1. Introduction

This paper reconsiders the development of the Indian steel industry after the country’s independence in the late 1940’s, not least focusing upon industrial policy and the system of capital accumulation. The policy reform launched from 1991 allowed the private sector to enter the steel business, which had previously been reserved for the public sector, and the government implemented various deregulation measures (Gedam 1999, D’Costa 2000, Vaidya 2002, Sengupta 2004, Sato 2007). The industry shows a faster growth after the reform than before and this performance has been readily and casually attributed to neo-liberal policy. However, it is misleading to understand that ‘free markets’ have brought this faster growth, and the dichotomy between market and state obscures the reality of the development. Indeed, as the industry is typically characterised by having scale economies, entailing massive initial investment and specific assets in the production sphere, and forming monopolistic or oligopolistic markets in the exchange sphere, it offers little justification for assuming the existence of a perfect free market and the non-existence of transaction costs. This paper argues that the development should be understood as the complex outcome of underlying political and economic relations and interests.

To demonstrate this point, this paper compares the development of the Indian steel industry with that of Japanese and South Korean. There are two reasons why these three countries are compared. First, industrial policy towards the steel industry has, in the broadest sense, been pervasive in these countries due to its strategic importance. Second, the content and method of industrial policy for each country toward the industry share the same features to some extent, but their effects and outcomes differ across the countries and over time. As such, the methodological and empirical issues found in the debate over the development of the Japanese and South Korean steel industries are also relevant to the study of the Indian steel industry.

The most important general implication of this paper is that the development and restructuring of the industry would be better understood by conceiving market and state as being “the consequence of or form taken by underlying political and economic relations and interests” (Fine 2006, p. 114), rather than taking the dichotomy as an analytical starting point. In other words, the paper shows the strong need to situate political and economic relations and interests.
as a basic layer of analysis. As an alternative approach, the paper examines the political economy of industrial policy in terms of the restructuring of capital in the steel industry.ii

The next section briefly reviews selective literature on the steel industry and argues the limitations of the approaches taken. Section 3, comparing India with Japan and South Korea, delineates some aspects of the underlying political and economic relations and interests which have been driving the development and restructuring of the steel industry in these countries. The last section briefly offers some implications for industrial and sectoral studies.

2. Literature survey relating to the steel industry

In general, there is much less literature studying the steel industry than focusing on the automobile or electronic industries. This could be because export-oriented industries have drawn attention in the debate on the East Asian Miracle and the Asian Crisis. However, the integrated steel firms of Japan, South Korea and India have been studied widely in terms of the importance of industrial policy.

Thus, although neo-classical economics literature tends to undervalue the role played by the state and industrial policy, the steel industry has been an exception. For example, even Balassa (1988), a famous free trade advocate, in denying strategic state intervention in South Korea during its rapid economic growth, accepted the importance, or at least the existence of industrial policy for the South Korean steel industry, noting “apart from the promotion of shipbuilding and steel” (p. 286).

Yet, when it comes to conducting ‘empirical’ studies, neo-classical economics is destined to reduce or obscure the effects of industrial policy by its strict adherence to mathematics and the various assumptions involved. Conducting such calculations, some studies suggest that to develop the steel industry in developing countries, free markets and trade should rule (Truet and Truet 1997). However, there are a number of theoretical and empirical flaws in the studies that estimate an aggregate production or cost function for the steel industry, for almost no assumptions that are needed to conduct such calculations, such as perfect competition in input and output markets, the existence of optimising agents, and constant returns to scale, hold true for the conditions of steel production and markets (Sato 2005). As such, the results of these studies, and corresponding policy implications, are highly dubious.iii

With regard to methodological aspects, these earlier studies tend to focus on rationality or efficiency of the workings of the market and to conceive state interventions as a response to market failures. The economy is explicitly or implicitly conceived as a set of numerous ahistorical homogenous utility maximising consumers or profit maximising firms. Consequently,
on the one hand, they tend to overlook the sectoral transformation of specific countries and the changes in specific industries. Also, by focusing on the aggregated indicators, differences and complex relations between industries are often neglected. On the other hand, state interventions for various industries are conceived as ‘microeconomic’ supply-side measures which are separable from ‘macroeconomic’ demand-side policies. For the steel industries, the markets have been never perfect both for supply and demand, and state interventions have been prominent in various ways, trespassing across the conventional dubious distinction between macro and micro economic policies.

The developmental state approach shows considerably different views on the development of the steel industry (e.g. Amsden 1989, Shin 1996, D’Costa 1999). As the facility investment needed for establishing a modern integrated plant is massive, it is often argued that there are high barriers for developing countries to launch steel projects. And when such projects are successful, such as in Japan and South Korea, latecomer’s advantage is often stressed and, in realising this advantage and the role of government, institutions and social capability are focused upon. In short, the approach argues that integrated steel producing technology can be introduced, managed and run only by a set of wise industrial policies and by well-organised institutional capability.

The developmental state approach can be divided into two schools, the political and economic (Fine 2006, 2007). The political school focuses upon the relations between various agencies, such as the government, public and private financial institutions, industrial associations and individual firms. The (embedded) autonomy of the state in forming and implementing industrial policy is regarded as the key factor of success (e.g. Evans 1995). One problem with this is that it tends to result in arguing that the developmental state is destined to undermine its basis as industrialisation proceeds, implying that it has limited life. It argues, not least facing the Asian Crisis, that globalisation and the rise of the strong economic class have lessened the room for industrial policy. This is not convincing when looking at the steel industry, as will be discussed in the next section.

The economic school focuses upon the contents of industrial policy. Chang (2006, Chap.7) offers various examples of industrial policy that can be justified by economic theory. The categories of industrial policy listed by Chang can be summarised as follows: first, state coordination for complementary investments in the presence of scale economies and capital market imperfections (big push, industrial plans); second, coordination of investments for competing projects (managed or excessive competition), recession cartel and M&A for decreasing social costs; third, industrial policy for ensuring cost competitiveness (industrial
licensing, government procurement, export requirements, and subsidies) and the maximum possible scale in production (luxury consumption control) in the presence of scale economies; and fourth, protective industrial policy offering social insurance for the shortrun (recession cartels) and promoting structural change in the longrun (cartels for the structurally depressed industries). Facing the Asian Crisis, the economic school argues that various liberalisation measures resulted in the demise of industrial polices, and that the liberalised regime for foreign capital exposed the domestic economy to an inherently unstable international capital market (Chang et al. 1998). Moreover, they argue that deregulation was promoted through external pressure.7

In short, the economic school of the developmental state approach has pointed out that state interventions went beyond remedying cases of market failure, as exemplified by the well-known phrases, ‘getting the relative price wrong’ (Amsden 1989) and ‘governing the market’ (Wade 1990). Thus, an implication of this school is that in the catching-up phase, there is a plenty of room for the state to push economic development through trade, industrial, and technological policies (Chang 1994).

It is true that each measure listed above is observed in the steel industries of Japan, South Korea and India, as will be studied in the next section. However, ‘justification’ for industrial policy cannot offer why and how such policy materialises (or does not materialise) in certain countries at certain times and brings different results, and as such, throws this problem back to the political school. In addition, “justifying” industrial policy in this manner presumes a state v. market dichotomy. Consequently, as Fine (2006) points out, this approach can and has been absorbed and outflanked by the information theoretic approach, which ‘justifies’ wider state intervention in developing than in developed countries, based on the existence of pervasive market imperfections in the former.

3. The steel industries of Japan, South Korea and India

In order to examine the political economy of industrial policy in the Indian steel industry, this section offers case studies of Japan and South Korea in addition to India. Industrial policy is often seen as successful when the industry is growing rapidly and as unsuccessful when the industry is stagnating. The existing literature was searched for successful cases in the period from 1946 to mid-1970s for Japan, from the early 1970s to the mid-1990s for South Korea, and from 1991 to the present for India, while for unsuccessful cases in the period from the mid-1970s to present for Japan, from the late 1990s to the present for South Korea, and from 1948 to around 1990 for India (Figure 1). As noted above, a problem with case studies is that
the success and failure of industrial policy is readily interpreted in terms of market v. state. The purpose of this section lies neither in testing the effects of industrial policy nor in finding theoretical justifications for it, rather in depicting interactions among underlying political and economic relations and interests by focusing upon industrial policies.

Figure 1 Trend of Crude Steel Production (1946-2005, million tonnes)

Sources: Handbook for Iron and Steel Statistics, various issues (Japan Iron and Steel Federation), Steel Statistical Yearbook, various issues (Korea Iron and Steel Association), Statistics for Iron and Steel Industry in India, various issues (Steel Authority of India Limited), Steel Statistical Yearbook, various issues (International Iron and Steel Institute).

3-1. Japan and South Korea: The development phase v. stagnation and crisis?
The Japanese steel industry showed rapid development from 1946 to the early 1970s. Crude steel production increased from 0.6 million tonnes in 1946 to 119.3 million tonnes in 1973, even exceeding the US. The industry has established the most efficient steel making model in the world, that is, creating integrated steel works with mammoth blast furnaces, basic oxygen furnaces (BOF), and hot strip mills sited at deep water ports in the late 1950s, and the competition among the six private integrated firms realising scale economies of this model through the 1960s and 70s. In the case of South Korea, crude steel production increased from almost zero in 1970 to 23.1 million tonnes in 1990. The main agency in this process was the sole integrated firm, POSCO, a state-owned firm.

Various studies have attributed the development of the steel industries of Japan and South Korea to wise industrial policy in raising finance and choosing technology, on the one hand, and the autonomy of the government, non existence of a strong economic class, and/or the capability of bureaucrats and institutions in formulating and implementing policies, on the other (Amsden 1989, Shin 1996, D’Costa 1999). The governments have been praised for making the right decisions in selecting state-of-the-art technology, raising finance successfully for this, and for establishing the oligopolistic (Japan) or monopolistic (South Korea) market structure through various industrialisation policies. It is undeniable that these policies played an important role in materialising the scale economies of steel production so effectively. Also, it has been argued that due to the size of the economy and the difference in political regime, in addition to the non-existence of integrated steel production before the Second World War, state intervention in South Korea had been much more direct than for Japan (Shin 1996). There is some truth in these arguments. However, they involve points that are misleading, each of which is now discussed in turn.

First, there was no space in the ‘initial condition’ where the government could enjoy autonomy. The Japanese government had been affected by various internal and external interests in the initial conditions, not least by US interests and the inherited capital of the industry before and during the Second World War. The interaction between the changes in the policies of the US Occupation Force and the response to these policies by the industry as well as by the government eventually enabled the rehabilitation of the industry and altered its structure (Ichikawa 1969). Also, “it was nothing more than superb luck” (Yonekura 1994, p. 197) that steel demand increased due to the Korean War breaking out in 1950. Even after the occupation ended in 1952, for technology, finance, raw materials and export, the industry depended heavily upon the US and, as such, the pattern of restructuring was frequently affected by the interests of the US.
Similarly, it is misleading to assume that the South Korean government was free from political and economic relations and interests in launching its massive steel project. The government had gone through significant struggles up until POSCO was established as a state-owned company (Amsden 1989). As South Korea had been facing a reduction in US aid and mounting pressure from North Korea, and as the international competitiveness of the light manufacturing industry such as textiles was eroding, the steel project was given top priority to lay the foundations for heavy industrialisation. When the World Bank rejected South Korea’s request for a loan, concluding that its economy was immature for integrated steel production, the finance and technology was arranged by the military government mainly through the Japan-Korea Normalisation Treaty of 1965. Also other changing relations and interests contributed to the establishment and expansion of POSCO, not least, the economic stagnation of advanced countries after the first oil shock enabled South Korea to raise foreign funds at low rates of interests.

Second, the institutional capability argument unduly focuses upon the relations among the government, integrated firms and financial sector in achieving the necessary technological introduction and innovation, and tends to neglect the changes in the steel industry as a whole. Within the Japanese steel industry, the impressive development in production and exports of this period coincided with the massive restructuring of Open Hearth Furnace (OHF) and Electric Arc Furnace (EAF) companies as well as the workforce (Ichikawa 1969). The process of centralisation and concentration of capital into the integrated firms was intensified by the government, representing and reflecting the balance among interests of various steel firms and other agencies.

For South Korea, the development of POSCO typically represented that of the South Korean steel industry as a whole. As such, how POSCO developed in the 1970s and 80s has been the main subject of study and, consequently, the development of private minimills and rolling makers established in the period has been neglected. Their establishment occurred under government entry regulations, but was not neatly planned (Abe 2007). Indeed, they suffered from excessive capacity in the 1980s, an aspect of the underlying political and economic relations and interests that prompted policy changes in the late 1980s.

In contrast, for the period when steel industry growth slowed both in Japan and South Korea, it is often conceived that the role of the government had become limited and that there was a need to shift industrial policy towards a neo-liberal policy of liberalisation. In other words, the argument is that there is a demise in the role of developmental industrial policies as the economy matures, since it becomes difficult for the government to formulate and implement
industrial policy. First, it loses its disciplinary power over the private sector and, second, it cannot imitate any more the technological path and choice of advanced countries, reaching the frontier of its technology. Also, it is often pointed out that on the road to becoming an advanced country, the room for industrial policy to manoeuvre decreases, not least due to the international (free) trade regime. However, liberalisation should be understood as another type of state intervention, reflecting changing political and economic relations and interests. Furthermore, state intervention, or industrial policy in the broadest sense, shows no demise at all.

For Japan, since the early 1970s, the production volume has been fluctuating around 100 million tonnes, and has never exceeded the level achieved in the early 1970s. Because of the overcapacity problem, the production capacity of the integrated firms was reduced, particularly in the mid-1980s. At the same time, the established integrated steel making model was strengthened by the introduction of various energy- and cost-saving technologies, such as continuous casting machines and automation. In the case of South Korea, the growth was punctuated by the Asian Crisis in the late 1990s. The share of crude steel production of the integrated steel firms decreased both for Japan and South Korea in this restructuring phase, reflecting the relative rise of EAF companies.

First, the government has been continuously involved with the changes in market structure and the stabilisation of prices, even though the methods and effects of policy differ across time. For the integrated steel firms, upon their request, the Japanese government stopped and adjusted the excessive competition for facility investment to build new integrated works, and promoted a merger between the largest two (Yawata and Fuji) (Yonekura 1994). The merger took place in 1970 to form Nippon Steel Corporation (NSC), but was unable to stop the investment pattern of the integrated firms. The facility investment competition came to an end in the late 1970s through the increasing overcapacity problem and trade friction (Yonekura 1994). Further, the integrated firms were forced to restructure in the mid-1980s facing price competition from the minimills and growing foreign firms, such as POSCO, as well as falling domestic demand and the appreciating yen after the Plaza Accord. In forming their restructuring plans, the integrated firms consulted with one another and the government was involved in coordinating the process (MITI 1987). In the late 1990s, after experiencing the long recession and in the face of external and internal pressure, the government abolished the ban on establishing holding companies by amending the Anti-Trust Act.iii This, in addition to other factors such as massive international restructuring in the automobile and mining sectors, prompted the reorganisation of the five integrated firms into two groups in 2002.

In the EAF sector, minimills sought policy measures to coordinate falling prices of
their products after the first oil shock, in a situation of low capacity utilisation, a rapid increase in the prices of electricity and wages, and a rise in import prices of steel scrap. The government allowed a recession cartel for some long products in 1977 and implemented a structural improvement programme to abolish excess capacity of 3.9 million tonnes in 1978, designating the EAF sector as the ‘structural recession sector’ (Noble 1998). The latter policy also regulated new establishment and renovation of EAFs, and promoted M&A. This regulation lasted until 1988, and most minimills followed the policy. Some minimills had tried to resist this policy and began to compete with the integrated firms in some relatively high value-added long products in the early 1980s, undermining the price leadership of the integrated firms.

For South Korea, the privatisation of POSCO was promoted and entry restriction was removed due to internal and external pressure in the late 1980s. This triggered structural change in the industry (Abe 2007). POSCO invested in the downstream process, such as cold rolling, since the privatisation forced POSCO to invest in high return projects as well as try to match the development of the Korean automobile and electronics industries. This created intense competition in the flat product markets among existing minimills and rolling companies and they too began to invest in new facilities, with the involvement of conglomerates. In addition, the government implemented the ‘My Home’ policy in the late 1980s. This increased the demand for long products and, thus, the minimill companies began to build new EAFs in the 1990s and even POSCO built an EAF in 1993, which also stimulated investment competition. These investments were facilitated by the liberalisation of capital markets. The intensified competition between conglomerates across the industries exerted internal pressure on the government to deregulate further, not least in finance, and in turn investment was driven by financial liberalisation. As a result, fierce investment competition materialised in the steel industry. As is well known, the first three companies whose collapse triggered the crisis in Korea in 1997 were steel companies.

After the crisis, the government, pushed by the international financial institutions, promoted and arranged M&A for bankrupted firms. For the steel sector, the Hyundai automobile group has played the major role. Also after the crisis, POSCO was privatised completely in 2000. The Hyundai automobile group announced installation of a new integrated works in 1995, prompting the plan to be at once denied by the government resorting to its remaining regulatory power in fear of excessive capacity. Nevertheless the group has continued to make efforts and it plans to install an integrated steel works by 2011.

Second, the so-called ‘macro policy’ and other policy such as fiscal policy towards public construction is also the result of underlying relations and interests, and in turn has
affected the industry. For example, the Nixon shock of 1972 and the Plaza Accord of 1985 sharply appreciated the yen. The Japanese government had to allow the Plaza Accord due to the international situation. As a result, the Japanese integrated firms further lost their control over prices. Due to the recession caused by the appreciation of the yen, the government lowered the bank rate to extremely low levels from 1987 to 1989, which triggered the economic bubble. In addition, the regulation of the establishment and renovation of EAFs lapsed in 1988. Consequently, there was an investment boom on building EAFs as domestic steel demand surged. However, after the bursting of the bubble, the government was forced to cut its budget on public works. The EAF association again requested the government to implement some legal measures to protect the sector which significantly depends upon public construction. The Industrial Regenerating Act of 1999 was the response, and some EAF companies have been restructured in accordance with the scheme laid out by the Act.

Third, the Japanese government has been involved with the internationalisation of the steel industry. Dealing with continuous trade friction with the US and EC, the government was involved in mediating the friction and framing the various trade schemes. As a result, in addition to the request of the Japanese automobile and electronics industries, the Japanese steel industry began to make FDI in the US in the early 1980s. Since the 1990s, the integrated steel firms have invested in building the downstream sector, such as cold rolling and galvanising processes, in Southeast Asian countries. This is partly to meet the request of the Japanese automobile and electronics sectors which invested a little earlier in these countries. The government together with the steel and other manufacturing industries have made efforts to promote Free Trade Agreements (FTA), easing the exports of various ‘mother steel products.’ For South Korea, POSCO, responding to the changing relations and interests such as Hyundai’s plan to build an integrated plant, has begun to invest heavily in Asian countries including India and Vietnam. The government is also making efforts to promote FTA treaties with these countries.

In short, the case studies of Japan and South Korea shows that industrial policy has always reflected underlying political and economic relations and interests but has brought about different results in different contexts. As such, it is misleading to conceive that there was ‘autonomy’ of the government in the development phase and that there was, in the broadest sense, a demise of industrial policy in the period of stagnation.

3-2. India: Failure of industrial policy and success of liberalisation?

India shows a sharp contrast with the cases of Japan and South Korea. As discussed across the literature (Sidhu 1983, Gedam 1999, D’Costa 1999, Vaidya 2002, Sengupta 2004,
Sato 2007), India succeeded in installing state-owned integrated works in the late 1950s, but growth was slow after the mid-1960s (Table 1). Crude steel production exceeded 15 million tonnes only in 1990, taking more than 30 years from the start of the national steel project, while South Korea achieved the same level in 15 years. The integrated steel making technology that India chose was the OHF method, which is much less efficient than the BOF method, and the plants are located inland close to the iron ore and coal mines.

Those studying performance have argued that industrial policy partially succeeded in establishing and expanding steelmaking capacity, but that it was not satisfactory in materialising scale economies of steel production and selecting technologies (D’Costa 1999). It is pointed out that the government had been influenced by various interests in formulating and implementing policies and the capability of institutions had been weak. Needless to say, there is some truth in this, but the problem is that the interpretation is casually attached to the argument of state failure. Here, the formulation, content and effects of industrial policy will be examined in terms of the underlying political and economic relations and interests involved.

First, India tried to promote economic independence in addition to political independence. This resulted in the Nehru-Mahalanobis model of heavy industrialisation, which pursued import-substitution industrialisation. The policy brought the steel industry under strong governmental control in every aspect of corporate activity, and established state-owned steel works with foreign aid, not least from the USSR. Industrialisation was punctuated in the mid-1960s, mainly by a drought which damaged the agricultural sector and the suspension of US aid due to the wars with China and Pakistan. The government, then, at the expense of state-owned steel firms, set steel prices lower than costs for most products in order to provide the inputs domestically for the steel-using industries and for the protected small-scale industry, reflecting the balance between the changing relations and interests.

Second, the national steel project was trapped in using the OHF method with its resource-based location, which turned out to be considerably inefficient and costly compared to the BOF method sited at deep water ports, which emerged in the late 1950s in Japan; the timing in India was a little early, and India had rich reserves of iron ore and coal, while Japan and South Korea depended upon imports. The location of the integrated steel works was not related to the location of the steel-using industry that includes the automobile and ship-building industries, thus increasing transportation costs. Facility investment had been directed towards capacity expansion of the OHF method in the 1960s and 1970s rather than shifting to the BOF method due to various reasons such as the shortage of foreign money. Also, as the policy promoted domestic procurement and restricted imports of raw materials, the technological
development was directed towards using low quality coal which was domestically available.

Third, the decision making power of the state-owned company (SAIL) had been severely restricted by the government. As such, any plans for the layout of a plant, employment, product mix, investment and so forth could not be formed and implemented efficiently. Not least, with regard to employment, the integrated steel firms had the role of social and regional development including the creation of employment; therefore, they did not necessarily give priority to ‘efficient’ management. As such, due to these political factors, compared to other countries, the integrated firms employed large numbers of people (Ishigami 1982, D’Costa 1999).

Last, extracting advantages from the protective measures for the small-scale industry and from the regulated steel prices for the integrated firms, ministeel plants and re-rollers flourished from the 1970s (Ishigami 2007). They contributed to the increase of steel production. However, the upgrading of the production system of the integrated firms was partially hampered by this development of the small-scale steel producing sector, even though the sector declined as the steel prices adjusted in the mid-1980s.

In contrast, after economic liberalisation, the Indian steel industry showed better performance, which was triggered by the foreign reserve crisis in 1991 and prompted by external pressure. Liberalisation lifted almost all regulations on the steel industry and widened the room for corporate decision making, and the tariff has also been gradually lowered (Sato 2007). Crude steel production increased from 15 million tonnes in 1990 to 38 million tonnes in 2005. In addition, new types of production system have been developed with rich resource reserves. This change is regarded as a successful case of liberalisation. It is true that the pattern of capital accumulation has significantly changed, but liberalisation is best interpreted as another type of state intervention.

First, the development of the industry in the regulated era formed the basis of the growth after 1991, by accumulating capital and experience needed for a liberalised regime, as D’Costa (2000) argues. Thus, the private sector was able to respond to the liberalised environment gradually, even risking investment in massive steel businesses. The so-called ‘secondary producer’, such as the Essar, Ispat and Jindal groups, has contributed to the rapid growth, by producing mainly flat products. The share of the incumbent firms in steel production has been decreasing. The significant part of the workforce for new steel firms has been supplied from ex-employees of the state-owned firms.

Second, with the abolition of the industrial licence system in 1991, some of the above-mentioned conglomerates entered the market with a new integrated production system
combining DRI and EAF, following significant technological improvements in the 1980s. In this process, the government and associations of steel makers cooperated in raising finance, as at first, the financial sector was reluctant to invest in the steel sector and the interest rate was too high for the steel firms to bear. \textsuperscript{xii} As such, facility investment has begun to take place only since the mid-1990s. It has been difficult for SAIL to shift its inland-based old production system to a much more efficient new production system, while newcomers were able to adopt immediately the new production system. Nevertheless, SAIL has been trying to upgrade its technology and continues to gain competitiveness through having captive mines.

Third, liberalisation eased pressure on the incumbent firms allowing them to implement rationalisation measures. Both SAIL and Tata Steel (formerly known as TISCO) have reduced their manpower significantly via voluntary retirement schemes (Sato 2007). Yet, due to various political and economic factors, the state-owned firms have not been privatised despite the promotion of privatisation policy. And SAIL even absorbed the heavily troubled IISCO in 2004. \textsuperscript{xii}

Fourth, small-scale steel makers installed electric induction furnaces, which produce long products, have flourished (Sato 2007). The production system of this sector is small and technologically obsolete and the sector has been developing mainly because the steel markets of India are regionally segmented. Steel demand of various regions has been increasing with the development of the construction and manufacturing sectors after the withdrawal of various regulations in 1991. Therefore, the sector provides very low grade steel to meet regional demands.

Last, the steel trade of India has increased (Sato 2007). The export and import system has been liberalised and the tariff has been lowered gradually since economic liberalisation. This has promoted the segmentation of steel markets of flat products in terms of quality. The international steel boom with high prices of steel products from 2002 in addition to the qualitative mismatch of domestic steel supply and demand has further resulted in increases both in imports and exports, not least for flat products.

Tables 1 and 2 show the imports and exports of semi-finished products and hot rolled, cold rolled and surface-treated flat products. First, average import price is higher than average export price for the finished products, showing that, in general, the products India imports are higher in grade than the products she exports. Second, for imports, the share of Japan and South Korea is high in cold rolled and surface-treated products, and average prices bought from the two are significantly higher than the average prices of total import of each product. Third, semi-finished products are imported from China, the Ukraine and South Africa and low grade
hot rolled products from Russia, as suggested by the average prices. Fourth, for the finished flat products, the US is the most important destination of exports. The domestic demand of high grade flat products for the automobile and electronics industries has been increasing, so some secondary producers such as Bhushan are aiming at this market, substituting imports. The other secondary producers which have strong international networks such as Essar and Ispat have been increasing exports due to the international steel boom.

Table 1 India’s imports of steel products by major countries (2006)

<table>
<thead>
<tr>
<th>Semi-finished Products</th>
<th>Hot Rolled Flat Products</th>
<th>Cold Rolled Flat Products</th>
<th>Surface-treated Flat Products</th>
</tr>
</thead>
<tbody>
<tr>
<td>share(%)</td>
<td>average price (US dollar/kg)</td>
<td>share(%)</td>
<td>average price (US dollar/kg)</td>
</tr>
<tr>
<td>China</td>
<td>27.8</td>
<td>0.44</td>
<td>Russia</td>
</tr>
<tr>
<td>Ukraine</td>
<td>13.1</td>
<td>0.46</td>
<td>Ukraine</td>
</tr>
<tr>
<td>South Africa</td>
<td>10.6</td>
<td>0.32</td>
<td>China</td>
</tr>
<tr>
<td>Brazil</td>
<td>9.1</td>
<td>0.38</td>
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<td>Australia</td>
<td>7.0</td>
<td>0.36</td>
<td>Iran</td>
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<td>Bhutan</td>
<td>6.6</td>
<td>0.37</td>
<td>Japan</td>
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<tr>
<td>Iran</td>
<td>6.3</td>
<td>0.34</td>
<td>Romania</td>
</tr>
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<td>Russia</td>
<td>6.1</td>
<td>0.52</td>
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<td>Germany</td>
<td>3.4</td>
<td>0.38</td>
<td>Malaysia</td>
</tr>
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<td>Turkey</td>
<td>2.2</td>
<td>0.46</td>
<td>Belgium</td>
</tr>
<tr>
<td>Total (World)</td>
<td>100.0</td>
<td>0.40</td>
<td>Total (World)</td>
</tr>
<tr>
<td>(1,000 tonnes)</td>
<td>408.9</td>
<td>(1,000 tonnes)</td>
<td>2,744.9</td>
</tr>
</tbody>
</table>

Source: World Trade Atlas

Table 2 India’s exports of steel products by major countries (2006)
<table>
<thead>
<tr>
<th>Semi-finished Products</th>
<th>Hot Rolled Flat Products</th>
<th>Cold Rolled Flat Products</th>
<th>Surface-treated Flat Products</th>
</tr>
</thead>
<tbody>
<tr>
<td>share (%)</td>
<td>average price (US dollar /kg)</td>
<td>share (%)</td>
<td>average price (US dollar /kg)</td>
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<td>Sri Lanka 15.7 0.44</td>
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</tr>
<tr>
<td>Saudi Arabia 9.5 0.46</td>
<td>United Arab Emirates 8.6 0.59</td>
<td>South Africa 5.9 0.64</td>
<td>United Arab Emirates 7.0 0.83</td>
</tr>
<tr>
<td>Indonesia 8.5 0.47</td>
<td>Iran 5.3 0.68</td>
<td>Indonesia 5.1 0.59</td>
<td>South Africa 5.2 0.80</td>
</tr>
<tr>
<td>Korea, South 8.1 0.45</td>
<td>Spain 5.1 0.55</td>
<td>Nigeria 4.3 0.67</td>
<td>Spain 3.5 0.81</td>
</tr>
<tr>
<td>United Arab Emirates 7.3 0.41</td>
<td>United Kingdom 4.3 0.51</td>
<td>United Kingdom 4.2 0.51</td>
<td>Iran 3.3 0.79</td>
</tr>
<tr>
<td>Brazil 5.4 0.36</td>
<td>Indonesia 3.4 0.43</td>
<td>Myanmar 4.1 0.62</td>
<td>United Kingdom 2.1 0.72</td>
</tr>
<tr>
<td>Thailand 5.1 0.35</td>
<td>Kenya 3.2 0.53</td>
<td>Kenya 3.8 0.72</td>
<td>Ghana 1.9 0.98</td>
</tr>
<tr>
<td>United Kingdom 4.6 0.35</td>
<td>Djibouti 2.9 0.55</td>
<td>Sri Lanka 3.7 0.61</td>
<td>Sudan 1.5 0.89</td>
</tr>
<tr>
<td>Total (World) 100.0 0.44</td>
<td>Total (World) 100.0 0.57</td>
<td>Total (World) 100.0 0.64</td>
<td>Total (World) 100.0 0.80</td>
</tr>
<tr>
<td>(1,000 tonnes) 793.5</td>
<td>(1,000 tonnes) 1,635.5</td>
<td>(1,000 tonnes) 294.0</td>
<td>(1,000 tonnes) 2,083.2</td>
</tr>
</tbody>
</table>

Source: World Trade Atlas

The government announced the “National Steel Policy 2005” in 2004 (GOI 2004). In this, the government suggests that various industrial policies will be deployed, such as preferential treatment for sponge iron makers in procuring high quality domestic coal, promotion of inviting FDI, infrastructure provision, assistance for adopting environmentally friendly and cost-efficient technologies and the promotion of exports of high value products. Also, India largely maintains its high customs duty for producing steel products, even though it has been declining gradually. The Policy sets the target of achieving 100 million tonnes of crude steel production by 2019. While the Policy lacks analysis of the steel using industries, massive investment plans have been announced one after another by POSCO, Mittal and Tata Steel, in which both the central and local governments promise to cooperate in creating infrastructure and land acquisitions. Thus, the case study of India also shows that the government is still playing an important role in the steel industry.

4. Concluding remarks

To summarise, from production through technology and finance to trade, demand and labour, the system of capital accumulation in the steel industry of the studied countries differs from one another and across time. To “justify” industrial policy is to be trapped in the dichotomy of market and state, and fails to capture the reality or specific patterns of the development and restructuring of the industry. This paper’s limited overview reveals that industrial policy in the broadest sense is continuously formulated and implemented, and brings
different results and changes, reflecting changing political and economic relations and interests.

After all, the reason why the role played by the government cannot be grasped by the dichotomy between market and state is that there is no such thing as ‘the market’, but rather there exist various markets for inputs and outputs. As such, state intervention is identified in every aspect of the production and exchange spheres, coordinating and facilitating finance, importing technologies, promoting technological changes, providing infrastructure, changing market structure, stabilising prices, securing the procurement of raw materials, and so forth.

Another important implication of this study is that the main agencies in the steel industry are not limited to mega-integrated firms and the government. To understand the specific patterns of capital accumulation in the industry, the industry as a whole should be studied. In addition, each country cannot be looked at in isolated manner. Nor can the significant importance of trade and various types of foreign investment of steel firms in the industry be overlooked, as these interact with the industrial policy of each country.

In short, the study of the steel industry shows, first, that the role of the state has not been decreasing, even though the contents and methods of state intervention are surely changing. Second, it demonstrates the strong need to situate industrial policy in the context of political and economic relations and interests, rejecting the dichotomy of state and market.

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\i As Rodrik and Subramanian (2004, p. 1596)) put it, “[i]n the conventional view of the Indian development process, there was a long and dark period – the period of controls and import substitution – followed by the burst of sunlight and reforms since 1991”.

\ii The restructuring of capital is a concept “drawing upon Marx’s notion of centralisation (and concentration) of capital and its implications through production, distribution and exchange. The approach argues that the restructuring of capital materialises in production but can be levered through corporations directly, the state (industrial policy in the broadest sense), exchange (access to markets and competition), finance (the role of banks in funding and/or directing investment) and labour (through its workplace and political struggle)” (Fine, Petropoulos and Sato 2005, p. 45).

\iii Apart from such mainstream approaches to the steel industry, one unique understanding is put forward by the Flying Geese model. There are a couple of variations of the model, but they commonly consider the steel industry as being a capital-intensive and heavy intermediate industry, locating it between labour-intensive industry and knowledge/technology-intensive industry. It is assumed that latecomers will develop labour-intensive industry in the first stage, then capital-intensive, followed finally by knowledge-intensive industries. However, as Kawabata (2006) points out, the steel industry is not necessarily accommodated within this framework if the
development of the industry is looked at closely.

iv An advantage of backwardness can be that a latecomer can adopt the state-of-art technology of the era, so that it can shorten the development period of the industry.

v Wade (2000) argues that, ultimately, it is the credit expansion of the US that is to be blamed as the main cause of massive capital inflow to Asian countries, thus triggering the crisis.

vi The process of steel production basically consists of three steps, iron-making, steel-making and rolling. In iron-making, pig iron is made from iron ore, cokes, and limestone by using blast furnaces. In steel-making, in the indirect method, pig iron is turned into molten steel in open-hearth furnaces (OHF) or BOF. In the case of the direct method, scrap or directly reduced iron (DRI) is cast in electric arc furnaces (EAF). This process decides the quality or types of steel, such as mild (carbon) steel, various alloy steel and stainless steel, which are distinguished by the amount of alloying metals and carbon included. Then, acquired molten steel is transformed into semi-finished steel products, i.e., blooms, billets or slabs. In rolling, by using various mills, finished products are made of semi-finished products, yielding the final shapes of products, such as flat products (coils, sheets and plates) and long products (bars, rods, sections). Integrated firms or plants mean that they are involved in all three processes, while minimills or EAF companies produce steel in EAF and rolling processes. See Sato (2007).

vii As the economy matures, domestic steel demand stagnates through two ways in general. First, industrial structure shifts from the manufacturing to service sector and, second, steel usage per product decreases.

viii The ban on establishing holding companies was introduced by the US Occupation Force to repress the revival of Japanese conglomerates.

ix Trade unions had strong connections with political parties, and the existence of plural unions in a plant caused difficulties in industrial relations. Also, the integrated plants had to employ local residents, regardless of their abilities and skill. This contributed to the increase in employment and to low labour productivity.

x Interviews with steel firms and steel associations conducted in 2005 September.

xi Interviews with steel firms and steel associations conducted in 2005 September.

xii A driving factor of this was the request of the West Bengal state government ruled by the Marxist Communist Party. Interviews with steel firms and steel associations conducted in 2005 September.
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GOI (Government of India) [2004] National Steel Policy 2005, New Delhi, Ministry of Steel.


