



The Resurgence of East Asia

500, 150 and 50 year perspectives

Edited by

Giovanni Arrighi, Takeshi Hamashita and Mark Selden

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The East Asian path of economic development

A long-term perspective

Kaoru Sugihara

Introduction

This chapter attempts to explain how and why East Asia's share in world GDP increased between 1500 and 1820, decreased between 1820 and 1945, and then increased rapidly over the last half century.

Table 3.1 suggests that between 1500 and 1820 there was only a marginal increase in the world's per capita GDP, while after 1820 there was both an accelerated increase in population and a dramatic rise in per capita GDP. The most plausible interpretation of the first shift is that the industrial revolution in Britain constituted a major watershed in global history, ushering in a deepening of the penetration of the modern world system, emanating from Western Europe and encompassing the rest of the globe from the nineteenth century.

The same table, however, reveals a significant increase in world GDP and a much slower increase in per capita GDP between 1500 and 1820. This is primarily because world population was on the rise, with much of this rise coming from Asia, particularly China and India. According to Maddison's 1995 data, as much as 52 per cent of world GDP in 1820 came from Asia, of which China contributed 29 per cent and India 16 per cent. Table 3.2 shows that in 1820 six East and Southeast Asian countries accounted for 35 per cent of world GDP, while the share of six advanced Western countries was 18 per cent. Angus Maddison's figures, drawing on the work of regional specialists, in my view, reflects the general trend of recent scholarship (for a summary of progress in demography, see Saito

Table 3.1 World economic performance, 1500–1995

	1500	1820	1995
World population (million)	425	1,049	5,664
World GDP per capita (1990\$)	565	673	5,194
World GDP (billion 1990\$)	240	706	29,412

Sources: Maddison (1995: 19) for the data for 1500, and Maddison (1998: 40) for 1820 and 1995.

Table 3.2 Relative economic performance: the West vs Asia, 1820–1992
(GDP in billion 1990\$)

	1820	1913	1950	1992
Six advanced Western countries ^a	128	1,138	2,422	9,781
Six East and Southeast Asian countries ^b	243	435	603	7,487
China	199	301	336	3,616
Japan	22	69	157	2,415

Source: Maddison (1995: 19, 180–3 and 190–1).

Notes

a The UK, USA, France, Germany, Italy, Austria.

b Japan, South Korea, Taiwan, China, Indonesia, Thailand. Figures for South Korea, Taiwan and Thailand in 1820 are not available, but have been estimated as \$5 billion, \$2 billion and \$3.5 billion respectively. Territorial boundaries are based as in the 1992 definition. For details, see Maddison (1995).

Osamu 1997). To take China as an example, recent work has confirmed findings, which originally emerged around the middle of the nineteenth century and were summarized by D.H. Perkins in the 1960s, that China's population increased rapidly during the eighteenth century. China's population, which had previously risen several times to a peak of 100 to 150 million only to fall, increased to nearly 400 million by the end of the eighteenth century. This was clearly a world demographic landmark (Perkins 1969; Liu and Hwang 1977; Naquin and Rawski 1987; Van de Ven 1996), and its impact on world GDP far outweighed that of post-industrial revolution Britain, whose share of world GDP in 1820 was less than 6 per cent. There is an important, relatively unexplored question of the 'Chinese miracle' here, that is, how China managed to escape Malthusian checks, and maintain such a vast population without serious deterioration in the standard of living. Essentially the same observation can be made with regard to developments in Japan in the seventeenth century, which, as will be argued below, took place under the influence of the China-centred international economy of East Asia.

Furthermore, during the eighteenth century the Japanese standard of living began to rise, if slowly, and the trend continued into the nineteenth. In addition, much of the economic progress made in East Asia during the second half of the nineteenth century was based on the indigenous development of labour-intensive industry rather than on the introduction of Western technology. How can one explain the sequence of population growth followed by a rise in the standard of living, both in the absence of any strong Western influence? This is the first question addressed, in the next section of this chapter.

Between 1820 and 1945 the West, including regions of recent European settlement in the Americas, Australasia and South Africa, achieved

global dominance. The industrial revolution, the transport and communications revolution, the opening up of vast land areas in the new continents and the utilization of natural resources such as coal and oil, all benefited the Western population, whose per capita income increased enormously, resulting in a widening gap between the rich West and the poor non-West (see Table 3.3). The growth of trade between the West and Asia was often accompanied by colonialism, which tended to reinforce inequality, particularly between temperate and tropical zones (Lewis 1978: Chapter 8).

The third section of this chapter attempts to account for the ambiguous performance of East Asian economies during this period. On the one hand, the core of the region escaped Western colonialism and was able to pursue import-substitution industrialization. In China after 1870 and in Japan throughout, there was a slow but relatively steady rise in population without a deterioration in the standard of living. At the same time, East Asia was unable to catch up with the advanced Western countries, which went through a period of further technological advance (the second industrial revolution), and the gap in per capita income between the West and East Asia increased until about 1930. The Japanese standard of living did rise slightly, and the country's attempt to compete with Western manufacturers in the international market was widely viewed in the West as an example of unfair competition coming from a low wage economy. But the West continued to dominate the heavy and chemical industries, which required high technology, large amounts of capital and access to natural resources.

After 1945 the trend was reversed, and East Asia's GDP grew faster than that of the West. The precise timing of this reversal is difficult to determine, as the Great Depression and the Second World War make it hard to obtain reliable information on exchange (or other forms of conversion)

Table 3.3 Per capita GDP in selected countries, 1820–1992 (1990\$)

	1820	1870	1913	1950	1973	1992
USA	1,278	2,457	5,307	9,573	16,607	21,558
Germany	1,112	1,913	3,833	4,281	13,152	19,351
France	1,218	1,858	3,452	5,221	12,940	17,959
UK	1,756	3,263	5,032	6,847	11,992	15,738
Japan	704	741	1,334	1,873	11,017	19,425
Taiwan			794	922	3,669	11,590
South Korea			948	876	2,840	10,010
China	523	523	688	614	1,186	3,098
Indonesia	614	657	917	874	1,538	2,749

Source: Maddison (1995: 23–4).

rates, or GDP itself for a number of countries. But, at some point in the middle of the twentieth century, and certainly by 1960, per capita income of East Asian countries began to grow faster than that of advanced Western countries as well as other developing countries. The growth of Japan's per capita GDP during the period from 1955 to 1973 was the most conspicuous example of this new trend. A sustained annual growth rate of around 10 per cent for this long a period had never occurred anywhere before (see Table 3.3). Furthermore, the same table suggests that the 'Japanese miracle' was in fact the beginning of an 'East Asian miracle' in which a number of other Asian countries have begun to participate (World Bank 1993). In the final decade of the twentieth century, East Asia's share in world GDP (as defined in Table 3.2) apparently exceeded that of the six largest Western economies.

Geopolitical considerations in the early stages of the Cold War were crucial to the changes in the American attitude towards Japan's economic future. In contrast to the pre-war situation, Japan was expected to use her economic strength to counter communist penetration in Asia, and was now able to import all necessary raw materials and resources, including oil, from the rest of the world (by contrast, the US ban on oil exports to Japan in 1941 was an immediate cause of the outbreak of the Second World War). In the post-war period Japan also enjoyed favourable opportunities to increase exports of manufactured goods to advanced Western countries. This change in international circumstances allowed Japan, and later a number of other Asian countries, to pursue the systematic introduction of capital-intensive and resource-intensive heavy and chemical industries to an economy with relatively cheap and disciplined labour. The fourth section discusses how the Western and East Asian paths of economic development fused to produce high-speed growth in East Asia.

The final section summarizes the argument, and attempts to place the 'East Asian miracle' in the context of global history. It will be argued that industrialization of the Western European variety, the mainstay of the growth of the world economy between 1820 and 1945, created the North-South divide, and failed to push up world GDP in a balanced way, until East Asia initiated an alternative pattern, emphasizing a more thorough utilization of human resources through labour-intensive technology and labour-absorbing institutions. The chapter will suggest that, while East Asia would not have industrialized without the West's impact, it was the East Asian path of economic development that made it possible for the majority of the world's population to benefit from global industrialization.

This chapter will not attempt to rigorously define the term 'East Asia'. Instead it concentrates on describing the experiences of the area or the country which led the technological and institutional innovations at each stage of development. The approach adopted here is to abstract a

historically mobile but relatively autonomous core of economic development of the region (initially the Yangzi delta of China, subsequently primarily Japan), and identify the features common to the region but distinct from other regions of the world. I use country-based macro-data going as far back as 1820, for the purpose of a broad comparison between East Asia and Europe and cite data for 1500 in a more general way. I have also referred to the relatively developed areas of present East and Southeast Asia as 'East Asia' for the most recent period, for the sake of simplicity. But this should not suggest that all areas of East Asia have been influenced, throughout the period, by the pattern of development described below. Nor should it imply that accumulation of country-based studies is sufficient for understanding the region's long-term development (for comments on the limits of country-based historiography, see Sugihara 1996b). Rather, it is assumed here that a substantial degree of economic interaction has long existed in the region, for example between China and Japan, and that they influenced the region's long-term pattern of development in a fundamental way (Sugihara 1996b; for a full exposition of this position, see Sugihara 1996a). Other key terms such as Europe and the West are treated in the same spirit.

The development of labour-intensive technology

The industrious revolution path

As already stated, East Asia experienced a sustained period of population growth accompanied by a modest rise in the standard of living from the sixteenth to the eighteenth century. The argument of this section is that it did this because it successfully responded to natural resource constraints, particularly the scarcity of land, by developing a set of technological and institutional devices for full absorption of family labour. I shall call these devices labour-absorbing institutions and labour-intensive technology.

The term labour-intensive technology does not imply that East Asian technology developed in the scientific tradition so influential in the West. The great Chinese agricultural manuals, offering information, for example, on the methods of seed selection for different types of soil or on the use of a variety of agricultural tools, were transmitted in different languages and across cultures, for example, from China to Japan. They set the main pattern of dissemination of economic knowledge across East Asia. During the sixteenth and seventeenth centuries international contact in East Asia was driven by massive silver flows from Japan to China. Even during the eighteenth century, when intra-Asian bullion flows were reduced to insignificance and the volume of Japanese trade declined under the seclusion policy, the transfer of economic knowledge continued through written information. However, this knowledge consisted

essentially of technical rules of thumb, wisdom rooted in the accumulation of experience.

Equally, in speaking of labour-absorbing institutions we do not imply the development of a set of institutions characteristic of a mode of production in a particular stage of economic development. Nor do we refer to feudalism or the emergence (or absence) of the nation-state when we talk of the key economic institutions which undergirded the East Asian path of economic development. What we have in mind is the development of much smaller units, namely the household (often, though not always, the family), and, to a lesser extent, the village community. In many cases these units survived political turmoil and changes in the mode of production and remained as the region's key institutions, underpinning the technological and institutional path. It is important to recognize this aspect of 'path dependency' in order to understand the rise of East Asia in a long-term perspective.

In his 1967 article Akira Hayami drew a figure, reproduced here as Figure 3.1, to describe the different paths which England and Tokugawa Japan followed, calling them the industrial revolution and the industrious revolution respectively (Akira Hayami 1967; for English versions see Akira Hayami 1986 and 1992). With their different mix of factor endowments, in this case of capital and labour, and assuming that no transfer of factor inputs took place between England and Japan, Hayami explained that it was natural for societies as economically-minded as these two countries to pursue different paths, and for Japan to exploit the potential benefit of increasing labour absorption. However, Hayami's graph has often been

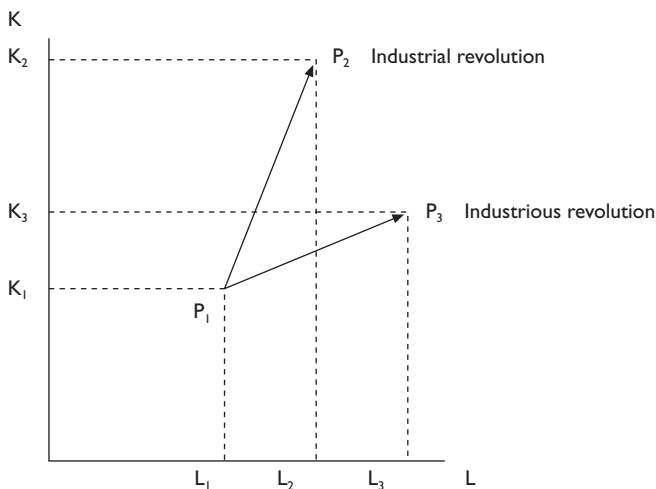


Figure 3.1 The industrial revolution and the industrious revolution

Source: Hayami Akira (1967: 13).

interpreted to imply that the industrious revolution did not lead to a rise in labour productivity of a magnitude comparable to the industrial revolution. It was drawn to explain how Japan was relatively well prepared for industrialization in the late nineteenth century.

It is possible to apply the industrious revolution theory to the Chinese case, for the purpose of comparing it with the Western European path. Well before 1500, probably during the twelfth and thirteenth centuries, China developed a set of highly advanced labour-intensive methods, involving seed selection, irrigation and water control, double cropping and the extensive use of agricultural tools. Central to this development was the opening up of land near the Yangzi River delta for rice cultivation. Of course, Chinese development had its ups and downs, and the commercialization of agriculture, the monetization of land tax, and the introduction of new world crops played an important part in the increase in population and agricultural output during the sixteenth to the eighteenth centuries. But the essential characteristics of small-scale production, centring on irrigated rice cultivation, established in the lower Yangzi region in the twelfth and thirteenth centuries (Shiba 1989), were extended to other parts of China and transmitted to Japan by the late sixteenth century. While adapting to ecological diversity and developing geographical specialization (see Buck 1937: 27), East Asian agriculture after the late sixteenth century nevertheless exhibited a clear tendency towards regional convergence, driven by the diffusion of intensive rice agriculture and several key commercial crops, notably cotton, silk and sugar.

The East Asian path of industrious revolution must be distinguished from that in Europe and North America with respect to labour-intensity. The size of land holdings was far smaller in East Asia than in, for example, Western European peasant society. The average farm size in East Asia in the nineteenth and early twentieth centuries ranged from 1 to 3 hectares (Bray 1986: 115–16; Buck 1930: 103). About 70 per cent of Japanese farms had 0.5 hectares of land or less, and nearly 90 per cent had 1 hectare or less at the time of industrialization in the late nineteenth century. In contrast, the average size of farm in France, a country with a strong peasant tradition, was 14 hectares in 1882 (Heywood 1996: 115).

Second, there were substantial differences in the degree of labour absorption within rice agriculture. Figure 3.2 highlights the importance of labour absorption at the initial stage of development of labour-intensive technology in rice agriculture (Ishikawa 1978: 34; see also Ishikawa 1967: Chapter 1; 1981: Chapter 1). Before mechanization, greater labour input was critical to raising land productivity. With the introduction of tractors and other inputs of capital, the size of holdings became larger, and labour inputs smaller. Thus the technology of land-use had two phases in terms of 'labour absorption'; first, land productivity rose with a proportionately greater input of labour, and then after a certain point it was improved

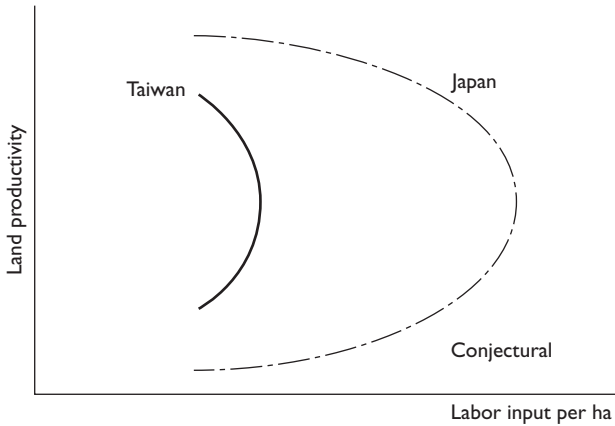


Figure 3.2 The Ishikawa curve

Source: Ishikawa (1968: 34).

with proportionately smaller input of labour. Booth and Sundrum (1984: Chapter 1) called this the 'Ishikawa curve'. On this path, labour productivity was unlikely to rise fast, if at all, at the initial stage of agricultural development (in Figure 3.2 this part of the Japanese path, mainly in the Tokugawa period, is shown in broken lines, indicating that it is conjectural). But it also meant that society could maintain a much greater number of people per unit area of arable land. This, essentially, was the East Asian answer to Malthusian checks, which applies to much of Japan and the wet-land farming areas of China.

Third, land productivity could be raised significantly prior to mechanization, and it is this supply-side change that was crucial to the industrious revolution. Table 3.4 suggests how advanced Japan's land productivity was by the late nineteenth century (for a historical comparison between India and Japan, see Sugihara with Yanagisawa 1996). A large part of the development of labour-intensive technology in Asian rice agriculture since then has been associated with the adaptation of Japanese rice technology to different soils and climates, first in Korea and Taiwan and later in other parts of East Asia. After the Second World War, the Ishikawa curve became the basis of a policy recommendation which emphasized labour absorption at the initial stage of development, and became one of the guiding principles behind the ILO programme for Asian agriculture.

An important conclusion we should draw from the above discussion, particularly from Figure 3.1, is that the industrious revolution path was much more successful in maintaining the region's large share in world GDP than the industrial revolution path was for England up to 1820. If

Table 3.4 Estimates of rice yields in Japan and other Asian countries

Country	Date	Tons per ha
Japan	1878–82	2.53
China	1921–5	2.56
India ^a	1953–62	1.36
Thailand ^a	1953–62	1.38
Indonesia ^a	1953–62	1.74
Malaya ^a	1953–62	2.24
Korea ^a	1953–62	2.75
Taiwan ^a	1953–62	2.93

Sources: Hayami and Yamada (1969: 108). For China, Buck (1930: 204).

Notes

The above Japanese figure is the revised official estimate. Other estimates range from 2.36 to 3.22 tons/ha.

a = FAO figures.

the world had ceased to exist in 1820, a hypothetical ‘global historian’ would surely have written an economic history centring on the industrious revolution path, with an important additional chapter on the recent rise of Western Europe. We should avoid accepting the nineteenth-century view, which was inclined to project European superiority, nor should we be unduly influenced by the observations on China by such well-known contemporary writers as Adam Smith and Thomas Robert Malthus. They were clearly handicapped by the lack of information, and believed that China’s population was either stagnant or declining (Smith, A. 1776; Malthus 1798). By the time J.R. M’Culloch edited *A Dictionary of the Various Countries, Places, and Principal National Objects in the World* in 1868, people were much better informed. Indeed M’Culloch’s dictionary included most of the relevant information on Chinese population which formed the basis of later studies (for example, Perkins 1969). Unfortunately, he, like such contemporaries as Karl Marx and Charles Darwin, was at a loss to interpret these enormous population figures and failed to see their global significance.

Sources of dynamism

Both Marxist historiography and the more recent literature of institutional economics have assumed the importance of the establishment of property rights as a condition of economic change (Marx 1867; North and Thomas 1973). Once property rights were clarified and land freely bought and sold, agriculture would become more efficient, as market forces would allocate resources, spread technology and select the optimum size of holding. Without the establishment of property rights, the transaction

cost would not be lowered sufficiently to enable these developments. Moreover, on the basis of the establishment of the right to income from property, classical political economists in England saw the emergence of a class society and distinguished the main categories of income, with wages given to workers, profit to capitalists, and rent to landlords. This would enable the ruling classes to accumulate capital and develop more productive large-scale farming. Using this yardstick, East Asia does not fare well, as much of the most fertile land continued to be cultivated by family labour, and farming remained small-scale. And the traditional characterization of small-scale production has been that it lacked internal forces for change, because it neither faced constant pressure for technological improvement nor was driven by the capitalist principle of relentless profit maximization.

The argument against this view has been expressed in various forms whenever the dynamism of the peasant economy was recognized. A.V. Chayanov, for instance, tried to understand the behaviour of the peasant as if he were maximizing his earnings and welfare (Thorner 1966). Such an attempt can explain the responsiveness of peasant society to some extent, but stops short of pointing out some of the problems inherent in the Western (in this case more specifically English) model of class society. The East Asian peasant family worked a very small plot of land, and attempted to harvest the maximum amount of rice through a greater degree of labour input. They needed to perform a number of different tasks in accordance with the agricultural calendar, from transplanting to weeding to harvesting. They allocated family labour, and cultivated different varieties of rice to even out seasonal labour requirements and avoid hiring outside labour. They also exploited their own off-peak surplus labour for proto-industrial activities. Thus an ability to perform multiple tasks well, rather than specialization in a particular task, was preferred, and a will to cooperate with other members of the family rather than the furthering of individual talent was encouraged. Above all, it was important for every member of the family to try to fit into the work pattern of the farm, respond flexibly to extra or emergency needs, sympathize with the problems relating to the management of production, and anticipate and prevent potential problems. Managerial skill, with a general background of technical skill, was an ability which was actively sought after at the family level.

Looking at the separation of agricultural workers from management after the disappearance of peasant society in England from this perspective, it seems obvious that class division based on specialization had its own costs. Agricultural workers in England were deprived of the opportunity to share in managerial concerns, while specialist artisans came to despise the 'Jack-of-all-trades'. Division of labour, guided by the 'invisible hand', prevented the development of inter-personal skills needed for flexible

specialization. The advantage of the 'visible hand' of the head of the peasant household was that he could allocate labour for production, distribute income among the members of the family for consumption and saving, and even control the number of children, hence the size of the family, all at the same time. Thus managerially independent farmers, even if they did not own land, had more reason than large-scale farm managers to increase output or income by linking effort to reward, not through the market, but directly.

The main institutional reinforcement of this dynamism came from the family and the village community, rather than from forces outside the village such as the nation-state's attempt to establish property rights. Effective sanctions were social rather than legal. Although the enforcement of paternalism and social cohesion could be as harsh as straight rejection or physical coercion, it did not necessarily imply the existence of nepotism and personal favours. On the contrary, rational, meritocratic, and market considerations all seem to have been as important for the East Asian peasant as for their European counterparts. Free from feudal restrictions, Chinese peasants were not rigidly tied to land, and could become local merchants. It was not unimportant that at least in theory, anyone could take the official examination to become a civil servant. Japanese peasants were less free, but in the course of the Tokugawa period (1603–1868) they enjoyed an unprecedentedly long period of peace, stability and political and economic independence from outside forces, perhaps more than anybody else did. Compared to China, the family system in Japan was less lineage-based (adoption was common) and more individually inclined (meritocratic concerns were taken seriously), and this helped make the peasant family an effective production, distribution and consumption unit (Macfarlane 1997). Their standard of living rose, if slightly, and many of them sent their sons to local schools to learn reading and abacus by the early nineteenth century (Dore 1965; Hanley 1997; but for criticism see Saito Osamu 1998). Under these circumstances it was natural for the East Asian peasant to become motivated to increase agricultural output or family income. So long as they observed social codes, the transaction cost of trade was small, and the risk involved in technical innovations was relatively low. While there was little room for big innovations or for investment in fixed capital or long-distance trade, these East Asian institutions provided the best opportunity for the development of labour-intensive technology.

Efficiency growth

In modern economics, a distinction has been made between extensive growth and intensive growth, to investigate whether growth occurred as a result of greater factor inputs or thanks to technological and institutional

advance (Hayami Yujiro 1997: Chapters 5 and 6). The point about the industrial revolution was technological advance, with or without the corresponding accumulation of capital. But the idea of distinguishing between extensive (input-based) growth and intensive (efficiency) growth can be applied to the pre-industrial revolution economy. Was there efficiency growth in the industrious revolution path? Can we find output growth in spite of the exhaustion of factor inputs such as land and labour?

The best case for testing answers to this question is Tokugawa Japan from 1700 to 1850. By the end of the seventeenth century the possibilities for opening up new areas were exhausted, and a strong demographic pressure on land built up. The use of horses for cultivation and transport visibly declined, as the pressure on land left less and less available for raising animals. Already, in the 1734 official survey, the typical household illustrated in the 'model village' is assumed to cultivate less than a hectare of land. There was now very little chance to subdivide land among sons. It became increasingly difficult to get a new household 'approved' in the village, and, even if it was approved, its status was likely to be inferior to that of the existing households. Status mattered not just in village politics and ritual rights but in the allocation of water and sharing of labour. Thus there were good reasons for 'family planning' through infanticide and abortion. The former implied sex selection (in favour of males) as well as control of the number of children (Smith, T. 1977). Some economic historians suggest that this was the result of farmers' conscious attempts to raise their standard of living (Hanley and Yamamura 1977). But infanticide and abortion alone are unlikely to explain the low 'birth rate'. In some cases marital fertility itself was lower than the natural level, despite the fact that the average caloric intake was probably adequate. It is possible that the development of labour-intensive technology meant that women worked harder during their pregnancy in the eighteenth century, contributing to lower fertility (Saito Osamu 1992). In any case, Tokugawa demographic history lacked drastic Malthusian checks on a nationwide scale. Although there were some famines, catastrophes such as epidemics and warfare played little part in determining the overall trend, and mortality remained relatively low. Japan's population remained stable between 1721 and 1846 at a little over 30 million. In other words, there was no increase in the availability of either land or people.

Yet in Tokugawa Japan, per capita agricultural output stopped declining around 1730, and began to rise continuously thereafter. By 1850 it was 25 per cent higher than in 1730. The annual rate of increase is estimated to have been 0.38 per cent for 1730–50, 0.25 per cent for 1750–1800, and 0.08 per cent for 1800–50 (Hayami and Miyamoto 1988: 44). Clearly, more labour was absorbed for the cultivation of the same acreage of land. The trick was 'labour absorption' without population increase. The number of days a late Tokugawa peasant worked per year was greater than

that in most other Asian countries in the late nineteenth century (Hayami and Yamada 1991: 251–2). However, if marginal labour productivity had declined considerably, it could have easily offset longer work days, and producers would soon have reached a point where further labour input would not be worthwhile. It was the development of labour-intensive technology and labour-absorbing institutions that overcame this Ricardian trap. To take a well-known example from the Meiji period (1868–1912), the development of summer–fall rearing of cocoons enabled farmers to combine rice production with sericulture, as, unlike the spring–summer rearing, it avoided the peak season of work in the rice fields (*ibid.*: 175–97). Progress in the Tokugawa period, if more modest than it was during Meiji, was clearly developing the East Asian technology path. While it would be hard to prove the presence of intensive growth in terms of output per day or per hour, the contribution of labour-intensive technology to the increase in per capita annual output is unmistakable. In other words, the East Asian path also had growth in efficiency without additional inputs of land and people. The difference from the Western path was that it mobilized human rather than non-human resources.

After the second half of the eighteenth century, major urban centres and castle towns in Japan declined, while rural industries began to grow. Rural merchants engaged in regional commerce, while feudal domains actively pursued policies to promote agriculture, commerce and industry to earn ‘foreign’ exchange. Both of these activities gave farmers a chance to exploit non-agricultural as well as agricultural economic opportunities. The rural household mobilized cheap labour, to produce more in response to the demand arising from the gradual rise in rural income. By the end of the eighteenth century the daughter of a rich farmer was likely to include a silk kimono in her dowry, but this did not have to be produced in the city of Kyoto where the most elaborate kimonos were made. Inter-regional merchants could bypass the merchant guilds in Osaka and Edo to cut their margins, which helped the expansion of the market for mass consumer goods.

From the point of view of the rural household, this proto-industrial work was merely an extension of their labour absorption strategy. For example, the rural merchant would bring a loom and yarn to the peasant household and collect the cloth a month later, thus providing a small income for the housewife-cum-weaver. Or cottage industries would bring workers together in one place to manufacture sake, using simple tools and waterpower. For the rural household, the ‘main’ agricultural work remained rice cultivation. Both non-rice cash crop production and proto-industrial work of all sorts were called ‘additional’ work, whether performed by household members or hired labour (Sugihara 1997a).

The growth of proto-industry in East Asia differed from the European pattern, where geographic specialization occurred and the household

combination of agriculture and industry disintegrated. While geographic specialization did occur, proto-industry in East Asia grew as a further development of the peasant family economy. The division of labour between agriculture and industry occurred through the allocation of family labour, particularly in the form of the gender division of labour. The 'main' agricultural work was considered to be primarily a man's job, while women engaged in 'subsidiary' agricultural work as well as proto-industrial employment, particularly silk-reeling and cotton weaving (Saito Osamu 1983: 30–54). Farm family by-employment, carefully scheduled and organized around the agricultural calendar, constituted the bulk of East Asia's proto-industry. There was relatively little need for urban growth and rural–urban migration. In fact proto-industrialization brought about a relative decline of urban industry in late Tokugawa Japan. Thus in industry too, efficiency growth occurred without substantial inputs of land, people and capital.

The persistence of traditional industry is well noted in Chinese economic history, especially for the period after the middle of the nineteenth century (Oyama 1960; Feuerwerker 1970; Chao 1977). Figure 3.3 explains how the traditional sector, in this case the cotton weaving industry, survived in the face of competition from the modern power loom sector. When the modern sector was able to supply cotton cloth more cheaply, the traditional sector was able to respond by reducing prices, because of the nature of farm family by-employment. Insofar as one could find surplus labour, either at night or during off-peak periods, without disturbing the 'main' work of the

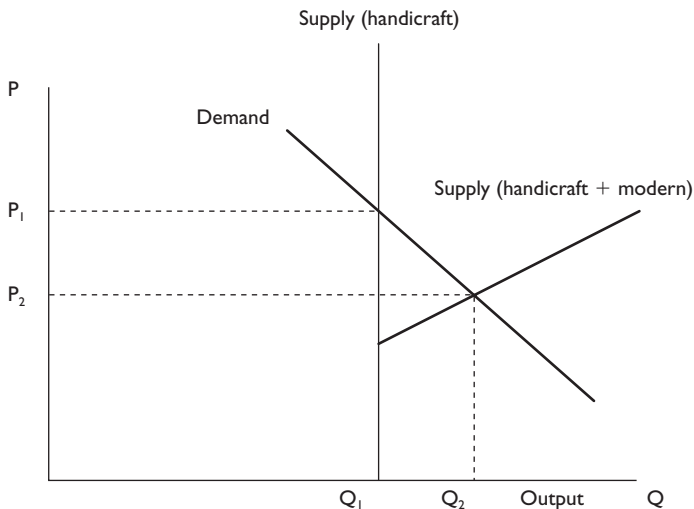


Figure 3.3 The survival of traditional industry

Source: Chao (1975: 200).

family, wages could come down to a very low level indeed, as there was virtually no extra cost involved in this employment. This was something which no modern factory could match.

The trap

Efficiency growth contributed to East Asia's relatively successful escape from Malthusian checks in the form of famine, epidemics and war, but failed to significantly increase labour productivity. If a society maintained a vast population without being able to improve the level of welfare for a long time, it could be argued that it fell into a 'trap', even if disasters were avoided. By the nineteenth-century Western standard, population pressure on land stifled East Asian growth, and the East Asian path fell into a Malthusian trap, often resulting in a significant degree of resource depletion. But it was a particular kind of Malthusian trap, because the society reached deadlock only after it had exhausted all the potential for efficiency growth. The higher the level of technical and institutional sophistication attained, the greater the degree of path dependence and the less flexibility.¹ Thus we get the sense that the trap resulted from dynamism rather than from stagnation.

Referring to China from the fourteenth to early nineteenth centuries, Mark Elvin called such a situation the 'high-level equilibrium trap' (Elvin 1996: Chapter 2). His point was that Chinese agriculture made various technological and organizational improvements aiming at high land productivity, but by the end of the period it had more or less exhausted the possibility of further improvements without the introduction of a radically new technology, such as that pursued by the Western path, which required a very different mix of factor inputs. Given the path dependency, the chances of such a radical change taking place from within progressively lessened. By this measure, Tokugawa Japan fell much more deeply into Elvin's trap than China during the same period. By the end of the Tokugawa period most Japanese entrepreneurs regarded Japan as the universe, and lacked the imagination to initiate big changes.

The government was powerless to tackle the issue too. Central and local governments played an important role, both in China and Japan, in reducing the risk of attacks from outside (the control of Japanese pirates was one such example) and maintaining internal peace. They also created a bureaucracy, and with it urban services and demand for food and clothing, in return for collecting land tax. Internationally, something of a balance of power was established in East Asia with the Chinese tributary-trade system in the centre, which helped maintain peace. But, as Chapter 7 by Arrighi *et al.* in this volume argues, there was no international order in East Asia, comparable to the one created in Europe by the treaties of Westphalia after 1648, that was able to back the growth of a

commercial empire such as the one built by the Taiwan-based Zheng family in the seventeenth century. What was crucially missing in the region was the strong 'big' government of the nation-state in pursuit of territorial expansion and long-distance trade, willing to borrow heavily for that purpose and ready to promote big business and investment in fixed capital. Without such initiatives, there was no chance to develop the navigation and military technology, which in Europe prepared a scientific revolution and an industrial revolution.

Labour-intensive industrialization

Patterns of global industrialization

The standard understanding of the global diffusion of industrialization is that during the first half of the nineteenth century, Britain became the workshop of the world, while the rest of the world came to be specialized in the export of primary products. Countries in continental Europe and the regions of recent European settlement are thought to have achieved industrialization by learning new technology and/or by importing capital, labour and machinery with their export earnings (Hatton and Williamson 1994; Foreman-Peck 1995; Woodruff 1966; Kenwood and Lougheed 1999). In continental Europe, old barriers to trade and the transmission of knowledge were gradually removed, and an international regime which would facilitate, rather than hinder, the diffusion of industrialization emerged. The formation of the Customs Union in Germany in 1834 and the adoption of the gold standard by a number of countries of Western Europe in the late nineteenth century were among such moves.

Turning to the New World, the integration of vast natural resources into the international economy served as the engine of economic growth. Labour was scarce and land was abundant, and the difference in factor endowments between the old and the new worlds induced a growth of trade, migration and investment. Thus in the nineteenth century, the growth of the Atlantic economy dominated long-distance trade. Falling transportation costs were a crucial factor facilitating this process. This implied that the regions of recent European settlement had a greater incentive than Britain to raise labour productivity, using abundant natural resources and employing imported capital. The movement towards the development of labour-saving, capital-intensive and resource-intensive technology was most clearly observed in the United States (Habakkuk 1962; Saul 1970; David 1975). The need to save skilled labour led to standardization of industrial production such as the use of transferable parts, which in turn facilitated the transfer of technology across industries and mass production, as well as the 'deskilling' of labour. Industrialization became associated with the exploitation of economies of scale.

In recent ground-breaking work, Kenneth Pomeranz argued that this was not really the result of the accumulation of technology and institutions in Western Europe before 1800. Rather, the sudden rise of the West in the nineteenth century came from the incorporation by Western Europe of two highly contingent factors into its economic orbit: the availability of coal in the relatively developed regions of Western Europe; and (2) rich natural resources of the New World. Until the end of the eighteenth century, the core regions of Western Europe and East Asia were both exhibiting equally promising signs of development of commercial agriculture and proto-industrialization, and the standard of living of these regions were rising well above subsistence. Thus, for Pomeranz (2000), the West's rise during the nineteenth century was the 'great divergence' from the general pattern.

The American frontier was exhausted around 1890, and by the early 1920s migration from Europe ceased to be encouraged. But American technology continued to lead the world, by raising labour productivity through automation, the introduction of more systematic labour management and mass marketing. Looking back from the twenty-first century, the British industrial revolution only began to show the explosive power of labour-saving technology through the use of coal and steam engines, and merely paved the way for a fuller replacement of skilled labour by capital and technology. Therefore, although the 'industrial revolution path' may have been laid before 1800, the 'Western path', with an emphasis on capital-intensive and resource-intensive technology, arguably only became fully established, as a result of the 'great divergence'.²

Differences between East Asia and Europe became much clearer in the way industrialization occurred. In Asia the process started during the 1850s when India began modern cotton spinning in Bombay, and this was followed by Japanese efforts in the 1860s and the 1870s. In these cases the direct transfer of Western technology and institutions was the norm. By the 1880s, however, the Japanese government had developed an industrialization strategy quite different from its attempts in the preceding decades (for the significance of this change, see Sugihara 1995). Recognizing that both land and capital were scarce, while labour was abundant and of relatively good quality, the new strategy was to encourage active use of the tradition of labour-intensive technology, modernization of traditional industry, and conscious adaptation of Western technology to different conditions of factor endowment. The path Japan developed can be termed 'labour-intensive industrialization', as it absorbed and utilized labour more fully and depended less on the replacement of labour by machinery and capital than the Western path.

This pattern was essentially repeated in China and Korea, with state reinforcement, and the 'flying geese pattern of economic development' (Akamatsu 1962) emerged by the inter-war period. Both the development

of labour-intensive technology, which occurred in East Asia in the previous period, and the colonial rule by Western powers in South and Southeast Asia which discouraged such a development in the subsequent period made East Asian producers of industrial goods competitive *vis-à-vis* those of other Asian countries. A number of relatively labour-intensive industries in East Asia proved to be internationally competitive. In particular, the Japanese cotton textile industry competed well in the Asian market with other Asian manufacturers as well as with Lancashire and other Western competitors. Thus there developed an industrialization-based international division of labour within Asia, and Japan, and to some extent China, was able to exploit the South and Southeast Asian markets for industrial goods. This was reflected in a much faster rate of growth of intra-Asian trade than of world trade between 1880 and 1939 (Sugihara 1996a: Chapters 1, 4; for English versions see Sugihara 1986a and 1998).

After 1945, in spite of the disruptions caused by the war, the growth in the international competitiveness of East Asia's labour-intensive industries continued. By the early 1950s, Japan had regained the position of the world's largest exporter of cotton textiles that it had held in the 1930s, and was replaced by China in the early 1970s. The chain of development of labour-intensive industries across other Asian countries has been impressive, starting from Hong Kong and spreading to Taiwan, South Korea, Thailand, Pakistan and Indonesia, and has by now reached many other countries, including those with the lowest levels of per capita income (Hayami Yujiro 1998). While the effects of this chain of diffusion cannot be seen as comparable to those of the global diffusion of high technology in a number of other respects (such as the effects on capital accumulation or on the international political and military order), it has surely been significant in terms of the creation of global employment. In fact, the majority of the world's industrial population must have been employed in those sectors primarily influenced by this kind of development. By now labour-intensive industrialization constitutes one of the two major routes to global diffusion of industrialization.

Going back to the period from 1820 to 1945, the fundamental difference with the period prior to it is that Western impact on the East Asian path of development became much more important. This is the case, in spite of the great influx of silver from the New World to China and the contribution of the Dutch East India Company to the growth of intra-Asian trade, particularly, though not exclusively, during the seventeenth century. By the middle of the nineteenth century the impact of industrialization had become world-wide. The key to the East Asian success was that the region was able to respond to the growth of resource-intensive and capital-intensive industries across the Atlantic resulting from the 'great divergence', by creating a resource-saving and labour-intensive path to industrialization. As a result, a new international division of labour

emerged between advanced Western countries, with manufacturing competitiveness in 'high' (capital-intensive) technology industry, and East Asian and other developing countries, with manufacturing competitiveness in 'low' (labour-intensive) technology industry. Indeed, this was the only way in which the non-Western world could industrialize before 1945, given the international climate of imperialism, that is, by showing the West a new way of creating complementarity, which would increase world trade and output for mutual gain. By contrast, those Asian and African countries subjected to Western colonialism with a long tradition of labour-intensive technology, such as India, suffered from the imposition of technology and institutions associated with the Western path on an environment quite ill-suited to them.

The Japanese experience

Let us look now at the Japanese experience in the pre-Second World War period to see the origins of some of the characteristics of labour-intensive industrialization. First, it was rural-based. The first Japanese census conducted in 1920 found that the proportion of people living in cities was 18 per cent. Although this figure had risen to 38 per cent by 1940, it was still very small compared to most countries in Western Europe at a similar stage of development. The rate of urbanization in Britain exceeded 48 per cent by 1840 and 65 per cent by 1870, while the 'European norm' was 31 per cent in 1840 and 45 per cent in 1870. Put another way, the bulk of Japan's industry was a modernized version of the cottage industries, predominantly situated in rural areas. Between 1911 and 1915, 61 per cent of the population were engaged in agriculture, while the non-agricultural sector consisted of a large traditional sector (32 per cent) and a small modern sector (7 per cent). Cottage-industry production accounted for 51 per cent of total industrial production as late as 1909, and continued to grow in absolute terms. Takafusa Nakamura illustrated this process by showing the interdependence between traditional industry and modern industry (Nakamura 1983: 28 and 80. See also Figure 3.4). Thus, in its fully developed form in the early 1930s, the Japanese manufacturing industry had a relatively small, fast-growing modern urban sector and a large, slow-growing but steadily modernizing rural sector. Japanese manufacturing competitiveness, reflected in the rapid growth of exports to other Asian countries in the 1930s, came not just from the modern urban sector. The initiatives of the rural weaving industry played an important part in the expansion. In fact, it was more typically cooperation between the rural and urban sectors that was responsible for rapid export growth (Sugihara 1989).

Why was the modernization of rural industry so crucial? An obvious answer is that, given the technology gap, the relative abundance of cheap

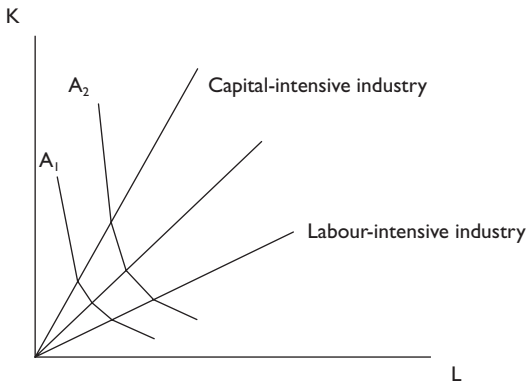


Figure 3.4 The choice of industrial structure

Source: Nakamura (1983: 69).

labour and the scarcity of capital, it was sensible for Japan to minimize the cost of building urban infrastructure, and specialize in the rural production of low-technology industrial goods. It was possible to produce many traditional commodities (such as ordinary kimono cloth and pottery) in bulk and mass-market them, provided the product was standardized and its quality was controlled. There were also attempts at production of transferable parts (Suzuki 1996). In the meantime, Western countries could supply capital and advanced machinery to Japan, so long as traditional commodities such as raw silk earned foreign exchange. Thus, the bulk of industrial goods produced in Meiji Japan were hybrid in character. Low-count yarn was produced in modern cotton mills in cities, while rural female workers hand-wove this machine-made yarn on improved traditional looms (and later power looms).

Second, a crucial factor in this process was the concerted efforts by local and central governments to foster rural entrepreneurship (Sugihara 1994). Rural promotion policies were first developed in the 1880s under French influence, with a heavy emphasis on agricultural protection. Following the Sino-Japanese War victory of 1894–5, however, the Ministry of Agriculture and Commercial Affairs staged a series of three supra-ministerial conferences between 1896 and 1898, in which a number of important policy proposals were made. By this time the priority was clearly on fostering internationally competitive export industries, while abandoning protection of uncompetitive branches of agriculture, such as raw cotton and sugar. With the exception of administrative reform (i.e. deregulation and reduction of the number of bureaucrats), most of the proposals were put into practice, though often in diluted forms and not immediately.

This rural orientation required the development of a set of policy tools quite different from the ones seen in Europe. It meant that there was a greater need to provide market information and technical assistance for the manufacture of local or regional industrial goods. Only those who were familiar with local consumer taste, societal values and peasant-worker mentality had a chance of identifying suitable markets and production methods, so members of the elite with a Western educational background or Westerners with good local knowledge needed a network of people who would cooperate with them. The government helped reorganize networks of local or regional merchants, and created a number of supporting institutions such as technical and commercial schools, commercial museums and regular exhibitions at the local, regional and national levels.

Third, turning to the development of modern industry, early government mills were ill-conceived and financially unsuccessful, but the success of the Osaka Spinning Company, which started production in 1883 with mules of more than 10,000 spindles, demonstrated the economic viability of modern factory operation. A few of the company's Japanese engineers managed to produce 15 to 20 count yarn, which was the suitable (low) count for the domestic market, without the presence of foreign engineers. Following the success of this company, many mills were established in the late 1880s. The ring frame, which was new and suited to the production of low count yarn, was imported through Mitsui Bussan, a general trading company, from Platt Brothers, and rapidly adopted within the industry. The invitation of foreign engineers was expensive, but the availability of Japanese-language manuals made it possible for local factories to operate new machines aided by the visits by Japanese engineers (Saxonhouse 1974). Short staple cotton suited for the production of low count yarn was initially imported from China, but in the 1890s direct links with Indian producers were established to secure a stable cotton supply. A cotton spinners association was formed partly to press the government to lift the import duty on raw cotton and provide freight subsidies for imports of cotton from India. In the 1890s, Japanese mills enjoyed extremely favourable circumstances for exports when Indian exports of cotton yarn to China were made difficult by the adoption of the gold exchange standard in British India, causing a rise in the value of the rupee against the silver-linked tael and yen. In the 1900s the ingenious technique of mixing short staple Indian cotton with a small amount of long staple American cotton was developed in Japan to cut costs and also to shift production gradually towards slightly higher count yarn. Some mills began to set up their own weaving operations, while the demand for improved handlooms (and eventually powerlooms) provided the basis for the development of the machinery sector (Nakaoka 1982: 54–61; Kiyokawa 1985; Sugihara 1990).

An overriding concern in this process was to minimize the cost of

capital, which was scarce. The introduction of foreign machinery was thus accompanied by a variety of capital-saving devices. Along with the spread in use of the ring frame, which was relatively simple to operate, young country girls of 15 to 20 years of age were recruited from poor peasant households in relatively distant places, and were put into dormitories for the period of their stay (normally two to three years) as factory workers. The industry was able to save wage costs by selecting this section of the labour force, which was expected to play only a peripheral role in the maintenance and reproduction of the rural household. This was an effective way of recruiting and managing labour, albeit one whose long working hours, harsh working conditions and the prevalence of tuberculosis caused much concern. The dormitories also suited the night-shift system, which was another capital-saving device. To the extent that Japanese agriculture was labour-intensive, these girls were used to hard work and long working hours. This gave Japanese mills a distinct advantage over the competing Indian mills, which suffered from lack of discipline in their workers. Japanese workers understood the concept of loyalty and filial piety, both prevalent in rural society, and the knowledge that their performance in the factory would be reported to their parents and the village community at large, not only prevented them from running away from the factory when working conditions were harsh, but motivated them to compete with fellow workers to be designated a 'model worker'. Japanese mills took advantage of this strong rural societal base, and attempted to build on these traditional values to establish their authority (Sugihara 1986b).

In sum, the process involved complex interactions between the transplantation of Western technology (in cotton spinning, for example, which dramatically raised labour productivity) and the modernization of traditional technology (for example, in hand-weaving, which offered women in peasant households ample employment, due to the improvement in weaving methods). But a notable underlying characteristic was that, unlike most of its Western counterparts, East Asian technology aimed at the most effective use of labour wherever capital and labour were substitutable. This is the definition of labour-intensive industrialization adopted here.

The Chinese experience

China did not frame a systematic industrialization plan until the late 1920s and the 1930s, when the Nationalist government gained tariff autonomy, unified the currency and linked it to the international system, and announced comprehensive industrial policies. These plans were dashed by the Great Depression, the internal political struggles between nationalists and communists, and, above all, Japanese aggression and the Second

World War. Coble argues that the Nationalist government did little to help the Shanghai capitalists between 1927 and 1937, as it was preoccupied with the pressing short-term need to finance the war. The government failed to create an efficient bureaucracy, in part because officials often conflated their public duties with personal gain (Coble 1980).

On the other hand, there is strong evidence to suggest that a number of successful attempts were made by local, provincial and national governments to promote rural industries from the early twentieth century on. In Gaoyang, Hebei in north China, for example, a series of new policies, including a rural industrialization programme, were initiated in 1903 by Yuan Shikai, the newly-appointed Governor General:

Inspection teams were sent to Japan where they discovered the semi-automatic iron gear loom. Prototype looms were imported and Japanese technicians invited to serve as instructors at a technical training school set up in Tianjin. Weavers in Gaoyang began to use the loom in 1908, and by 1910 Gaoyang had become the model for the new textile districts. By 1910, 20 per cent of the looms in use were iron gear looms, and by the middle of the next decade there had been a full conversion to the semi-automatic looms.

(Grove 1993: 3)

There is no doubt about the resilience of Chinese rural industry for most of the pre-Second World War period (Rawski 1989: 76–7). The cotton trade between Shanghai and the rest of China grew rapidly, particularly in the 1920s. Raw cotton came to Shanghai where it was machine-spun; some of the yarn was sent to weaving centres in various regions of China, while some was woven there and the cloth sent to the countryside (Kose forthcoming). The interdependence between traditional and modern industries was clearly developing. An examination of various documents and periodicals published by the Nationalist government during the second half of the 1920s and the first half of the 1930s reveals that a large number of technical and vocational schools were being supported by local governments to improve production methods, with some notable results (for example, *Chinese Economic Journal* 1928: 609–11). A comprehensive industrial policy document, drafted by the Department of Industry and Commerce in 1928, included the promotion of inventions, the promotion of foreign trade, the establishment of commercial and industrial banks, the organization and reorganization of commercial and industrial trade associations, and the arbitration of management-labour relations (Mantetsu 1930: 81–4). H.H. Kung's manifesto in 1930 was in a similar spirit, and particularly emphasized the importance of industrial exhibitions and commercial museums.

Although these plans were only partially realized, the Nationalist

government was able to control China's exchange rate reasonably well and raise import tariffs selectively to foster industrial development (Sugihara 2001). A series of boycotts against foreign (mainly Japanese) goods in the early decades of the twentieth century can be seen as part of this industrialization strategy (Goto-Shibata forthcoming). By the 1930s China effectively had become a 'rational shopper', importing machinery from many different countries, without necessarily being tied to capital imports from a particular country or affected by foreign pressures in ways experienced by the colonial states of Southeast Asia. For a country like China with a large rural population, it was difficult to determine whether to commit not only to import substitution but also to export-oriented growth. In the 1930s, however, there was a clear attempt at export promotion, with some success (Kubo 1999). In other words, the basic framework for economic nationalism was set, though industrial policies were pursued largely by local governments in a rather uncoordinated fashion.

Constraints on growth

Labour-intensive industrialization in East Asia contributed to a modest but notable rise in per capita GDP, but it did not match the growth of per capita income in advanced Western countries. This is because the region's developmental path was conditioned by both the international order dominated by Western powers and internal constraints on land.

As long as East Asia was willing to accept the international division of labour, in which the West specialized in resource-intensive and capital-intensive technology, and East Asia specialized in labour-intensive technology, the logic of complementarity worked. But when Japan attempted heavy and chemical industrialization in the 1930s, it faced the formidable problem of securing a supply of natural resources. It is well known that a variety of factors – investment, markets, emigration, and the availability of raw materials and other resources – motivated Japan's advance into Manchuria. However, in the 1930s at least, Manchuria, while absorbing vast amounts of capital and manpower, failed to become an adequate supply base for the raw materials and resources that Japan needed. In fact, the latter's need to import key raw materials from outside the yen bloc increased.

As Toichi Nawa has made clear, Japan's main economic motive for the advance into North China was to secure the American-type long-staple raw cotton produced there, and this was also one of the most important reasons why the Chinese spinners of Shanghai and the Nationalist government resisted it. Intra-East Asian competition in the cotton trade was the most important economic factor behind the outbreak of the Sino-Japanese War in 1937. Furthermore, the stronger China's resistance, the heavier Japan's burden became. Even if the conflict had been resolved,

Japan would still have been largely dependent on the West for raw fibres and for the raw materials for its heavy and chemical industries. With regard to the latter, Japan relied on British Malaya and Australia for iron ore, India for pig iron, Canada for aluminum and lead, Canada and Australia for zinc, British Malaya for rubber, and the United States and the Dutch East Indies for oil. In short, it was impossible to envisage autarky or even a significant reduction in resource dependency while at the same time pursuing rapid heavy and chemical industrialization (Sugihara 1998).

Even more important were the domestic difficulties, particularly the relative shortage of land. The level of agrarian rents was extremely high, and, in spite of high land productivity, labour productivity remained low by international standards (see Table 3.5). This set a ceiling for the rise in rural purchasing power and the standard of living of the peasant household. Because the bulk of industrial labour continued to come from the countryside, industrial wages were kept down as well. Under these circumstances, there was a limit to the expansion of the domestic market. The more East Asia industrialized in accordance with the new type of international division of labour mentioned above, the greater the productivity gap between East Asia and the West became. This constituted the background of the Japanese dilemma in the 1930s, which led to aggression and war (Sugihara 1997b).

Table 3.5 Land rent in different countries of the world *circa* the First World War

Country	Date	Type of field	Yen per ha
Japan	1921	Paddy field (one crop)	317.5
		(two crops)	396.0
		Dry field	97.1–109.4
		Mulberry field	232.8
England	before the First World War		25.0
Scotland	1912–20		20.0
Ireland	1881–1920		18.0
Germany	1913		19.2
Austria	before the First World War		24.6
France	before the First World War		12.0–16.0
USA	before the First World War		10.0–15.0

Source: Yasuba (1975: 67).

Note

Japanese data are taken from *Honpo Kosaku Kanko*. Other data are from Yasushi Sawamura, 'Nihon no Nogyo oyobi Nogyo Mondai (Agriculture and Agrarian Problems in Japan)' in Kamekichi Takahashi et al., *Gendai Nihon Keizai no Kenkyu*, vol. 2, Kaizosha (1930: 635). The data included in this table has been assembled in this form in Moritaro Yamada, *Nihon Shihonshugi Bunseki* (The Analysis of Japanese Capitalism), Iwanami Shoten (1934: 188–9), and was cited in Yasuba's article in 1975. I have converted the figures from per tan to per ha, assuming that 10 tan equals one hectare.

The fusion of the two paths

The enlargement of the East Asian path

Figures 3.5 and 3.6 have been calculated from Maddison's work to show the changes in the patterns of global distribution of income. This is a 'Lorenz curve', originally designed to show the degree of income inequality for a particular society. If everyone in that society had the same income, the 'curve' would be a straight line from the bottom-left to the top-right corner. In reality some people are richer than others, so if we chart on the horizontal axis groups of people with different levels of income starting with the poorest group on the left corner and move from left to right, and plot the percentage of total income the poorest 10 per cent have earned, that the poorest 20 per cent have, and so on, we can

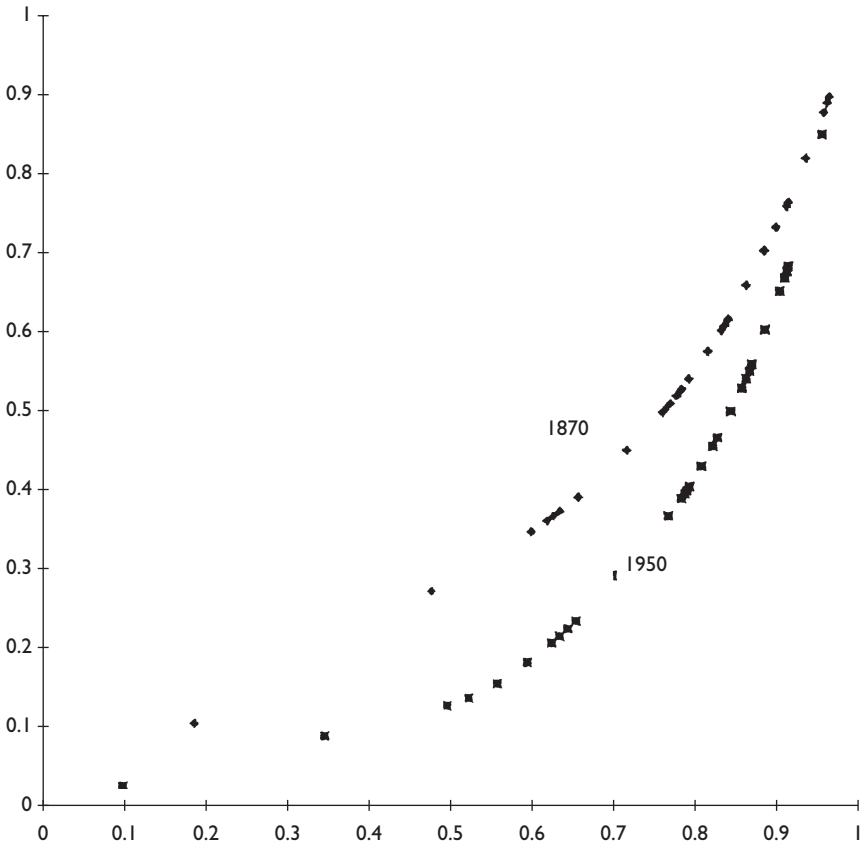


Figure 3.5 Global Lorenz curve (thirty countries) in 1870 and 1950

Source: Maddison (1995: 104–206).

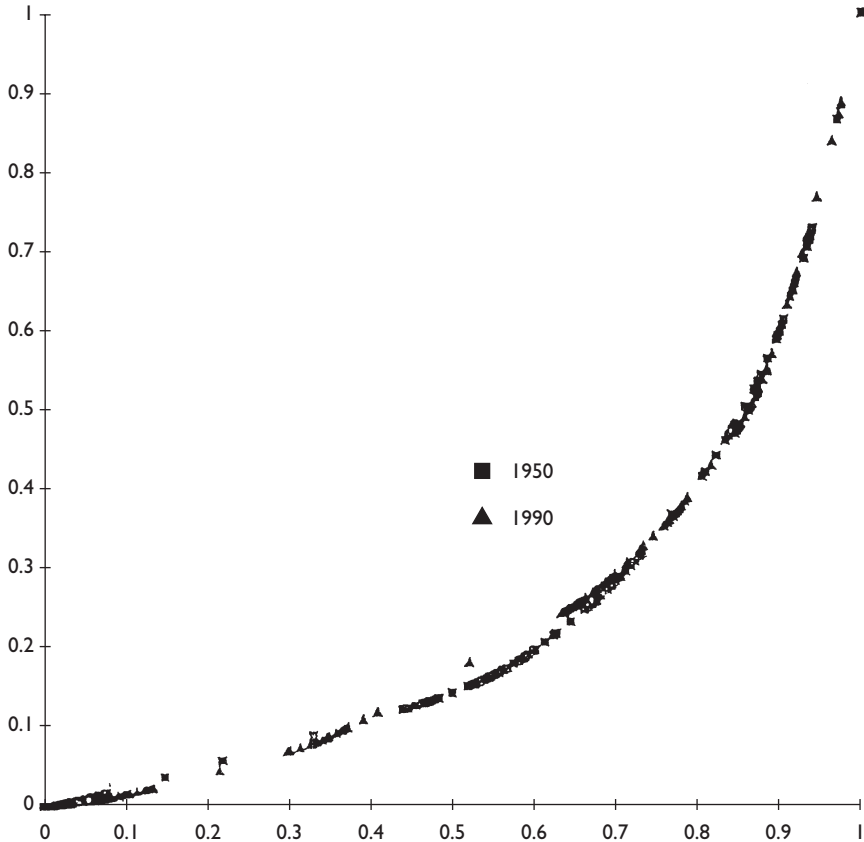


Figure 3.6 Global Lorenz curve (199 countries) in 1950 and 1990

Source: Maddison (1995: 104–206 and 217–21).

draw a curve which will have a downward bulge. The bigger the bulge, the greater the inequality.

Figure 3.5 differs from the normal Lorenz curve in that it represents global, rather than national, income inequality. It ranks thirty countries in terms of per capita GDP in ascending order, and allocates space for each country, proportionate to its population size, on the horizontal axis. Then the percentage of income the poorest 10 per cent had earned in global GDP, that the poorest 20 per cent had, and so on, is plotted. It is clear from Figure 3.5 that the bulge in 1950 was much larger than that in 1870. In other words, between 1870 and 1950 there was a substantial increase in global income inequality. However, if we take 199 countries in 1950 and 1990 and do the same exercise, we see that the bulge in 1990 was about the same as that in 1950 (see Figure 3.6).

This change in the trend of the global Lorenz curve was largely the result of the 'East Asian miracle'. Tables 3.2 and 3.3 suggest that the sustained rise in per capita GDP in East Asian countries was the main cause of this change. First, Japan moved up the ladder of world ranking of per capita GDP, joining the high-income group. This move was then quickly followed by other countries in East and Southeast Asia, and eventually reached China. The overall effect of this on the curve was that a large number of East and Southeast Asian countries moved up the ladder from the low to the middle-income, as well as from the middle to the high-income groups, ironing out the bulge.³

In my view, this has a global significance which has not been well recognized. When Arthur Lewis wrote 'Economic Development with Unlimited Supplies of Labour' in 1954, he devoted the latter half of the article to the 'open economy model' and discussed why poor tropical countries were disadvantaged and the income gap persisted. His main message in the first half of the article was that economic development would be possible if poor countries were able to absorb labour from the countryside at subsistence wages. But in the latter half, he suggested that the equalization of global income distribution would be impossible unless agricultural (labour) productivity in poor countries was raised. He thought it unlikely that such an equalization was achievable in a short space of time. He had primarily tropical countries in mind, and the situation there, as well as the growing inequality between rich and poor countries, was too serious to make him feel optimistic about the future. In fact, it turned out that East Asia realized his dream, largely conforming to his vision of economic development. If the 'European miracle' was a miracle of production which initiated the transformation of the world economy, the 'East Asian miracle' has been a 'miracle of distribution', which brought the benefit of that transformation to the majority of the world's population.

If there was a missing element in Lewis' vision, it was the fusion of the two paths that enabled East Asia to overcome its resource constraints. In part, this was made possible by the Cold War regime and further development in the international division of labour. One of the most striking features of global development between 1945 and 1973 was the strong growth of capital-intensive and resource-intensive technology, both in the United States and the Soviet Union. One thing the two countries had in common was that they were able to translate abundant mineral resources into technological and military strength. Large-scale factories were built in the steel, aircraft, military, space and petro-chemical industries, and the technology race constituted a major element in the competition between the two with their different ideological stances the 1950s and 1960s.

This created room for a new international division of labour in which East Asia not only specialized in labour-intensive industries, but in the relatively resource-saving section of capital-intensive industries. After its

defeat in the Second World War, the Japanese government was determined to pursue a programme of full economic modernization, primarily through expansion of the domestic market. But the problem of resource constraints mentioned above remained a critical bottleneck. The emergence of the Cold War offered the political background for a new American attitude towards Japan's economic future. By the late 1940s the USA viewed Japan as a country whose economic strength should be deployed to protect and further the 'free world' zone in East Asia, and it was allowed to pursue the systematic introduction of capital-intensive heavy and chemical industries. Although heavy and chemical industrialization was attempted in the 1930s and in some ways accelerated during the period of the wartime controlled economy, it was at this point that the character of Japanese growth shifted from labour-intensive industrialization to the fusion of the two paths, and its experiment began to assume global significance.⁴

Even after the Japanese 'miracle' was recognized, contemporary observers were slow to appreciate the economic potential of other Asian countries. This was in part because major political changes had taken place in Asia since the second half of the 1940s. Mainland China, India and some Southeast Asian countries either entirely or largely ceased to trade internationally, as a result of the policies of newly independent governments or as a consequence of the establishment of communist regimes and US-led embargoes. Some countries fought for their independence while others achieved it by political negotiation, and the 1950s saw the rapid progress of decolonization and a surge of nationalism. Although South Korea, Taiwan, Hong Kong, Singapore (collectively called newly industrializing economies, NIEs) and Malaysia came to be associated with the 'free world' at a relatively early stage, the clear entry of four ASEAN countries (the Philippines, Indonesia, Malaysia and Thailand) into the open economy zone had to wait until the middle of the 1960s. Then China, which had been heavily influenced by the Soviet model at the initial stage of the communist regime and had remained outside the 'free world' for thirty years, reopened the door to international economic contacts in the 1970s. By the early 1990s most East and Southeast Asian countries were participating in the dynamism of the Asian international economy.

East Asian growth was also closely related to the rise and demise of the Cold War regime. American hegemony provided an international framework in which NIEs and ASEAN countries pursued industrialization. They developed a variety of strategies, combining American technology and aid with cheap and relatively good quality labour. During the 1970s and 1980s some Asian countries such as South Korea and Indonesia gradually abandoned the heavy and chemical industrialization strategy, and tried to focus more on a thorough exploitation of human resources. What

followed was the emergence of a new Asian international division of labour in which Japan specialized in relatively capital-intensive industries and the rest of Asia produced relatively labour-intensive goods. But a crucial change occurred when China changed its economic policy towards a more open and export-oriented outlook, as it dramatically broadened the region's labour-intensive industrial base. The fundamental problem of the Soviet model was that, with its emphasis on state allocation of resources, it lacked an effective incentive mechanism for production, distribution and consumption units (Hayami Yujiro 1997: Chapter 8). Therefore, China's re-integration into the regional dynamism of East Asia has inevitably been a gradual process. Nevertheless, in its fully developed form in the 1980s and the first half of the 1990s, the re-emergence of a powerful East Asian regional economy represented the fusion of the two paths, within the international order dominated by the United States.

In the 1950s and 1960s Japan chose to develop certain industries (such as automobiles and consumer electronics) which were neither too resource-intensive nor too labour-intensive, to achieve the fusion of the two paths. In this narrowly focused experiment, there was not much scope for a comprehensive fusion that would embrace the diversity of global economic allocation of resources. In the 1970s and 1980s, the range of industries which benefited from the fusion became broader, and it started to take place throughout Asia. Meanwhile, the success of the Cold War regime, that is, the retention of a period of 'long peace' (and this trend not only continued but was reinforced after the collapse of the Cold War regime in 1989), paradoxically reduced the importance of resource-intensive and capital-intensive technology. As a result, the relative influence of the two paths on the direction of global economic development became more equal. By the late 1980s, the transfer of Japanese technology was no longer confined to Asia. A large part of the recovery of the American automobile industry in the 1990s came from a conscious adaptation of Japanese production methods (Abo 1994). In this most recent period it appears that the sheer diversity of the Asia-Pacific region, in technological, institutional, and cultural terms, has offered the best opportunity to benefit from the fusion, enabling sustainable development on a global scale.

Japan's high-speed growth

The main source of energy for the Japanese economy in the immediate post-war period was coal, and the coal and steel industries were prioritized as the leading sectors for national economic rehabilitation. But it soon became clear that the domestic coal industry could not meet growing demand. Following the pre-war pattern, most oil firms in Japan depended heavily on capital and technology. The shift to oil began around 1954, and

in the early 1960s the Ministry of International Trade and Industry (MITI) formulated a new policy for fostering the Japanese oil industry, in view of the vital importance of securing energy supplies. The biggest demand for oil in the 1950s came from the steel industry, but after 1960 the power stations became the most important consumers. The growth of demand in the transport sector and the petrochemical industry was also strong (Saito Tomoaki 1990). In 1953 oil accounted for 18 per cent of Japan's total energy consumption. Its share rose to 38 per cent in 1960 and to 71 per cent in 1970, all of it imported (Shimizu 1993).

Japan's domestic transformation into an oil-based economy involved fundamental structural changes. Pre-war Japanese industrialization was essentially based on coal, textiles and machinery and much of this activity was located in rural areas. The oil supply enabled Japan to expand its relatively small inorganic material-based sector into a leading sector of the economy. Major refineries and petro-chemical complexes were established along the Pacific coast, often using the sites of former arsenals and naval bases. Textile firms developed man-made fibre businesses. The steel industry invested heavily in large plants equipped with the latest technology, shifting its resource base from coal to oil. The machinery industry developed major new branches for the manufacture of transport machinery (tankers, trucks, passenger cars and railway carriages), electrical machinery (both industrial machinery and consumer electrical goods), heavy machinery (particularly for the construction industry) and precision machinery for industrial use. The shipbuilding and shipping industries were encouraged to build tankers and secure a level of tonnage sufficient to meet Japan's needs as well as to earn foreign exchange. Large ports and related facilities were built or renovated near major cities to meet the demand from the growth of trade.

It is absurd to view this development as an attempt to 'catch up' with or challenge the United States (or the Soviet Union for that matter), ignoring the fundamental difference in factor endowments between the United States and Japan. It is well known that the latter's heavy and chemical industries lacked a military side (Japan's aircraft and space industries were also weak). Although many parts of the heavy and chemical industries were related to the development of Japan's infrastructure and were capital-intensive, the bulk of the machinery (including shipbuilding and automobile manufacturing sectors), chemical and textile industries favoured labour-intensive processes, and it was these industries that eventually became internationally competitive. The Japanese automobile industry, for example, developed an efficient mass production system, with in-house programmes of skill formation and a well-organized network of subcontracting firms. These industries attempted to go beyond the constraints of Fordism, a technology which pursued automation, scientific labour management and economies of scale in a resource-rich and labour-

scarce environment (Shimokawa 1994; Shiomi and Wada 1995). In the lower layers of the hierarchy of sub-contracting firms there was a growth of efficient small and medium-sized businesses, which offered the bulk of employment.

In other words, the fusion of the two paths occurred, not by attempting a direct articulation of the (originally labour-saving) imported technology and cheap labour (trained to replace capital) in any particular industry or factory, but through the development of inter-linked industries and firms with different factor inputs. The extremes at both ends, such as the space industry and traditional cottage industry, were abandoned and a balanced growth of industries in-between was attempted. Figure 3.4 was originally created by Takafusa Nakamura to demonstrate the rationality of the growth of traditional industry, and that, in fact, during the Meiji period modern industry and traditional industry coexisted and reinforced each other's development. But it can also be used to illustrate the process of fusion in which different types of industries simultaneously develop, linking and reinforcing one another, during the period of high-speed growth.

As such linkages formed, a massive rural-to-urban migration took place in the 1950s and 1960s. The proportion of city dwellers in the total population rose from 38 per cent in 1950 to 76 per cent in 1975. In addition to the demand for industrial workers, a huge demand for labour was created by the process of urbanization. The Japanese economy shifted its base from the rural household to the urban household, coinciding with a persistent rise in wages. But the standard of living did not necessarily rise as fast as nominal wages, since the urban infrastructure was poor, and living and environmental conditions were frequently appalling. On the other hand, the government made sure that social overhead capital, particularly goods and public transport, was able to cope with the demand arising from growth. Good communication networks also contributed to the diffusion of mass consumer culture. As a result, income distribution was kept remarkably egalitarian. At this time it was politically important to avoid creating a 'dual economy' of any kind. An effort was made to reduce regional inequality, while the growth of small and medium-sized businesses was encouraged.

While the increase in agricultural (labour) productivity, particularly in rice farming, contributed to containing the rise in agricultural imports, much of the new urban demand was absorbed by the growth of mass consumer goods. Initiatives ranged from the diverse attempts to mix elements of Western and Japanese food to the development of space-saving consumer electronics. In order to maintain the quality of labour with reasonable wage costs, it was necessary to form the stable urban household quickly and smoothly, and the management of big business sought to respond to this need. The diffusion of company housing and other

welfare facilities, of occupational pensions and of 'companism' as an ideology all helped to fill the gap created by the rapid disappearance of the rural household and the village community.

Equally important was the rapid rise in the level of universal education. By the end of the period the majority of the core industrial workforce were recruited from high school graduates (at the age of about 18), rather than from junior high school graduates (at about 15). The investment in human capital was not confined to formal education. Large corporations adopted institutions such as lifetime employment, the seniority wage and the enterprise union, which suited their commitment to on-the-job training and their preference for multi-skilled workers. In the second half of the 1960s, the wage gap between white-collar and blue-collar employees narrowed, but what actually happened was that all workers increasingly came to be treated like salaried white-collar employees. Culturally and institutionally, class boundaries became very blurred.

The fusion in East and Southeast Asia

Coinciding with political splits arising from the surge of nationalism and the Cold War, fierce inter-Asian competition existed throughout the post-war period. Turning to the case of the cotton textile industry again, it was Chinese competition (and its price-cutting export strategy) that drove the rapid increase of labour productivity in Japanese industry in the 1950s (Sugihara 1999), and South Korea and Taiwan were Japan's main competitors in the man-made fibre market in the 1960s. More generally, relatively low wage industrializers competed well for their share in the world market for textiles, sundries and machinery, by using a technology similar to the more advanced countries. In this way, industrialization spread to low wage countries, encompassing a broad range of industries across East and Southeast Asia. As soon as wages in one country rose even fractionally, it had to seek a new industry which would produce a higher quality commodity to survive the competition, creating an effect similar to the 'flying geese pattern of economic development'. At the same time, successive entrance of new low wage countries ensured the lengthening of the chain of 'flying geese'. It is this aspect of industrialization, part of the enlargement of the East Asian path, that has been responsible for the increase in East Asia's share in world GDP.

As for income inequality, there has been an unmistakable rising trend in per capita income in lower to middle income groups among the participants in the 'East Asian miracle'. Although super-rich classes emerged in a number of Southeast Asian countries, the overall character of economic development was that of egalitarian income distribution. Under the environment of resource constraints, East and Southeast Asian countries invested heavily in human capital, which yielded a general rise

in labour productivity. While there is a tendency for income inequality to increase to a peak before starting to improve as economic development occurs, the peak was reached in Asia when the level of per capita income was much lower than in the West. As a result, income distribution in East Asia has generally been more egalitarian than in advanced Western countries at similar stages of development (Oshima 1993: Chapter 9). Although like Japan, the rise in the standard of living lagged behind due to poor urban infrastructure, a 'law of rising expectations in the standard of living' has been set among the majority of the population. And, with high growth, expectations and living standards rose much faster than they had earlier in the case of Western populations. Even the informal sector came to look like a 'slum of hope' with a small proportion of people able to get out of the slum to move up the social ladder.

Another observation is that East Asian countries went through industrialization with a comparatively low level of energy intensity, because, in the early stages of industrialization, the region imported the bulk of its steel and heavy machinery from the West, and resource-intensive and capital-intensive industries never dominated the region's industrial structure. This was the case in spite of the wars in Korea and Vietnam, and despite the popularity of developmental authoritarianism and the influence of the Soviet model of heavy and chemical industrialization in some countries. If we take the period from the 1950s to the 1970s and compare the performance of Asian countries, those countries that placed more emphasis on heavy and chemical industries or did not promote agriculture and other labour-intensive sectors of the economy generally fared less well than those that pursued balanced growth with a more egalitarian profile of income distribution (Oshima 1987). Thus Taiwan in the 1950s and 1960s grew faster than South Korea, and China placed more emphasis on equality and education than India, with better results. Thailand outperformed the Philippines, and Malaysia fared better than Sri Lanka in terms of the improvements in agricultural productivity. As a result, the growth economies of East and Southeast Asia acquired a less resource-intensive profile than those following the Gerschenkronian 'catch-up' strategy or the Soviet model of economic development.

Clearly, the lack of proper infrastructure and dependence on cheap labour was a temporary solution to resource constraints with the serious consequences of pollution, poor urban health and congestion. And, as Table 3.6 suggests, many Asian countries were still going through the process of urbanization in this period. With the exception of Japan, a significant part of the building up of social overhead capital has been financed and/or guided by foreign resources. The East Asian regional economy has been conditioned by the development of a wider framework of the international division of labour, particularly in the Asia-Pacific. It would be wrong to assume that the growth of intra-Asian trade and a new

Table 3.6 The rate of Asia's urbanization in comparative perspective (%)

Country	1970	1993	1800	1870	1993
Japan	71	77			
South Korea	41	78			
Malaysia	34	52			
Thailand	13	19			
The Philippines	33	52			
Indonesia	17	33			
China	17	29			
India	20	26			
Bangladesh	8	17			
Britain			34	65	79
European norm			23	45	55

Sources: World Bank, *World Development Report 1995*, and Crafts et al. (1991: 112–13).

Note

The rate refers to the urban population as a proportion of total population. As the concept of urban population differs country by country, these figures should be taken as a rough guide. It is well known that the Japanese definition is too strict (hence the figures are too low) and the Chinese even stricter, ignoring the tens of millions of people living and working in cities without residence permits, confounding comparative analysis.

Asian international division of labour could have occurred without the simultaneous growth of Pacific and world trade and the enlargement of the region's resource base. The fusion in East and Southeast Asia was a truly global phenomenon.

The development of resource-saving technology

From the first oil crisis of 1973 Japanese technology showed a distinctive response to severe resource constraints. There was a concerted effort to diversify energy sources, the most important of which was an increased use of nuclear power stations. The exploitation of LNG (liquefied natural gas) also played a part. Furthermore, more efficient use of energy with the application of high technology and new industrial materials became a priority. Between 1975 and 1988 the oil intensity, measured by the ratio of oil consumption to GDP, fell by about 57 per cent (Hamauzu 1990: 50–1). Overall, energy intensity, the ratio of all energy consumption to GDP, declined substantially. In terms of the level of per capita energy intensity, Japan did far better than advanced Western countries.

Thus there was a significant shift from oil-using to energy-saving technology in the manufacturing industry, and a new industrial structure was built in the 1970s and 1980s. The relative importance of the steel, chemical, cement and aluminium industries declined. Within the machinery sector, the transport machinery and heavy machinery sectors

shrank, while the electric (mostly electronic) machinery and precision machinery sectors grew. The automobile industry shifted its material base to harder and thinner steel as well as to plastics and other 'new materials', thus making cars lighter and more fuel-efficient, while the consumer electronics industry developed smaller and lighter products. The development of the machine tool industry enabled the production process in these sectors to become less energy-intensive as well.

At the core of this new economic structure was the development of the electronics industry. The computer, semi-conductor, telecommunications equipment and general electronic parts sectors interacted with one another, resulting in the creation of a sophisticated communications network to which many manufacturing industries could link their products and services. The dynamic growth of the service sector, not just in banking and distribution but in the new software industry as well as in medicine, education and management consulting, was also partly dependent on this new environment. Although the electronics industry was neither large in size nor always internationally competitive, it provided other industries with both vital technology and an informational infrastructure.

This application of the electronics industry's new products and knowledge to other manufactured goods played a significant part in enhancing the international competitiveness of Japanese industry. Exports of automobile and consumer electronics to the United States and the rest of the world grew rapidly, despite the appreciation of the yen from 1986. The strong yen adversely affected export industries, but also lowered the price of oil in yen terms. Equally important in this context was the survival of Japanese oil-using industries. The steel and shipbuilding industries attempted a reduction in energy consumption as well as a diversification into new fields on their own initiative (Hashimoto 1991: 71-143). They survived tough competition from other Asian countries by achieving productivity increases, partly through the application of high technology to the production process.

In other words, the Japanese path did not fully converge with the Western path, which had a much higher level of energy intensity. The Japanese level of energy consumption per capita per GDP remained among the lowest in advanced countries, and stayed at about half the American level, in spite of the latter's steady improvement in energy efficiency. Rather than finding new energy sources or financing new technology which would require inputs of additional natural resources, Japanese efforts were concentrated on developing new industrial linkages within the machinery sector, in the context of severely constrained factor endowments (Hashimoto 1996). Of course, as Japanese wages in dollar terms rose quite rapidly during this period, labour-saving technology advanced, and the simpler types of work were replaced by robots or transferred to

other Asian countries. More importantly, however, Japanese industries (and society at large) attempted to increase labour productivity, not by deploying more capital and resources, but through the more efficient use of labour in manufacturing and service industries. It is in these areas that the recent transfer of Japanese technology to the rest of the world has been taking place. Furthermore, by the 1990s these tendencies came to be widely shared by other resource-poor Asian countries and city states, including Taiwan and South Korea. A combination of mechanical engineering and electronics helped them to build internationally competitive machinery industries (Zhou 1997). Of course, there remains a huge gap between the frontline technology and the reality of East Asian economies, and in some respects the gap may well be widening in recent years. But the innovative core of East Asian technology remains firmly in the resource-saving tradition of the East Asian path.

To some extent, the resurgence of the East Asian path was reinforced by the changes in the nature of the international division of labour itself. Between 1974 and 1985 Japan developed a huge trade deficit with all the oil-producing countries, especially of the Middle East, and settled it with an equally large trade surplus with the rest of the world, especially advanced Western countries. Faced with strong competition from Japan and other East Asian countries in the international automobile and consumer electronics markets, the United States and Western Europe were inclined to focus on exporting arms and military-related equipment, especially to the Middle East. This 'oil triangle', consisting of Japanese imports of oil from the Middle East, Western imports of Japanese manufactured goods and Middle Eastern imports of Western arms, constituted the largest single pattern of multilateral trade settlement in this period (Sugihara 1993). This development reinforced the new international division of labour where the West specialized in military-related technology and Japan specialized in high-technology mass consumer goods, maintaining the difference in the level of energy intensity, particularly between the United States and Japan. While East Asia depended critically on the United States for the region's security, American hegemony in turn depended increasingly on its ability to monitor the changing international division of labour, as East Asia's share in global manufacturing output increased. This explains why the US–Japan trade conflict, on the face of it no more than a bilateral trade imbalance, became an issue of global significance.

Conclusion

In the standard literature on the evolution of the modern world system, industrialization is understood to have emanated from Western Europe and spread to the rest of the world, and all industrialization is simply

taken as a chain of technological diffusion. In this chapter, we looked at the East Asian experience, and argued that in fact there were two paths of economic development, the industrial revolution path, which started in Western Europe, and the industrious revolution path, which developed in East Asia.

From this perspective, global development consisted of three phases. In the first period, from about 1500 to 1820, the two paths developed independently of each other, but with broadly similar results. There were significant connections between these regions, for example, through world silver flows, but they did not result in the convergence of the two paths. We have emphasized the fact that the East Asian path was more successful in maintaining the region's large share in world GDP, as it was able to increase the size of the population through the development of characteristically labour-intensive technology and labour-absorbing institutions. Core regions of East Asia, notably Japan and coastal China, matched the West in per capita GDP as well.

The second phase was led by British industrialization, particularly during the first half of the nineteenth century, and it is generally accepted that it spread principally to Europe and the regions of recent European settlement. This is a model based on the growth of the Atlantic economy. In particular, the growth of the US economy brought Western technology to a new height, exploiting abundant resources, economies of scale and a liberal political order backed by superior military technology. In fact, we suggest, there were two routes of global industrialization, one represented by the American experience which developed capital-intensive and resource-intensive technology, the other represented by the East Asian experience which developed labour-intensive and resource-saving technology.

The West European variety of industrialization did not spread into the non-European world in its original form, as the man-land ratio was very different there, and the straightforward introduction of Western technology proved to be problematic. Thus Japan, as well as China and Korea, pursued an alternative pattern of industrialization, with greater labour inputs relative to capital. This we call labour-intensive industrialization. Beginning in the 1880s, Japan created a wide range of modern Asian industrial goods such as cheap cotton textiles and noodle-making machines, to accommodate Asian cultural needs. Japan also reactivated traditional Asian local institutions, which eventually emerged as modern corporations committed to raising the quality of labour. During the first half of the twentieth century other East Asian countries followed suit. However, despite an increase in land productivity, and the growth of labour-intensive industries, during this second phase of global development East Asia's labour productivity lagged behind that of the West, and the region's share in world GDP decreased.

In the second half of the twentieth century, Japan underwent heavy and

chemical industrialization, and acquired the highest level of Western technology while retaining the East Asian institutional framework, which permitted a more thorough exploitation of human resources than had been possible following the American path. By this time the mass consumer goods Japan produced (small cars and fax machines, for example) were no longer targeted at Asian cultural needs alone. It was not the industrial revolution in Britain or the subsequent Western technological advance alone, but the fusion between such technology and East Asian human resource exploitation that produced the very high rate of economic growth in East Asia.

This fusion did not occur easily. Although heavy and chemical industrialization began before the Second World War, it was not until after it that full interaction between the two paths occurred across the Asia-Pacific region. This fusion turned out to be much more powerful than the development of labour-intensive industrialization, involving deeper clashes and articulations of technology and institutions. It represents the third phase of global development.

Strictly speaking, the three phases sketched above are neither mutually exclusive nor geographically separate. The two paths both attempt to utilize capital and labour efficiently, and create institutions to do so. Depending on ecological and cultural endowments, different institutions are created at different times in different places, and they set the pattern and pace of economic growth. What has not been well recognized is that the greater the difference in the nature of the two paths, the greater the potential for generating growth. The different technological paths followed by Europe (and its offshoots) and East Asia between 1500 and 1945 created the best opportunity for explosive growth, especially in the Asia-Pacific region.

The development of the third phase has had major implications for global history. First, it suggests the possibility of a move to end worsening global income inequality. The possibility of labour-intensive industrialization is now a real one for the majority of developing countries. If the 'European miracle' was a miracle of production which initiated the transformation of the world economy, the 'East Asian miracle' has been a miracle of distribution which brought the benefits of global industrialization to the majority of the world's population. Second, the resurgence of the East Asian path has contributed to the diffusion of industrialization by retaining and promoting energy-saving technology. In spite of the rising concern about environmental destruction as a result of the diffusion of industrialization and the very high level of energy consumption in advanced countries, few would argue for a complete halt of this process. The only way to make global industrialization possible is a further improvement in energy efficiency on a global scale. In order to allow the miracle of distribution to continue, the Western path must converge with the East Asian path, not the other way round.

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Notes

- 1 Much has been made of the fact that most proto-industrial regions of Western Europe failed to initiate the industrial revolution (Pollard 1981; Wrigley 1988). Even so, they must have had a greater chance than their East Asian counterparts in initiating one, if only because land intensity was less thoroughly exploited there, and the dependence on labour-intensive technology and labour-absorbing institutions was that much weaker.
- 2 Although Pomeranz acknowledges that capital accumulation and the scientific revolution were both necessary conditions for the industrial revolution, he does not see the 'divergence' between East Asia and Western Europe occurring before 1800. He argues that, far from escaping from the Malthusian trap, Western Europe after 1750 was heading towards the vicious circle of population growth, diminishing returns from land and the tendency towards labour-intensive technology, in the same way as East Asia had been. Thus the West could only be rescued by the contingent factors (coal and the New World). I substantially agree with his view, but wish to retain my emphasis on the important differences in the man–land ratio between the core regions of East Asia and those of Western Europe before 1800 (see Pomeranz 2000: 16–17, for his comments on my work). The core regions of Western Europe never experienced the type of land scarcity seen in eighteenth-century Japan, and it was in Japan, not Europe, that land productivity rose to the extreme and the perception of work was most systematically moulded around labour-intensive technology (Take-mura 1997). It is as crucial to formulate the concept of the industrious revolution on the basis of the typical East Asian (Japanese) experience as to formulate the concept of the industrial revolution on the basis of the typical European (English) experience. It is surely possible to plot both the European experience of the industrious revolution (for a conceptualization of the European experience with emphasis on demand-side changes, see de Vries 1993, 1994) and the East Asian experience of capital accumulation (see Pomeranz 2000: Chapter 4) in the broadly Smithian–Malthusian comparative perspective suggested by Pomeranz (see also Wong 1997), without denying the notable divergences in factor endowments in Japan and England emphasized in this chapter. Pomeranz (Chapter 4, this volume) observes a similar pattern emerging in the Jiangnan region of China.
- 3 It is likely that the shape of global Lorenz curves for the period from 1500 and 1820, if they could be drawn would look more egalitarian than that in 1950 or

even in 1870, because the amount of global surplus over and above global subsistence needs must have been smaller. Certainly the East Asian societies in the earlier period looked more egalitarian. If that is the case, the post-war 'East Asian miracle' was a correction of temporary imbalance on a global scale, arising from the 'European miracle'.

- 4 If Pomeranz is correct in suggesting that the industrial revolution was unlikely to occur anywhere in the world without the presence of highly contingent factors, a similar sentiment can be expressed with regard to the fusion of the two paths. On the face of it, when world resources came to be freely allocated through trade and the pressure on land eased, East Asia could have converged with the West, as simple 'convergence' theory predicts. In practice, however, the population of East Asia and the rest of the developing world was so large that it would have been impossible to raise their standard of living to the Western level, given the level of technology and available world resources. In any case, American technology was so heavily biased towards resource-intensive and capital-intensive technology that it was ill-suited to the needs of developing countries. But to lower Western standards of living for a more egalitarian world would have been politically unacceptable to the population of advanced Western countries. Thus, a much more likely scenario would have been the persistence of the North-South divide, and the continued struggle for a greater share of income and resources among nations, leading to military and political tension. Fusion only took place because of the presence of two highly contingent factors; the Cold War regime fortuitously creating a vacuum which allowed Japanese industrial growth, and the Japanese determination to achieve economic modernization using the fewest possible external resources, which was an instinctive reaction to the self-inflicted consequences of the Asia-Pacific War.

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