Real Wages in Europe and Asia: A First Look at the Long-term Patterns

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1. Introduction

Understanding the causes of economic development and underdevelopment has been a central concern of social science since its inception. A paradigm case is the contrast between Europe, which has had a growing economy since before the industrial revolution, and China and India, seemingly trapped in backwardness until recent decades. Elaborate theories have been spun to explain the divergence. Possible causes include differences in modes of production (capitalist or Asiatic), the efficiency of property rights, World Empire, religion, political fragmentation or centralisation, and the presence or absence of the scientific spirit. Revisionist historians have called much of this speculation into question. In a thoroughgoing reassessment, Pomeranz (2000), for instance, has shown that land, labour, capital, and product markets were as efficient in China as in Europe. Theories emphasising differences in property rights and modes of production are contradicted by these findings. While the theories have been sweeping, their factual basis has been weak. The working hypothesis in the standard literature is that Europe was ahead of Asia well before the industrial revolution. In contrast, to Pomeranz "it seems likely that average incomes in Japan, China, and parts of southeast Asia were comparable to (or higher than) those in western Europe even in the late eighteenth century".[1] The evidence offered is important, but indirect, as it does not include comparisons

1 Pomeranz (2000: 49). See Pomeranz (op. cit. 31) for his summary of the standard literature.

of income and its purchasing power. In his discussion of parallel issues for India, Parthasarathi (1998) quotes numerous eighteenth century English observers who claimed that living standards were higher in Europe. Many of them cite the low level of wages in India as support for their conclusions. Parthasarathi disputes this evidence and offers some comparisons of his own that show the real earnings of weavers in India were higher than those of their counterparts in eighteenth-century England. This comparison is important evidence but needs to be replicated for other times and places if it is to be accepted as generally true.

What incomes should be compared? GDP per head is the most common measure of living standards. While estimates are being pushed back into the nineteenth century and even earlier, the difficulties are immense and reliability will always be a concern. Moreover, the early modern states of Europe and Asia were often non-egalitarian, so average income may be a poor guide to the standard of living of the majority of the population. To address both issues, this paper explores the implications of real wages for the history of living standards.

Wages played two roles that must be distinguished. First, they represented the cost of labour to manufacturers. To compare wages, we need the market exchange rate to convert wages in one currency into another. However, in many cases, we lack those exchange rates. This is particularly true for the intercontinental comparisons that most interest us. There is a solution, however. Silver coins were the principal medium of exchange in most countries in the early modern period. Consequently, the exchange rates can be approximated by the relative amount of silver represented by their units of account. To make these comparisons, we convert English pence and Chinese Tael, for instance, into the weight of silver they could buy. Expressed in grams of silver, Indian and Chinese wages were, indeed, much less than European wages, as noted by the commentators cited by Parthasarathi. English observers were well aware of this fact, as it explained the low price of the Indian cloth they shipped to

Europe, Africa, and the Americas. Whether low silver wages imply a low standard of living is another matter, however.

Second, wages reveal the standard of living if they are compared to the price of consumer goods. This is the interpretation that matters in assessing the prosperity of Asia vis-a-vis Europe. Provided low Asian wages were matched by low consumer goods prices, the standard of living of workers could have been the same at both ends of Eurasia even though Asian manufacturers had a competitive advantage in the textile industry. In other words, the wage observations of Parthasarathi's eighteenth century commentators are – possibly – compatible with his revisionism.

The European side of the comparison is reasonably well documented due to the long-standing tradition of writing prices histories. These provide time series of prices and wages that extended as far back as the thirteenth century. For many important European cities, one can construct real wage indices back to 1500, and the levels of real wages can be compared across cities as well as over time. The deflators in these indices are based on important consumer goods like food, fuel, and cloth.

The history of prices and wages in Asia remains highly fragmentary since comprehensive price histories have not yet been written. Japan is something of an exception to this generalisation, as to so many others, since there have been studies of prices in leading cities running back into the Tokugawa period. These series stop in the 1720s, however, so the seventeenth century, which is of great historical interest, remains a statistical Dark Age.

If they can be executed, real wage comparisons will throw much light on relative living standards in the seventeenth and eighteenth centuries. There is a second issue they can be address as well. The early modern period needs to be brought into rapport with the nineteenth and twentieth centuries. If the revisionists are right and Asia was as prosperous as Europe before the Industrial Revolution, how are we to understand the great difference in incomes in

the twentieth century? Did China and India stand still as Europe advanced or was there immiseration in Asia as well? To answer this question, early modern Asian wages must be compared to wages in the same region in the twentieth century.

Definitive conclusions on both questions await the writing of comprehensive price histories for Asia. What can be done at present is to marshal the existing evidence to see what generalisations it suggests. I begin by reviewing the history of real wages in Europe, and then consider the published information for Japan, China, and India. The aim is, first, to compare real wages in Europe and Asia in the seventeenth and eighteenth centuries, and, second, to see whether low Asian living standards in the twentieth century represent a descent from earlier prosperity or whether Asia was simply marking time while Europe progressed.

2. Trends and Levels of Real Wages in Europe

In the case of Europe, I rely on my own investigation of real wages in major cities of Europe from the late middle ages to the First World War (Allen 2001). The cities include London, Oxford[2], Antwerp, Amsterdam, Paris, Strasbourg, Madrid, Valencia, Naples, Milan, Florence, Vienna, Leipzig, Krakow, Gdansk, Lwow, and Warsaw. These are cities for which price histories – with their many tables of prices and wages – have been written. Building craftsmen and labourers and, occasionally, male agricultural workers are the groups whose living standards can be studied. The wages and prices were entered into computer files. The local weights and measures were translated into metric equivalents. The local units of account were converted into grams of silver. The conversion to silver was not made because silver has any transcendent significance. Instead, the procedure approximates the market exchange rate between the units of account since silver coins were the medium of exchange. This material

2 Really the small towns in southern England whose wages were collected by Phelps Brown and Hopkins (1955). Oxford is among them.

makes it possible to compare wages across Europe, to compute consumer price indices[3] over time and across space, and, finally, to calculate real wage levels by dividing silver wages by their purchasing power.

This inquiry establishes three important generalisations about living standards in Europe:

First, there was growing divergence in living standards between 1500 and 1750 (see Figure 5.1). At the end of the Middle Ages, real wages were remarkably similar across Europe. In the next two centuries, real wages collapsed in southern and central Europe. The drop was much less in London and the Low Countries. These were the growth poles of the early modern economy, and their living standards returned to the high level of the late fifteenth century. A large gap had emerged between these centres of international commerce and the rest of the continent by 1750.

Second, the sixteenth drop in the real wage in English provincial towns was as steep as on the continent and much greater than the decline in London. However, the dynamism of London spread to the rest of England in the eighteenth century. Real wages in places like Oxford rose sharply after 1700 when they surpassed wages in southern and central Europe and began to close the gap with London. These gains were confined to the urban economy. There had been little difference in the wage of Oxfordshire agricultural and building workers before 1700, but a gap emerged in the eighteenth century and continued to grow in the nineteenth as Oxford building workers shared in the benefits of economic development, while farm workers were left behind.

Third, there was some fluctuation in the real wage series in England between 1500 and 1850, but no general advance was realised before the last third of the nineteenth century. It was only after 1870 that real wages finally began to rise in many cities in Europe and only

3 While house rents have been included in the consumer price indices of some cities, no systematic attempt has yet been made to compare house rents across countries as well as over time. While that is a major limitation of

then that the levels of the late fifteenth century were surpassed. The Industrial Revolution raised GDP per head, but it took a century before it raised the standard of living of building workers.

Figure 5.1 here

3. Real Wages in Asia

Ideally, real wages in Asia and Europe should be compared by specifying a basket of consumer goods that could be priced in both continents. The cost of that basket would be the deflator that converted nominal into real wages. This was the procedure used to compare living standards across Europe in Allen (2001), but it must be modified to deal with differences in diet between Europe and Asia. Bread was the major source of calories in Europe and accounted for about one third of spending in the European consumer price index. Rice was the counterpart in Asia. Calculations for India, where bread was also consumed, show that rice was the cheapest source of calories. This was generally true in China, although in Yangtze wheat gruel was cheaper in the summer and eaten by the poorest people (Li 1998).

I have dealt with the issue of bread and rice by specifying different baskets for Europe and Asia (Table 5.1). 143 kilograms per year of rice was included in the Asian basket versus 208 kilograms of bread in the European. Rice has more calories per kilogram than bread, and these weights correspond to the same calorie intake per day (1950). (The European diet, however, was richer in protein.) The budgets also include peas (or beans), meat, and fat (ghi, butter, or oil depending on the locale). Non-foods include oil for illumination and cotton cloth in Asia and linen in Europe. “When in Rome, do as the Romans” was the philosophy that

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the existing estimates, rent accounted for only 5-10% of consumer spending, so its importance should not be

defined the basket of goods, subject to the requirement that it yield the same number of calories. Weights and nutritional composition are shown in Table 5.1.

Table 5.1 here

This scheme can be applied to India, but not all of the prices are available for Japan and China. Two responses have been taken to this problem. One is to estimate the missing prices by using Indian price relatives. The resulting prices, the costs of the baskets, and the implied real wages are set out in Appendix Tables 5.1-5.4 These calculations are extended, or other indices are linked to them, as will be explained. The second approach is to simplify the calculations radically by using the cost of a calorie implied by the prices of rice and bread as the deflator. Both procedures lead to similar results.

3.1 Japan

I begin with Japan since it has the most elaborated statistical history. Prices and wages for Kyoto, Osaka, and Edo and some villages have been collected. These allow the calculation of real wages from 1726 to the twentieth century. Ohkawa et al. (1967: 153-155, 245) include the prices of many consumer goods from 1879 onwards as well as series of wage rates for building craftsmen, building labourers, and agricultural workers. These have been used to link the Japanese wage and price series with Europe. Five-year averages (1880-1884) of the prices of the commodities shown in Table 5.1 were used to calculate the cost of the consumption basket shown there. The cost of that basket relative to the cost of the same basket in Europe was used to convert the average Japanese wages of building craftsmen, building labourers, and male day labourers in agriculture for 1880-4 into ‘real’ terms. Indices of real wages in

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overstated.

Japan[4] were, then, re-based to equal this average value for 1880-1884. These real wage series can be compared to European ones to measure the growth and level of living standards of the two ends of Eurasia.

The comparisons are carried out in Figures 5.2-5.5. Figure 5.2 shows the real wage of skilled building craftsmen (carpenters and masons) in London, Oxford, Northern Italy, and Kyoto from 1727 to 1913. The real wage was similar in Kyoto and northern Italy, and there is little evidence of any increase before the First World War. Oxford wages were not much higher in the eighteenth century. London wages were highest throughout, and after about 1800, the Oxford wage rose above the Japanese wage approaching the London wage. After 1850, the wage in both London and Oxford rose decisively above the real wage in southern Europe and Japan. The wages of building labourers showed the same pattern (Figure 5.3).

Figures 5.2 and 5.3 here

Figure 5.4 summarises the evidence respecting the wage of farm labourers. The Oxford series, which represented the earnings of male agricultural labourers in the county, showed no trend. The Italian wage data are taken from the village of Montferrat (Montaldeo) near Genoa in 1727-1765 (Doria 1968). There was no significant difference between Oxfordshire and Italian wages in the early eighteenth century. The Japanese wage series is for the small town of Kamikawarabayashi near Kyoto. Real wages were very low in the early eighteenth century and were significantly below European farm wages. The rise in agricultural wages in the mid-

4 For 1727-1831, Saito's (1978: 89-91) nominal wage series for carpenters and day labourers in Kyoto and day labourers in Kamikawarabayashi were deflated by Crawcour and Yamamura's (1970) 'Sauerbeck' and Kyoto consumer price indices. (Saito's wage series, which end in 1830, were extended to 1831 on the assumption that they equalled 100 in that year.) These series were extended to 1880-1884 using Williamson's (1998: 39) real wage series for Japanese workers. The resulting three series were linked to the real wages of building craftsmen, labourers, and farm labourers computed from Ohkawa (1967) as explained in the text.

eighteenth century in Japan, an increase noted by Tokugawa historians, closed the gap with Europe.

Figure 5.5 combines the English and Japanese series for building and farm labourers. This figure highlights important features of the labour markets of the two countries. (1) Real wages were highest in London. In part, this premium is an illusion as it was offset by the higher cost of housing, which is excluded from the index. The housing price differential was not large enough, however, to account for the higher London wages – it reflects the tight labour markets of the Metropolis. (2) Steady advance in the real wage only occurred after 1870, however. (3) The wage of Oxford building labourers exceeded that of Oxfordshire farm labourers in the early eighteenth century. This was a new development, for their wages were very similar in earlier centuries, and it represents the spread of a strong economy outward from London, to throughout the Home Counties. (4) By the early nineteenth century, Oxford wages were following those of London, breaking away from Oxfordshire farm wages. Those remained constant throughout the period as labour left agriculture.

Figures 5.4 and 5.5 here

The situation in Japan was very different. The real wages of labourers in Kyoto and Kamikawarabayashi were identical – or virtually so – for the whole period. This indicates both close integration of the markets and the absence of the dynamic urban economy that disequilibrated English labour markets and led to higher wages in English cities than in Japanese. Japanese labourers' wages were similar to those of English farm workers throughout and close to those of Oxford labourers in the eighteenth century.

Figures 5.2-5.5 have important bearing on the assessment of Japanese economic performance. Japanese living standards in the late Tokugawa were on a par with those in

provincial England. Japanese wages were not as high as those in the western European growth poles, but they were similar to those on most of the continent. The figures also indicate that living standards began to diverge for most people after 1870. This was not because Japanese wages fell but because wages in England rose for many people. Should we regard pre-industrial Japanese economic performance as a success? It was in the sense that Japanese living standards were similar to those in many parts of Europe, but Japan lacked the high wage economy of the dynamic cities of northwestern Europe. That economy was the leading edge of general prosperity. As more of England became incorporated into that economy, the advance in wages became more general. Japan did not achieve the same breakthrough until after World War I, perhaps even until after World War II (Minami 1986: 296-396).

3.2 India

For the study of real wages in India, I rely on evidence and sources used in the debate on long run living standards that appeared in the *Indian Economic and Social History Review* in the 1970s.[5] The discussion ranged from real incomes to agricultural productivity to demographic indicators. Here I am concerned only with the real wage evidence. Comparisons were drawn between 1595 and c. 1960 (in most cases). The latter was chosen to establish long-run trends. The former was dictated by a unique document – Abul Fazl's *Ain-i Akbari* – which recorded wages and prices paid (presumably) in Agra amidst much other information on the Mughal Empire.

The *Ain-i Akbari* reports the prices of all of the commodities shown in Table 5.1, so it is straight forward to compare the price levels in India in 1595 to Europe at various dates. The chosen years are 1500-1509, 1600-1619, and 1750-1759; that is, wages and prices in each European city in those years, are compared to Indian wages and prices in 1595. Obviously, it would be desirable to have Indian prices for the same dates, but that evidence is not available.

The values for 1500-1509 show the European situation before the price revolution and at the real wage peak of the fifteenth century for most places. Averages for 1600-1619 show European wages at the end of the Price Revolution, while values for 1750-1759 do the same for the eve of the Industrial Revolution. Table 5.2 shows comparisons between London, Oxford, Amsterdam, Valencia, Vienna, and northern Italy.

Table 5.2 here

Even before the price revolution, wages and prices in Europe exceeded those in India. The Italian price level in 1500, for instance, was triple that of India in 1595. In 1600-1619, after the European inflation, the differential widened to almost 6 to 1. It is no wonder that European explorers found many good buys in the Indies or that commodities flowed from East to West with the trade being balanced by silver flows from Europe to Asia.

It was a similar story with wages. Indian wages in 1595 were a third or a half of European wages in 1500 when both are expressed in grams of silver per day. Comparisons around 1600 show even larger differences. The low silver wages noted in the eighteenth century were long standing.

Table 5.2 compares European real wages in the years shown to Indian real wages in 1595. In the table, the Indian real wage is set equal to 1.00. Real wages were high and reasonably uniform across Europe in 1500-1509 and fell everywhere except Italy in the sixteenth century. The Italian declined happened in the fifteenth century. The drop was least in London and Amsterdam. In the seventeenth and eighteenth centuries, there was little change in real wages in Valencia, Vienna, or Strasbourg. In England and the Low Countries, on the other hand,

5 Desai (1972, 1978); Heston (1977); Moosvi (1973, 1977). Mukerjee (1976) produced a parallel set of calculations that made their way into the debate.

wages rebounded. Table 5.2 shows the same divergence in living standards as was shown by Figure 5.1.

Since the wages in Table 5.2 are indexed with respect to Indian wages in 1595, it also shows European living standards relative to Indian standards at the end of the sixteenth century. The high water mark of European wages in the fifteenth century exceeded the Indian level in 1595. Population growth in Europe in the sixteenth century pushed European wages below Indian wages except for the few booming cities of the northwest. Skilled workers did particularly well in India since skilled wages there were twice unskilled wages, while the premium was only about 50% in Europe and Japan. Unskilled workers in south and central Europe earned about the same real income as their counterparts in Indian, while skilled workers did better in India than in south or central Europe. In northwestern Europe, unskilled workers did better than in India, while the earnings of skilled workers were a toss-up. These results confirm that Parthasarathi's findings for English weavers were not limited to that group.

What happened to Indian living standards in the next four centuries? The contributors to the standard of living debate did not compute conventional real wage indices. Instead, they calculated how much of each good could be purchased if all of the wage were spent on it. Results for 1595 were compared to those for c.1960. The conclusion was that workers' living standards declined over these four centuries.

This pessimistic conclusion is confirmed with the real wage framework utilised here (Table 5.3). The basket of goods cost 73.5 grams of silver in 1595 and 277.3 rupees in 1961. The relative difference is 3.77 (=277.3/73.5). Over the same period, the wage of an unskilled worker changed from .83 grams of silver to 2.4 rupees, that is, by a factor of 2.89 (=2.4/.83).The implication is that the real wage fell by 23.3% (1.028=2.89/3.77) in almost four centuries. This finding confirms Desai's pessimism.

Table 5.3 here

3.3 China

The data for China are the most limited. Li (1998) provides a detailed, quantitative account of farm productivity in the Yangtze valley in the seventeenth and eighteenth centuries. Agricultural handbooks are the main source of his information, and they report 'typical' prices of rice, wheat, and cotton cloth as well as farm wages. By extrapolating the missing prices with Indian relative prices, the cost of living and the real wage of farm workers in the Yangtze can be compared to their counterparts in England, Italy, and Japan. These are the pertinent comparisons since we have no information about wages in Chinese cities.

One thing India and China had in common was low wages and prices in the early modern period: the Chinese price and wage levels were only about one third of the English levels when expressed in grams of silver. This is the immediate reason that China was so competitive in the production of manufactured goods.

Since prices as well as wages were lower in China than in Europe, low Chinese silver wages do not imply that the standard of living was lower in China. This is confirmed by Table 5.4, which shows the real wage of farm labour c. 1500, c. 1600, and c. 1750. The Chinese value shown for 1750 really applies to the late seventeenth century. The real wage of unskilled labour in India c. 1595 is also shown. It is not certain that this refers to farm labour; however, the similarity of the wage of farm and non-farm labour in pre-industrial Japan and in seventeenth century Oxfordshire increases the interest in the Indian comparison, whatever the exact nature of the work being done.

Table 5.4 shows the well-established fall in English real wages after 1500. The level of wages in 1600 and in 1750 can be compared to the Asian economies. By this reckoning, European farm wages were slightly higher than Asian wages in the early modern period, but the difference is small.

Table 5.4 here

Farm workers were poor and devoted large fractions of their income to bread or rice. In view of the weaknesses of the Asian price data for other commodities, it might be better to relate wages to the cost of a calorie implied by bread and rice rather than to the broader cost of living index. Table 5.5 does this. It shows the number of calories that could be purchased with a day's wage if all of the money was spent on rice or bread. The real wage was generally on the order of 10,000 calories per day. In interpreting this figure, allowance must be made for non-working days and for the other family members supported by the wage earner. Allowing a 300 day work year would reduce family calorie consumption to 8219 (=10000*300/365), which would support a wife and several children. Of course, if any of them generated income, as they often did, the situation would be eased further. The family could then buy items besides food and expand their consumption of animal products that cost more per calorie. Using the price of a calorie as a deflator indicates that there was little difference in the standard of living of English, Chinese, and Japanese farm workers. Italian farm workers, by these figures, were in a particularly difficult situation: their earnings were not enough to support a family. Asia did not lag behind Europe according to Table 5.5.

Table 5.5 here

If China was not far behind Europe prior to the industrial revolution, did the large difference in living standards in the twentieth century result from European advance or Chinese decline or a combination of the two? Buck's (1937: 306) famous survey of Chinese farms in the 1920s throws some light on the matter. He reports that the average full time farm labourer in the Yangtze could buy 1187 kg of rice if he spent his full yearly earnings (including the value of payments in kind) on that commodity. Assuming he worked 300 days per year, this corresponds to a daily 'real' wage of 14125 calories in the 1920s. This is the 'real' wage using the rice price as the deflator and is, therefore, directly comparable to the figures in Table 5.5. By these figures, the standard of living in the Yangtze rose by over 40% between the early eighteenth and early twentieth centuries. This assessment of living standards is consistent Brandt's (1989) interpretation of Chinese agricultural development in the late nineteenth and early twentieth centuries. Chinese poverty in the early twentieth century, by these figures, was not the result of Chinese decline but rather of growth that was slower than Europe's.

4. Conclusion

The wage comparisons undertaken in this paper support several important conclusions about living standards in pre-industrial Europe and Asia.

First, wages expressed in grams of silver were lower in China and India than in Europe. The views of the eighteenth century observers cited by Parthasarathi are confirmed. This is important since it was the proximate cause of Asia's competitive advantage in textiles and luxury manufactures and was, thus, the basis for Asian-European trade in the early modern period. Why these differentials persisted for hundreds of years is an important question in international and monetary economics that must be addressed to explain the dynamics of the world economy in this period.

Second, low Asian silver wages were matched by low Asian prices with the result that living standards in Asia were similar to those in many parts of Europe. Farm workers in Europe and urban workers in central and southern Europe did not enjoy higher living standards than their counterparts in Asia.

Third, some parts of Europe did generate higher real wages than we find in Asia. When real wages were at their peak following the Black Death, most Europeans had a higher standard of living. But this was a transitory condition for most of the continent. High wages persisted only in the commercial centres of the northwest – London and the Low Countries generally. During the eighteenth century, the provincial towns of England were drawn into the same high wage orbit, but agriculture was left behind. This dynamic, urban economy was the engine of growth in early modern Europe, and Asia appears to have had no counterpart. It is possible, of course, that a more extensive Asian database would reveal a parallel: the absence of information on urban Chinese wages is particularly troubling in this regard. However, neither the Japanese cities nor the capital of the Moghul Empire had particularly high wages. The evidence at hand suggests that Asia lacked Europe's engine of growth.

This point may be put differently. The revisionist literature on Asia argues that it exhibited Smithian growth, just like Europe. This may be, but Smithian growth can be intense or moderate; it can lead to an industrial revolution, but it need not. The issues here were rehearsed in the debate about proto-industrialisation, and Coleman's (1983) scepticism about its importance applies equally to Smithian growth.

Fourth, the wage data lend support to the classical notion of a 'subsistence' wage. Leaving aside Europe's transitory fifteenth century real wage peak and the high wages generated by the commercial success of the northwest, most of the continent settled down to wage levels like those in Asia. Was this coincidence or were there demographic or other equilibrating processes that kept incomes at a similar level across Eurasia? Alternatively, were

wages destined to be the same from Portugal to Japan unless the labour market was disrupted by a major demographic shock or by continuous growth in demand due to capital accumulation and technological advance?

Fifth, only in India was there evidence of falling real wages between the early modern period and the twentieth century. In China and Japan, they were constant or rose. There was a difference in living standards between Europe and Asia in the twentieth century because Europe pushed ahead, while growth in Asia was moderate in the extreme.

These conclusions are only as good as the wage and price data that underlie them, and for Asia they are weak, indeed. The International Price History Commission emphasised the importance of long series of wages and prices as the basis for sound economic history. One hundred years of research have blessed European historians with price histories that allow the measurement of market integration, inflation, and productivity, as well as the reconstruction of living standards across the continent. Global comparisons show the necessity of extending this research worldwide. Who will write the price histories of Delhi and Beijing, of Shanghai and Bombay?[6]

6 Work has been done on this question for India--e.g. Habib (1963, 1982), Hasan (1969), Chaudhuri, S. (1977), Chaudhuri, K.N.(1978), Attman (1981), van Santen (1982), and Praskash (1985)--but the range and completeness of the wage and price series are far less than for Europe.

Tables

Table 5.1. European and Asian Baskets and Nutrition

	India			Europe		
	Quantity	Daily calories	Daily protein	Quantity	Daily calories	Daily protein
Foods						
Rice	143,0 kg	1403	39			
Bread				208,0 kg	1400	57
Peas	52,0 l	161	10	52,0 l	161	10
Meat	26,0 kg	179	14	26,0 kg	179	14
Ghi	10,4 kg	208	0	10,4 kg	208	0
Total		1951	63		1948	81
Non-foods						
Oil	2,6 l			2,6 l		
Cloth	5,0 m			5,0 m		

Source: Appendix for Tables 5.1-5.4

Table 5.2. European Wages Relative to Indian in 1595

	London	Oxford	Amsterdam	Valencia	Vienna	N.Italy
Unskilled						
1500-9	1.88	1.50	2.29	1.42	1.76	.88
1600-19	1.38	.83	1.83	1.02	1.18	.91
1750-9	2.00	1.32	1.86	1.00	1.00	1.10
Skilled						
1500-9	1.29	.97	1.48	.97	1.13	.70
1600-19	.86	.54	1.13	.53	.65	.80
1750-9	1.27	.85	1.05	.51	.69	.78

Source: Appendix for Tables 5.1-5.4

Table 5.3. Indian Standard of Living, 1595 and 1961

Item in basket	**Quantity in basket**	**Price 1595,** in gr. of silver	**Expense 1595,** in gr. of silver	**Price 1961,** in rupees	**Expense 1961,** in rupees
Rice	142.2 kg	.22	31.5	.57	86.9
Peas	52.0 l	.09	4.5	.38	19.9
Mutton	26.0 kg	.72	18.6	.37	95.9
Ghi	10.4 kg	1.16	12.0	5.94	61.8
Oil	2.6 l	.88	2.3	2.30	6.0
Cloth	5.0 m	.91	4.5	2.46	12.3
Total			73.5		277.3
Unskilled wage			.83		2.40
Real wage			.011294		.008656

Source: Appendix for Tables 5.1-5.4

Table 5.4. Real Wages of Farm Workers, CPI Deflator

	England	**N. Italy**	**Japan**	**China**	**India**
1500	.017	.012			
1600	.010	.014			.011
1750	.011	.010	.009	.009	

Source: Appendix for Tables 5.1-5.4

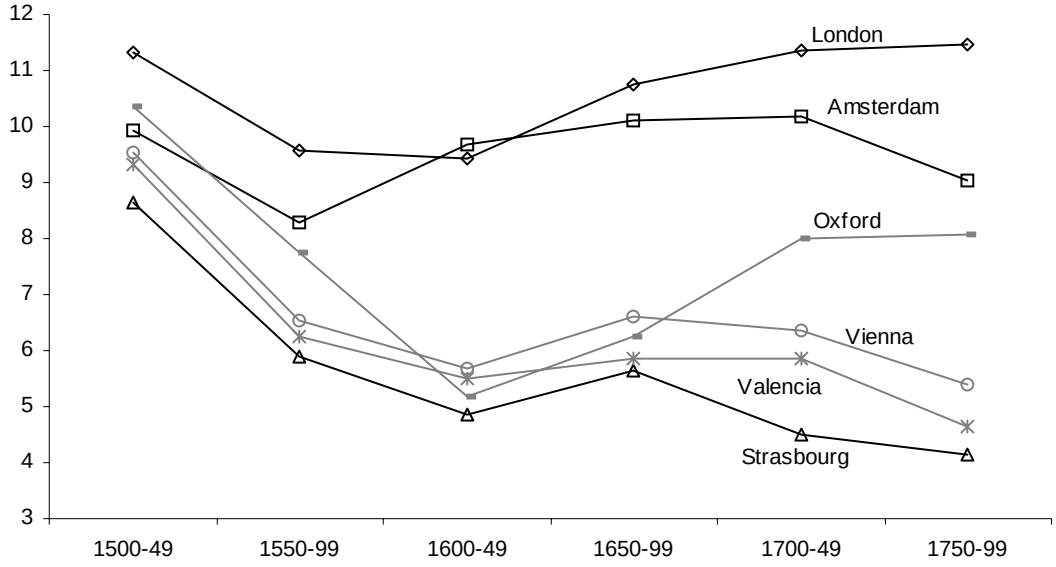
Table 5.5. Real Wages of Farm Workers, Calorie Price Deflator

	England	**N. Italy**	**Japan**	**China**	**India**
1500	15339	10746			
1600	9160	5742			13441
1750	9961	5654	10552	9996	

Notes: Figures in the table shows the number of calories that can be purchased with a day's earnings if all of the money is spent on bread (in Europe) or rice (in Asia). A kilogram of rice is assumed to contain 3570 calories and a kilogram of bread 2450 calories.

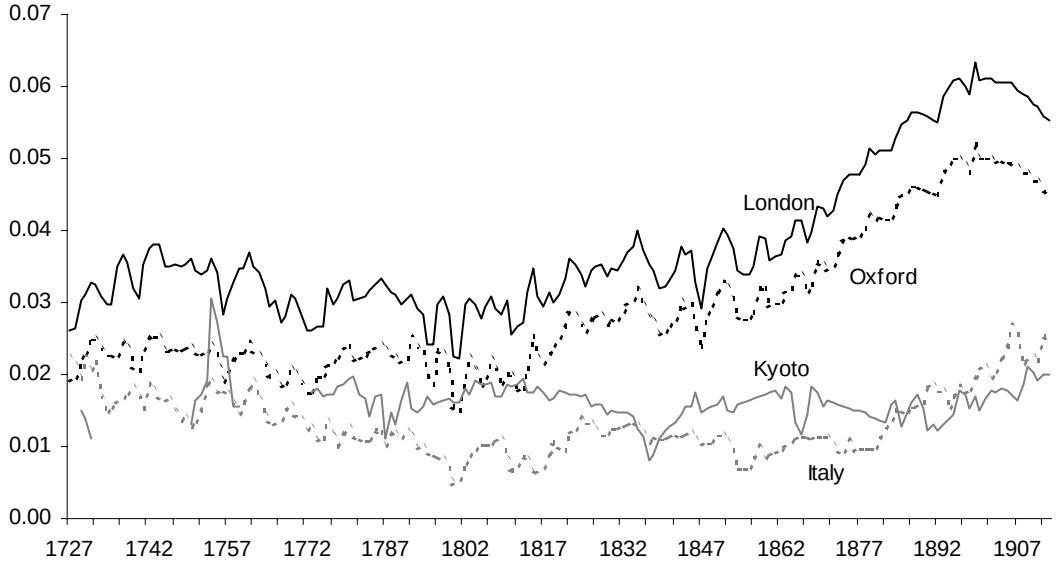
Figures

Figure 5.1. Real Wages in Europe, 1500-1750
(silver wages deflated by cpi)



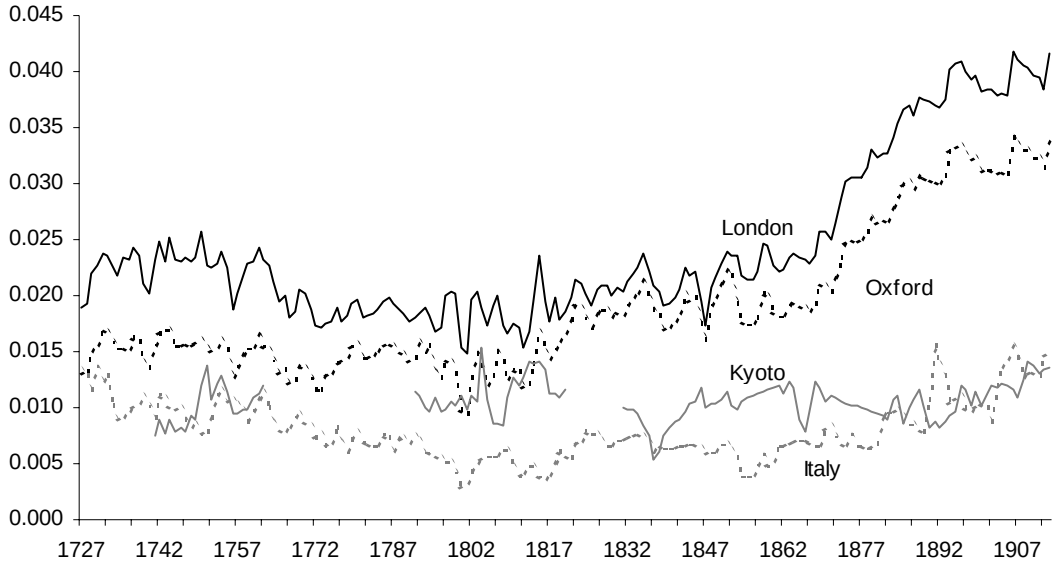
Source: See text.

Figure 5.2. Masons' Real wage, 1727-1913
England, Japan, and Italy



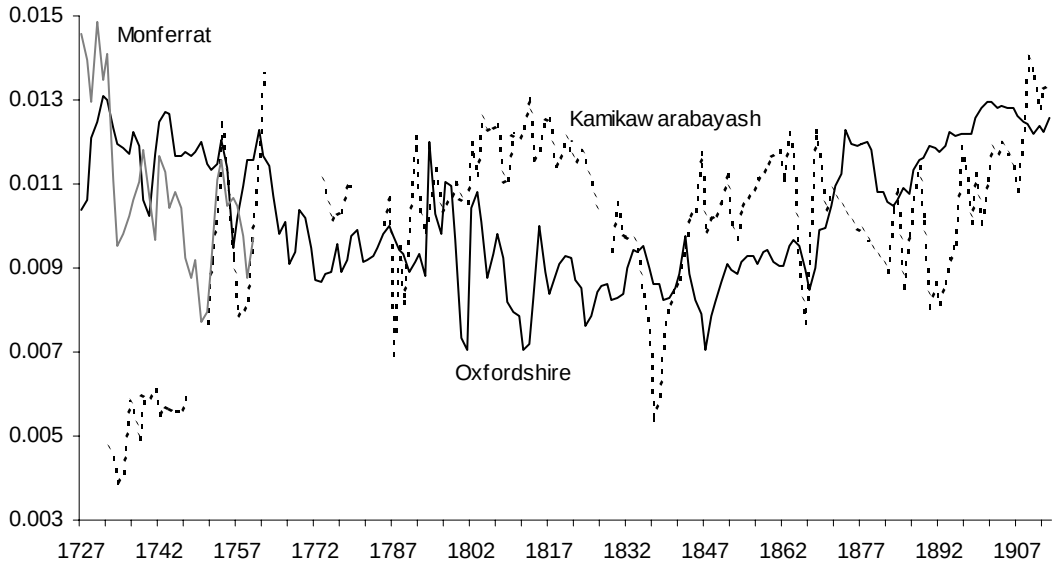
Source: See text

Figure 5.3. Building Labourers' Real Wage, 1727-1913
England, Japan, and Italy



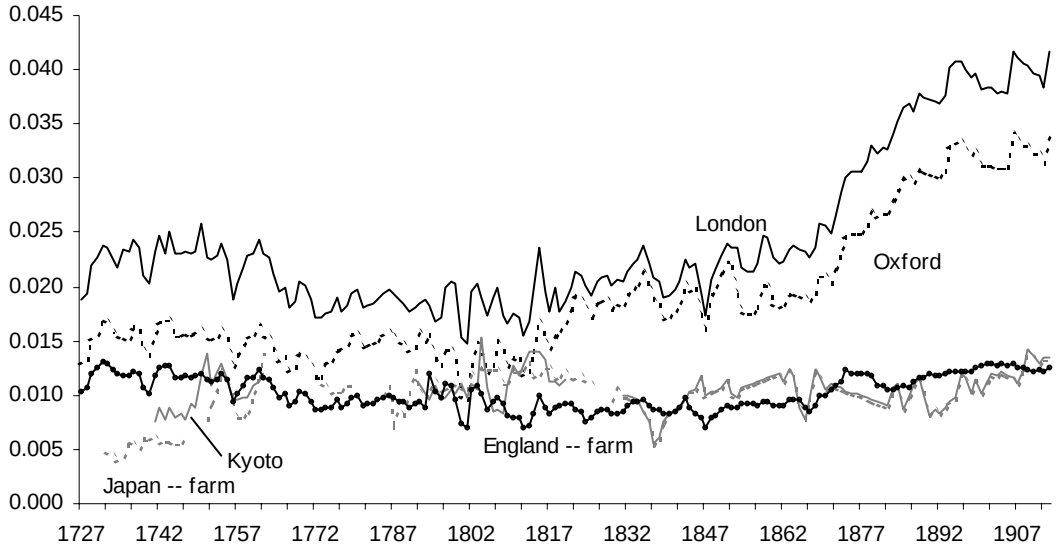
Source: See text

Figure 5.4. Farm Labourers' Real Wage, 1727-1913
England, Japan, and Italy



Source: See text

Figure 5.5. Labourers' Real Wage, 1727-1913
England and Japan



Source: See text

Appendix

Appendix: Table 5.1
Base Values for India in 1595

Commodity prices:

	Indian units	Grams of silver per metric unit
Rice	20 dam/man	.221 g/kg
Peas	6 dam/man	.087 g/l
Meat	65 dam/man	.717 g/kg
Fat	105 dam/man	1.158 g/kg
Oil	80 dam/man	.882 g/kg
Cloth	3 dam/yard	.908 g/m
Cost of basket	101.058 grams of silver	

Wage:

Unskilled	3 dam/day	.830463 grams of silver/day
Skilled	7 dam/day	1.937747 grams of silver/day

Real Wage:

Unskilled	.011294
Skilled	.026352

Notes:
(1) assumptions about weights, measures, and money: one rupee of 40 dam weighed 11.07284 g. of pure silver, one man equals 25.1 kg, one litre of peas weighs .76 kg.
(2) Fat was ghi.
(3) Cost of basket obtained by multiplying quantities in Table 1 by silver prices shown here.
(4) Real wage is wage divided by cost of basket.

Appendix: Table 5.2

Base Values for China in late 17th century¨

Commodity prices:

	Chinese units	Grams of silver per metric unit
Rice	1 tael/shi	.555 g/kg
Peas	[.219]g/l	
Meat	[1.803]g/kg	
Fat	[2.219]g/kg	
Oil	[2.219]g/l	
Cloth	.31 tael/bolt	2.355 g/m
Cost of basket	247.3088 grams of silver	

Wage:

Farm	.05tael/day	1.553333 grams of silver/day

Real Wage:

Farm	.008527

Notes:
(1) Money: one tael weights 31.06667 grams of pure silver.
(2) Assumptions about weights and measures (Li 1998: xvi-xvii): one shi of paddy rice weighs 65 kg (1.3 dan or picul each weighing 50 kg), one bolt of cloth equals 3.63 square yards or 3.03 sq meters.
(3) Fat was oil.
(4) Cloth price is Li's (1998: 149) figure for the net income that producer's received from making cloth inflated by Pomeranz's (2000: 319) ratio of output to labour costs.
(5) Silver prices in brackets calculated as price of rice multiplied by the ratio of the Indian price of the commodity to the Indian price of rice as given in Appendix: Table 1.
(6) Cost of basket obtained by multiplying quantities in Table 1 by silver prices shown here.
(7) Real wage is wage divided by cost of basket.

Appendix: Table 5.3.
Base Values for Japan in 1880-1884

Commodity prices:

	Japanese units	Grams of silver per metric unit
Rice	.09476 yen/sho	1.662 g/kg
Peas	.06000 yen/sho	1.163 g/l
Meat	[5.403]g/kg	
Fat	[6.650]g/kg	
Oil	[6.650]g/kg	
Cloth	.502 yen/tan	3.7530 g/m
Cost of basket	540.3853 grams of silver	

Wage:

Unskilled	.2 yen/day	5.00 grams of silver/day
Skilled	.2975 yen/day	7.44 grams of silver/day
Farm	.1975 yen/day	4.94 grams of silver/day

Real Wage:

Unskilled	.009200
Skilled	.013685
Farm	.009085

Notes:
(1) assumptions about weights, measures, and money: one yen equalled 25 grams of silver. Ohkawa et al. (1967: 153) states that one sho of rice weighed 1.425 kg, while one sho of soy beans weighed 1.29 kg. Li (1998: 205, n4) reports that one tan of cloth equalled 4.1 square yards (3.43 sq meters).
(2) Fat was oil.
(3) Silver prices in brackets calculated as price of rice multiplied by the ratio of the Indian price of the commodity to the Indian price of rice as given in Appendix Table 1.
(4) Cost of basket obtained by multiplying quantities in Table 1 by silver prices shown here.
(5) Real wage is wage divided by cost of basket.

Appendix: Table 5.4

Base Values for England and Italy in 1750-1759

Commodity prices(grams of silver per metric units):

	England	**Norther Italy**
Bread	1.37 g/kg	.91 g/kg
Peas	.42 g/kg	.58 g/kg
Meat	3.33 g/kg	2.32 g/kg
Fat	6.89 g/kg	2.32 g/kg
Oil	3.19 g/kg	2.32 g/kg
Cloth	4.87 g/m	8.63 g/m
Cost of basket	579.736 g	381.982 g

Wage:

Unskilled	7.42 g/day	3.44 g/day
Skilled	11.14 g/day	5.73 g/day
Farm	5.57 g/day	2.10 g/day

Real Wage:

Unskilled	.014909	.009737
Skilled	.022383	.016229
Farm	.011191	.009752

Notes:
(1) See Allen (2001) for discussion of underlying data.
(2) Wages shown for England are for Oxford. London wages were 16.70 g/day for skilled and 11.14 for unskilled.
(3) Fat was butter in England and oil in Italy.
(4) Cost of basket obtained by multiplying quantities in Table 1 by silver prices shown here.
(5) Real wage is wage divided by cost of basket.

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