Chapter 1

Income Growth and Inequality over the Very Long Run: England, India and Japan Compared

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Introduction

In *The Great Divergence: China, Europe and the Making of the Modern World Economy* (published in 2000), Ken Pomeranz argued that until about 1750, both East Asia and western Europe were reasonably advanced in terms of commercial growth and market integration, and hence that the former region's standard of living was more or less on a par with that of the latter. The book thus postulates that there had been a sort of East-West convergence before the real divergence emerged with the industrialisation of the nineteenth century, and as such has stimulated debate amongst economic historians at both ends of Eurasia (Pomeranz, 2000).

Although the empirical basis of the argument was not particularly solid in his 2000 book, much progress has since then been made by quantitatively oriented economic historians such as Bob Allen and Jan Luiten van Zanden. They are chiefly concerned with the inter-regional comparison of real wage levels in the early modern period, for which it is difficult to apply PPP or similar methods of adjustment. Allen's new method, which postulates a minimum level of caloric and protein intakes but allows for an actual basket of consumer goods to vary across countries, enables us to calculate a family's level of wage earnings in relation to the subsistence line. He first applied this measure, called the 'welfare ratio', to European countries, and then with van Zanden and others extended the exercise to areas outside Europe, that is, China and Japan (Allen, 2001, 2005; Allen et al., 2005).

These are findings that, on the face of it, suggest that great divergence had already existed in the early modern period, for the welfare ratios calculated for East Asia were substantially lower than those for northwestern Europe, that is, England and the Netherlands. At the same time, they have found that a similar divergence had also emerged within Europe—southern Europe lagged behind the northwestern countries. To put it differently, while England and the Netherlands were well ahead of the rest of the world, East Asia was on a par with southern Europe. This picture is indeed not inconsistent with that derived from conventional measures of growth and standard of living. Recent estimates of per-capita GDP made by Angus Maddison and van Zanden (for Europe only) do indicate that there was a European divergence during the early modern period as well as northwestern Europe's supremacy over East Asia in terms of both level and growth rate (Maddison, 2001; van Zanden, 2005).

As far as Japan is concerned, their findings may be taken to imply that Tokugawa Japan was somewhat better performing amongst countries in the 'rest of the world' group. Indeed, there is

consensus that despite the de facto lack of overseas trade, there did occur a modest kind of growth during the Tokugawa period: a quarter of a century ago, Thomas Smith drew our attention to this phenomenon and suggested that it should be characterised as a kind of rural-centred growth (Smith, 1973). There is now consensus that there was modest growth in Tokugawa Japan: a numerical expression of it may be found in Maddison's estimates of per-capita GDP growth rates, which are not high but consistently positive, and in sharp contrast with those of imperial China, which are estimated to be zero over the Ming and Qing periods.[1]

As for real wages, I accept that the welfare ratio estimates derived solely from wage data were below the levels enjoyed by northwestern European populations. However, I have argued elsewhere (Saito, 2005b):

(1) that non-wage incomes were not negligible in the Japanese family economy, so that the household income could have been on a par with the yearly wage earnings of the northwestern European household; and
(2) that its underlying difference was a contrast between a peasant and proletarian family economy. Nevertheless,
(3) both experienced early modern growth with the common denominator being an increased Smithian division of labour.

Such 'Smithian growth' may be equated with market growth. By 'Smithian growth', however, I mean something different from Joel Mokyr's definition, which embraces both static and dynamic gains. Also, Mokyr's denotes just one source of economic growth, others being Solovian, Shumpeterian, and Boserupian: with this typology, one can periodise history as moving from the Malthusian to the Smithian, then on to the Shumpeterian (Mokyr, 1990, pp. 4-6).[2] Here, I refer to increasing returns derived from an increased division of labour in Adam Smith's sense or, to use Alyn Young's terminology (1928), from increased roundaboutness. This effect should be distinguished from static gains like those from Ricardian comparative advantages: it is more to do with the emergence of a new market between separated processes of production, such as a market for cotton yarn that used to be prepared by weavers themselves. The notion thus enables us to cover not just the classical industrial revolution—characterised by a disproportionate expansion of the production of intermediate goods such as cotton yarn, iron and steel, and machine tools—but the early modern process of proto-industrialisation as well. In other words, both Japan and the West experienced Smithian growth during the early modern period.

This paper turns to an issue that has not been explicitly discussed in the debate on the 'Great Divergence', that is, the question of class differentials in household earnings, and places inequality in the context of income growth from early modern to modern times.

By adding India, where de-industrialisation is said to have taken place in the nineteenth

[1] See Maddison (2001, pp. 251-252). His estimates for Tokugawa Japan are based largely on the figures provided by Satoru Nakamura for farm output.
[2] See also Parker (1984).

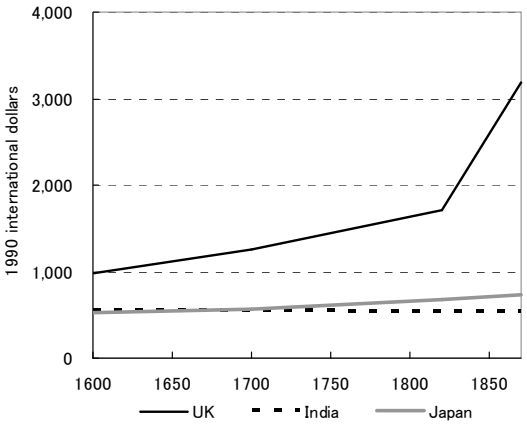
century, to the Europe-Japan comparison, the paper will examine the three countries' early modern social tables, and how they changed over time with special reference to trends in growth and inequality in the period from the late nineteenth century to the 1930s.

Facts about Early Modern Growth

According to Maddison's historical national accounts table for countries in the world, GDP per capita in the United Kingdom grew more than threefold from 1600 to 1870. On the other hand, India's per capita GDP is estimated to have declined by 3 percent, while Japan achieved modest growth of 42 percent over the same period (Figure 1).

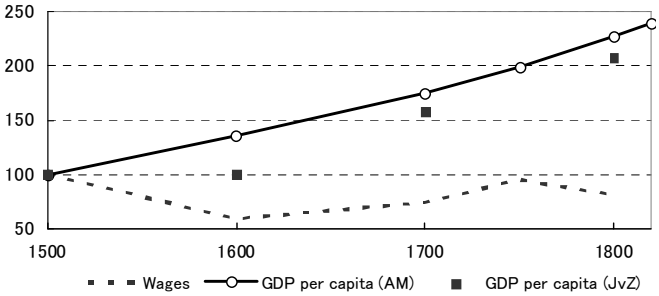
If such experiences of average income and output growth are compared with those of wage growth in England and Japan, somewhat different pictures will emerge. In Figures 2-3, I have added alternative estimates of per-capita output growth for both countries (van Zanden's less optimistic per-capita GDP figures for England, and Satoru Nakamura's figures for Japan, which cover the farm sector only). Different as these alternative estimates are, however, the general conclusions are the same. In England, a high-growth country, the growth of real wages for labouring men lagged far behind that of income experienced by men in the middle position of the entire population. In Japan, a low-growth country, there was little gap between the two indicators. It is not unlikely that early modern growth in the former case was associated with a widening tendency in income inequality, while in the latter, no worsening took place in the class distribution of income.

Figure 1. Maddison's estimates of GDP per capita for UK, India and Japan, 1600-1870



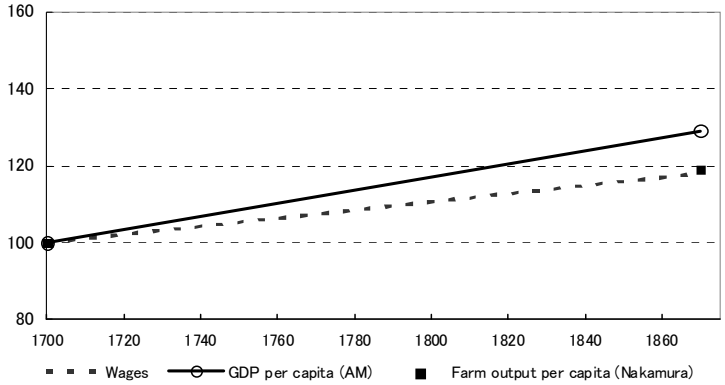
Source: Maddison (2001, p. 264).

Figure 2. Trends in wage and output growth: England, 1500-1820



Sources: Allen (2001, p. 437); Maddison (2001, p. 264); and van Zanden (2005, Table 3).

Figure 3. Trends in wage and output growth: Japan, 1700-1870



Sources: Saito (2005a, pp. 90-95), and Maddison (2001, pp. 255, 264).

What we need to know is whether or not such contrasting tendencies in income distribution imply that there was an equally substantial gap between the two countries in terms of the absolute level of inequality. In the next section, therefore, I explore this issue by introducing a third country, Mughal India, into the Eurasian comparison.

Comparative Early Modern Social Tables

The seventeenth-century political arithmetician Gregory King put forward 'A scheme of the income, and expence, of the several families of England; calculated for the year 1688'.[3] This sort of table is called 'social table', which enables us to show both the level of household income and that of overall inequality among the social classes in one table. In this section, an attempt is made to compare King's social table for Stuart England at the end of the seventeenth century with those for Mughal India and Tokugawa Japan.

For Mughal India, there is an interesting attempt by Maddison (1971). His guesswork provides us with percentage distributions of income and the labour force for c.1600, from which we can calculate one social class's average income per capita *relative to* those for other classes. What we have for Tokugawa Japan instead are data for regional income by industry. The region is the samurai domain (*han*) of Chōshū. Located at the end of the western end of Honshū Island, this mini-state was neither poor nor very rich by late-Tokugawa standards. For the Chōshū economy, thanks to Shunsaku Nishikawa's pioneering work, estimates of output are available by industry, *net of input*. What is not available is the distribution of the total net output across various social groups within the domain. As explained in Appendix 1, by making a couple of rather strong assumptions, I have converted Nishikawa's net output data into average household income estimates by social class.

A couple of other considerations are necessary in order to make the three-country compari-

[3] King, *Natural and Political Observations*, reproduced in Laslett (1973).

son possible. One is the classification of social classes, and the other the question of how household income should be compared between the countries chosen.

As for the former, I adopt Maddison's three-category scheme: village and non-village, the latter of which is further divided into the ruling elite and the rest. Thus, Tokugawa Japan's four statuses, samurai (*shi*), peasant (*nō*), artisan (*kō*), and merchant (*shō*), are grouped into the ruling samurai, the urban (*kō* and *shō*), and the village (*nō*) population. For England, since King's table is more detailed in terms of occupational classification, I have tried to regroup them into the same broad categories as for Tokugawa Japan. One difficulty in such a reclassification, however, is the place of soldiers. The samurai were administrator-soldiers, while in the other two countries, the vast majority of soldiers were a separate group of government employees who were never regarded as part of the ruling elite. In the case of England, I have made two alternative calculations for the ruling class with and without soldiers, but since the two do not alter the results greatly, the English distributions will be presented in the following tables without soldiers in the ruling class (no adjustment is made for the Indian table since where soldiers were classified is not explicit).

The second is concerned with the inter-country comparison of living standards. I have shown elsewhere that although early modern northwestern European countries were ahead of Tokugawa Japan in terms of GDP per capita, their *household* income levels are likely to have been on similar levels *if* the class of agricultural labourers and that of peasants are chosen for comparison (Saito, 2005b). This is because while the family of a European agricultural labourer lived mostly on wage earnings, the Japanese peasant family had a mixed income. If they owned their own land, they received both land and labour shares of the agricultural value added *plus* a non-negligible portion of earnings from non-farm by-employment. As for the England-Japan comparison, therefore, their household incomes are assumed to have been more or less comparable (although this is probably an underestimate for England because in its village economy, there were small but sizeable higher-income, non-labouring populations). This should not be taken to imply that GDP per capita was the same for the two countries: average household incomes of other classes are likely to have differed between the countries.

Table 1. The distribution of income by social class: England, India and Japan

	Social class		
	Non-village		Village
	Elite	Middling	
A. Population share (%)			
England, 1688	4	18	78
India, c.1600	1	17	82
Japan, 1840s	10	15	75
B. Income per capita (Village=100)			
England, 1688	602	202	100
India, c.1600	2,563	372	100
Japan, 1840s	177	160	100

Source: Laslett (1973), with corrections made in Arkell (2006); Maddison (1971, p. 33), and Table A.2 below.

Turning to the India-Japan comparison, very little is known about how their absolute levels of household or per-capita income were compared with each other in the period before the nineteenth century. Since Maddison's (2001, p. 264) historical national accounts suggest that there was not much difference in the level of GDP per capita between the two countries in the seventeenth century (in 1990 international dollars, 550 and 520 respectively in 1600, and 550 and 570 in 1700), I have decided to assume simply that the national average household income was identical in the early modern period, an assumption which allows me to directly compare the pattern of income inequality between the two countries.

Table 1 sets out both social stratifications and income distributions for the three countries. According to panel A, while Mughal India had comparatively the largest village population, its size in Tokugawa Japan was not larger than in England. As for the middling sort of non-village population, its size was comparatively largest in England, while the smallest was found in Japan. Such comparative results for Japan may sound a little surprising, but it is chiefly because Tokugawa Japan had an excessively large elite population. This elite class of samurai was not a landed aristocracy: a vast majority of them were stipend receivers from the overlord (*daimyo*). As a class, they also included vassals of a samurai. Although they were usually not rich since their stipends did not come from the overlord but from their master samurai, they were given the status of samurai.

Panel B shows the average household income per family member in each social class relative to that of the village population for the three countries. There is a surprisingly sharp contrast between Mughal India and Tokugawa Japan. The former is unusually unequal, whereas the latter looks almost egalitarian; and Stuart England comes in between. Admittedly, we cannot assume that income inequality within each social class was more or less identical across the countries. It is for example not unlikely that the gap between rich and poor samurai families was greater than that in England. However, even when such intra-class differentials can be taken into account, the overall comparison will not be very different: the level of inequality was low in Tokugawa Japan by early modern standards.

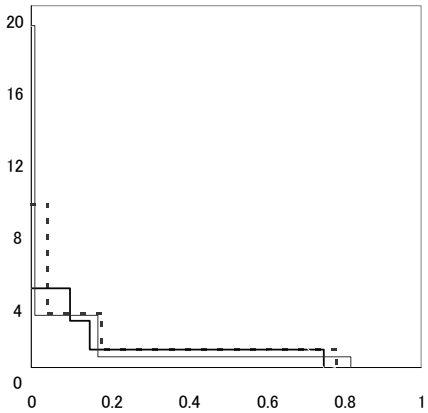
One explanatory note is necessary for the Tokugawa case, however. While class differentials in income are usually measured on a before-tax basis, and procedures for England followed this tradition, the calculation for Tokugawa Japan has been made on an after-tax basis. This reflects the peculiar system of Tokugawa taxation. Under Tokugawa rule, indirect taxes were insignificant. Although there are some transit taxes collected at ports and river landings, no customs, no excise duties, and no market charges were instituted. Two consequences of this system were that first, a disproportionately large proportion of samurai revenues came from direct taxation on land. For the samurai household, therefore, before-tax income had no meaning. Second, the level of taxation was heavy on produce from land, while it was unbelievably low on non-agricultural pursuits.[4] If

[4] According to Shunsaku Nishikawa's estimates for the regional economy of Chōshū in the 1840s (see Appendix 1 for details), the proportion of taxes to the total value added was 33 percent. However, the sectoral difference was enormous: the rate of tax burden in agriculture was 52 percent, whereas it stood as low as 3 percent in the non-agricultural sector (calculated from Nishikawa, 1987, p. 325).

comparison had been made on a before-tax basis, then the average before-tax income of Tokugawa farmers would have become unrealistically higher than the corresponding income for non-agricultural producers.

Figure 4 combines such conclusions about stratification and income distribution with comparative information about living standards for the three countries. The horizontal axis measures the relative size of the population in each social class, and the relative level of household income per capita is measured along the vertical axis. Each building block represents a social class with the village population on the basement, next, the middle class, and the elite on the top. The height (that is, income per capita) of the village population is assumed to be the same for both England and Japan, while the total area of the three blocks is assumed to be identical for India and Japan. This single diagram clearly shows how different the three early modern countries were in terms of both income level and distribution. These were consequences of the early modern economic performance of each country, and also of institutional settings that had shaped the people's economic activities in the period in question.

Figure 4. Comparative early modern social structures in England, India and Japan



Source: Table 2 above. See also text.

Thus, Figure 4 indicates what might be called pre-conditions for subsequent changes in each country. Did an egalitarian society become unequal as its economy grew? Or is it an unequal society that became even more unequal in the subsequent periods? These are questions we turn to in the next section.

Changes in The Subsequent Periods

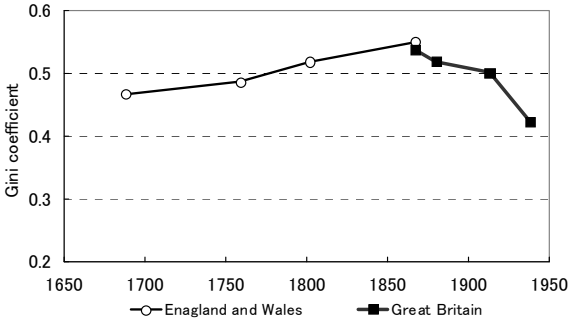
England

In his classic essay on historical relationships between economic growth and income inequality, Simon Kuznets hypothesised, based chiefly on the historical experiences of Great Britain and two other countries, that inequality increased in the initial phase of modern economic growth followed by another phase of contracting inequality, for which period he was empirically on firmer ground (Kuznets, 1955).

Now, the pattern is much clearer for Great Brittan. There is evidence that the Gini coefficient for the nation peaked at a level of 0.54-0.55 in 1867. The decline since then was gradual, but accelerated after World War I, reaching 0.42 in 1938/9 (Figure 5, for which all calculations are for before-tax incomes).

Although the problem of poverty was not yet solved and factors at work were complicated,[5] the tendency of contracting inequality was apparent from 1870 onwards. A few points may be made about how it went. First, output growth in the period between 1873 and 1913 slowed down in comparison with the 1831-73 period, but managed to remain on a comparable level during the classic industrial revolution, despite the difficulties Britain faced in the international productivity race with emerging industrial powers like Germany and the USA. The annual rate of growth in GDP was 1.7 percent in 1780-1831, 2.4 percent in 1831-73, and 1.8 percent in 1873-1913 (Crafts, 2004, p. 11). Second, forces in the labour market worked, however modestly, for the wage differential between skilled and unskilled manual jobs to contract in the period after the 1860s—in the phase up to World War I, slowly and since 1914, more evidently (Phelps Brown, 1977, pp. 71, 73). The movement of the workforce was from low- to high-wage occupations, and from poorer to wealthier regions, and while the relative importance of profits and property incomes declined, the share of wages and salaries went up, although middle-class salaried employees gained more than working-class men.[6] Third, however, social security measures introduced before the Beveridge reforms seem to have exerted a non-negligible impact on the decline in inequality. Starting with the 1908 Old Age Pensions Act, several measures were introduced in the areas of health and employment under the Liberal and subsequent governments, as a result of which by 1937, 5-6 percent of the national income had already been redistributed to the poor (Hatton and Bailey, 1998).[7]

Figure 5. Gini coefficients: England and Wales/Great Britain, 1688-1938/9



Source: For 1688-1913, Williamson (1985, p. 68), and for 1938/9, *Royal Commission* (1977, p. 240).

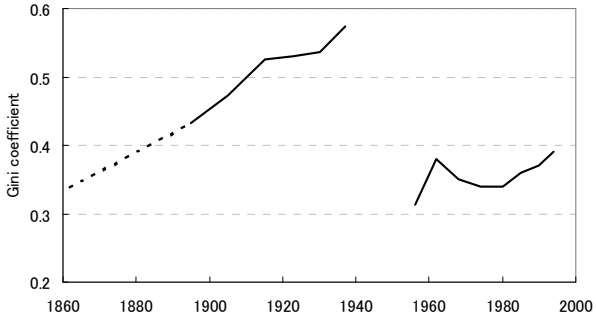
Japan

After a long period of self-imposed seclusion, Japan re-entered world trade amid the emergence of the first globalisation wave. The stylised facts about inequality trends, summarised graphically in Figure 6, for the period after the late nineteenth century are as follows: first, there was a sweeping rise in income inequality from 1895 to 1937, during which GDP per capita grew at an average annual rate of 1.7 percent—a takeoff from the slow-growing Tokugawa past.[8] According to Ryoshin Minami's (1998, 2000) estimates for before-tax income distribution, the Gini index was 0.42 in 1890-94 and 0.57 in 1937. If back projected, this implies that the coefficient level must have been a little over 0.3 soon after the opening of the country in 1859. It is worth emphasising

[5] See for example Daunton (2007, ch.12).
[6] For factor shares, see Mathews, Feinstein, and Odling-Smee, (1982, p. 164).
[7] See also Middleton (2004, pp. 487-488).
[8] Calculated from GDE data. Ohkawa and Shinohara (1979, tables A3 and A53, pp. 256-258, 392-393).

that while the level of 0.3 does not compare unfavourably with any present-day welfare state, the estimated coefficient of 0.57 for the late 1930s is higher compared not only with the corresponding British figure, but also with Britain's peak index in 1867. Thus, in less than a century, Japan changed from a reasonably egalitarian to a very unequal society. Then came a sudden drop in the Gini coefficient in the period of austerity and reforms immediately after World War II. In 1956, the Gini stood as low as 0.31. Subsequently, the coefficients remained generally low, although it is worth noting that there were alternating sub-periods: an initial rise, a long period of decline, and a recent upturn in inequality.

Figure 6. Gini coefficients: Japan, c.1860-1994



Source: Minami (1998, p. 45; 2000, p. 44).
Note: The dotted line is an extrapolation from the 1895-1937 trend.

Although little effort has been made to identify what accounted for the spectacular rise in income inequality from the late nineteenth century to 1940, there is a thesis proposed by Jeffrey Williamson (2000, 2002). He argues that the expansion of global trade triggered by transport innovations since 1870 brought about commodity price convergence in the world markets, which led to a more even distribution of income in developed countries but to an increase in income inequality in Asian and other less industrialised countries. It is shown that such effects, revealed in wage-rental and wage-income ratios, were felt more profoundly in the period before 1914, while in the period between the two world wars, the ratios levelled off in many Asian countries. He believes that Japan was no exception.

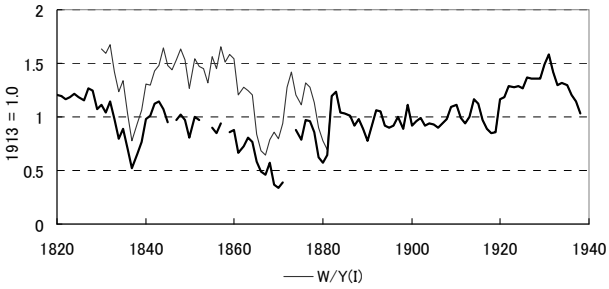
Interesting and stimulating as his hypothesis is, however, the periodisation suggested by Williamson does not fit the Japanese case. This is partly because there may well have been some computational errors in his tables for Japan (see Appendix 2). Also, a glance at the historiography reveals that there is consensus that differentials in both wages and income widened in the inter-war period, whereas in the period before World War I, wage and income growth was more or less balanced (Nakamura, 1983, pt. 1).

There also exist a few issues that account for why the impact of globalisation was felt differently in Japan in the late nineteenth and early twentieth centuries. First, the increase in inequality was far more marked in urban than in rural regions (Minami, 1998, pp. 45-46). This was particularly the case, not in the first globalisation period, but in the inter-war period when Japan as well as other economies of the world became inward looking.

Second, in the lower sections of society, especially in the rural sector, income-levelling forces seem to have been at work. The time series of both wage-income and wage-rental ratios do not exhibit patterns expected from the globalisation thesis (for details, see Appendix 2). The ratio of wages to GDP per capita (in Figure 7) shows that between 1859 and 1870, growth in national

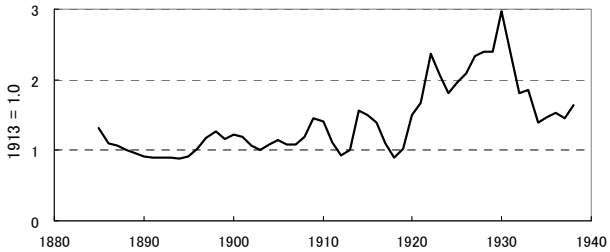
income was faster than wage growth, suggesting that it was a consequence of entry into global trade. This effect did not last long, however. There was an unmistakable rebound in the late 1870s and, after a sharp drop at the time of deflation around 1880, it remained at that level until the World War I period. After 1920, the ratio increased initially, reflecting both economic difficulties after the wartime boom and the downward rigidity in money wages, then declined sharply after the 1929 Great Depression. The latter ratio of wages to land rents (in Figure 8) also exhibits a similar pattern: stable in the period before World War I, rising until 1930, and declining sharply during the depression period of the early 1930s. There is also evidence that differentials in landholding started declining after the period of increased inequality in landholding between the time of the Land Tax Reform of 1873 and 1908. The trend of levelling-off continued up until the 1940s.

Figure 7. Wage-GDP per capita ratios in Japan, 1820-1938



Source: Appendix 2. The wage series used to calculate the ratios is for building craftsmen in Edo/Tokyo (series I: 1818-1881), soy sauce makers in Chōshi (series II: 1830-1881), and industrial workers (1882-1938).

Figure 8. Wage-rental ratios in Japanese agriculture, 1885-1939



Source: Appendix 2.

Third, given the benign effect of globalisation on factor shares in the domestic economy, we may turn to other areas for explanation. Although it is impossible to go beyond impressions, two points may be made. First, it seems that no deliberate measures were taken to curtail the handsome profits gained through new business opportunities opened up since the Meiji Restoration. Second, no effective social security measures were introduced by pre-World War II governments, either; it is symbolic indeed that the Ministry of Welfare was founded as late as 1938.

India

Angus Maddison compared the Mughal social table with that at the end of British rule. Table 2 shows that no drastic change occurred in between, but if any, it suggests that it was a slight decline in the share of top incomes (Maddison, 1971, pp. 33, 69). The elite or upper-class families' share declined from 15 percent to 14 percent, and since 'traders and bankers', excluded from the 1600 table, were included in the 1940 table, the actual decline must have been a little more substantial.

Table 2. Social stratifications and income distributions of India, c.1600-1940

	c.1600		c.1940	
	Population share (%)	Income share (%)	Population share (%)	Income share (%)
Non-village	18	52	18	44
Elite/upper	*1*	*15*	*1*	*14*
Lower	*17*	*37*	17	30
Village	72	45	75	54
Upper			*9*	*20*
Middle			*49*	*30*
Landless			*17*	*4*
Tribal	10	3	7	2

Source: Maddison (1971, pp. 33, 69).

Note: The elite category of the Moghul does not include merchants and bankers, and traditional professions, while the upper category at the end of British rule includes Indian capitalist, merchants and managers, and the new Indian professional class.

No measures of overall inequality are available for the earlier periods, only for 1875 and 1950. The estimates of the Gini coefficients put forward by Tirthankar Roy for the two benchmark years point to a 'mild decline from a level above 0.35 to nearer 0.3'; and the reason for the high 1875 estimate seems to be found in the 'feature that the British rulers of India had emulated from the Mughals—the presence of a tiny governmental elite that received fantastically large incomes', thus suggesting that the finding from Maddison's tables must reflect, at least partially, that this change that took place in more recent periods (Roy, 2007, p. 86).

However, inequality trends in rural India—which cannot be discerned from Maddison's tables—may well have been different. In its rural regions, while agricultural production expanded, cottage and craft industries declined.[9] According to Roy's survey of evidence, while data for the nineteenth century are ambiguous, there are indications that rural inequality increased during the first half of the twentieth century. The ratio of agricultural wages to rents seems to have declined, and the wage-income ratio for the whole country also declined up to about 1930. Also, as indicated in Table 2, there emerged a class of landless, rural proletarians: its population share had become nearer to 20 percent by the end of the British period.[10] What happened in India's countryside was in sharp contrast with her Asian neighbour, Japan, where the wage share increased at the expense of rent receivers and proletarianisation never took place in agriculture throughout its history since Tokugawa times.

Given the size of the agricultural sector in that period, these findings may be taken to suggest that inequality increased in agriculture from the late nineteenth to the mid-twentieth century. On the face of it, these findings are not inconsistent with Williamson's thesis, as he sees income inequality in Asian countries, including India, increasing in the period before World War I, and levelling off in the period between the two wars. But Roy argues based on various pieces of evi-

[9] Roy (2006, chs.3-4), and also Roy (2005). Whether or not the magnitude of de-industrialisation was as marked as has been supposed is yet to be debated.

[10] See Roy (2007, pp. 84-87). For an interpretation of the 1950 Gini coefficient, see also Ojha and Bhatt (1964).

dence that much of the problem of increased poverty and, hence, increased income inequality in rural India between 1870 and 1940 cannot be accounted for by the impact of globalisation, but should be 'explained with reference to internal factors of the rural economy, and in particular to production conditions in agriculture which moved from land surplus to land shortage with more or less unchanging land yield' (Roy, 2007, p. 91).

Concluding Remarks

In this paper, I have looked at the historical cases of England, India, and Japan—a minuscule sample in the statistical sense—in order to examine the relationships between income growth and inequality over the very long run. Not many conclusions can be drawn from such a small sample study. However, a few remarks may be made.

First, it is likely that Smithian growth was associated with a widening trend in income inequality, unless external forces such as state actions intervened, or unless exceptionally strong income growth exerted a trickle-down effect. Take the early modern west European case, whose growth paths were often characterised by both market expansion and proletarianisation. According to van Zanden's work, the levels of inequality in both income and wealth had already generally been high and were on the increase over the entire period in question, suggesting that the history of the Kuznets curve can be extended into the early modern period (van Zanden, 1995). On the other hand, Tokugawa Japan's experience, on the face of it, seems inconsistent with this proposition. However, the country was cut off from global trade in the Tokugawa period, which as Thomas Smith (1973, p. 37) argued decades ago, may well have an adverse effect on both town merchants and the samurai: they failed to seize gains from the commercial activities that one would like to term 'merchant capitalism'. This in turn implies that the distribution of income would become uneven after the opening of the treaty ports, irrespective of commodity price convergence in the global market. The case of Japan in the periods before and after entry into world trade, therefore, is not inconsistent with the interpretation here.

Second, the provisos given to the above statement suggest that the historical institutional setting was very important in determining early modern inequality levels. Although it is impossible to compile a complete list of particular institutions at this stage, I can think of at least three as factors that exerted a profound influence on the distribution of income across the social classes, that is, the existence or absence of a landed aristocracy, overseas trade, and tax farming and other forms of rent seeking. In Mughal India, all three existed; in early modern England, the first two were present; and in Tokugawa Japan, none existed.

Third, on the other hand, the Indian case seems to suggest that class structure such as the caste system exerted strong, far-reaching effects on both inequality and income growth. In one sense, a social arrangement such as this may well have increased the social division of labour beyond the existing level of productivity since all sorts of non-farm occupations were hereditarily fixed. It is suggested that the proportion of non-agricultural occupations could be incredibly high—according to one case study of a south Indian region, as high as 45 percent—by early mod-

ern Asian standards.[11] At the same time, the system was not only inequality enhancing, but is likely to have acted as an obstacle to further growth by limiting the scope for the Smithian division of labour. Tirthankar Roy points out in a recent article on divergent technological pathways in the early modern world that while artisanal skills were learned and transmitted along the family line, most elite artisan castes tended to be 'engaged in the production of final goods rather than intermediate goods'. For example, in textiles and iron making, there was an unmistakable tendency for producers of final goods to rely on self-made tools and other capital goods, which in turn discouraged the development of specialist producers of those intermediate goods. Thus, he concludes, 'Crafts tended to simplify tools and develop craftsmanship instead. Tool making and material processing on a commercial scale became marginal traditions'.[12] Undoubtedly, such traditions must not only have limited the scope for technological innovation and spillover, but Smithian growth, the process of the proliferation of industries and markets with increasing returns, also set in.

Finally, it is worth re-emphasising that the issue of inequality should be integrated into the agenda for the Great Divergence debate. By examining the inequality question with the issues of market growth and integration, and also with the question of living standards, we will be able to gain a far better understanding of global economic history from a comparative perspective.

[11] Mizushima (2008), citing J.K. Bajaj and M.D. Srinivas on 2,200 villages in the Jagir, Chingleput, south India.
[12] Roy (2008), especially pp. 371, 386.

Appendix 1. Household income per capita by social class in Tokugawa Japan*

In his article on farm family by-employment in one Chōshū county, Kaminoseki, Thomas Smith demonstrated how high, by early modern standards, the share of *non-farm* production and how large the proportion of *non-farm* incomes to the total income earned by farm families could have been. The data he utilised are district returns of a region-wide survey taken by the Chōshū government in the early 1840s,[13] and his research results show that as much as 55 percent of the county's domestic product was non-agricultural, that the proportion exceeded 70 percent in four districts of the county, and also that in many districts, the proportion of non-farm earnings to the total farm household income was over 50 percent with the lowest being 16 percent and the highest, 75 percent. In order to arrive at these estimates, he made assumptions about sources of non-farm incomes earned by farm families and a county-level productivity ratio between the farm and non-farm sectors (Smith, 1988). Now that, thanks to Shunsaku Nishikawa's painstaking study of the same survey returns,[14] we have a more comprehensive set of statistics (including a two-sector input-output table) for the entire Chōshū region, similar calculations may be made at the regional level, which will in turn enable us to make some rough estimates of differentials in income per capita by social class in the late Tokugawa period.

The Chōshū material is surprisingly detailed as a pre-modern survey of output and income. However, there was an unmistakable tendency for non-farm services to be substantially underreported. In order to overcome this difficulty, Smith assumed a fixed productivity ratio between the farm and non-farm sectors in Kaminoseki, while Nishikawa has tried hard to derive a region-wide estimate for each industry from the actual data in the returns. Also, Nishikawa pays more attention to intermediate inputs as one of his aims has been to construct an input-output table for the entire region. All this resulted in more realistic and consistent estimates of output and earnings in value-added terms. For example, the results give 39 percent as the share of non- agricultural production for the entire Chōshū region, suggesting that Kaminoseki was one of the most developed areas in the region, and probably in the whole country (Nishikawa, 1987, p. 329).

Another problem we have with this survey material is that household incomes are not readily available. What the survey returns give us are two separate kinds of data. One is a table of gross products, from which Nishikawa has successfully estimated output net of intermediate inputs for ten industrial categories. The other is an occupational table, for which enumeration in the original survey was made for household heads only. There is no one-to-one relation between classification categories in these industrial and household tables. There are more industrial categories than

* I am most grateful to Professor Shunsaku Nishikawa for allowing me to use some of his worksheets and also to read manuscripts for a book on the Chōshū economy, which he is currently drafting, in the process of writing this appendix.

[13] Later compiled and published by the Yamaguchi-ken Monjo-kan (Yamaguchi Prefectural Archives) as *Bōchō fūdo chūshin-an* in 22 volumes.

[14] Nishikawa (1987) and Nishikawa and Akimoto (1977). The monetary system used in Chōshū was a silver one. It was originally a currency by weight with 1 *kan* = 1,000 *momme*. By the 1840s, however, paper money was introduced by the domain government and remained in circulation. All the values quoted below are in silver-denominated domain notes (*hansatsu*).

household groups, suggesting that occupational categories like 'farm household' and 'merchant' were omnibus terms. Facing this problem, Smith made the assumption that farm families 'produced all such income not produced by nonfarmers'.[15] Given the prevalence of by-employment in the countryside, this supposition sounds realistic, and what this assumption actually means is that while all goods listed as 'handicrafts' were produced by professional, full-time artisans, paper, cotton cloth, *saké*, salt, and forest products were produced by farm hands and to a lesser extent, by fishing families.

Table A1.1 sets out pre-tax output estimates for ten categories in value-added terms, together with household numbers wherever the two categories are thought to have roughly matched. Here, sectoral division is made between village and non-village (largely urban but non-governmental), rather than between farm and non-farm.[16] On Smith's assumption, the former includes paper making, cotton weaving, *saké* brewing, and salt making, as well as fishing, forestry, and quarrying. According to this table, 83 percent of the region's commoner population (or 79 percent of the total population including samurai and their families and retainers) were in the village sector. A vast majority of them were classified as farmers, while agriculture represented only 59 percent of the re-

Table A1.1 Output and the number of households by occupational class: Chōshū in the 1840s

Industrial category	Output (*kan*)	No. of households
Samurai	-	5,700
Village		
Agriculture	58,179	85,531
Paper making	916	(13,300)
Cotton weaving	2,213	-
Saké brewing	2,526	-
Salt making	3,371	-
Fishing, forestry and quarrying	7,155	3,567
Sub-total	74,360	89,098
Non-village, non-governmental economy		
Artisans	3,972	5,840
Commerce and services	12,769	7,865
Transport and others	3,895	4,029
Sub-total	20,636	17,734
Total	98,996	112,532

Sources: Nishikawa (1987, pp. 325, 326, 332), Nishikawa and Akimoto (1977, pp. 106-108, 113-115).

Note: 1) Output estimates are pre-tax and net of intermediate inputs.
2) The number of samurai households does not include their retainer (*baishin*) families, who numbered approximately 6,200.
3) Paper making households are included in the number of farm households.
4) For cotton weaving, sake brewing and salt making, no corresponding entry is found in the occupation table of each village return. They are thought to have been produced by farm or fishing households or both.

[15] Smith, 'Farm family'; quote from Smith (1988, p. 81).

[16] Unlike Smith's and Nishikawa's, this excise places fishermen in the 'farm' sector. It is true that there was a small but sizeable number of wealthy fisher-entrepreneurs on the one hand and petty, self-employed fishermen on the other. However, it is also true that a vast number of fishermen did combine fishing with farming, and also that many farm families in the coastal villages are likely to have engaged in fishing as a subsidiary occupation. According to this broader definition, there were 89,000 households in the 'farm' and 18,000 households in the 'non-farm' sector. The former yielded 28,000 *kan* of agricultural products and also produced 17,000 *kan* of non-agricultural commodities altogether, while the latter sector yielded 19,000 *kan* of earnings. Both farm and non-farm incomes thus calculated are after-tax earnings, although the overall tax rate was as high as 52 percent on agricultural products, whereas it was just 3 percent on non-agricultural products (Nishikawa, 1987, p. 325). To calculate the farm and non-farm averages, the assumption is made that the 'surpluses' of 4,000 *kan* were generated only by non-farm activities.

gion's total product (the proportion increases to 66 percent if fishing, forestry, and quarrying are included). With by-employment activities, in other words, the village economy's share in the total product amounted to 75 percent.

These statistics, together with information about samurai stipends, allow us to calculate after-tax, per-capita income estimates for three classes, that is, samurai, non-village (largely urban) households, and village households, provided that tax rates are known and that population data are available for the three population groups. Tax payments made by farm households are estimated by Nishikawa to be approximately 30,000 *kan* plus 400 *kan* paid additionally by the cottage industry of paper making, while the total taxes paid by others amount to 600 *kan* only.[17] Population data also exist but are less accurate than household data. The data for samurai families are particularly weak and likely to have excluded live-in domestic servants (they were commoners so that they had to be listed separately). Approximate figures for samurai, non-village, and village populations are 50,000 (10 percent), 78,000 (15 percent), and 392,000 (75 percent).[18] Thus, estimated income per capita is 220 *momme*, 257 *momme*, and 112 *momme,* respectively (Table A1.2, assumption I).[19]

The results indicate that the productivity ratio between village and non-village populations was a little over 1:2, which on the face of it looks reasonable.[20] On closer inspection, however, it turns out that the imputed average non-village, urban incomes per capita exceed those of the samurai by 17 percent. No doubt there existed very wealthy merchants in the castle town, and it is probably true that in Chōshū, too, the samurai's stipend levels tended to decline in real terms. Yet, it is highly unlikely that the average income level of the ruling class dipped below the average of all occupational classes in the non-village, urban sector, suggesting that the latter average is an overestimate, a result of having divided an inflated income total by a more or less usable population figure.

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[17] Nishikawa (1987, p. 326), and Nishikawa and Akimoto (1977, pp. 106-107). Under the Tokugawa regime, there was only one kind of taxation, that is, land tax. Although supplementary taxes did exist on various sources, no systematic effort was made by either the shogunate or daimyo governments to raise revenues from non-farm activities by collecting indirect taxes. The reason that Chōshū's paper industry had to pay additional contributions is that it was under an export promotion scheme set up by the regional government.

[18] For the samurai population, there is much uncertainty regarding the head counts. Chōshū's samurai class was two tiered: there were genuine samurai and their retainers (*baishin*). The latter were hereditary retainers of their own master samurai, not retainers of the overlord, so that the samurai had to support their retainers and the retainers' families from stipends they received from the lord. The problem here is that in the case of samurai, it is their family size that we have no data for, whereas in the case of retainers, we are uncertain about the number of their household heads (see Suematsu, 1911, vol.1, pp.12-13). Thus Nishikawa assumed, based on a genealogical study of samurai fertility (Yamamura, *Study of Samurai*, ch.5), that both samurai and their retainers had on average 4.25 family members in order to estimate the missing figures. This assumption may be considered conservative since even the calculated mean size of household for the commoner class is 4.4. At any rate, the average of 8.8 overstates the actual size of an average samurai family because in this calculation, retainers are treated as if they had been the master samurai's domestic servants. On the other hand, there is a factor that tended to understate the actual size of household: the assumed quotient of 4.25 does not cover non-samurai servants living in the samurai household. All this implies that a per-capita income figure presented in the table above is likely to be an *overestimate* for the samurai.

[19] Under this assumption, the proportion of non-farm earnings to the total after-tax village household income is 36 percent. On this account also, Kaminoseki seems to have been too 'advanced' as an average Chōshū county.

[20] According to Smith's (1988, p. 80) estimates, it was 1:2.47 for Kaminoseki County.

This consideration leads us to question the adequacy of assumption I. To put it differently, the non-village total in Table A.1 may also have included non-farm incomes earned by farm families in the village sector. Under assumption I, it is supposed that all handicraft products were produced by full-time, non-village artisans. However, an early-Meiji census of the population and their occupations in Yamanashi Prefecture reveals that there were many dually occupied carpenters and other craftsmen in the countryside, a majority of whom reported their craftwork to be a subsidiary occupation. The Yamanashi census also shows that there were farmers whose subsidiary pursuits were in commerce and services.[21] The Chōshū survey, too, gives a similar hint with respect to the category of 'day labour'. The survey returns give 2,680 families for this category, a substantial portion of whom were town dwellers. However, there were also those who worked by day 'along with' farming or 'in the intervals between' farming seasons. Nishikawa (1987, pp. 332-333) believes that 'even estimating conservatively, they numbered more than 1,350', implying that at least half of wage incomes were earned by farm families.[22] In order to take such aspects of rural dual occupation into account, therefore, I formulate two versions of an additional assumption, that is, that the per-capita income level in the village sector was either 10 percent or 30 percent below the samurai average of 220 *momme*. Admittedly, this gap of 10 or 30 percent is arbitrarily set. Yet the point of making this assumption lies in that it enables us to arrive at an estimate of the average household income per capita in the village sector, without specifying how much each non-village industrial/commercial product actually earned by village people in the form of by-employment. In other words, it is to assume that any difference between income figures implied by the first and the additional assumptions must have also been earned by village people in the form of by-employment. Table A1.2 reports the results of this calculation under assumptions II and III.[23]

Table A1.2 Estimated income per capita by social class: Chōshū in the 1840s

	Class		
	Samurai	Non-village	Village
Households	5,700	17,700	89,100
Population	50,000	78,000	392,000
Assumption I			
Total earnings (after tax, *kan*)	11,000	20,036	43,960
Earnings per capita (*momme*)	220	257	112
Assumption II			
Total earnings (after tax, *kan*)	11,000	15,444	48,552
Earnings per capita (*momme*)	220	198	124
Assumption III			
Total earnings (after tax, *kan*)	11,000	12,012	51,984
Earnings per capita (*momme*)	220	154	133

Source: Same as for Table A1.1.

Note: 1) Samurai earnings are equal to stipends they received from the overlord.

2) Two sets of assumptions are made to estimate the sectoral totals of after-tax earnings in both village and non-village sectors. For details, see text.

[21] Tōkei-in, *Kai no kuni*.

[22] In Table A.1 above, 'day labour' is included in 'Transport and others'.

[23] Under assumption II, the proportion of non-farm earnings to the total after-tax village household income becomes 46 percent.

This second exercise gives a three-layer income differential structure of 220 *momme*, 198 *momme*, and 124 *momme*, while the third gives a three-layer income differential structure of 220 *momme*, 154 *momme*, and 133 *momme* (Table A1.2, assumptions II and III). They imply that the bottom group earned only 44 percent under assumption II and 40 percent under assumption III less than the highest-income group. The corresponding percentages with the middle group are 37 and 14. These results may sound unbelievably undifferentiated; certainly those from the third exercise seem a little unrealistic. However, as far as the second exercise is concerned, the results are believed to be reasonable. In fact, there are a couple of reasons to believe that even this level of income inequality could be an *overestimate*. First, as the third assumption indicates, if one thinks that the difference in per-capita income between the samurai and non-village sectors must have been a little wider, it is to suppose that the income level of the bottom group was somewhat higher than 124 *momme*, thereby making the whole differential structure even narrower. Second, the estimated top-layer income per capita, 220 *momme*, is likely to have been slightly overstated since the denominator, that is, the samurai population, did not cover live-in domestic servants, whose numbers must have been non-negligible among the ruling class.

Crude as these estimates may be, therefore, Chōshū in the 1840s seems to have been rather egalitarian as an early modern society.

Appendix 2. Ratios of wages to GDP per capita and wages to land rents, Japan, 1818-1939*

Williamson's nominal wage series for carpenters is a combination of the Sano series up to 1874, the Bank of Japan wage series for 1868-1886, and the Long-Term Economic Statistics (LTES) estimates from 1887.[24] There are a couple of problems with this combined series. First, the rising trend in real wages the Sano estimates suggested for the very end of the Tokugawa period is questionable. The data source Sano relied on was a retrospective survey of six building craftsmen in Edo/Tokyo compiled by trade associations in the Meiji period, and even a cursory look at the original tables reveals that there were many abrupt jumps and a smaller number of drops in individual craft series. Second, a close examination of the Williamson figures for the very early Meiji years suggests that both the choice of the Bank of Japan's nominal wage data and of the price of rice for a cost-of-living index during the 1868-86 period, a period of volatile prices, seem to have resulted in unreliable estimates.

In order to avoid these problems, an attempt is made to link the LTES series of all manufacturing workers directly with the Tokugawa series. The former, both nominal and real, are available from the year 1882 onwards with the base years being 1934-36 (Ohkawa et al., 1967, p. 243).

For the Tokugawa wage series, what I have taken up first is a series derived from the same dataset on which the Sano estimates were based, estimated by myself for all the Edo/Tokyo six

* I thank Yuki Umeno for research assistance in the preparation of this note.
24 Sano (1962); Nihon Ginkō (1966); and Ohkawa et al. (1967).

craftsmen collectively (Saito, 1998, 2005a). This nominal wage series covers the period from 1830 up to 1894, and its real series is derived by deflating the former with a newly constructed cost of living series. Second, I also use another Tokugawa wage series based on data for a soy sauce maker in Chōshi, a country town some 90 km east of Tokyo. The series is a composite index of skilled and unskilled workers in the industry, covering the period from 1818 to 1893 with some missing years. The link with the LTES series is made in the overlapping years of 1882-94.

The real wage series thus estimated for the entire period 1818-1938 is shown in Table A-1, together with the nominal series. Series I links the LTES manufacturing wage indices with the Tokugawa indices of building wages and series II, with those in the Chōshi soy sauce industry.

Like the Williamson estimates, real per-capita GDP data for the wage/per-capita GDP ratios are Maddison's (1995, Appendix C) estimates for the benchmark years of 1820 and 1870 and the annual series for the period after 1885. Estimates for the years between 1820 and 1870 and between 1870 and 1885 are interpolated. The ratios calculated are set out in Table A2.2, with the two versions of the wage/per-capita GDP ratios for the period before 1881.

Apparently, money wages in the building trade were stickier than those in the soy industry. There was also a sudden upsurge in builders' wages in 1855 when a devastating earthquake hit Edo. Evidence reveals that market wages recorded a sevenfold rise. Although such a hike in the market was not fully captured by trade association data, it is evident that the natural disaster as well as the rigidity associated with institutional wages kept Edo's wage levels in the 1850s higher than the levels in Chōshi where the quake did not affect town life, suggesting that series I cannot capture actual changes that took place in the period before 1881. However, one problem with series II is that Chōshi's money wages in the 1880s seem less reliable. There were many missing years during that decade, and wages recorded for 1884 and 1887-88 are, on the face of it, unbelievably high. While such wage quotations may have reflected the actual situation of an individual industry in a particular region, it is likely that these high wages were not representative of the general situation of the 1880s. This suggests that the linked indices for the period before 1881 are a little too low. The actual levels in series II of real wages and hence in the wage/per-capita GDP ratios may have been somewhat higher during the Tokugawa period than those shown in Tables A2.1 and A2.2.

For the period after 1885, I have calculated another wage/per-capita GDP ratio series (Table A2.3). It is a series with manufacturing wages replaced by male agricultural day labourers' wages.[25] Any differences from the manufacturing wage/per-capita GDP ratios may be interpreted as reflecting changing sectoral differentials.

Finally, Williamson's wage/land rent ratios are re-calculated with the carpenters' wage data replaced by those for male agricultural day labourers.[26] The results, which are not very different from the Williamson series except for the late 1930s, are shown in Table A2.4.

[25] Taken from Ohkawa et al. (1967, p. 245).
[26] Land rents are from Umemura et al. (1966, pp. 220-221).

Table A2.1. Two stimates of real wage series, 1818-1938

Year	Index (I)	Index (II)	Year	Index (I)	Index (II)	Year	Index	Year	Index
1818		36.6	1850	35.0	22.5	1882	36.5	1911	49.4
1819		33.2	1851	42.8	27.7	1883	38.0	1912	47.9
1820		32.3	1852	40.8	27.0	1884	32.2	1913	51.0
1821		32.0	1853	40.3		1885	32.1	1914	56.6
1822		31.4	1854	36.6		1886	34.0	1915	59.1
1823		32.1	1855	43.6	25.1	1887	32.0	1916	58.4
1824		32.8	1856	40.4	23.6	1888	32.6	1917	54.4
1825		32.2	1857	46.3	26.2	1889	30.7	1918	51.9
1826		31.4	1858	42.3		1890	28.8	1919	57.4
1827		34.2	1859	44.4	24.0	1891	32.2	1920	72.6
1828		33.7	1860	43.3	24.6	1892	39.5	1921	80.8
1829		29.0	1861	33.8	18.7	1893	39.1	1922	86.7
1830	44.4	30.3	1862	35.9	20.3	1894	37.9	1923	84.6
1831	43.4	28.3	1863	35.1	22.6	1895	36.9	1924	86.7
1832	45.7	31.0	1864	33.8	21.6	1896	35.4	1925	87.9
1833	38.7	26.7	1865	23.7	16.3	1897	38.9	1926	93.9
1834	33.6	21.9	1866	19.4	13.7	1898	40.9	1927	93.5
1835	36.6	24.2	1867	18.0	13.1	1899	46.9	1928	99.1
1836	28.3	19.4	1868	22.1	16.3	1900	40.0	1929	100.9
1837	21.3	14.3	1869	24.1	10.4	1901	42.6	1930	101.5
1838	25.6	17.9	1870	22.5	9.5	1902	41.0	1931	106.6
1839	29.1	21.1	1871	26.8	11.0	1903	40.4	1932	102.2
1840	36.0	26.9	1872	36.7		1904	40.8	1933	101.5
1841	35.7	27.9	1873	40.9		1905	39.3	1934	101.7
1842	39.5	30.9	1874	35.2	25.5	1906	42.7	1935	100.8
1843	40.9	31.5	1875	32.5	23.0	1907	45.9	1936	99.0
1844	45.2	29.5	1876	38.8	28.6	1908	47.5	1937	97.4
1845	40.7	26.3	1877	38.0	28.6	1909	52.1	1938	93.2
1846	39.8		1878	34.0	25.7	1910	53.1		
1847	42.3	26.9	1879	27.0	18.9				
1848	45.2	28.2	1880	23.6	17.4				
1849	42.5	26.8	1881	21.2	19.5				

Source: See text in Appendix 2.

Table A2.2. Two estimates of wage/per-capita GDP ratios, 1820-1938

Year	Ratio (I)	Ratio (II)	Year	Ratio (I)	Ratio (II)	Year	Ratio	Year	Ratio
1820		1.20	1851	1.54	0.99	1882	1.19	1911	0.99
1821		1.19	1852	1.47	0.97	1883	1.23	1912	0.94
1822		1.16	1853	1.45		1884	1.04	1913	1.00
1823		1.19	1854	1.31		1885	1.03	1914	1.16
1824		1.21	1855	1.56	0.90	1886	1.01	1915	1.12
1825		1.19	1856	1.45	0.85	1887	0.92	1916	0.97
1826		1.16	1857	1.66	0.94	1888	0.98	1917	0.89
1827		1.26	1858	1.51		1889	0.89	1918	0.85
1828		1.24	1859	1.58	0.86	1890	0.77	1919	0.85
1829		1.07	1860	1.54	0.88	1891	0.92	1920	1.16
1830	1.63	1.11	1861	1.20	0.67	1892	1.06	1921	1.18
1831	1.59	1.04	1862	1.28	0.72	1893	1.05	1922	1.29
1832	1.68	1.14	1863	1.25	0.81	1894	0.92	1923	1.27
1833	1.42	0.98	1864	1.20	0.77	1895	0.89	1924	1.28
1834	1.23	0.80	1865	0.84	0.58	1896	0.92	1925	1.27
1835	1.34	0.89	1866	0.69	0.49	1897	1.00	1926	1.36
1836	1.03	0.71	1867	0.64	0.46	1898	0.89	1927	1.36
1837	0.78	0.52	1868	0.78	0.58	1899	1.12	1928	1.35
1838	0.93	0.65	1869	0.85	0.37	1900	0.92	1929	1.35
1839	1.06	0.77	1870	0.79	0.33	1901	0.96	1930	1.49
1840	1.31	0.98	1871	0.94	0.39	1902	0.99	1931	1.58
1841	1.30	1.01	1872	1.28		1903	0.92	1932	1.42
1842	1.43	1.12	1873	1.41		1904	0.93	1933	1.30
1843	1.48	1.14	1874	1.21	0.88	1905	0.92	1934	1.32
1844	1.64	1.07	1875	1.11	0.78	1906	0.89	1935	1.29
1845	1.47	0.95	1876	1.32	0.97	1907	0.94	1936	1.20
1846	1.44		1877	1.28	0.96	1908	0.98	1937	1.14
1847	1.53	0.97	1878	1.14	0.86	1909	1.09	1938	1.03
1848	1.63	1.02	1879	0.90	0.63	1910	1.11		
1849	1.53	0.97	1880	0.78	0.57				
1850	1.26	0.81	1881	0.70	0.64				

Source: See text in Appendix 2.

Table A2.3. The ratio of agricultural wages to GDP per capita, 1885-1938

Year	Ratio	Year	Ratio
1885	1.06	1912	0.95
1886	1.04	1913	1.00
1887	1.01	1914	1.16
1888	1.11	1915	1.08
1889	1.04	1916	0.91
1890	0.92	1917	0.82
1891	1.04	1918	0.83
1892	1.08	1919	0.93
1893	1.11	1920	1.11
1894	1.00	1921	1.20
1895	0.96	1922	1.27
1896	1.08	1923	1.36
1897	1.13	1924	1.35
1898	0.99	1925	1.29
1899	1.07	1926	1.33
1900	1.05	1927	1.26
1901	1.12	1928	1.21
1902	1.12	1929	1.19
1903	1.01	1930	1.13
1904	0.99	1931	1.03
1905	0.95	1932	0.87
1906	0.91	1933	0.80
1907	0.92	1934	0.80
1908	1.01	1935	0.83
1909	1.07	1936	0.80
1910	1.06	1937	0.79
1911	1.02	1938	0.81

Source: See text in Appendix 2.

Table A2.4. Wage/land rent ratios, 1885-1939

Year	Ratio	Year	Ratio
1885	1.31	1913	1.00
1886	1.10	1914	1.57
1887	1.07	1915	1.50
1888	1.01	1916	1.40
1889	0.96	1917	1.09
1890	0.91	1918	0.90
1891	0.90	1919	1.02
1892	0.90	1920	1.50
1893	0.89	1921	1.68
1894	0.89	1922	2.36
1895	0.91	1923	2.07
1896	1.02	1924	1.81
1897	1.17	1925	1.97
1898	1.27	1926	2.09
1899	1.15	1927	2.34
1900	1.21	1928	2.40
1901	1.19	1929	2.40
1902	1.07	1930	2.97
1903	1.00	1931	2.38
1904	1.08	1932	1.81
1905	1.15	1933	1.86
1906	1.08	1934	1.39
1907	1.08	1935	1.47
1908	1.19	1936	1.53
1909	1.45	1937	1.46
1910	1.40	1938	1.65
1911	1.11	1939	1.78
1912	0.92		

Source: See text in Appendix 2.

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