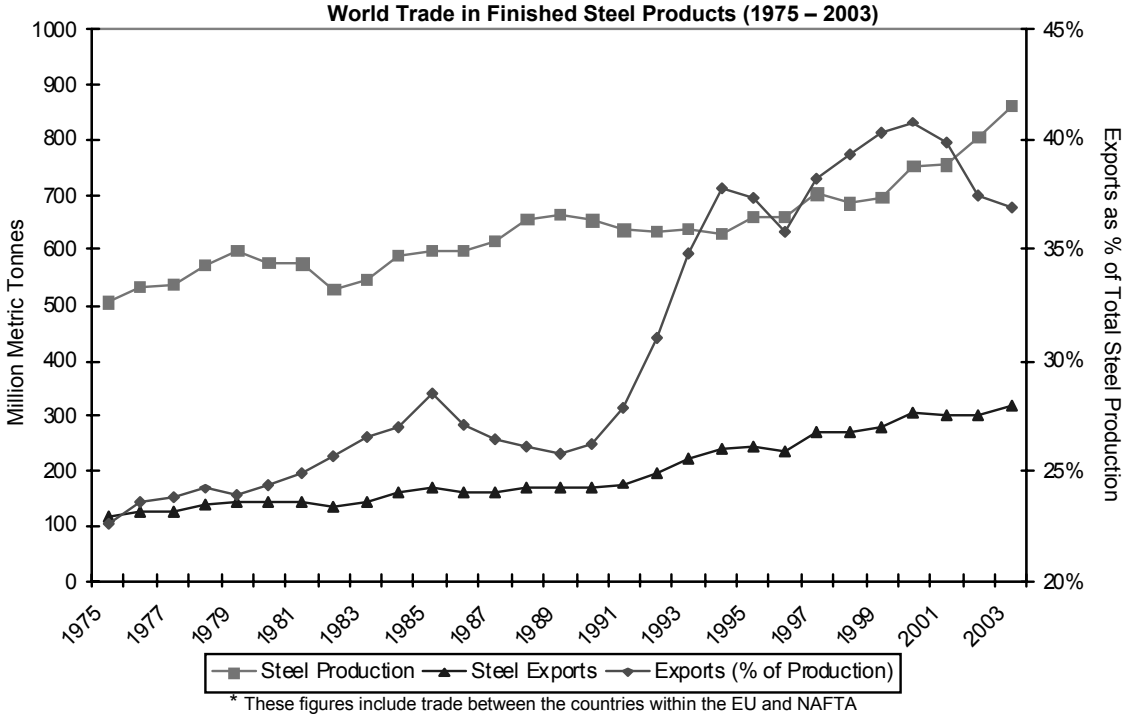
4. Currently global steel production is above 1bn tonnes and we expect it to reach 1.5bn tonnes sometime between 2015-2020. Nearly all of this growth will be in Asia, in particular some further growth in China but a strong growth in India.

5. In terms of the physical location of production the industry has globalised. In 1894 when 22m tonnes of steel were produced, there was virtually no production outside of the United States, the United Kingdom, Germany, France and Russia.

6. Perhaps of great interest is that after the Second World War in the mid 1940s over 50% of world steel production was located in the United States. If again Russia and the UK are included then over ¾ of world production of 170m tonnes was then located in those three countries. Part of the reason for this was a substantial destruction of the European steel industry due to war activity.

7. As can be seen clearly from Table 1 there has been not only an explosion in the amount of steel production but also a huge dispersion in the location of that production. So the production of steel has globalised over the last 100 years.

Table 2 – World Trade in Finished Steel Products (1975 – 2003)



Trade in 2003, excluding the EU and NAFTA, amounted to 232 MT or 26.9% of global steel production

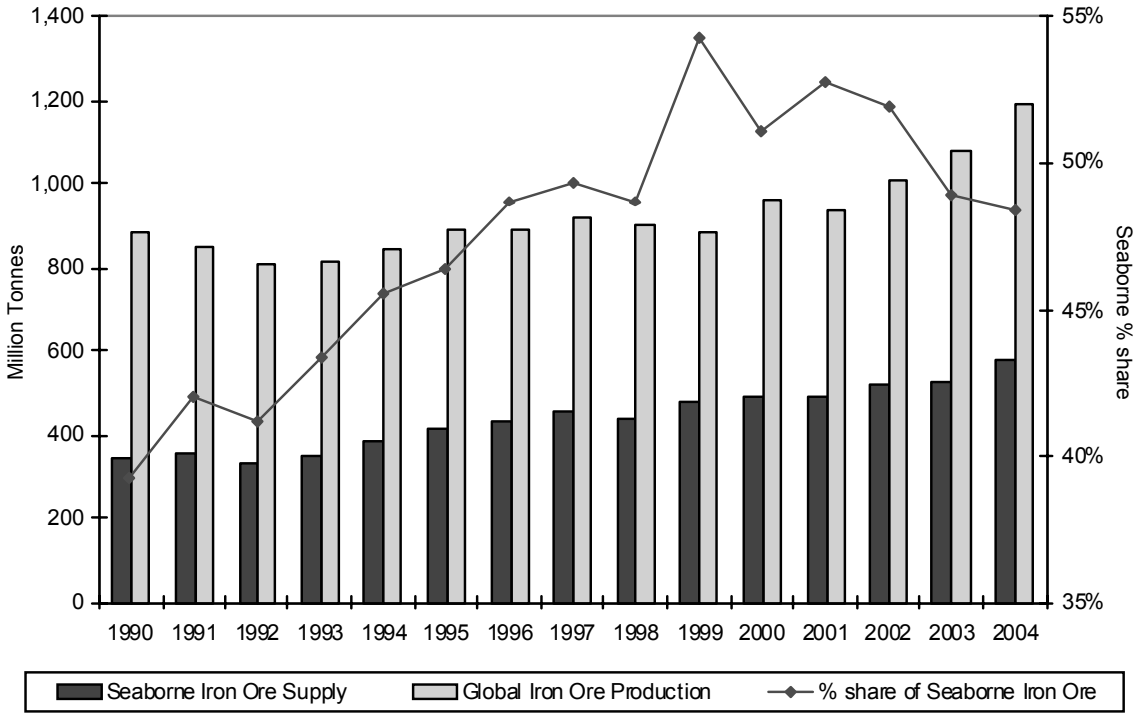
8. Despite this global spread of production the volume of trade in steel products has actually expanded from approximately 23% of steel production in 1975 to between 35%-40% of steel production today as shown in Table 2. So steel markets have become more integrated. One reason for the flow of trade is not only the decrease in the relative costs of transportation the introduction of low cost competitors into the free market e.g. Ukraine and Russia, but also a significant increase in specialisation amongst steel companies serving different market niches and customers.

9. Whilst the market side of the industry as represented by trade, has shown an increase in the degree of global integration, the supply side of the industry as represented by iron ore has done likewise.

10. Historically steel companies tended to place themselves at the origin of their raw materials, particularly iron ore. This was the case in England, Germany, North America and Russia.

11. Over time, these iron ore resources have either been worked out or have declined in the quality of their grades and have been replaced to a large extent by higher grade, lower cost materials, shipped over the seaborne iron ore trade. This trade is now dominated by three companies, CVRD, BHP Billiton and Rio Tinto. The growth of seaborne trade as a participant in the total demand for iron ore can be seen in Table 3.

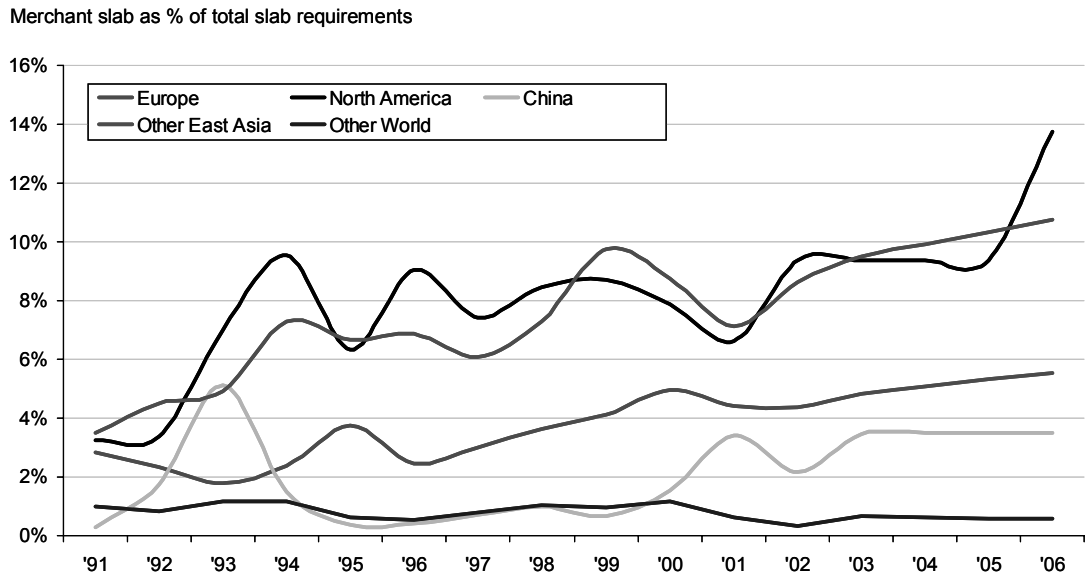
Table 3 – Share of Seaborne Iron Ore Trade / Total Iron Ore Production



12. In summary then, the growth of the steel industry can be seen to show the classic symptoms of globalisation and of the exploitation of comparative economic advantage. So today Brazil and Australia are the main sources of the seaborne iron ore trade because they have high quality, lower cost resources. The growth in finished steel trade volumes has developed at the same time that steel production has disseminated across the world. This is representative of lower transportation costs and of comparative economic advantage between different companies and different products.

13. We should expect these trends to continue and indeed new ones to emerge. For example Table 4 shows the growth by region of the merchant slab trade. Merchant slabs are slabs produced in independent integrated steel making facilities and then transported to other independent hot rolling and finishing facilities in a different geography. The growth of the merchant slab trade indicates again the development of comparative economic advantage with countries such as Brazil, the Ukraine, in the future India and other locations with inherently lower cost structures for the production of steel, taking advantage of this to substitute for facilities in higher cost locations such as North America and Europe, as well as supplier countries with inherently higher cost structures such as Thailand.

Table 4 – Merchant Slab as % of Total Slab Requirements

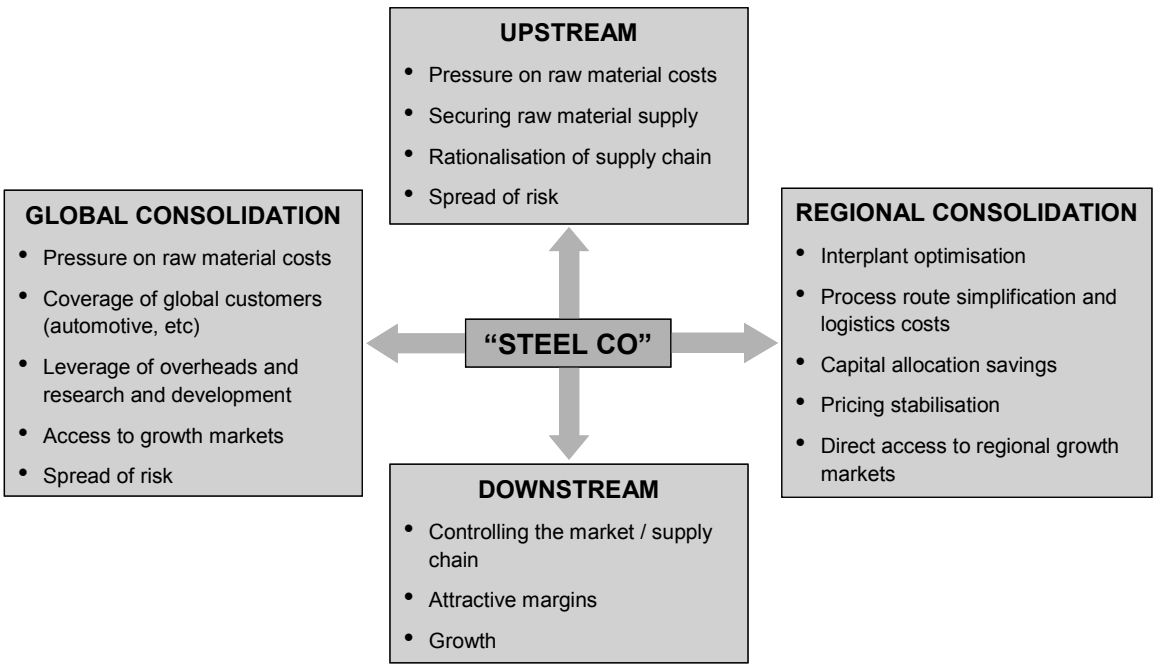


14. All these developments of course are capable of further exploitation, and have emerged with a decline of trade barriers and the retreat of governments from state ownership of steel making assets.

Consolidation; general characteristics

15. When a steel company looks at consolidation there are a number of different directions in which it can seek to pursue that concept. Table 5 identifies these four and the major driving forces behind them.

Table 5 – Opportunities for Consolidation theoretically exist in four different dimensions



Regional horizontal

16. Normally, we think of consolidation quite naturally as being horizontal in nature; one steel company takes over another or two steel companies merge to create a larger total steel company operating at a larger volume. We are witnessing the Mittal offer to acquire Arcelor. There is a strong rationale for these consolidation moves. Two steel companies can operate with little more than one steel company's head office and central overhead costs including research and development. Likewise assuming that the steel companies have complimentary products and manufacturing processes, the order books can be reloaded on different assets so as to produce longer production runs and better economies of scale so lowering average costs for individual product lines. Capital allocation savings can be made through better utilisation of assets and a better phasing of capacity expansions. Best practices can be transferred between assets and management systems.

17. Of the greatest importance is the search for and the achievement of pricing stabilisation. Historically the steel market has been highly volatile both as to production volumes and prices. Volume volatility is a function of steel being at an early stage of the industrial production cycle with the result that small changes in end customer markets, such as demand for automobiles or construction activity, gets amplified up the supply chain. In general terms a 3% or 4% change in demand in a finished steel market can result in a 15% change in steel demand ex works over the short term.

18. This kind of amplification in changes of volume is reflected and emphasised in changes in prices. Prices of steel products historically have been capable of varying up to 30% across a six month time period. When there are a large number of producers in the market producing a very similar product it is difficult for co-ordination of production changes to take place in the face of declining volumes of demand. Hence individual producers will seek to maintain their order books when faced with a decline in the market place or even enhance their order books to gain market share and prices are used as the tool to do that. With a small number of producers changes in demand are easier to understand, there are fewer decision makers and thus fewer "signals" to understand regarding production and price changes.

19. Thus regional consolidation both in overall steel production and individual product lines is highly desirable from the steel producers perspective, likewise because price instability affects users just as badly as steel producers, it is inherently to the benefit of markets as long as there is enough competition for long term pressures for product improvement, technological innovation and the competition for customers to take place.

Global horizontal

20. Global horizontal consolidation is also taking place in the industry. This is best seen as intercontinental consolidation such as Arcelor building a major position in Brazil, US Steel building a position in Slovakia and Europe and Mittal Steel's historical development. There are a number of drivers for this behaviour; in addition to those for regional horizontal consolidation.

21. The most well known is to achieve coverage of global customers particularly in the automotive sector and I will address this issue separately shortly. Again there are benefits to averaging overheads and research and development costs across a higher volume than can be achieved on a regional basis. Given the increasing importance of raw material costs as a percentage of the total steelmaking cost structure then increases of scale can enable purchasers to exert some pressure on raw material costs and on the purchasing of consumables and other supplies.

22. Perhaps of increasing importance is the fact that there are some very rapidly growing markets and some steel production locations, which have inherently lower costs than others. So Arcelor can take

advantage of Brazilian costs in making slabs and hot bands for use in European markets. Global consolidation is a mechanism whereby companies in the developed world, Japan, North America and Europe can gain access to, and transfer technology to, China and possibly in the future to India and other high growth markets.

23. A global structure can also balance a spread of risks whether they are currency, political or general market volatility risks.

Upstream

24. Turning to vertical integration this can be either upstream or downstream. Raw material costs are an increasing proportion of crude steel making cost structures and in particular the iron ore industry is substantially consolidated with approximately 80% of the seaborne trade being in the hands of three companies. This has led to enhanced margins, particularly in iron ore, and increased cost pressures on steel companies. EBITDA margins are very substantial in the iron ore business and these margins and these cost pressures have led steel companies to seek ownership of these raw material sources. Thus in Russia all the major steel groups are heavily backward integrated and essentially self sufficient in coal and iron ore, except for MMK. Those companies who are backward integrated hold a competitive advantage in the consolidation process as access to iron ore at cost is an advantage both in terms of cash generation capability and in terms of pricing flexibility. So consolidation is taking place upstream.

Downstream

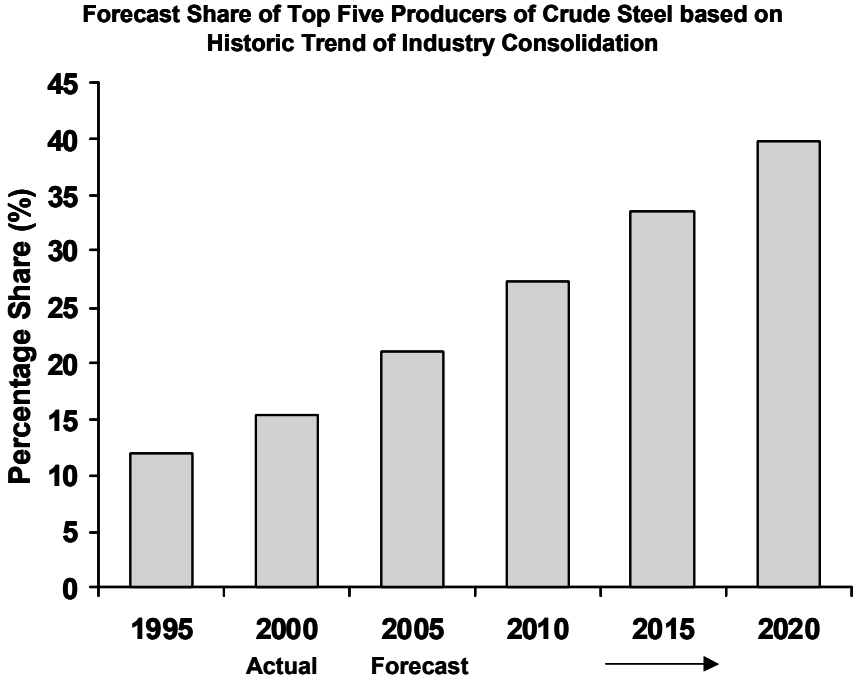
25. Downstream integration has been a constant theme in the steel sector for the last two or three decades. Indeed looking back in time even further, many of the major steel groups were much more downstream integrated than they are today. Bethlehem Steel used to own shipyards. The drivers for downstream integration were particularly intense when the steel industry was heavily regulated, predominantly state owned, and there were substantial trade barriers to the global consolidation process. Then downstream integration offered one of the few growth avenues which appeared to be attractive.

26. Indeed downstream integration has taken place into the simpler manufacturing process steps such as distribution, pipe and tube, roll forming etc. However, quite quickly the industries, manufacturing practices, key performance indicators, management control processes for downstream business activities become so very different from steel manufacturing that the apparent attractiveness of the industry is counteracted by difficulty of managing two very different activities within the same culture. Downstream integration therefore holds substantial challenges beyond primary manufacturing processes for the steel sector.

Crude steel consolidation

27. Over the last 15 years consolidation in crude steel production has progressed at the rate of approximately 7% per annum. In other words the percentage of crude steel production under the control of the largest five producers of such product, has increased not by 7 percentage points per year, but by 7% from its base starting point, this is shown in Table 6. This should be contrasted with growth in total steel production on a per annum basis over these 15 years of about 3% per annum.

Table 6 – Crude Steel Production : Consolidation



28. There is a progressive consolidation of crude steel production. If this trend line is carried forward over the next 15 years to the year 2020, approximately 40% of crude steel production will be in the hands of five companies.

29. At that point there will be approximately 1.5bn tonnes of steel being produced so that the largest five companies will represent 600m tonnes, this would be a significant shift in the structure of the industry at the crude steel making stage. I will come back at the end of this paper to some considerations of the likelihood of this happening and some of its potential consequences.

Consolidation in end product markets

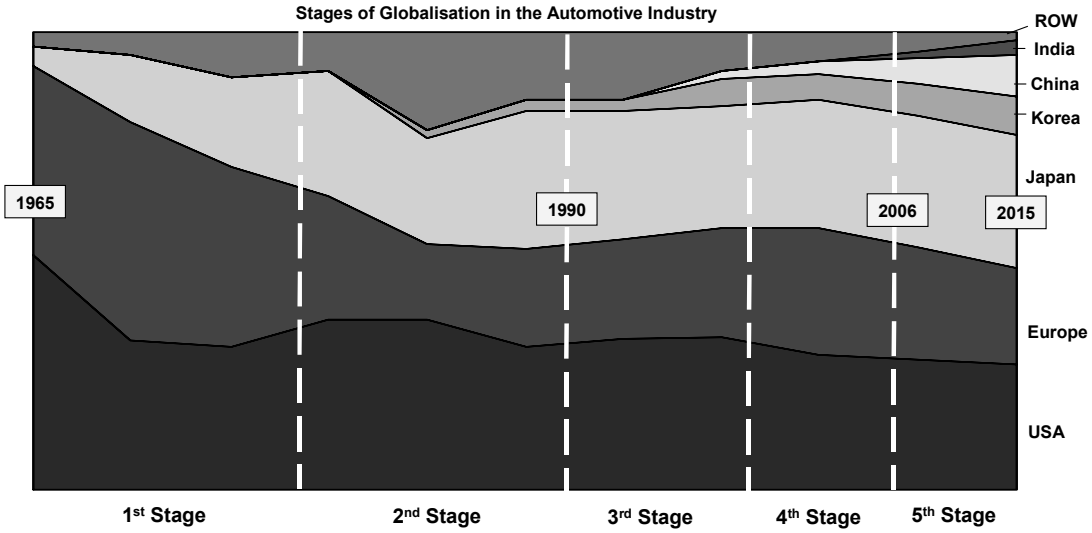
30. Whilst crude steel production is essentially still very fragmented, there are individual product market segments where consolidation has progressed very significantly. And in fact it is in some cases more consolidated than the customer segments. I would like to look in particular at a case study of the automotive industry.

31. There are only now 11 truly independent, large scale, auto assembly companies as opposed to any semi-independent but affiliated and partially owned auto assemblers. This has declined from 45 such companies in 1960, and this despite the substantial growth of overall automotive production.

32. Table 7 illustrates that the automotive industry itself has globalised in a not dissimilar way to the way in which the steel industry has globalised in terms of the location of automotive assembly.

33. This can be described in five different stages. The first stage of the 1960s and 1970s being dominated by North America and Europe as world leaders in automotive innovation, excellence and scale of production. Starting in the ‘70s and growing rapidly through the ‘80s, Japan broke through and gained a similar reputation if not better, for excellence, knowledge transfer and a continuous improvement culture.

Table 7 – Stages of Globalisation in the Automotive Industry



34. The third stage starting at about 1990, saw South Korea develop very strongly, somewhat through alliances with car makers in other geographies. The forth stage of development is now in full swing with the growth of the Chinese automotive industry currently with a capacity of 5 million vehicles a year, both through indigenous OEMs and joint ventures, but likely to grow to 15 million vehicles a year over the next decade.

35. The fifth stage which we are now entering should see the growth of the Indian automotive sector to match somewhat in scale the Chinese development.

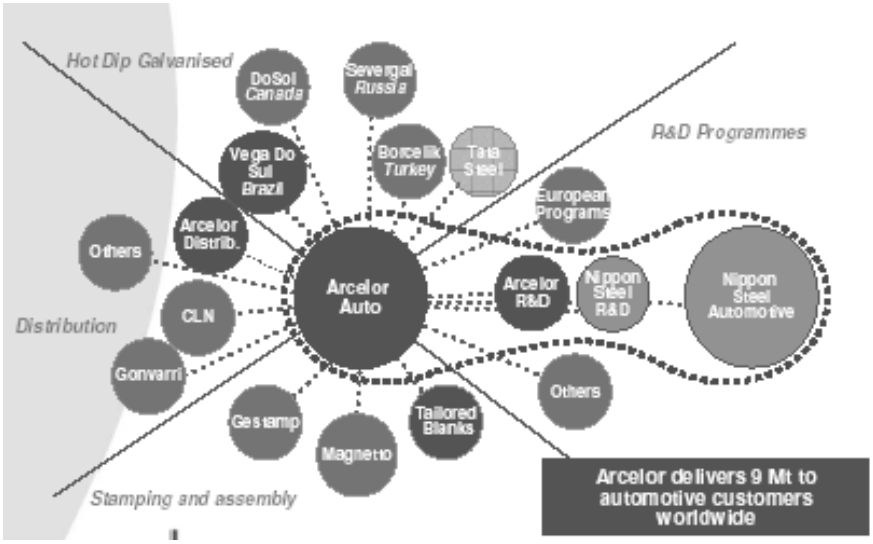
36. The steel industry has had to respond to this development. Individual car assemblers wish to have the same product quality all over the world. They wish to have the same steel grades, the same supply structures, the same ability for just-in-time delivery, the same level of technical support and so forth, which they may have in their home market to be replicated Worldwide.

Table 8 – Toyota Assembly Assets

37. Table 8 shows the physical location of Toyota's assembly assets across the globe. It is the job of suppliers to match this assembly structure as closely as possible.

38. In the case of the steel industry, which historically has returned extremely low returns on capital and through that and state ownership had a lack of capital available to it to spread its physical assets around the world; we have seen the growth of joint ventures and alliances to access and serve this growing market.

Table 9 – The Arcelor Automotive Supply Structures
Leading and sponsoring a network of automotive suppliers



39. Table 9 is Arcelor's illustration of the Arcelor/Nippon global automotive alliance structure. What such an alliance achieves is a 'virtual' presence for Arcelor and Nippon in a range of markets; EU and Japan naturally, but also China, India, Russia, Brazil and North America. It also provides the ability to deliver service as well as product and to integrate downstream knowledge (stamping) into steel specification decisions. It entails seamless integration of Arcelor and Nippon's technical development programs : a very demanding and unusual condition.

40. These structures are probably unstable in the long term as they represent a practical and empirical response to the need for global reach and the physical shortage of capital. As the steel industry is now returning better returns on its invested capital as we shall see shortly, it is becoming more possible for steel companies to physically consolidate ownership structures and to gain better control over their dispersed automotive servicing assets; witness Arcelor's recent acquisition of Dofasco.

41. The case of the automotive industry also shows that consolidation in individual products can be high. The global automotive industry requires approximately 70mt of flat steel products p.a. With Arcelor's recent acquisition of Dofasco they will supply in excess of 11mt; whilst the total alliance shipments are probably close to 20mt.

The role of capital markets

42. So far I have addressed the topics of this paper from the inside perspective of the Steel companies : that is from how they look at these topics in their boardrooms and as they consider their strategic options. However, these considerations would be futile unless the surrounding economic environment did not facilitate their fulfilment.

43. For a long time the environment was inimical to these consolidation and globalisation imperatives. State ownership of steel assets was predominant in the steel sector until very recently. Even today, with the growth of the 90% state (central and provincial) owned steel sector in China it is significant; probably still accounting for 40% of world capacity. If the Chinese industry is excluded then state ownership has declined from perhaps 50% of capacity to less than 10% over 20 years.

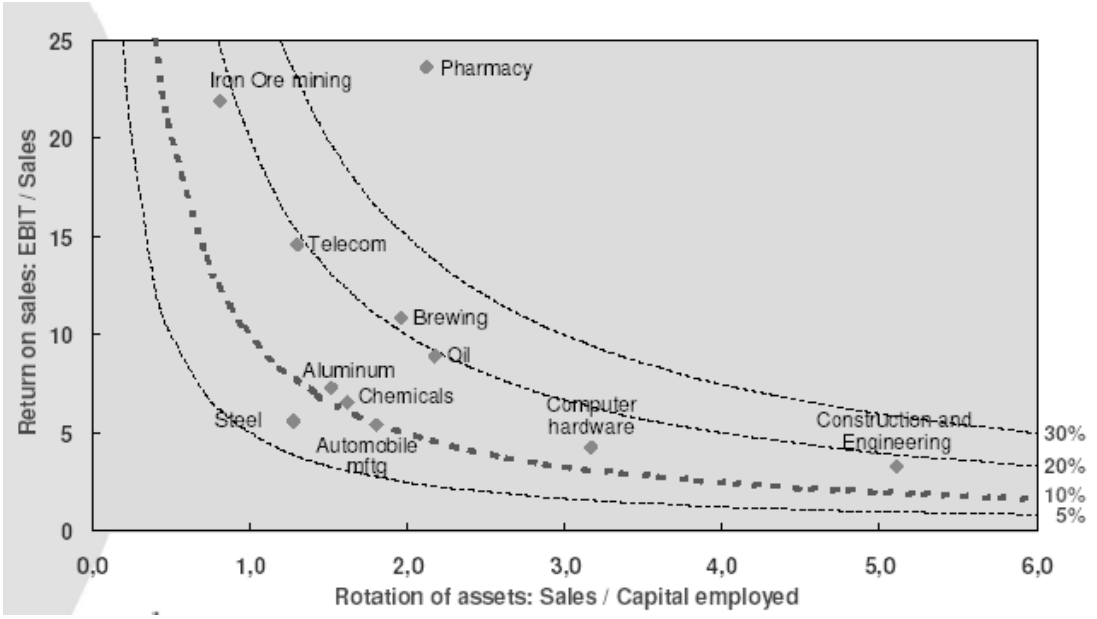
44. This process of privatisation started in the mid '80s with British Steel being the first major example and accelerated through the '90s especially with the dramatic collapse of state ownership in the FSU.

45. Whilst States were the dominant provider of capital steel companies were forced to be largely national in character and consolidation, with few exceptions, could only take place within national boundaries. State imperatives of employment protection, trade policy and "strategic" or military purposes shackled the steel sector to underperformance, in economic terms, and to the servicing of local market needs.

46. This situation was not helped by the continuous interruption to normal economic activity by protectionist calls or calls for centralised plans of reorganisation. The largest of the latter was the D'Avignon plan and hopefully the last of the former was Bush's invocation of Section 201 in 2001.

47. Whether as cause or effect the steel sector was also crippled as to its capacity to achieve a desirable return on capital – so that even private sector steel companies were progressively starved of funds for growth due to their inability to provide shareholders with an attractive return. Table 10 shows the steel sector's positioning in economic returns compared to other sectors during the '80s and '90s – all competing against each other for shareholders attention in the market place for capital.

Table 10 – The Steel Industry has not been able to pay the cost of capital across the cycle

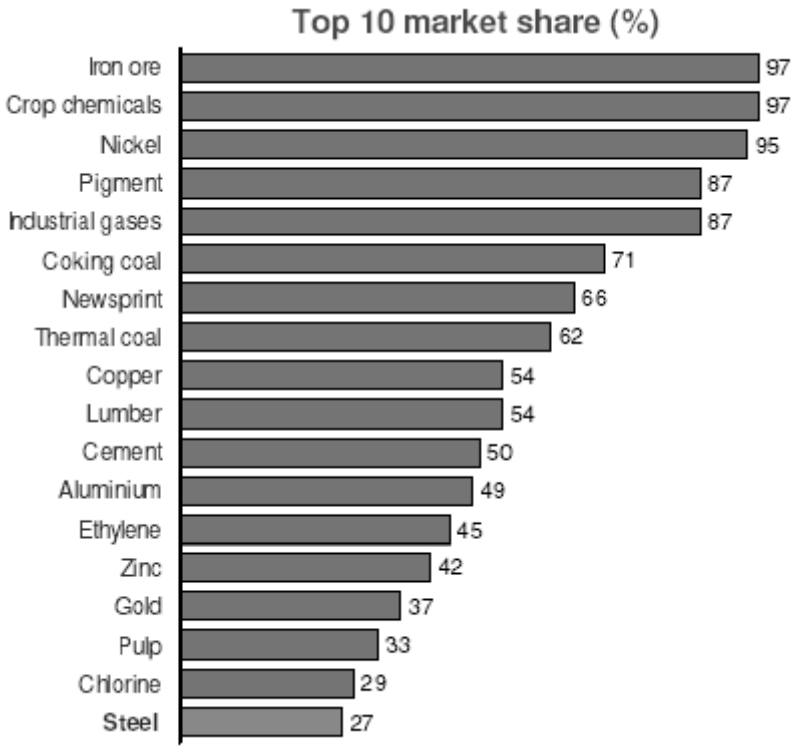


48. The diagram plots the position of different industries in terms of sales to capital employed and return on sales. In addition the total derived return on capital is shown against 4 "hurdles" of 5%, 10%, 20% and 30%. The average return on capital for the 20 years to 2000 was about 7%. The cost of capital can be accurately calculated as approximately 9.5%. Thus the industry was actually, and was seen to be, unattractive. It destroyed economic wealth.

The road to economic value creation

49. Through the '80s and into the mid '90s economists and corporate financiers in particular, began to realise that the retreat of state ownership would create an opportunity to reverse this long-term destruction of value. If the performance of other commodity type industries is examined two characteristics go with higher returns: lack of state interference (indicated by lack of state ownership) and degree of consolidation. Without doing a detailed analysis, a glance at the other industries plotted on Table 10 will suggest a lower level of state ownership in those industries outperforming steel.

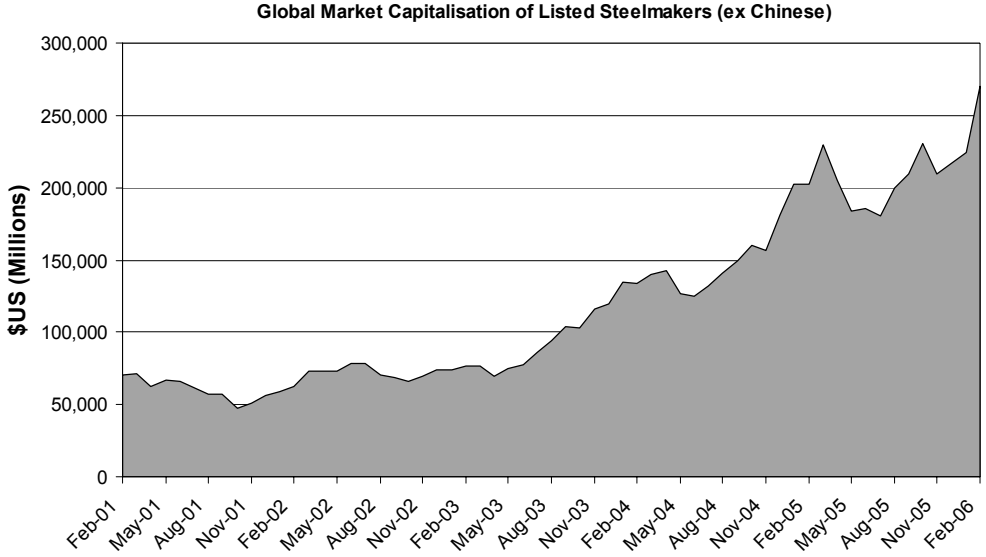
Table 11 – The Steel Industry is less concentrated than other base materials industries



50. Table 11 shows a wide selection of commodity or materials sectors and the market share held by the largest 10 corporate entities in the year 2003. The consolidation does not always produce an industry which is high performing but it invariably produces an industry performing better than steel and meeting its cost of capital. To take a few examples of particular relevance to steel : iron ore, aluminium and cement – all perform above the cost of capital and at 1.5-3 times the level at which steel used to perform.

51. The road to economic value creation was seen to be privatisation followed by consolidation. To achieve the latter required willing capital markets.

Table 12 – Global Market Capitalisation of Listed Steelmakers (ex Chinese)



52. Table 12 shows how willing these have been over the last few years. The market capitalisation of listed steel companies has more than quadrupled in the last 5 years. The availability of capital has been the gasoline in the consolidation engine.

"Overcapacity" and China

53. Some readers/listeners may be getting agitated that no mention has been made of overcapacity and China. The first topic was cited by many eminent steel industry observers and members as the reason for the low economic performance of the industry – and this over many years. Indeed the overcapacity was used as one reason to promote state involvement and trade barriers. I myself was a sceptic. It always appeared to me that any mature, developed industry with freely available technology and plenty of experienced managers would tend to have more capacity than market requirements. Indeed if capacity fell short prices would rise and more capacity would be created to meet that need and further expectations of further need.

54. The problem always appeared to me to be a lack of good management of capacity and this itself was a function of state ownership, breeding, economic irresponsibility together with lack of consolidation meaning too many price setters and capacity investment decision takers.

55. So overcapacity as a hindrance to economic prosperity always seemed a "red-herring".

56. Then in the late '90s along came China's explosive growth in steel demand. Of course their growth had been consistent at approximately 20% p.a. from the late '80s, with one short period of adjustment in '92-'94; only few people bothered to notice or consider the consequences of this. China's steel demand exceeded its production capacity from 1990 to 2005. At its peak China represented a 35mt p.a. production "deficit" or demand surplus. Suddenly in the early 2000's capacity of steel world-wide came into balance with demand; prices surged in 2002-4 and the returns available to steel makers became very attractive.

57. All the important stars were in alignment for consolidation to take a major step forward; the retreat of the state through privatisation, awaking capital market interest, radically improved returns and the elimination of "overcapacity".

58. These are the reasons we have seen a surge in consolidation activity; supported by capital markets. Thus the level of M&A activity in the steel sector was US$13.8bn in 2001 and US$28.2bn in 2005.

Acquisitions, mergers, joint ventures and strategic alliances

59. The means to consolidation deserves a short mention. All the means in this subheading represent levels of consolidation as they all represent different ways of coordinating activity to a common purpose. However joint ventures (JVs) are definitely only a temporary or small-scale contributor. Almost all JVs represent one person's way into a business and another person's way out. They are a function of either capital shortages, an emerging market not yet capable of supporting two independent producers, or a result of a political blockage to full ownership. As such they are essentially temporary in nature. The same applies to Strategic Alliances which are often announced as a prelude to something very substantial but not yet fully defined.

60. Mergers are desirable in one sense; they require no premium to be paid by either party and so do not endanger shareholder value at the point of transaction – but they often fudge the issue of control and endanger shareholder value in the longer term. The most conspicuous case of this in recent years was the creation of Corus from British Steel and Hoogovens. When mergers are long planned and thought through; such as Thyssen and Krupp, they can succeed.

61. The predominant pattern of consolidation will be through mechanisms of acquisition which deliver full control to one group of executives sharing a common business culture and economic vision. Even the automotive alliance structure is essentially a response to shortage of capital and political difficulties.

The competitive and customer impact of consolidation

62. In general consolidation will be good for customers because an economically healthy steel industry will be good for customers.

63. A highly fragmented steel industry lacks the capital access to invest in new technology and in new products, to compete with alternative materials, to attract management and technical talent and deliver what the customer requires when he requires it and in the condition and to the specification which he requires.

64. Furthermore, and of the greatest significance, a fragmented industry has demonstrated its difficulty in dealing with volume volatility except by recourse to price volatility. Price volatility is bad for customers. Many customers are primary processors of steel; this includes distributors, fabricators, pipe and tubers, wire drawers etc. These customers have simple manufacturing processes and limited value added. Indeed for perhaps the majority of steel's direct customers the cost of steel represents more than 50% of their total costs. These customer sectors are also highly fragmented and have limited access to credit and working capital. Price volatility is very difficult for these customers to deal with. Indeed it has a real cost in itself and often threatens the very existence of the business.

65. In the absence of a price risk hedging mechanism such as steel futures contracts – which may one day become an accepted and popular feature of the steel market place, consolidation is the best means to facilitate increased price stability.

66. Of course consolidation may go too far but most jurisdictions have adequate anti-trust mechanisms in place to act as a deterrent to outright oligopoly and cartel.

67. It should also be emphasised that consolidation does not mean absence of competition. Indeed most competition in the steel market is inter-material not intra-material. In the auto sector it is a fight between steel and aluminium and to a less extent plastic. In construction it is between steel and concrete.

68. Even if in a continental context such as the EU a combined Mittal/Arcelor existed this would only represent some 35% of the flat rolled market and there would still exist 8 remaining independent producers of flat rolled steel within the EU; including the technical leaders in the auto, tinplate, electrical steels and construction sectors.

Prediction is always difficult …. Particularly when it involves the future (Nils Bohr)

69. So, bearing in mind Nils Bohr's proviso, and assuming no environmental, political and trade catastrophe and that effective reductants can be found which don't generate "free" CO_2; what can we foresee for the future?; say to 2030 or 25 years ahead?

70. Global steel requirements will be around 1.7mt p.a; capacity will continue to exceed demand by approximately 15% but prices will only be volatile to a maximum of 10% over any 6 month period. Steel futures will play a part in that but it will also be a function of industry structure.

71. The largest 5 steel companies will control in excess of 50% of global production – perhaps even more. The largest such company might control 250-300m tonnes of annual capacity of crude steel manufacturing. This will still represent less than 20% of world demand.

72. Of the steel made 36% is today from the EAF route. Currently and for the next decade, scrap supply at acceptable prices will be short : given that the time lag of increased consumption to obsolescence is 15-17 years. However in our time scale this will have worked its way out and 50% of World steel will be EAF : with a substantial increase in DRI and other equivalent products.

73. EAF steel will be made locally at the source of scrap and demand. Virgin iron unit steel will increasingly be made close to the source of iron ore so that the trade in semi-finished steel, overwhelmingly slabs, will expand enormously; perhaps reaching 200mt – only a 7% p.a. growth rate. Most of this trade will be captive to individual companies who will supply to finishing facilities especially in NA, EU and China. There will be no economically justified new BF's in these countries and few economically justified relines. China will become again a net importer of steel, particularly in semi-finished form, as its comparative economic advantage in steel is negative, whilst in steel intensive manufactured goods it will remain positive.

74. For this trade in steel the country which stands to benefit most is India which has iron ore, a large and growing market, emerging sophistication in capital markets and engineers and entrepreneurs. Other beneficiaries will be Ukraine, Brazil, then Russia and possibly South Africa and Australia and also possibly West Africa.

75. The steel sector will be supported in these developments by capital markets for whilst steel; as a mature industry, cannot expect to achieve "super" returns it will – as long at it avoids an increase in state interference – achieve better than the cost of capital and can expect to exist in a range of 12-15% returns.

76. There will still be many steel companies at different points in the value chain, integrated and non-integrated, in specialist niches by product or geography or raw material access etc. One reason for this is that whilst consolidation raises the level of performance of a materials or commodity industry as a whole,

it is not necessarily the largest companies which show the highest returns. These tend to be smaller niche operators.

77. Upstream and downstream we may see the pattern of the past somewhat reversed, I should expect much more integration upstream by the steel producers and not much more downstream, indeed given the growth of steel requirements we may see a decline of downstream integration in percentage terms. Although individual smaller scale producers may find particular niches or technologies they can exploit to become predominantly steel processors rather than makers.

78. In general we will witness the playing out of the principles of comparative advantage combined with capital markets imperatives – and my predictions will probably turn out to have been too conservative.