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ABSTRACT

This paper critically examines the role of industrial policy in the economic development of East Asian countries with a view to drawing lessons for other countries, especially European ones. It describes the evolution of industrial policies in Japan, Korea, Taiwan, and Singapore and evaluates the East Asian industrial policy experience – in general and in relation to the East Asian miracle, the 1997 financial crisis, and the Japanese stagnation since the 1990s. In drawing lessons for other countries, the paper discusses the transferability of the ‘East Asian model’ – or any other economic model – to other countries and highlights the determinants of industrial policy successes and failures. A key conclusion is that there is scope for successful industrial policy even in countries that have reached the technological frontier and want to push it further.

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Industrial policy in East Asia – lessons for Europe

1. Introduction

Since the end of the Second World War, the East Asian economies – first Japan and then Taiwan, Singapore, Hong Kong, and South Korea (henceforth Korea)– have achieved literally the fastest industrialisation in human history.

Roughly speaking, these economies have grown at a rate of 5-6 percent in per capita terms during the second half of the 20th century. This means that their living standards have doubled every 12½ years. Over half a century, such a rate of growth is capable of producing a 16-fold increase in income. The magnitude of East Asian development can be put in perspective when we recall that per-capita-income growth in today's developed countries during the Industrial Revolution was 1-1½ percent or that the average growth rate in per capita income in those countries during the Golden Age of Capitalism (1950-73) was around 3 percent.

In 1961, per capita income (in current dollars) in Japan, the richest economy in the region, was \$402, around one-sixth that of the United States (\$2,308), and similar to that of South Africa (\$396), Argentina (\$378), and Chile (\$377). In 2003, its per capita income, at \$34,510, was (in current dollars) basically the same as that of the United States (\$37,610) and 8-12 times that of the countries with a similar per capita income only four decades ago (South Africa, \$2,780; Argentina \$3,650; Chile, \$4,390).

In 1961, Taiwan's per capita income was \$122, less than a third that of Chile (\$377), around half that of Colombia (\$222), and similar to that of Morocco (\$120). In 2003, its per capita income was, at \$13,139, ten times that of Morocco (\$1,320), more than seven times that of Colombia (\$1,810), and more than three times that of Chile (\$4,390).

In 1961, Korea's per capita income was \$82, which was less than half that of Ghana (\$179) and Honduras (\$182), and similar to that of Kenya (\$72). In 2003, at \$12,020, its per capita income was about 12 times that of Honduras (\$970), just under 30 times that of Kenya (\$390), and nearly 40 times that of Ghana (\$320).¹

In the debate surrounding this spectacular economic transformation, the most contentious has been on the role of industrial policy. While the earlier interpretations of the East Asian experience tended towards a free-market, free-trade story, now most commentators agree that these countries, except for Hong Kong, used a wide range of industrial policy measures. Some argue that their success owes a lot to the intervention by their governments that involved promoting certain industries through a mixture of trade protection, subsidies, government-mediated mergers and acquisitions (M&A's), regulations on entry and capacity expansion, technology licensing, and so on. However, others believe that the East Asian industrial policies were not great successes and that, even if they were successful, they cannot be applied by other countries, as the East Asian success has owed so much to idiosyncratic factors, such as Confucian culture, meritocratic bureaucracy, and Cold War politics (for a critique of these arguments, see Chang 2006).

¹ The 1961 income figures are from Kindleberger (1965, pp. 12-3, table 1.1), except for the Korean figure, which is from the Korean central bank statistics (<http://ecos.bok.or.kr/>). The 2003 figures are GNI (gross national income, the World Bank's new term for GNP) figures from World Bank (2005), table 1, except for the Taiwanese figure, which is GNP per capita data from the Taiwanese government statistical website ([http://210.69.121.6/gnweb/english/statistics/stat9.xls#C3001\(2\)!A1](http://210.69.121.6/gnweb/english/statistics/stat9.xls#C3001(2)!A1)).



Ha-Joon Chang

In this paper, I critically examine the role of industrial policy in East Asian development, with a view to drawing lessons for other countries (especially the European countries). In Section 2, I will discuss some definitional issues. In Section 3, I will discuss the evolution of industrial policy in Japan, Korea, Taiwan, and Singapore (Hong Kong not having pursued much industrial policy). In Section 4, I evaluate the East Asian industrial policy experience, both in relation to the so-called East Asian miracle, the 1997 financial crisis, and the Japanese economic stagnation since the 1990s. In Section 5, I will draw the conclusions and try to extract lessons for other countries, especially the European countries.

2. Some definitional issues²

The concept of industrial policy is not clearly defined, resulting in heated but often fruitless debates.

A major problem with the industrial policy debate is that the very concept of industrial policy is not clearly defined, resulting in heated but often fruitless debates.

For example, in the early debate on Japanese industrial policy in the late 1970s and the early 1980s, the opponents of industrial policy often argued that “industrial policy is not the major reason for Japan’s success”, as the title of one article goes (Trezise 1983), on the grounds that subsidies and governmental loans to industries (as a share of GDP) in Japan were smaller than in many other comparable countries. They argued that, given its sheer quantitative insignificance, it was impossible for Japan’s industrial policy to have had much impact on the course of the country’s development.

Behind this assertion is the implicit definition of industrial policy as a policy that involves monetary transfers intended to change the incentives facing industries. However, as we will see later, financial transfers have only been a small part of Japanese (and other East Asian) industrial policy. Therefore, unless we abandon this narrow, finance-oriented definition, we cannot understand the true magnitude and influence of East Asian industrial policy.

Having said that, the problem with the (often implicit) definitions of industrial policy in circulation is usually that they are too broad rather than too narrow. For example, Pinder (1982), a leading British proponent of industrial policy in the 1980s, considers all of the following components of industrial policy: general industrial support policies such as manpower policy; fiscal and financial incentives for investment; public investment programmes; public procurement policies; fiscal incentives for R&D; firm-level policies such as specific R&D support; antitrust policy; merger policies to create ‘national champions’; support for small firms; regional policies such as the development of physical and social infrastructure and the establishment of industrial complexes; generalised trade protection; sectoral policies such as the organisation of recession cartels in depressed industries; product upgrading in labour-intensive industries. The tendency to adopt an encompassing definition also exists among those who are sceptical of the values of industrial policy. Donges (1980), an ardent critic of industrial policy, categorically states that industrial policy “embraces all government actions which affect industry” (p. 189).

However, although all the above policies would have implications for industrial development, classifying every policy that affects industrial development as industrial policy is not a useful way to proceed. If we did that, virtually every policy could be classified as industrial policy, which would make the concept meaningless.

² This section draws heavily on Chang (1994), Chapter 3.

In this sense, Landesmann's (1992) emphasis on the 'particularistic', or discriminatory, nature of industrial policy deserves attention. According to him, industrial policy is "designed to be *specific*, i.e., directed towards particular industries, firms, regions, groups in the labour market, etc., rather than general . . . Implicit in industrial policy formulation and execution are therefore always trade-offs between different groups, regions, industries, etc." [italics original] (p. 5). According to this definition, we may exclude such general policies as creating skilled workforces or improvements in labour-management relations from the realm of industrial policy, making the concept more focused.

However, Landesmann's concept of industrial policy is still somewhat overloaded, because it includes policies designed to affect both particular regions and particular groups in the labour market. True, industrial policy affects different regions and different groups differently, but its effects on particular regions and groups are better viewed as by-products than as aims of the policy. Likewise, regional and group-oriented policies may affect particular industries (e.g., setting up an industrial park for the garment industry in a high-unemployment region), but this should not make them industrial policies.

Given the above considerations, I propose to define industrial policy as a policy aimed at affecting particular industries (and firms as their components) to achieve the outcomes that are perceived by the state to be efficient for the economy as a whole. This definition is close to what is usually called 'selective industrial policy' (e.g., by Lindbeck 1981).

In my definition, first of all, I emphasise the words 'particular industries', and therefore implicitly exclude policies designed to affect industry in general (e.g., educational investment, infrastructure development) and policies aimed principally at affecting other categories than industries (e.g., regional policy, group-oriented policy) from the domain of industrial policy. Second, I emphasise the word 'efficient' to stress that the guiding principle of industrial policy in its purest form is efficiency, and not other aims (e.g., equity). Third, I emphasise the phrase 'the economy as a whole' to stress that, although it is directed at specific industries, industrial policy ultimately aims at improving the efficiency of the economy as a whole and not that of particular industries. Therefore, in an industrial policy regime, whenever the efficiency objective of an individual industry and that of the whole economy clash with each other, the latter is permitted to dominate.³ Last, I emphasise the phrase 'perceived by the state', to stress that the perception of the state may not necessarily be correct or justifiable to everyone.

Having defined industrial policy, a comment on the distinction between so-called general and selective industrial policies is in order.

There is a tendency among mainstream economists to argue that general industrial policy, which affects all industries equally, is less distortionary and therefore preferable. For example, Corden (1980) states that "the best industrial policy may be to provide an adequate infrastructure, some limits on the powers of monopolies and cartels, an education system that helps to generate the human capital for industrial success, indicative guidance about industrial prospects (without compulsion or subsidies), stability and simplicity in the system of taxation, a free and flexible capital market and a steady movement towards zero sectional protection, whether direct and indirect" (pp. 182-3). In its famous study on East Asian miracle, the World Bank (1993) argues that selective

Industrial policy is defined here as a policy aimed at affecting particular industries to achieve the outcomes that the state perceives to be efficient for the economy as a whole.

³ For example, in their study of Japanese industrial policy, Magaziner and Hout (1980) document that Japan's Ministry of International Trade and Industry (MITI) often "will suggest that a company participate in an unappealing foreign investment project or delay a capacity addition to *accomplish a broader end*" [italics added] (p. 34).

industrial policy is not only economically inferior to general industrial policy but it is also unlikely to work in other developing countries because it requires high administrative capabilities, which many of them do not have.

In practice, the distinction between general and selective industrial policies is mostly meaningless.

Whatever one's position is on the relative merits of selective industrial policy, there is one important definitional issue here. As Lall (1994) points out, in practice, the distinction between general and selective industrial policies is mostly meaningless, because virtually all general industrial policies involve an element of selectivity to one degree or another.

This is because, in a world of limited financial resources and limited administrative capabilities, there will always be some degree of selectivity involved in the conduct of industrial policy. For example, it may be thought that a generalised support for R&D (unlike, say, a subsidised R&D fund for a designated industry) does not involve selectivity. However, unless there are unlimited financial and administrative resources, devoting more resources to support R&D activities means that R&D-intensive industries are now implicitly being favoured over other industries. In this way, the so-called general industrial policy may end up targeting certain sectors without acknowledging it, with the consequent risk of policy incoherence.

To take another example from the above quote by Corden, the government cannot just 'provide an adequate infrastructure' in abstract. It has to decide, say, what road to build where, and in deciding this, it would have to consider, among other things, its likely impacts on industries in the relevant localities. To take another example from Corden, it cannot provide 'an education system that helps to generate the human capital for industrial success' without deciding in which areas future scientists, engineers, and skilled workers will be trained – a decision closely linked with its vision for the future of the country's industries. Universities and technical high schools cannot train engineers and skilled workers in abstract – they have to be trained in very specific areas (chemical engineering, operation of computer-numeric-control machines, and so on).

Thus seen, the dichotomy between general and selective industrial policies is in the end untenable, except for policies like primary education and health care provision – policies that should not be classified as industrial policy anyway, at least according to my definition.

Whether or not we use terms like targeting, selectivity is an issue that has to be, and in fact is being, routinely confronted by the practitioners of industrial policy. Indeed, it may be better to explicitly acknowledge the inevitability of selectivity and openly discuss which sectors to target in which ways, rather than trying to pretend there is no targeting going on, thereby increasing the danger of incoherence between different targeting exercises. Moreover, contrary to what the World Bank (1993) says in this regard, countries with weak administrative capacities have a better chance of success with policies that are more precisely targeted, as they save on the scarce administrative resources.

The crucial question, in conclusion, is not whether or not industrial policy should be selective, but how to be selective in the right areas in the right manner, given the overall industrial policy objectives.

3. The evolution of industrial policy in East Asia

To put it briefly, since the Second World War, Japan and the other East Asian countries have promoted industries with high growth potential and widespread externalities through an array of means, which included: infant industry protection; export promotion through export subsidies and export marketing help; coordination of complementary investments; regulation of firm

entry, exit, investments, and pricing intended to 'manage' competition; temporary subsidies and restriction of competition intended to help technology upgrading; subsidies to the private sector or establishment of state-owned enterprises (SOEs) in high-risk large-scale industries. At the same time, these countries could successfully import and assimilate foreign technologies because their governments could: skilfully integrate their education and training policies with industrial policy; effectively initiate and subsidise private-sector R&D while also providing public-sector R&D in key areas; and deliberately regulate technology licensing and foreign direct investments by transnational corporations (TNCs) in a way that maximises technology spillover.

Of course, there are important national differences, as it will become clearer with the following comparison of the four countries in the region – Japan, Korea, Taiwan, and Singapore. Let us first start with Japan, which had been the 'template' for industrial policy in other countries in the region.

3.1 Japan

In the earlier days of its capitalist development, Japan was not able to use trade protection, as the series of 'unequal treaties' it was forced to sign in 1858 (following its opening up in 1853) barred it from having tariff rates over 5 percent until 1911 (see Table 1). However, even during this period, in a manner similar to what the Prussian government did in the early 19th century in the absence of private sector entrepreneurial initiatives, the Japanese government established state-owned 'model factories' (or pilot plants) in a number of industries – notably in shipbuilding, mining, textiles (cotton, wool, and silk), and military industries (see Smith 1955 and Allen 1981, for further details). Although most of these were soon sold off to the private sector at discounted prices, many of them were heavily subsidised by the state for many years after privatisation (McPherson 1987). In addition, the Japanese government implemented policies intended to facilitate the transfer of advanced foreign technologies, for example, by hiring foreign technical advisors.

Following the ending of the unequal treaties in 1911, the Japanese government started introducing a range of tariff reforms intended to protect infant industries, to make imported raw materials more affordable, and to control luxury consumption goods (Allen 1981, McPherson 1987). By 1913, Japan had become one of the more protectionist countries in the world, although it was still less protective of its manufacturing industries than the United States (see Table 1). In 1926, tariffs were further raised for some new industries, such as woollen textiles (Allen 1981).

Nevertheless, tariff was "never more than a secondary weapon in the armoury of economic policy" in Japan before the Second World War (Allen 1981, p. 134), although some key industries were indeed heavily protected (e.g., iron and steel, sugar, copper, dyestuffs, woollen textiles). Here we can find some parallel between Japan after 1911, on the one hand, and Germany and Sweden in the late 19th and the early 20th century, on the other hand, in that all of them used 'focused' tariff protection, whereby the overall tariff regime remained moderately protective but strong protection was accorded to some key industries, rather than the 'blanket' protection used by countries like the United States, Russia, and Spain at the time.

During the 1920s, under strong German influence (Johnson 1982), Japan began to encourage the 'rationalisation' of key industries by sanctioning cartel arrangements and encouraging mergers, which were aimed at restraining 'wasteful competition', achieving scale economies, standardisation, and the introduction of scientific management (McPherson 1987). These efforts were intensified and government control over cartels strengthened in the 1930s, in response to the world economic crisis following the Great Depression and the war efforts, especially with the enactment of the 1931 Important Industries Control Law. Thus, the basic pattern of post-war industrial policy was established (Johnson 1982). Japan's military build-up during the 1930s is believed to have contributed to the

Until 1911, Japan could not use trade protection, but by 1913, it had become one of the more protectionist countries in the world, although it was still less protective of its manufacturing industries than the United States.

development of heavy industries (although with an ultimately disastrous political outcome) by stimulating demand and creating technological spill-over effects (McPherson 1987).

Table 1. Average tariff rates on manufactured products for selected developed countries in their early stages of development (weighted average; in percentages of value)

	1820	1875	1913	1925	1931	1950
Austria ¹	R	15-20	18	16	24	18
Belgium ²	6-8	9-10	9	15	14	11
Denmark	25-35	15-20	14	10	n.a.	3
France	R	12-15	20	21	30	18
Germany ³	8-12	4-6	13	20	21	26
Italy	n.a.	8-10	18	22	46	25
Japan	R	5	30	n.a.	n.a.	n.a.
Netherlands ²	6-8	3-5	4	6	n.a.	11
Russia	R	15-20	84	R	R	R
Spain	R	15-20	41	41	63	n.a.
Sweden	R	3-5	20	16	21	9
Switzerland	8-12	4-6	9	14	19	n.a.
United Kingdom	45-55	0	0	5	n.a.	23
United States	35-45	40-50	44	37	48	14

Source: Chang (2002), p. 17, table 2.1. For a similar table see World Bank (1991, p. 97)

Notes: R= due to numerous and important restrictions on manufactured imports, average tariff rates are not meaningful. Data for 1820 and 1875 are very approximate rates, and give range of average rates, not extremes. 1/ Before 1925, Austria-Hungary. 2/ In 1820, Belgium was united with the Netherlands. 3/ The 1820 figure is for Prussia only.

Despite its developmental efforts, until the Second World War, Japan was on the whole not the economic superstar it became thereafter.

Despite all these developmental efforts, until the Second World War, Japan was on the whole not the economic superstar it became after it. According to the authoritative study by Maddison (1989), between 1900 and 1950, Japan's per capita income growth rate was only 1 percent a year. This was somewhat below the average for the 16 largest now-OECD economies he studied, which was 1.3 percent a year.⁴ Table 2, also from Maddison, shows that between 1913 and 1950, Japan's per capita income growth rate (0.89 percent) was slightly below the average of the 12 European countries that appear in the table (0.83 percent) and only half that of the United States (1.61 percent).

After the Second World War, the Japanese economy was in a dire state. The defeat in the war, which had already stretched its capacity to the limit, meant a drastic collapse in the economy; per capita income fell by almost half from the peak of \$2,897 (GDP per capita in 1990 dollars) in 1941 to \$1,555 in 1946 (Maddison, 2001). Immediately after the war, the situation was so desperate that the government had to forcefully channel resources into steel and coal production in order to keep the economy going at all. Its main car manufacturer, Toyota, almost went bankrupt in 1949, and had to be saved through an intervention by the central bank, the Bank of Japan.

⁴ The 16 countries are Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Italy, Japan, the Netherlands, Norway, Sweden, Switzerland, the UK, and the United States.

Table 2. GDP per capita growth of today's developed countries in different phases of their development

	1870-1913	1913-1950	1950-73	1973-98
Austria	1.45	0.18	4.94	2.10
Belgium	1.05	0.70	3.55	1.89
Denmark	1.57	1.56	3.08	1.86
Finland	1.44	1.91	4.25	2.03
France	1.45	1.12	4.05	1.61
Germany	1.63	0.17	5.02	1.60
Italy	1.26	0.85	4.95	2.07
Netherlands	0.90	1.07	3.45	1.76
Norway	1.30	2.13	3.19	3.02
Sweden	1.46	2.12	3.07	1.31
Switzerland	1.55	2.06	3.08	0.64
United Kingdom	1.01	0.92	2.44	1.79
European-12 average	1.33	0.83	3.93	1.75
Japan	1.48	0.89	8.05	2.34
United States of America	1.82	1.61	2.45	1.99

Source: Maddison (2001), p. 265, table B-22.

Note: Annual average compound growth rates

The economy started to recover rapidly from 1950, partly thanks to the export boom due to the Korean War (1950-3), but even until the late-1950s, the economy was struggling to move out of exports of low-quality, labour-intensive goods. Until the late-1950s, the country's biggest export item was silk and silk-related products. Indeed, the country was so desperate to increase its exports, it was producing a large amount of fake Made in USA products; so much so that some manufacturers were even exporting Made in Usa products on the excuse that there is a small town near Tokyo called Usa.

The development of the car industry is the most instructive in this regard. When the first Japanese attempt to export passenger cars to the US market spectacularly failed in the late 1950s (Toyota's sub-compact car, Toyopet), the debate on the future of Japan's car industry flared up, with free-market economists arguing that this is what happens when a country whose biggest export item is silk tries to export things like cars. They argued that the car industry should be liberalised by lowering tariff barriers and putting an end to government subsidies. Luckily for Japan (and for the rest of the world, which eventually benefited from better cars), the protectionists around the Ministry of International Trade and Industry (MITI) prevailed and the Japanese government maintained its support to the industry, paving the way to the world leadership a generation later.

The Japanese performance after the 1950s, especially during the Golden Age of Capitalism (1950-73), is famous and there is no need to go into much detail here. As we can see from Table 2, during this period, per capita income in Japan grew at an amazing rate of 8 percent a year, which is more than double the average of the 12 European countries shown in the table. It is over

In the debate on the future of Japan's car industry in the late 1950s, protectionist economists prevailed over free-market economists, and the state maintained its support to the industry, paving the way to the world leadership a generation later.

3 percentage points higher than the second best performer, West Germany and over 3 times higher than that of the United States. By the 1970s, Japan started breaking into markets until then considered the domains of only Europe and North America – automobile, steel, shipbuilding, electronics, and so on. By the 1990s, Japanese products, represented by Toyota's luxury car, Lexus, became synonymous with quality, innovative design, and reliability – a totally different image from the days when desperate Japanese companies were exporting 'Made in Usa' products while their policy makers were debating whether to continue protecting the automobile industry.

While the industrial policy measures used by the Japanese government were not very different from those of other countries, Japan's post-war industrial policy involved important policy innovations.

What is important to note is that many of the industrial policy measures used by the Japanese government were not very different from the ones used by other governments to promote their industries – both before and after it.

Directly following the examples of the United States, Germany, and other more developed countries and continuing some of its own policies before the War, Japan provided trade protection (tariffs and quantitative restrictions) and various subsidies (export, investment, R&D, and infrastructure). It also used indicative planning (most famously used by France), foreign exchange rationing (used in all European countries until the 1970s to one extent or another), and special banks for long-term industrial financing (such as Development Bank of Japan, Long-Term Credit Bank, Industrial Bank of Japan). Even some measures that are frequently thought to be Japanese inventions are, when we go back in history, not so. For example, export promotion through tariff rebate on inputs used for exported goods, which many believe to be a post-war Japanese invention, is a measure Britain had actively used in the 18th century!

However, this is not to say that Japan was only repeating what other countries had done before. Japan's post-war industrial policy involved some important policy innovations. Two of them are worth noting here.

One is the establishment of deliberation councils for policy making in key industries, comprising government officials, industry representatives, and more 'objective' observers (such as journalists and academics). These councils are said to have made industrial policy more effective by improving information flows between the government and the private sector, on the one hand, and between private sector firms, on the other.

Another notable Japanese innovation, or rather improvement over past practices of its own and other countries, is the improved technique of managing cartels. Rather than regarding all cartels as negative, as in the United States, the Japanese government recognised that cartels can be crucial in managing industrial development by reducing 'wasteful competition' that destroys profit and undermines the capacities to invest and innovate in the long run. Of course, the problem, as Japan itself (and many European countries) had seen in the pre-war period, is that cartels can also become conservative forces that prevent progress. Therefore, in the post-war period, the Japanese government tried to minimise this problem by allowing cartels only under clear conditions in terms of their aims (e.g., avoiding duplicative investment, upgrading technology, avoiding price war in the export market, orderly phasing out of declining industries) and their lifespan.

3.2 Korea

Korean industrial policy was very similar to the Japanese one, but there were important differences, too.

The biggest difference is that, especially until the 1980s, the Korean government intervened much more aggressively than the Japanese government. This was partly out of necessity – Korea,

technologically well behind Japan, needed more forceful government intervention to raise internationally competitive firms. However, it was also because the private sector was far weaker than in Japan and, thus, the Korean government felt far less constrained in commanding the private sector than its Japanese counterpart.

Korea's industrial policy-making and -implementation were also more centralised than Japan's. The Korean planning ministry, the Economic Planning Board, was much more powerful than the Japanese Economic Planning Agency (not even a full ministry). The EPB even controlled the budget, which is in most countries – including Japan – the turf of the finance ministry. As a result, Korea's 'indicative' planning (and industrial policy as a part of it) was much more directive than the Japanese or even the French counterparts. As in Japan, deliberation councils existed, but the private sector firms had much less influence in their decisions than their Japanese counterparts.

Especially in the early days of the country's economic development, the Korean private sector was totally at the mercy of government rationing of credit and foreign exchange. Credit rationing was possible because all banks – not just special purpose banks as in the case of Japan – were state-owned until 1983 and because even the privatised ones were in effect controlled by the government until the early 1990s. Foreign exchange rationing was conducted through the so-called foreign exchange budgeting system, which was based on a legally mandated government monopoly of all foreign exchange transactions until the early 1990s.

Unlike Japan, which had no significant SOEs in the manufacturing sector since the late 19th century, the government of Korea did not mind using such enterprise when necessary. The most prominent example in this regard is the recently privatised Pohang Steel Company (POSCO), the second largest steel producer in the world until the recent mega-mergers in the world's steel industry (Box 1 offers more insights into the creation and performance of POSCO). Moreover, in various episodes of industrial restructuring, it practically nationalised many firms (usually temporarily but sometimes for an extended period) by becoming the leading shareholder of certain companies through the equity participation of the state-owned development bank, that is, Korea Development Bank.

Given its power, the Korean government could even push private sector firms into ventures they did not want to take on. The most famous story in this regard is Hyundai's entry into the shipbuilding industry in the early 1970s. Although the firm is one of the leading shipbuilders in the world today (and the country is now the biggest shipbuilder in the world), at the time even Jung Joo-Young – Hyundai's legendary chairman at the time, known for bold business gambles – was reluctant to build a large-scale shipyard in a country with no previous experience of modern shipbuilding. However, the Korean government offered Hyundai big sticks (e.g., threat to disfavour it in the rationing of credit and foreign exchange) and some carrots (e.g., trade protection and the offer to buy any unsold ship in the initial period), compelling the company to enter the industry (for further details, see Jones and Sakong 1980).

The Korean government intervened much more aggressively than the Japanese government, even pushing private sector firms into ventures they did not want.

The Korean government was also a lot more involved in corporate restructuring in the private sector than the Japanese government. Especially when business downturns put firms into danger zone, it would wade in to initiate M&A and production rationalisation. For example, in 1969, the proliferation of inefficient firms after a massive investment boom in the late 1960s (following a premature attempt at financial liberalisation) prompted the Korean state to force dozens of inefficient firms (exact numbers not released) into mergers, sales, and liquidation – sometimes sweetened by debt rollovers by the Korea Development Bank. Also, in the aftermath of the 1970s state-led Heavy and Chemical Industrialisation (HCI), which led to temporary excess capacity in

some major industries, the Korean state stepped in again with the Reorganisation of Heavy and Chemical Industries programme in 1980 (Box 1 presents more details about this programme). Another round of state-led mergers and liquidations of inefficient firms occurred between 1984 and 1988. The focus of this round of restructuring was the shipping, overseas construction, and fertiliser industries – all of them considered industries in decline (see Box 1 for more).

Box 1. Industrial-policy episodes from Korea

The role of state-owned enterprises

In the late 1960s, when the Korean government decided to apply for World Bank support to build its first modern steel mill, the World Bank declined the application on the grounds that the project was not viable. Not an unreasonable decision – so it seemed: the country's biggest export items at the time were fish, cheap apparels, wigs, and plywood; the country did not even possess deposits of the key raw materials (iron ore and coking coal); at the time, it could not even import them from nearby China because of the Cold War; such materials had to be imported from Australia. And, to top it all, the Korean government proposed to run this as a monopolistic state-owned enterprise, which it did until a few years ago; a perfect recipe for disaster from the view of mainstream economists. Nevertheless, the company became the most efficient steel producer in the world within ten years of its creation. For further details on POSCO, see Amsden (1989).

Government involvement in corporate restructuring in the 1980s

Round 1. Following the economic crisis of 1980, four companies in the power generating equipment industry were merged into Korea Heavy Industries and Construction Co. (KHIC), which was subsequently nationalised on the grounds that the state support needed to make KHIC profitable was too big to be given to a single private firm. In the passenger car industry, one of the three producers (Kia) was forced to exit and specialise in trucks and buses with a promise that it would be allowed again to produce passenger cars when demand conditions improved – this actually occurred. One of the three companies in the naval diesel engine industry (Daewoo) was forced to exit, and the other two were forced to split the market into two segments and specialise (Hyundai in over-6,000 hp and Ssangyong in under-6,000 hp engines). In heavy electrical machinery industry, comprising eight companies, three (Hyosung, Ssangyong, Kolon) were merged into one (Hyosung) and allowed to produce only highly specialised and expensive products. A subsidiary of Hyundai was asked to produce only for its sister companies. Four other minor companies were forced to produce only less sophisticated and cheaper products. Each of the four companies in the electronic switching system industry (Samsung, Gold Star, OPC, and Daewoo) was forced to specialise in a different product. The two companies in the copper smelting industry were merged by forcing one to buy the other's equity, which was supported by equity participation of the Korea Development Bank and a moratorium on bank loans repayment. See Chang (1994, chapter 4) for further details.

Round 2. In 1984, three fertiliser producers were liquidated, and 63 shipping companies were merged into 17. In 1986, a major reorganisation of the overseas construction industry was implemented, again involving mergers and liquidations. And between 1986 and 1988, 82 inefficient firms (23 of them in shipping and overseas construction industries) were forced into liquidation and mergers. See Chang (1994, chapter 4) for further details.

3.3 Taiwan

Many of Taiwan's industrial policy measures are similar to those used by Japan and Korea. For example, it also used trade protection, subsidies, government-led corporate restructuring, and other means of industrial policy. Like the Japanese and the Korean governments, the Taiwanese government helped its firms develop technologies and open export markets through state agencies (government research institutes and government export marketing agency, for example). In terms of the control mechanism, it used state-owned banks as Korea (but not Japan), while using foreign exchange rationing as both Japan and Korea. However, industrial policy in Taiwan differs in some important respects from those of Japan and Korea.

Many of these differences stem from the fact that Taiwan has not had many large firms in the private sector. This has been mainly for two reasons. First, the so-called Three People Principle – the official ideology of the Nationalist Party, which engineered the Taiwanese 'miracle' – is semi-socialist and dictates that key industries have to be nationalised. Second, the Nationalist government was considered an occupation force by the local 'Taiwanese' population⁵ and was therefore very reluctant to allow the emergence of large firms in the Taiwanese-dominated private sector that could challenge its political dominance.

As a result, most large firms in the Taiwanese economy have been SOEs or companies known as 'party enterprises', that is, enterprises that are nominally private because they are owned by the Nationalist Party, rather than the government, but in fact operate as *de facto* SOEs (Amsden 1985, Fields 1995). The private sector consists of small firms, with only few notable exceptions (e.g., the Tatung group, Formosa Plastic). This structure introduced an industrial-policy dynamic that is very different from what we see in Japan or Korea.

First of all, Taiwan, together with countries such as Austria and France, has had one of the largest SOE sectors in the world, apart from the oil-producing countries. This means that its government appears to be less interventionist than it really is because when Taiwan's government tells its large firms (most of them SOEs) what to do, this does not count as intervention but as an internal government directive.

Second, the absence of large firms in the private sector induces the Taiwanese government to intervene more heavily than the Japanese and Korean governments in the area of technological development (i.e., an area in which the large financing requirement makes it difficult for small firms to succeed). Thus the Taiwanese government accounts for over 60 percent of total R&D expenditure, whereas the corresponding figure is only around 20 percent in Korea and Japan, which both have large firms with capacities to embark on significant R&D projects. For the same reason, the Taiwanese government has been far more active than its two counterparts in setting up spin-off firms from government-funded high-technology research projects.

Third, not having many large private firms, Taiwan had to be more open to working with TNCs than Japan or Korea (until the 1997 financial crisis), although it was not even very open to FDI by international standard (see Annex Table 1). Japan has been very hostile to TNCs, with the result that its ratio of FDI inflows to aggregate investment is among the lowest in the world (0.1 percent or less). Korea, lacking Japan's technological capabilities, had to be more open to TNCs, but its policies

Taiwan's industrial policies are similar to those of Japan and Korea. But there are also important differences, often reflecting the relatively small number of large private firms in the Taiwanese economy.

⁵ Taiwan's indigenous population, the Kaoshan people, are Polynesians. The 'Taiwanese' are mainly descendants of the Chinese migrants from mainly south-eastern China since the 16th century – and even they can be divided into a few groups. The Nationalist government, when it moved into Taiwan in 1949 following its defeat by the Communists, was made up of people from mainland China, mainly from northern China.

were still very hostile to them outside its free-trade zones until the mid-1990s. The share of FDI in Korea's investment was one of the lowest in the world, after Japan though (see Annex Table 1).

Another statistic illustrating the same point is that, as of the mid-1980s, only about 5 percent of TNC subsidiaries in Korea were wholly-owned by foreign investors, whereas the corresponding figure was 50 percent for Mexico and 60 percent for Brazil, countries often believed to have had much more 'anti-foreign' policy orientations than that of Korea (Evans 1987). In contrast, due to the scarcity of large domestic firms that could become plausible joint venture partners, the Taiwanese government was more flexible on the question of ownership structure of TNC subsidiaries; Taiwan was somewhere between Korea and Latin America, with approximately one-third of the TNC subsidiaries (excluding the ones owned by overseas Chinese) being wholly-owned by foreign investors as of 1985 (Schive 1993).

3.4 Singapore

Given its status as a city-state, Singapore had to differ even more from the Japanese template than Korea and Taiwan in the design and conduct of its industrial policy.

Given its status as a city-state, Singapore had to differ even more from the Japanese template than Korea and Taiwan in the design and conduct of its industrial policy.

To begin with, given its tiny size (2 million people at the time of separation from Malaysia in 1965), infant industry protection was deemed to be too costly. As a result, it adopted a free-trade regime, making its industrial policies clearly distinct from other East Asian countries.

Moreover, given the paucity of local entrepreneurial talent, the Singaporean government decided to work with TNCs much more closely than the other East Asian countries. As a result, it has one of the highest share of FDI in total investment in the world, well before *laissez-faire* Hong Kong (Annex Table 1).

However, this does not mean that Singapore pursued a *laissez-faire* industrial policy, as many free-market economists suggest – on the contrary. First of all, in sectors considered critical, the Singaporean government set up SOEs (called government-linked corporations, GLCs for short), rather than inviting TNCs. Its world-famous Singapore Airlines is an SOE, while industries such as shipbuilding and telecommunications are also run by SOEs, resulting in a huge SOE sector. For example, between 1970 and 1990, the public sector share in gross fixed capital formation in Korea was around 10 percent, whereas the corresponding figure in Singapore was over 30-36 percent in the 1960s, 27 percent in the 1970s, and 30 percent in the 1980s (Shin 2005). Saying that virtually all large firms in Singapore that are not TNC subsidiaries are SOEs would not be an overstatement.

Second, adopting an extremely friendly policy towards TNCs, does not mean that Singapore indulged in *laissez faire*. Rather than taking a hands-off approach to FDI and let the TNCs decide what to do, the Singaporean government has worked hard to attract FDI into certain areas regarded as important for the country by investing in particular types of manpower and infrastructure and providing custom-designed financial incentives.

Third, the Singaporean government has run forced saving schemes and massive public housing programmes, which, on the basis of total public ownership of land, provide most of the houses in the country. Of course, these are not industrial policies, but they show how the Singaporean government is in certain respects even more interventionist than the Japanese or Korean.⁶

⁶ Interestingly, even in Hong Kong, the only *laissez-faire* country in East Asia, all land is publicly owned. This shows the particular importance of housing in city-states.

3.5 Concluding remarks

The above examination shows similarities among industrial policies in the four East Asian economies, but highlights important differences too.

At the level of principles, there were important similarities. All four East Asian countries deployed industrial policies aimed at upgrading their industrial structures through long-term investments in physical and human capital. As to the tools used and the mechanisms of policy implementation, however, there were important differences across countries, as shown in Table 3.

Table 3. Summary of industrial policies in four East Asian countries

	Japan	Korea	Taiwan	Singapore
<u>Policy</u>				
Infant industry protection	Very strong	Very strong	Very strong	none
Export promotion	Strong	Very strong	Very strong	Strong, but mostly indirect
SOEs in manufacturing	Not used	Used in some critical industries	SOEs ran most key upstream industries	SOEs ran some key capital-intensive industries
Large private-sector firms	Strongly promoted (especially enterprise groups)	Strongly promoted (especially enterprise groups)	Discouraged (most large firms were SOEs)	Not promoted (large firms were either SOEs or TNCs)
SMEs	Promoted by encouraging large firms to upgrade their subcontractors	Weakly promoted (some SME-specific funds)	Promoted through strong public investment in R&D and infrastructure	Weakly promoted (some SME-specific funds)
Private-sector corporate restructuring	Some involvement	Very deep Involvement	Deep Involvement	Some Involvement
TNCs	Strongly discouraged	Strongly discouraged outside selected sectors	Discouraged outside selected sectors	Strongly promoted, but in a targeted manner
R&D	Private-sector-led	Private-sector-led	Government-led	Government-led
<u>Policy implementation</u>				
Centralisation in policy making	Strong	Very strong	Very strong	Strong
Government-private sector relationship	Two-way cooperation, systematic	Top-down direction, less systematic than in Japan	Mixture of antagonism, benign neglect, and central control	Local private sector unimportant
Role of private-sector associations	Very important	Important, but controlled by the government	Important, but controlled by the government	Local private sector unimportant

Singapore stands out by not pursuing trade protection, but strongly encouraging FDI. Governments in Taiwan and Singapore used SOEs much more widely and played a bigger role in R&D than Japan or Korea, where large private sector enterprise groups were promoted and given a leading

role in organising R&D. In Korea and Taiwan, the government was much more deeply involved in corporate restructuring than in Japan or Singapore. In terms of promoting small and medium-sized enterprises (SMEs), Taiwan and Japan are closer to each other than to the other countries. And as Table 3 shows, there were other similarities and differences.

An interesting point to stress is that these countries cannot be put along a single spectrum. In terms of trade policy, Singapore might be considered much less interventionist than Japan or Korea, but in terms of relying on SOEs, it is way more interventionist than Japan or, to a lesser extent, Korea. Nor is it that they can neatly be grouped. To illustrate, in some policy areas, Singapore and Japan are similar to each other (in terms of government involvement in corporate restructuring, for example) while in others Singapore is closer to Taiwan than the other countries (in terms of the importance of SOEs, for instance). And then, Japan is closer to Taiwan in terms of promoting SMEs than it is to Korea, but in terms of promoting local private-sector enterprise groups, it is closer to Korea than it is to Taiwan. In sum, there was not one industrial policy template for all countries, but there have been several variations on the theme.

4. Evaluating industrial policy in East Asia: successes and failures

4.1 Industrial policy and East Asian miracle

In the beginning, there was reluctance among mainstream economists even to recognise that industrial policy existed at all in East Asia. I have already mentioned this in relation to Japan earlier (Section 2), but even as late as 1988, Bela Balassa was arguing that the role of the state in Korea, “apart from the promotion of shipbuilding and steel . . . has been to create a modern infrastructure, to provide a stable incentive system, and to ensure that government bureaucracy will help rather than hinder exports” (Balassa, 1988, p. 5286), while in other developing countries, for example, the Latin American countries, “there are pervasive controls of investment, prices, and imports and decisions are generally made on a case by case basis, thereby creating uncertainty for business decisions” (Balassa, 1988, p. 5287).

The important role of industrial policy in East Asian economies is widely accepted, but its contribution to the region’s economic miracle continues to be debated controversially.

From the late 1980s, it has been widely accepted that industrial policy played an important role in East Asian economies. However, in judging its contribution to the region’s economic miracle, there is still a lot of dispute. As it is not possible, nor is it necessary, to discuss all the technical points raised in the debate on the evaluation of industrial policy in East Asia, I will make four general points.⁷

First of all, we should not judge the success or failure of industrial policy on the basis of individual cases. The critics of East Asian industrial policy love to cite the failure cases to discredit industrial policy. For instance, it is frequently pointed out that in the 1960s the Japanese government wanted to let Nissan take over Honda, which then was a small producer deemed unable to survive. The subsequent success of Honda and the relative decline of Nissan, it is argued, show how wrong the Japanese government was to push this idea and how right Honda was to resist it. Or the critics talk about the mediocre result of the 1980s Japanese supercomputer project.

However, in the same way in which even the most successful businessmen does not make the right decision every time, national industrial-policy makers, however skilful they are, are bound to make

⁷ A discussion of some technical details can be found in Lall (1994), Rodrik (1994), and Chang (1995), reprinted as chapter 3 of Chang (2006).

mistakes. Therefore, the mere fact that a government has made a poor industrial-policy decision is not an argument against its industrial policy, in the same way a poor decision by Warren Buffet should not be used as an argument against his finance business itself. What makes the difference is that some governments get more decisions right than others – or, to use a sporting analogy, what matters is the ‘batting average’. Indeed, in the case of East Asia, for each failure story there are probably a few success stories.

In other words, the real question is not whether a government makes mistakes in industrial policy, as it is bound to do so sometimes, but it is how the mistake ratios are minimised and how quickly and effectively the mistakes are corrected. The records of the East Asian countries in this regard have been rather good.

Second, the evaluation of industrial policy very much depends on the performance measure used. Various measures of profit (e.g., operating margin, ordinary profit, and so on) usually do not make good performance indicators, especially if the government was trying to promote the industries in question against market logic in the short run. Other performance measures – such as labour productivity, total factor productivity, output growth, export growth, capacity utilisation, incremental output-capital ratio, social rate of return (based on social cost-benefit analysis) – all have their merits and problems.

Third, even in judging individual cases, the verdict could be very different, depending on the time frame. For example, in the early 1980s, many critics of industrial policy argued that the Heavy and Chemical Industrialisation programme of Korea in the 1970s was a total failure, on the grounds that many of the industries promoted through the programme failed to achieve full capacity utilisation and needed import protection to survive (Lal 1983). However, many of the industries criticised as failures at the time, such as the automobile industry, became the engine of Korean exports and economic growth by the late 1980s. This example shows that especially when we evaluate infant industry promotion programmes, we need to take a long-term view. Likewise, one should not forget that it took Japan three decades (between the end of the Second World War and the mid-1970s) of protection and subsidies before its car industry made significant inroads into the world market. In this context, it is also instructive to note that it took the electronics arm of Nokia, arguably one of the most successful businesses in human history, 17 years to make any profit at all!

Last but not least, whatever performance measure and timeframe we use, we cannot measure the impact of industrial policy only with reference to what has happened in the industry in question (or its immediate environment), as it is usually done in the mainstream literature. This is because spill-over effects are very important in evaluating industrial policy, which is clear from my definition of industrial policy (see Section 2) as a “policy aimed to affect particular industries (and firms as their components) to achieve the outcomes which are perceived by the state to be efficient for the economy as a whole”.

For example, World Bank (1993) uses TFP growth at two-digit level to measure the impact of industrial policy on the ground that spillovers exist only within the boundary of two-digit sectors, but such statement was based on a study “on the pattern of spillovers of R&D in industrial economies [which] demonstrates that the major beneficiaries are closely related sectors, often sectors that would be identified with a two-digit classification” (p. 326). However, especially for developing economies, where more important spillovers might come in the form of, say, developing a skilled labour force and increasing engineering capabilities, it is not very sensible to measure the impact of industrial policy from the narrow sectoral point of view (see Chang 1995, for further details).

In assessing industrial policies in East Asia, the real question is not whether governments make mistakes, but whether there are more successes than failures and how quickly and effectively mistakes are corrected.

4.2 Industrial policy and the 1997 Asian financial crisis⁸

After the 1997 Asian financial crisis, the critics of industrial policy argued that industrial policy was the major cause of the crisis (e.g., The Economist, 15 November, 1997; Brittan 1997). The argument is that Asian governments, in their attempts to promote their favoured industries, have explicitly and implicitly underwritten the investments in them, which naturally encouraged lax management and excessive risk taking. This argument is best summed up in the following passage from The Economist: “Most of the financial mess is of Asia’s own making, and nowhere is this clearer than in South Korea. For years, the government has treated the banks as tools of state industrial policy, ordering them to make loans to uncreditworthy companies and industries” (15 November, 1997).⁹

Critics of industrial policy consider it a major cause of the 1997 Asian financial, but there is little empirical evidence in support of this view.

Unfortunately for those who take this line, it is empirically difficult to sustain that industrial policy was responsible for the Asian crisis. First of all, except for Korea, the countries that were hit by the 1997 financial crisis – Korea, Hong Kong, Thailand, Indonesia, and Malaysia – had not used industrial policy very much. Hong Kong has been one of the most *laissez-faire* economies in recent human history. Thailand has had little in the way of systematic industrial policy except in the agricultural processing industry. Indonesia may have had a little more industrial policy, but many of their industrial policy programmes (such as the support for the aircraft industry) were haphazard and poorly conceived. Malaysia has had a more systematic industrial policy, especially in the palm oil and rubber industries, but it can hardly be described as the dominant factor in the country’s policy regime (Jomo and Rock 1998). Indeed, just before the crisis, the World Bank (1993) was making a big deal out of the fact that the Southeast Asian countries had grown fast without the East-Asian-style industrial policy, although some of the Bank’s critics also argued that the absence of such policy was precisely the reason why these economies failed to achieve an effective industrial upgrading.

Then how about Korea? Is it not one of the archetypal ‘industrial policy states’ and, therefore, is it not natural that industrial policy was the main factor behind its crisis, as the above quote from The Economist sums it up? Such conjecture sounds even more plausible when we recall that the over-investment at the origin of the Korean crisis occurred mostly in industries, rather than in real estate development as in the case of Southeast Asia. However, this story does not augur well with the facts.

Contrary to the popular perception, industrial policy was largely absent in Korea in the build-up to its 1997 crisis. It is true that up to the mid-1980s the country practised one of the most comprehensive and systemic industrial policies in the world. However, slowly from the late 1980s, and very rapidly from 1993 with the inauguration of the Kim Young Sam administration, the Korean government had dismantled industrial policy, except for R&D support in some high-technology industries (see Chang 2000 and Chang and Evans 2005, for further details). If industrial policy was largely absent, it seems rather difficult to blame the Korean crisis on it.

In fact, we can go even further and argue that it was actually the demise of industrial policy, rather than its continuation, that was mainly responsible for the 1997 crisis in Korea. It was, for

⁸ This section draws heavily from Chang (2000).

⁹ Although it is often mixed up with the ‘crony capitalism’ argument, the industrial policy argument can be, and should be, analytically separated from the latter, as it does not necessarily assume nepotism or corruption in the choice of favoured industries and companies.

example, the termination of the investment coordination policy that allowed the proliferation of duplicative investments in the key industries that fuelled the massive foreign borrowing between 1993 and 1997 (for more details, see Chang *et al.* 1998). In addition, the demise of industrial policy, as well as the official termination in 1993 of the three-decade-old five-year-planning practice, led to the disappearance of the 'rational' criteria by which government supports had been previously allocated and therefore facilitated access to credits for risky ventures through cronyistic connections or clever political manoeuvring (see Chang 2000, for further details).

4.3 Industrial policy and the Japanese stagnation

As much as, if not more than, the 1997 Asian financial crisis, Japan's economic stagnation since the 1990s has contributed to the growing scepticism on the value of industrial policy. Specifically, one may wonder whether industrial policy makes sense only for countries trying to catch up with countries at the frontier of technology or whether such policies are promising for countries at the frontier, too.

Since the bursting of the asset bubble in the early 1990s, Japan has seen sluggish growth – the Japanese economy has grown at roughly 1 percent in per capita terms between 1990 and 2003. More importantly, it has been challenged by competitors even in some industries of its traditional strength, such as consumer electronics, computers, and semi-conductors. And during most of this period, the scope of Japanese industrial policy has been narrowed quite dramatically and the Japanese industrial-policy officials themselves seem to have been overcome by a sense of impotence.

In the case of Japan, unlike in the case of the other East Asian countries (see Section 4.2), very few have argued that industrial policy was the cause of the country's recent economic problems. There is broad agreement that much of Japan's economic problems since the early 1990s owes to the failures of macroeconomic and financial policies – the failure to inject sufficient public funds to resolve the post-bubble bad debt problem at an early stage, the failure to lower interest rates sufficiently at the early stage of the post-bubble economy, the untimely raising of taxes in the mid-1990s that killed off the recovery, the excessively fast introduction of the BIS (Bank for International Settlement) capital adequacy standards in the mid-1990s that sharply contracted bank lending, and so on (Johnson 2001 and Lincoln 2003).

However, even some of the commentators in favour of Japanese industrial policy in the past are now arguing that the economy is too advanced for industrial policy (e.g., Anchordoguy 2001). It is often argued that the success of Japanese industrial policy in the past owed greatly to the fact that Japan was a catch-up economy, for which identifying the industries to promote through industrial policy was not a difficult task. When Japan was trying to catch up with the more advanced economies of Europe and North America, it is argued, it was obvious that industries like cars, shipbuilding, electronics, and so on were the industries to promote. But as the Japanese economy has reached the technology frontier, it has become less obvious which industries to promote because of the greater uncertainties inherent in industries using frontier technologies. In such a situation, it is argued, selective promotion of industries by the government becomes less effective.

While this argument is broadly correct, it should not be over-stretched into the assertion that industrial policy is impossible in a frontier economy. Indeed, it is possible for the government to

Given the sluggish performance of the Japanese economy in recent years, one may ask whether industrial policy is promising only for countries well below the technological frontier.

identify and support promising industries even in such an economy, as it can be seen from the experiences of other economies on the frontier.

The most important example is public support of R&D, and no other country illustrates the point better than the United States. Despite its pretension otherwise, the US government has been promoting strategic industries through aggressive R&D financing. While the ratio has fallen recently below 40 percent due to large R&D spending by the IT industry, during most of the post-war period the US government financed 50-70 percent of R&D in the country. Most industries where the United States has an international competitive advantage today are industries whose key technologies were developed by public R&D money. Semi-conductors, internet, and aerospace are only the most important examples of industries with origins in defence-related R&D, while the bio-technology industry has greatly benefited from R&D support for the National Institutes of Health. In contrast, public money finances only around 20 percent of total R&D in Japan – among the lowest in the OECD. This leaves open the question of whether Japan has sufficiently promoted basic R&D, an area the private sector was not likely to engage in after its economy reached the technology frontier.

Moreover, even in a frontier economy, there are industries that private firms do not enter despite relatively low technological uncertainties because of high entry costs. In such cases, government support can play a critical role in developing the industries. The best example in this regard is the entry into and eventual success in the aerospace industry by the four European countries (France, Germany, United Kingdom, and Spain) through the Airbus consortium backed up by government subsidies. Obviously, here I am not saying that Japan should have entered the aerospace industry, but only pointing out that even in frontier economies there are many industries that do not suffer from huge technological uncertainties but could nevertheless merit support through traditional industrial policy measures.

Even in an economy at the frontier of technology, industrial policy seems much more needed and feasible than many people believe.

All in all, it would seem that even in an economy at the frontier of technology, industrial policy is much more needed and feasible than many people, including the Japanese industrial-policy officials themselves since the 1990s, believe. It is true that the goals and the forms of industrial policy have to change as the economy reaches the technological frontier, but it is not as if industrial policy becomes irrelevant or impossible in such an economy. Thus seen, I would agree with Chalmers Johnson, a renowned authority on Japan, in arguing that the decline of Japanese industrial policy since the 1990s owes more to the influence of free-market ideology promoted by the United States as a part of its new post-Cold-War international strategy than to a realistic assessment of the limits of its industrial policy (Johnson 2001).

Fortunately, since the late 1990s, the Japanese government seems to have acknowledged the need for a revival of industrial policy – although not necessarily in the same form. Three policies are notable. First of all, the Japanese government has set up public funds to purchase bad debts with public money (such as the Resolution and Collection Corporation (RCC) set up in 1998 and the Industrial Revitalisation Corporation of Japan (IRCJ) set up in 2003) and injected public money from the state-owned Development Bank of Japan (DBJ) and the Japan Small and Medium Enterprise Corporation (JSMEJ) into ‘private turnaround funds’ in order to facilitate corporate restructuring. Second, the Japanese government is trying to increase public R&D support, both through direct financing and through tax exemptions. Third, the Japanese government is increasing financial support for start-ups in high-technology industries (for further details, see METI 2003). While the results of these policies are yet to be seen, they signify the welcome recognition on the part of the Japanese industrial policy makers that economic maturity does not preclude industrial policy.

5. Conclusions and policy implications

5.1 Some general remarks on 'drawing lessons' from East Asia

Whatever lessons we may want to draw from the experiences of the East Asian economies, we will always encounter the sceptics who question whether the 'unique' institutions and cultural elements of the East Asian countries that underlie their industrial policy regimes are replicable in other countries.

The critical question we need to ask here is whether East Asia is so unique that other countries cannot learn from it. The interesting thing is that many people who express scepticism about the transferability of the East Asian model are quite cavalier when it comes to the transferability of the market-dominated models of the Anglo-American economies. However, what makes them think that the Anglo-American model is more easily transferable than the East Asian model?

Rather than arguing about the validity of various 'East Asian special conditions' (see Chang 2006, chapter 4, for a detailed discussion), I would simply point out that the special-conditions argument can just as easily be applied to the US and UK development as it can to East Asian development. Britain, for example, prospered at a time in history when it could (and did) colonise and/or dominate weaker nations, use slaves, openly sell opium to China, and force young children to work twelve-hour days under miserable working conditions. During its development, Britain also routinely violated foreigners' intellectual property rights and, from 1750 to 1842, maintained a law that banned exports of machinery to competitor economies. The US economy benefited from very similar circumstances. Additionally, the United States benefited from its vast geographic scope (as the government was able to exterminate and/or forcibly relocate Native Americans), a large population of immigrant labour, and its exceptionally rich endowment of natural resources.

Many people who question the transferability of the East Asian model overlook that most of today's industrialised countries used an economic model that was far closer to the East Asian model than to the Anglo-American one.

We could go even further and argue that, historically, the East Asian model has been much more universal than the Anglo-American model. An honest examination of the historical record reveals that most of today's industrialised countries, including the United Kingdom and the United States, used an economic model that was far closer to the East Asian model than to the Anglo-American one (Chang 2002). Thus, if anything, it seems that the East Asian model (in all of its national variants) is closer to a world norm than today's Anglo-American model.

To sum up, every country is unique with regard to its mix of history, culture, ethnic composition, the timing of its development, and so on. Thus, the experience of East Asian countries is no more or no less idiosyncratic than the experience of any other country.

5.2 Determinants of industrial policy successes and failures

In discussing the determinants of industrial policy successes and failures, it needs to be made clear at the outset that we are not short of theoretical justifications for industrial policy of the types used in East Asia.

There are various market failures that justify industrial policy: the presence of specific assets that make free entry and exit socially costly; complementarity between investments across industries; externalities present in R&D efforts and other knowledge-generating investments; infant industry considerations arising from the cost of learning; and the capital market failure that makes long-

term financing more expensive than what is socially desirable (see, for instance, Chang 1994, Stiglitz 1996, Lall 2004, and Chang 2006).

Of course, as we all know, there are many examples of failed industrial policy attempts all over the world (including in the successful East Asian countries). However, the risk of failure should not let us deny the usefulness of industrial policy. Arguing against industrial policy on the basis of its potential risk would be like arguing for the ban of sharp knives on the grounds that some people get hurt using them, while some may even harm others with them. However, if we did that, we would lose the benefits of sharp knives altogether. What we need is a better safety education and a better control over their sales, not a ban on sharp knives.

The success of industrial policy critically depends on how exactly it is designed and implemented.

Recent debates have shown that the success of industrial policy critically depends on how exactly it is designed and implemented. Five points, in particular, are worth making.

First, it matters how realistically the target industries are selected in light of the country's technological capabilities and world market conditions. So, Korea started from exporting cheap garments and wigs, turned to assembling transistor radios and black-and-white TVs, moved on to making automobiles and steel, and then - after having been successful in these endeavours - embarked on the production and exports of semi-conductors and LCD displays. Of course, the difficulty is that people have different views on what is 'realistic' – not many people thought it realistic for Korea to enter the steel and the automobile industries in the early 1970s or for Japan to enter the luxury car market in the mid-1980s. However, the success of the East Asian countries owe a lot to the fact that they did not attempt to make too big a leap.

Second, the East Asian experience shows that it matters a lot how closely industrial policy is integrated with an export strategy, especially – albeit not exclusively – for a small economy. This is for a number of reasons. For one thing, for smaller countries, scale economies cannot be achieved without entering the export market early on – and if one gets the production scale wrong, the unit production cost could go up 2-3 times. There are, however, reasons that apply to larger economies as well. For example, export earning is critical in allowing a backward country, big or small, upgrade, as it provides the means to purchase advanced technologies and machinery. In addition, export market performance can provide a tangible criterion for the policy makers to judge the performances of the enterprises promoted by the government.

Third, the success of industrial policy depends critically on how willing and able the government is to discipline the recipients of the rents that it creates through various policy means (tariffs, subsidies, entry barriers). The point is that the suspension of market discipline, which is inevitable in the conduct of industrial policy, means that the government has to play the role of a disciplinarian. The East Asian governments have not always been fair and effective in disciplining the firms that were not delivering the results in return for government favours, but they have been more successful in this regard than most other countries.

Fourth, how competent and politically insulated the implementing bureaucracy is also plays a critical role for the success of industrial policies. Unfortunately, critics of industrial policy, who often argue that countries without a good bureaucracy should never try industrial policy, have hijacked this sensible point. However, the experience of the East Asian countries themselves contradicts this point. Especially in Korea and Taiwan, the bureaucracy was considered corrupt and incompetent until the 1960s – Korea was sending its bureaucrats to Pakistan and the Philippines for extra training until the late 1960s! The East Asian bureaucracies improved through continuous efforts, not because of some magical historical legacy that others cannot aspire to have.

Fifth, how closely the government interacts with the private sector while not becoming its hostage is very important. In his study of industrial policy in Korea and Taiwan, Evans (1995) has captured this beautifully in his notion of 'embedded autonomy', where it is argued that a government needs to have roots in the society ('embeddedness') but also has to have its own will and power ('autonomy') in order to be effective in its intervention. Autonomy without embeddedness can become dangerous, while embeddedness without autonomy means that the state is turned into Marx's executive committee of the bourgeoisie.

5.3 Lessons for Europe

Before I draw specific lessons for European industrial policy from the East Asian industrial policy experience, I would like to point out that the usual 'transferability' argument against learning lessons from East Asia does not apply to Europe.

For one thing, many European countries share industrial-policy traditions that are very similar to the ones in East Asia, not least because the East Asian countries had learned from the industrial policy experiences in a number of European countries in the past – especially Prussia in the 18th and 19th century and France in the post-war period.

For another, the European countries all have sophisticated policy formulation and implementation capabilities, thus no policy used in East Asia will be 'too difficult' for them (as some of them may be for some developing countries with limited bureaucratic capabilities).

With the above general point in mind, what are the lessons that Europe can learn from East Asia in terms of industrial policy?

First, the East Asian experience shows the importance of institutions that enable long-term-oriented business management. In this, government commitment to promote currently unprofitable industries that have future potentials is important, but other factors count as well. For example, the existence of long-term-oriented banks (development banks, long-term credit banks, and so on) can be important in determining the viability of long-term projects. Also important is the corporate structure. Diversified industrial groups make it possible for new ventures to be subsidised in the earlier (but not necessarily short, as we can see from the Nokia example) stage of their existence. This means that the current push to change the European corporate governance structure into the Anglo-American one that values independent firms may be incompatible with long-term-oriented industrial policy.

East Asian industrial policy lessons point to the importance of long term-oriented institutions, non-budgetary industrial policy measures, and a clear purpose and time limit of government interventions.

Second, the East Asian experience shows that budgetary transfers, traditionally a preferred means of European industrial policy, need not be the most important element of industrial policy. As we mentioned earlier, the East Asian industrial policies were much more influential than their counterparts in other countries, despite relatively small budgetary outlays. Of course, this is not to say that budgetary outlays are bad, nor that they do not matter – it can give clout to a policy vision that may not otherwise be realised. However, fixation with budgetary outlays can constrain policy imagination.

Third, the East Asian experience suggests that the European countries could improve their industrial policies by making the purpose and time limit of government intervention (or private actions sanctioned by the government, such as cartels) more explicit. Especially some of the support for declining industries in Europe has been prolonged beyond their necessity because the exact aim,

scope, and timeframe of this support had not been made clear at the beginning. The way in which the Japanese government masterminded the orderly phasing out of a number of declining industries (or the declining segments of otherwise expanding industries) in the late 1970s and the early 1980s is particularly instructive in this regard (see Dore 1986 for a brilliant study of this experience).

Finally, the decline of industrial policy in Japan – the East Asian country closest to most European countries in terms of the level of technological development – should not be interpreted as a proof that industrial policy becomes ineffective at the frontier of technology. The decline of Japanese industrial policy since the 1990s owes more to ideological conversion of the Japanese elite than to a judgment based on careful assessment of the limits of industrial policy in a frontier economy. As experiences like the US government funding of R&D and the European government's support for Airbus show, certain industrial policies are necessary and beneficial even in a frontier economy.

Annex

Table A.1 FDI Inflows in percent of gross domestic capital formation for selected countries and regions, 1971-99 (annual average)

	1971-75	1976-80	1981-85	1986-90	1991-95	1996-99
All Countries	n.a.	n.a.	2.3	4.1	4.3	10.2
Developed	n.a.	n.a.	2.2	4.6	3.7	9.6
European Union	n.a.	n.a.	2.6	5.9	6.0	14.5
Austria	1.8	0.9	1.3	1.5	2.9	7.2
France	1.8	1.9	2.0	4.1	7.3	11.5
Germany	2.1	0.8	1.2	2.0	n.a.	5.3
Netherlands	6.1	4.5	6.1	13.3	12.7	35.6
Sweden	0.6	0.5	1.6	4.0	19.0	62.3
UK	7.3	8.4	5.6	14.6	9.5	22.2
Switzerland	n.a.	n.a.	2.3	5.3	4.4	14.4
USA	0.9	2.0	2.9	6.9	4.2	11.0
Canada	3.6	1.7	1.0	5.8	5.8	14.5
Japan	0.1	0.1	0.1	0.0	n.a.	n.a. ¹
Developing	n.a.	n.a.	3.3	3.2	6.4	11.4
Africa	n.a.	n.a.	2.3	3.5	5.8	9.0
Latin America	n.a.	n.a.	4.1	4.2	7.5	18.3
Argentina	0.1	2.1	5.0	11.1	15.8	22.5
Brazil	4.2	3.9	4.3	1.7	2.2	17.1
Chile	-7.3	4.2	6.7	20.6	13.6	35.3
Mexico	3.5	3.6	5.0	7.5	11.8	14.8
Asia	n.a.	n.a.	3.1	2.8	5.9	9.2
Bangladesh	n.a.	n.a.	0.0	0.1	n.a.	3.3 ²
China	0.0	0.1	0.9	2.1	11.1	13.3
Hong Kong	5.9	4.2	6.9	12.9	8.0	32.9
India	0.3	0.1	0.1	0.3	1.2	3.0
Indonesia	4.6	2.4	0.9	2.1	4.7	1.1
Korea	1.9	0.4	0.5	1.2	0.7	4.5
Malaysia	15.2	11.9	10.8	11.7	19.3	16.5
Pakistan	0.5	0.9	1.3	2.3	4.5	7.1
Philippines	1.0	0.9	0.8	6.7	7.4	8.0
Singapore	15.0	16.6	17.4	35.0	30.7	28.0
Taiwan	1.4	1.2	1.5	3.7	2.4	3.6 ³
Thailand	3.0	1.5	3.0	6.5	3.9	11.2
Turkey	n.a.	n.a.	0.8	2.1	2.5	1.8
Eastern Europe	n.a.	n.a.	0.0	0.1	8.4	12.5

Source: Own calculation based on UNCTAD (1993), Annex Table 3 for 1971-80; UNCTAD (1995), Annex Table 5 for 1981-92; UNCTAD (1999), Annex Table B.5 for 1993-95; UNCTAD (2002) for 1996-9.

Notes: 1/ 1.1 percent in 1999; 2/ 1997-9 only; 3/ Data for 1998 are not available.

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