Lifestyles of the Rich and Famous: Living Costs of the Rich versus the Poor in England, 1209-1869

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August 2004

This paper reports work in progress towards an attempt to measure the cost of living in England for those with consumption patterns similar to modern European consumers from 1209 to 1869. Until the pioneering work of Hoffman et al. (2002) measures of real wages in pre-industrial Europe have typically been for the poorer and middling sectors of society: laborers and craftsmen. The poorest workers show remarkably little gain in real wages from 1280 to 1800, despite the narrative evidence of huge changes in these societies. Combined with population evidence, the implication seems to be that there was remarkably little technological advance in England from 1200 to 1800. In this paper I show that the perspective of people with consumption patterns like our own the pre-industrial world was a period of substantial economic change. Measured relative to the laboring wages the prices of these goods consumed by the rich were falling almost as quickly in the years 1300-1730 as in the Industrial Revolution years 1730-1869.

Introduction

The price history of pre-industrial England is uniquely well documented. England achieved substantial political stability by 1066. There was little of the internal strife that proved so destructive of documentary history in other countries. Also England's island position and relative military success protected it from foreign invasion, except for the depredations of the Scots in the border counties. England further witnessed the early development of markets and monetary exchange. In particular when reports of private purchases begin in 1208-9 the markets for goods were clearly well established. A large number of documents with such prices survive in the records of churches, monasteries, colleges, charities, and government.

These documents have been the basis of many studies of pre-industrial wages and prices. But the cost of living indexes constructed have mainly been for comparatively poor workers such as building laborers and craftsmen. Until the recent work of Hoffman et al. (2002) there has been little attention to the comparative movement in the costs of living of the rich, people like us in their living standards, versus the poor. Oddly, as far as living standards go much more is know about those of the poor in the pre-industrial era than is know about the rich! Yet there is every indication that the cost of living of the poorer workers moved in a different way from that of the rich, particularly in the years after 1500. In particular Hoffman et a. (2002) find that the cost of living of the richest consumers in Europe increased much less than that of the poorest in the years 1500 to 1650.

If we look at what happened to the living standards of the poorest workers in England, we see stagnation from 1200 all the way to 1800, with only modest gains in the 19th century to the 1860s. Figure 1 shows the calculated real day wage of farm laborers in these years with the average of 1860-9 set to 100. There is no evidence of any secular improvement in living standards. In particular real day wages are about the same in the first half of the thirteenth century as in the latter part of the eighteenth century. And in the plague years, from 1350 to 1550, real wages exceed those of 1800 substantially. Indeed at their peak the real wages of male day laborers in farming exceed the level of the 1860s at the end of the Industrial Revolution.

I can also calculate the marginal product of a day's labor in agriculture. This is the wage measured in terms of units of output of farm produce. This marginal product is graphed versus the estimated population of England from 1200-9 to 1790-9. Only in the 1620s is there any clear sign of technological advance in agriculture, and even here the gains are modest. The clear

impression is of a stagnating economy and society from 1200 to 1600, with the first signs of modest growth only in the 17th century.

This impression of economic stagnation seems odd in comparison to the catalogue of both the technological discoveries in Europe from 1200 to 1700, as well as the advances in the arts which sometimes were driven in part by technological innovations. Table 1 lists for example, a set of technological advances. From 1200 to 1700 Europeans discovered or rediscovered gunpowder, and applied it to an increasingly sophisticated set of weaponry. They greatly developed their ability to harness wind power, in the form both of windmills and of sailing ships. Using these enhanced abilities with wind power and with armaments to discover new lands, and a sea route to Asia. The discovery of the New World in turn led to the introduction of new plant varieties in Europe: the potato, the tomato and maize. They introduced a whole set of optical instruments: spectacles, telescopes and microscopes. They discovered moveable type and the printing press. They developed paper as a medium for printing on. They developed their calculating abilities greatly. Decimal notation and the zero were introduced in learned circles in Europe the thirteenth century. But at least in England, Roman numerals persisted in common use in accounts. Arabic numerals were popularized finally in the early seventeenth. Napier introduced the idea of logarithms in 1614. Mechanical clocks, which were introduced in the thirteenth century, became steadily more accurate and more compact. Knitted fabrics such as hose were mechanized with the introduction of the knitting frame in the late sixteenth century. Silk spinning was mechanized long before the classic Industrial Revolution in cotton, with Italians introducing spinning mills in the 17th century. Silk spinning machinery was patented in England in 1718 by Thomas Lombe, who essentially

imported the technology from Italy, and successfully operated a silk spinning mill employing over 300 workers by the 1730s.

Along with improvements in production technologies came improvements in communications. When the Paston family in England corresponded in the 15th century, their letters between Norfolk and London seem to have been carried by whatever acquaintances or their servants were journeying in the right direction.[1] By 1512 many countries in Europe had regular postal service. The operation run by the von Taxis family served Austria, Germany, Italy, Low Countries, Hungary, and Spain. France and England had informal carriage of public mail through the royal postal service from the 16th century onward. An official public postal service between major cities, with regular times of dispatch, was introduced in France in 1627 and in England in 1635.

The entertainments available to people expanded also. Table 2 shows some of the milestones in artistic production over these years. The variety of architectural spectacles was increased by the achievements of Gothic architecture in Northern Europe. The stock of literature greatly expanded over time, especially when the printing press made it possible for authors to charge for their works, rather than having to rely on patronage. Added to book publication was the arrival of newspapers and magazines, which in England can be traced back to 1720. The stock of music was expanded by the creation of new instruments, new forms such as Opera and Symphonies, and by the creation of a system of musical notation that could preserve and disseminate the details of compositions. The ability of artists to produce faithful renditions of nature scenes was enhanced with the development of techniques of perspective.

All this produced a society that by 1700 offered to the consumer of our tastes a menu that was not dissimilar to our own. Someone of an upper class status living in London in 1700 could

[1] Robinson (1953), pp. 1-2.

live a life that would be very familiar to us. He could drink coffee and tea at the coffee house, beer at the alehouse and wine at the tavern. Coffee houses, for example, were first established in London only in 1652. Yet by the 1700s there were 500 such establishments in the city (a large number per capita than in my city of Davis, which has only 15 for 65,000 people). These coffee houses also sold drinking chocolate. Coffee houses provided customers news books and newspapers, sold pamphlets, and displayed notices and advertisements (Latham (1983), p. 70). There were also over 400 taverns serving imported wines from France, Spain, Portugal and Germany. Eating places were numerous, and ranged in quality from fancy French restaurants to simple bakeshops. The foods they sold were flavored with spices from all over the world.

Relative Prices, 1260-1869

Before we consider the living standards of the rich we need to know what happened to the prices of goods they consumed that do not show up in the budgets of the poor, or show up in negligible quantities. Often the price quotes for these goods will come from scattered series, rather than continuous runs of prices as with staple commodities like wheat. And there are many more problems of controlling for quality over time and across sources in such goods as in the case of the more homogenous agricultural products such as wheat.

The component price series used here have been constructed in a standard fashion. Prices from different sources were combined into a single series by running regressions of the form

$$\ln(p_{ikt}) = \sum_t \alpha_t D_t + \sum_k \beta_k DUNIT_k + \sum_i \theta_i DLOC_i + \varepsilon_{ikt}$$

Where the D_t's are a set of indicator series for each year (or each decade where the price distribution is thinner), the $DUNIT_k$'s are indicators for the unit of measurement and the $DLOC_i$'s are indicators for the location or the quality of the output. The logarithmic form was

chosen to allow for consistent proportional differences in the level of prices across different price series as a result of measurement or quality differences. The reason for doing this is that even with agricultural commodities there could be considerable quality differences. Thus the average price of butter, in pence per pound, in the years 1815-1827 from five different sources for butter prices was as follows: Irish Imports, 4.87, Bethlem Hospital, 12.87, Greenwich Hospital, 9.52, Lord Steward (King's household), 19.87, Navy Victualling, 9.43. The king, unsurprisingly, got better butter than did the inmates of the insane asylum (though the inmates did better than sailors in the navy)! And butter imported by the barrel from Ireland was a lot cheaper than butter bought by institutions by the pound. Generally for a given commodity the larger the units the transaction was measured in the lower was the price per standard weight or volume.

In earlier years prices typically come from accounts that ran from Michaelmas (September 29) to Michaelmas. But churchwardens accounts often ran from Easter to Easter. Where the date within the year is not given these prices have been attributed to the year of the following January since most of the account falls in that calendar year.[2]

For each good considered here a collection of prices has been assembled from the following sources:

(1) Thorold Rogers incredible, promiscuous, collection of price quotes from 1260 to 1793.

(2) Beveridge's published volume on prices from 1400 to 1831 which gives price series for individual locations carefully controlling for quality (Beveridge (1939)).

(3) The unpublished extracts of price materials collected by Beveridge in the Robbins Library, LSE. Some of these were for a projected volume on prices 1200-1534 that

[2] By contrast Beveridge and Thorold Rogers both date prices according to the calendar year of the beginning of the account year.

Beveridge never completed. Others were scattered price material post 1534 that Beveridge did not incorporate into his book because of his preferences for material in continuous runs.

(4) Published accounts or translations of accounts from institutions such as town chamberlains, churchwardens, London Guild Companies, and ecclesiastical institutions. Most of the published transcripts are for the years before 1600.

(5) Original accounts for these same institutions. Unfortunately as we move forward from 1600 these accounts become less and less informative, since the details of payments increasingly were recorded by tradesmen on vouchers submitted for payment. In this case the accounts often merely summarize the totals of these vouchers.

(6) The original trademen's vouchers submitted to magistrates, town chamberlains, the clothworkers guild, and churchwardens in the years after 1600. Unfortunately most of these bundles of vouchers were subsequently discarded. But sufficient were retained that complete price series for many commodities for the years 1700 to 1869 can be constructed.

Table 3 shows in summary form the details of the new series constructed. In the first column is a summary description of the commodity. In the second is the range of dates with price quotes, in the third the number of price quotes, and in the fourth the unit of measurement. The next two columns should the average price in the base period, 1260-1349 compared to the end years looked at here, 1700-1759. The end years were chosen to be just before the changes of the Industrial Revolution.

The final column of the table shows the price of each commodity in 1260-1349 relative to its price in 1700-1759, measured in terms of the average day wage of building workers. The average day wage of building workers was taken as the simple average of the wage of craftsmen and of their laborers. The commodities have been arranged in order of those with the most dramatic fall in prices relative to wages. Those with the most dramatic price declines would typically be those with the greatest productivity gains in their production. But a complicating factor with many of these goods – such as books, paper, glass, spices, and sugar – was that they were taxed heavily as luxuries in England after 1689. In the case of pepper, for example, more than half the sales price in the early eighteenth century was import taxes.

Pride of place in the table goes to books. The estimated price of a standard page of text in the middle ages was 50 times the price in 1700-59. Figure 4 shows the price of books relative to building day wages from 1250 to 1860, with 1700-1759 set at 100. Unfortunately observations on book prices before 1450 are limited: I found only 32 price quotes for these years. And the prices vary a lot by decade since it is hard to control for the quality and size of the manuscript. Even though the scale goes up to 4000%, many of the decadal averages of prices before 1450 cannot be shown.

Paper, the raw material on which books were mainly printed, did not experience such a dramatic price decline. Figure 5 shows paper and parchment prices. But relative to labor costs paper nevertheless became much less expensive over time. The spike upwards in prices after 1690 was at least in part created by the sudden embargo on French imports (followed later by prohibitive tariffs), France having previously supplied most paper used in Britain. In the eighteenth and early nineteenth centuries paper was quite heavily taxed, these excise taxes not being totally repealed until 1861. Paper prices only extend back to 1356. The major writing

materials before 1400 were parchment and vellum, whose price trend is also shown. The spread of paper as the dominant medium for writing is clearly explained by the decline in paper prices relative to parchment from 1350 to 1650.

The next commodity to experience dramatic price declines was cane sugar. Figure 4 also shows the price of sugar again relative to building workers wages by decade from 1250 to 1869. Sugar cane cultivation, long established in India and the Middle East, spread to southern Europe in the later middle ages. In this period it was imported into England by the ships of the north Italian cities. With the Portuguese occupation of the Madeira's (1419) and the Christian conquest of southern Spain and the Canary Islands (1495) sugar cane cultivation spread to southern Spain and the Atlantic Islands. As can be seen in figure 5 by the 1490s, before sugar colonies were established in the new world, the price of sugar in England had fallen to one fifth of its level pre 1350 (relative to builders' wages). Further dramatic price declines came in the late 17th century with the establishment of sugar colonies, such as Jamaica, in the Caribbean using slave labor.

A number of spices imported from South and South East Asia also saw dramatic declines in prices over these years. Yet puzzlingly others from the same geographic areas saw no decline in prices over the same interval. Figure 6 shows the relative prices of imported spices with dramatic price declines. Pepper, the most important spice consumed in England, was produced mainly in Kerala, India until the nineteenth century, and its price declined to one fifth its real medieval level by the early eighteenth century, despite periods of very heavy taxation in these years. The price of Ginger, whose cultivation quickly spread from Asia to the New World declined by even more than this. Cloves, produced for most of this period only in the Moluccas Islands, also saw dramatic price declines.

There is, however, a puzzling lack of synchronicity in these price declines. The decline for cloves is the earliest, and most of the fall to 1700-59 occurs by the early fifteenth century. Ginger and pepper prices both fall dramatically only in the early seventeenth century. Cloves, however, was by far the most expensive eastern spice in the middle ages with a price per pound about 8 times that of pepper. Most of this high cost must have been created by high production costs rather than transport costs or the Arab monopoly of the spice trade. Thus the decline in clove prices before the Portuguese discovery of the sea route to the east probably came from declining production costs in the Mulaccas.

In contrast with the price declines for these spices, however, we have little or no decline in prices (relative to building workers' wages) for cinnamon or mace and nutmeg. Figure 7 shows these price paths. The prices of these spices fell not at all before there was a dramatic decline in the nineteenth century.

The next commodity in table 3 in terms of the extent of the relative price decline in gunpowder, though here the first observation is from 1379. Figure 8 shows the movement of gunpowder prices, as well as those of cutting tools (axes, hatchets, scythes, sickles, and spades) as a proxy for weapons. Also shown is the price series for nails of a standard length per pound relative to wages.[3]

After gunpowder comes glass in terms of price declines. Figure 9 shows the relative price of glass, as well as pigments and painting oils and house rents overall. Glass for glazing has prices quoted by the square foot from 1302 to 1869. This series was supplemented by the prices of glass bottles of standard sizes, and the prices of wine glasses. Paint throughout this period was composed of an oil base (typically linseed) combined with a pigment (sold by the lb.). The price series for pigments is the average of the price of red lead, white lead, Spanish

[3] The longer, and hence heavier, the nails typically the lower the price per pound.

white, verdigris, vermilion, Spanish black, yellow ochre, red ochre, ivory black, umber, and black lead.

The house rents are an extension of the series developed in Clark (2002). The attempt here is to measure the aggregate of house rent changes on houses of unchanging quality. House rents change little relative to the wages of builders from 1350 to 1869. But house rents are significantly higher in the years before 1350. One explanation of these high early rents is that interest rates, an important component in the annual cost of housing, were much higher before 1350 than in any succeeding period.

Figure 10 shows the prices of three sets of textiles: silk, woolens and linens. Despite the small numbers of observations the series on silk prices the price series here shows little variance. Clearly there was a dramatic decline in silk prices from the medieval period on, more significant than for the other textiles. This decline happened despite the imposition of various duties on silk imports in the seventeenth and eighteenth centuries with the aim of encouraging English manufacturers. Though I only have prices for silk thread up until 1794, the decline in silk prices obviously continued through until the 1860s, and may have been even more dramatic after 1794. For in 1849 the Clothworkers' Company in London introduced into the clothing of its male almsmen a "black silk neckerchief" (price 3/10 which is 46 d.). By 1852 the almsmens' hats were also made of silk. Thus silk, which had been an article only for the very wealthy in the middle ages (1 oz of silk thread in the 1280s cost 7 days wages of a building laborer) had become by 1849 part of the clothing of those of quite modest means.

Figure 11 shows the prices of various metal objects in house furnishing. Silver was made into knives, forks, spoons, cups and bowls. The price series here is for silverware in the years 1500-1800, extended into earlier years through the mint price of silver 1260-1500, and the

market price of silver 1783-1869. Pewter, an alloy mainly of tin with additions of lead, was a cheaper alternative for silver in producing these articles. The price series here is based on the prices of new pewter (typically sold by the lb.), old pewter, and the major raw material for pewter, tin. Brass and copper was used for goods such as kettles and pots that were subjected to significant heat. The prices here are for brasswares and copper vessels, supplemented by prices for raw copper and brass.

Figure 12 gives the cost of various types of light: tallow candles, used by the poor, and wax candles and lamp oil used by the rich. Tallow candles were typically made with a mixture of mutton and beef tallow (pork tallow smelled badly when burned and gave off a lot of smoke). But they created a lot of soot. Wax candles and oil lamps were preferred as burning with a much sweeter smell, and with much less soot. After 1700, and until the nineteenth century, tax policy made wax candles very expensive. By 1711 the tax on wax candles was raised to 8 d. per pound (the retail price then after the tax was levied being about 26 d. per lb.) compared to a tax of only 1 d. per lb. on tallow candles.

A Price Index for the Modern Consumers in a Medieval World

Table 3 reveals that there were dramatic changes in relative prices in pre-industrial England. This also implies that the cost of living for different consumers in pre-industrial society could change in very different ways. We saw above that for the poorest group in society, agricultural laborers, there was little change in real living standards from 1200 to 1800, because their consumption consisted overwhelmingly of domestic agricultural produce.

What happened to the cost of living of those whose consumption pattern more closely resembled our own? The consumer I have in mind here is not the aristocracy, but the

professional such as ourselves – the doctor, the vicar (earlier the monk), the grammar school master, the university professor, or the high Civil Servant such as Samuel Pepys in the 1660s. Table 4, for example, shows the proportions of wills inventoried between 1675 and 1725 that left various goods, such as books, silverware, mirrors, and pictures as a function of social class. People in the class of merchants and professionals had a very different stock of possessions than those in the laboring classes, even back in 1700.

The problem is to derive the appropriate weights for consumption, since as we see price trends are very different for different consumers. Budgets for such households in pre-industrial England are rare. Also the budgets for the noble households that do survive tend to aggregate the consumption of the masters with that of the servants, who received their wage partly in board and lodging. We do, however, get good estimates of the typical consumption patterns of modern consumers. Table 5 shows the broad categories of consumption expenditures that we can price for the pre-industrial era. The share of food, alcohol and tobacco in total expenditure is much smaller for the modern consumer. But the share of housing expenses in the UK is much greater –counting both the rental value of the structure and the cost of the panoply of home furnishing and decorations that goes into the modern home. The other items that noticeably increased were the shares devoted to personal services, and the share devoted to information and entertainment, here indexed by the prices of books for the years before 1869. However for about a third of modern expenditure I have no prices yet with which to measure the costs for most of the years before 1869. The obvious counterpart of the automobile, which absorbs so much of modern expenditure, is the coach and its associated horses, and horse feed. But there is no good series on the price of a unit of horse traction power. The counterpart of telephone services is the cost of delivering a message by post or messenger. But there was no public postal service before 1635.

For food we can get even more detailed breakdowns of consumption by quantities from the Department of the Environment, Farming and Rural Affairs (DEFRA) National Food Survey, and from import statistics for some foreign spices. Table 6, for example shows estimates for the modern UK consumer of the average food consumption per week in grams or liters of food of different categories.

Thus one way we can phrase the question is what would be the cost of living would be for the average modern consumer, consuming the relative quantities of our food basket? In this case we would construct a cost of living index of the following form (a Laspeyres Index):

$$p_t = \sum_i \alpha_i p_{it}$$

where the α_i are the quantity weights for each commodity. This index assumes that even when the relative price of an item increased in a given year its relative consumption was unchanged.[4]

The problem that immediately arises with such an approach is that with fixed quantity weights the implied share of expenditures on some minor items now is huge in earlier years. Table 6, for example, also shows in the last column the implied share of expenditures on food at 1700-59 prices of the modern consumption pattern (for those items I have prices for in 1700-59). Tea would be 48% of the food budget in 1700-59 at modern consumption levels! A more conservative approach is to assume fixed budget shares over time (which is the same as assuming for each good that the price elasticity of demand is -1, which implies that consumers have Cobb-Douglas Utility Functions). This implies that if a good was extremely expensive consumers choose to economize in its use.

[4] Goods are strict complements in the utility of the consumer.

The price index for rich consumers, those like ourselves, was thus formed as a geometric index of the prices of each component, with the assumed output shares of each commodity used as weights. That is, if p_{it} is the price index for each commodity i in year t, and α_i is the output share of commodity i, then the overall price level in each year, p_t is calculated as,

$$p_t = \prod_i p_{it}^{\alpha_i}$$

Thus it assumes constant shares in the value of output for each item as relative prices change from year to year.

The weights for this index are designed to echo those of the modern consumer, as inferred from the DEFRA, National Food Survey, 2000, and the Office of National Statistics, Family Expenditure Survey, 2000. For many modern expenditures, however, we have no direct equivalence (automobiles are a very important category of modern expenditure, for example). Thus at least at this stage the weights are a very rough approximation. Table 7 shows the weights used for the cost of living of farm workers in Clark (2004b), as well as the weights suggested by Vanderlint in 1734 for a London laborer. The fourth column shows the expenditure weights for modern British consumers. The final column shows how these have been translated into the weights for a cost of living index for the rich. For some commodities, such as rice, raisins etc. the prices series is not yet complete enough to allow them to be included in the calculation. But eventually even more new commodities than are introduced in this paper can be included.

Consider first food, alcohol and tobacco which gets a weight of 74.5% in the COL index of the poor, but only of 18% in the budgets of modern workers.[5] Table 8 shows the elements of the COL of farm workers, and the weights employed in their COL index (constant weights throughout), with 1860-9 set at 100. The first column shows the index for food, alcohol and tobacco. Table 9 shows the elements in the cost of living of the modern consumer transported into the past. Again the first column shows the index for food, alcohol and tobacco. Figure 13 shows

$$\frac{Food\ \cos t_{ModernConsumers}}{Food\ \cos t_{FarmWor\ ker\ s}}$$

with 1700-59 set at 1.00. The cost of food for a consumer with modern consumption habits (in terms of the share of their expenditure spent in food) was over twice as great in the years before 1450 than in 1700-59. Note that this is with a conservative stipulation of "modern consumption habits," in that we are just assuming that the share of their expenditure devoted to food products looks like that of modern consumers. Given the high prices for sugar and the spices included here before 1450 the consumption of these goods, in grams per day, is assumed much less than modern levels. The diet is assumed to be a lot more bland in 1300!

Housing, measured in the general sense of home plus furnishings, was another area where the cost of living of farm workers and of modern consumers diverged as we move back in time. The expenditure estimates of the family expenditure survey show that 24% of expenditures related to housing rents or mortgages, housing repairs, and the furnishing and decorating of houses. Clark (2004c) innovates in having an index of housing rents included in the cost of living of farm workers. These are measures of the rents paid to landlords. It also included the

[5] I included only a share of the costs of prepared meals and food eaten out of the home, for which a substantial part of the payment for such meals is for the labor in food preparation and service, and the rental of the cooking and eating establishments. The rest of the cost of these foodstuffs was included under "services" and "lodging" costs.

cost of pewter as 10% of the cost of shelter. But the expenditure of modern consumers on house furnishings, tableware and decoration is much more elaborate. The cottages of the pre-industrial poor had whitewashed walls, and earthen floors. The modern consumer walks on carpet, is shielded from the prying eyes of neighbors by window drapery, and has painted or wallpapered walls. Wood and wall surfaces are painted and varnished. Modern consumers own extensive collections of silverware (now stainless steel), plates, glasses, pots and domestic appliances. They sit and sleep on stuffed and padded sofas and beds, and store things in sideboards and cupboards. To represent such consumers the housing index constructed here has the following weights:

1.	House rents (for the house structure)	67%
2.	Silverware (cutlery, cups, bowls)	8.33%
3.	Glassware (bottles, glasses, plates)	8.33%
4.	Pewter (plates, bowls)	4.17%
5.	Brasswares (kettles, pots)	4.17%
6.	Paints (decoration)	8.33%

These weights are more a guess at the expenditure shares than a scientific estimate! The new and the old housing series are shown in tables 8 and 9. Figure 13 shows that with these additions of goods like glasswares, silverwares and paints with substantial productivity gains over these years, the cost of lodging is high in the past for the modern consumer relative to the farm worker. Note that this calculation does not include any allowance for the cost of housing textile fabrics, which will be included under textiles.

In textiles the crucial difference between the farm worker and modern consumers would be in the consumption of fabrics made from silk or its artificial substitute rayon. Silk prices, as

we saw, declined more than those of other textile products. Arbitrarily I assume 12% of textile expenditures for the modern consumer would be on silk or its substitutes. The prices indices here for the pre-industrial farm worker versus the modern consumer would not differ by much, even though silk saw more rapid price declines than other textiles.

For light I assume that the farm worker uses tallow candles throughout, while the modern consumer would use higher quality wax candles, lamp oil or (after 1810) gas lighting.[6]

The cost of services is assumed to be the average wage of workers in the building trades (from Clark (2004b)). This is the cost that rises most over time, so the fact that the farm workers consumed almost no services while "modern" workers consume many services means that in this respect the cost of living would rise much more rapidly for modern consumers than for farm workers who consumed mainly agricultural commodities.

The last column of tables 8 and 9 show the implied overall cost of living indices for farm workers and for a consumer of more modern consumption choices. Figure 14 shows the resulting relative cost of living for "modern" consumers versus farm workers. The overall effect of changing the shares of the consumption basket towards modern shares (which stand in for high income consumers in the past) is that living costs rose much more slowly in the years 1280 to 1650 for high income consumers than for farm workers. Indeed for the years before 1500 average living costs for the rich were double those of the poor relative to c. 1650. Thereafter if there was any trend it was towards somewhat slower increases in costs for the poor as opposed to the rich. In part this was because of the importance of wages in the cost of living of the rich, and the substantial rise in wages relative to other costs in the years after 1800.

Figure 14 also shows the relative cost of living calculated by Hoffman et al. (2002) for England in the years 1500-1869 for the upper 5% of the income distribution compared to the

[6] Tallow candles release a considerable quantity of soot.

bottom 40%. As can be seen the results are very similar for the years of overlap. The only substantial deviation is that the Hoffman et al. series shows living costs for the rich declining relative to the poor in the Industrial Revolution period, whereas the new series suggest that from 1670 to 1869 the living costs of the rich and poor were close to constant.

Hoffman et al. interpret the U shaped movement of the relative cost of living of the rich versus the poor from 1500 to 1750 largely in demographic terms. In periods of rapid population growth the cost of labor declined relative to that of land. This made staple foods expensive relative to servants and luxury goods consumed by the rich (Hoffman et al. (2002), p. 351). There may be some truth in this interpretation, but if demography was the dominant factor then the cost of living of the rich should have been low also in the years before 1349 and the onset of the Black Death. The interpretation I prefer here is that while demographic trends played some role, the dominant force was actually technological change that happened to favor the rich. One major form of technological change in these years was the reduction in the cost of importing goods from other regions of the world. The rich were greater beneficiaries of this because while the poor were looking mainly for the cheapest calorie which was still produced at home until the nineteenth century, the rich sought variety in consumption which was largely available abroad.

Finally I calculate a hypothetical real wage for the rich (doctors, attorneys, professors) versus farm workers for 1280-1869. This is a purely hypothetical real wage since I do not have any series for the average wages of the professional class in these years. All I am doing here is assuming that the wage of this group did not change relative to the wage of farm workers. This hypothetical wage is shown in figure 15. The calculated real wage of this professional group is nearly 2.5 times as great by the mid seventeenth century as in 1280-1349. In contrast the real wage of farm workers increased by only 30% in the same interval. Also the rate of real wage

gain for this hypothetical group is nearly as fast in the years 1300 to 1700 as in the years 1760-1860, those of the classic Industrial Revolution. From 1280-1349 to 1700-59 my hypothetical real wage for the rich grows at 0.26% per year. From 1700-59 to 1860-9 these real wages grow at the same 0.26% (though the growth rate for the shorter interval 1800-9 to 1860-9 is a much faster 0.67% per year.

Conclusions

Impressions of economic growth in England and in Europe before 1760 have been based in part on quantitative evidence that the real wages of building workers as portrayed by Phelps-Brown and Hopkins (1962) did not show any sign of secular increase over these years. On the oft quoted Phelps-Brown and Hopkins series the early seventeenth century is the worse in recorded English history in terms of workers' living standards. Real wages of craftsmen are about as high in 1300 as in 1800. Robert Allen in his recent study of European trends, which is focused on the divergent trends in wages, nevertheless finds even for building craftsmen that real wages fell, often by substantial amounts from 1500-49 to 1750-49 in 13 of 14 cities supplying evidence, the exception being London where they were the same (Allen (2001)).

It has been hard to square this wage evidence with other features of the economy which suggest substantial economic growth between 1300 and 1700. These features include the much greater urbanization rates, and the increasing possessions evident in the probate inventories of the deceased. This led to some historians, such as Neil McKendrick, positing a "consumer revolution": an independent cultural revolution in consumption pattern that lead to greater demand for consumer goods at the same income level. Alternatively Jan de Vries posited an "Industrious Revolution": starting in the seventeenth century consumers in England and the

Netherlands began to work more hours per year, substituting new consumer goods for leisure. They acquired a greater taste for goods as opposed to leisure (de Vries (1993, 1994)).

This paper suggests another potential resolution of this seeming paradox. The "consumer revolution" was driven not by any change in tastes, but by the declining prices of many consumption goods created by technological advance (which included technological advance in the ability to trade with tropical regions). As these new consumer goods got cheaper the rich, who had always consumed such goods, consumed more of them, and those of middle incomes explored this area of consumption also. This explanation of the "consumer revolution" can also explain why even though consumer goods were ever more abundant in inventories as we progress through the seventeenth and early eighteenth centuries, they represented a declining share of the total value of bequests (de Vries (1993), pp. 101-2).

Appendix 1: Tool and Utensil Price Observations

Item	Years	Observations
Cutting Implements:		
AXE	1208-1844	186
FALX	1316-1658	17
HATCHET	1275-1595	6
HEDGING BILL	1522-1579	4
HOE	1285-1667	11
REAPHOOK	1281-1579	31
KNIFE	1303-1723	217
SCYTHE	1218-1845	93
SICKLE	1364-1844	22
SPADE	1222-1845	241
STRIGIL	1273-1564	14
Containers:		
BUCKET	1222-1846	229
PAIL	1292-1863	55
Other:		
FORK (farm implement)	1233-1725	110
HAMMER	1279-1868	12
HORSESHOE	1216-1713	316
MATTOCK	1293-1683	15
PADLOCK	1220-1868	111
SHOVEL	1221-1861	277

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The Beveridge Wage and Price History extracted wage and price materials from a whole variety of archival sources. First there were medieval manorial records: eight Winchester manors, Hinderclay and Redgrave in Suffolk, Westminster Abbey manors, and some Battle Abbey material. Then there were the records of religious and charitable institutions: Westminster Abbey, Winchester College, St Bartholomew's Hospital in Sandwich, Kent, Eton College, Greenwich Hospital. Also town corporation accounts were utilized in the cases of Exeter, Canterbury, and Nottingham. Finally Beveridge extracted central government records from the Office of Royal Works.

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Table 1: Technological Achievements in Europe, 1200-1700

Date	Event or Discovery	Person	Place
c. 1200	Windmills	-	N. Europe
1275	Gunpowder	St Albertus Magnus	Germany
c. 1285	Mechanical Clock	-	N. Europe
c. 1325	Cannon	-	N. Europe
c. 1330	Crown Glass	-	France
c. 1350	Spectacles	-	Venice
c. 1450	Printing Press	Johann Gutenberg	Germany
c. 1450	Quadrant (ocean navigation)	-	
c. 1475	Musket	-	Italy, Germany
1492	Discovery of New World	Columbus	Spain
1498	Sea route to India	Vasco da Gama	Portugal
1512	European Postal Service	Franz von Taxis	Austria, Germany, Italy, Low Countries, Hungary, Spain
1522	Circumnavigation of world	Magellan	Spain
1532	Introduction of potato	-	Spain
1544	Introduction of tomato	-	Italy
1589	Knitting Frame	William Lee	England
c. 1600	Arabic numerals popularized	-	England
1600	Discovery of Electricity	William Gilbert	England
1608	Telescope	Hans Lipperhey	Netherlands
1614	Logarithms	John Napier	Scotland
c. 1620	Alarm Clock		
1635	English Postal Service	-	England
c. 1650	Mechanized silk spinning	-	Italy
1654	Liquid in glass thermometer	Grand Duke of Tuscany, Ferdinand II	Italy
1656	Pendulum Clock	Christiaan Huygens	Netherlands
1665	Microscope	Robert Hooke	England
1718	Silk Throwing Machinery	Thomas Lombe	England

Table 2: Achievements in the Arts in 1200-1700

Date	Event or Discovery	Person	Place
1120-1500	Gothic Architecture	-	N. France, England
c. 1315	The Divine Comedy	Dante Aligheri	Italy
c. 1350	Decameron	Giovanni Boccaccio	Florence
c. 1390	Canterbury Tales	Geoffrey Chaucer	England
c. 1400	Harpsichord	-	Flanders
1413	Perspective in Painting	Filippo Brunelleschi	Italy
1509	Wallpaper	-	England
1576	Public Theater	James Burbage	England
c. 1587	Tamburlaine the Great	Christopher Marlowe	England
1600	Opera – “Euridice”	Jacopo Peri and Giulio Caccini	Florence
1602	Hamlet	William Shakespeare	England
1620	Newspaper	-	England
1637	Public Opera House	-	Venice
1709	Pianoforte	Bartolommeo Cristofori	Italy
1719	The Novel - “Robinson Crusoe”	Daniel Defoe	England

Table 3: Price Indices Constructed for 1209-1869

Commodity	Years	Obs.	Unit	Price 1260-1349 (d)	Price 1700-59 (d)	Relative price (%)
Books	1262-1869	3,903	100 Pages	31.9	4.5	39.4
Sugar	1225-1869	2,325	Lb.	12.50	6.2	14.9
Tobacco	1621-1756	65	Lb.	-	12.5	-
Ginger	1265-1831	457	Lb.	19.0	13.8	10.1
Gunpowder*	1379-1844	125	Lb.	31.3	17.3	8.06
Glasswares	1302-1868	656	Sqr. Foot	4.44	6.0	5.39
Cloves	1265-1831	594	Lb.	100.2	157.1	4.62
Pepper	1258-1856	1,373	Lb.	12.7	21.2	4.46
Nails	1209-1868	2,664	Lb.	2.14	3.6	4.43
Silk Thread	1285-1794	151	Oz	12.0	23.0	4.17
Pigments	1284-1858	245	Lb.	2.19	4.1	3.95
House Rent	1280-1869	4,801	House/week	8.1	16.6	3.63
Painting Oil	1303-1849	82	Gallon	15.1	38.5	2.90
Woolen Cloth	1248-1869	3,040	Yard	34.9	98.6	2.65
Silverwares	1273-1869	913	Oz.	25.7	74.7	2.58
Tallow Candles	1261-1869	2,009	Lb.	1.73	5.0	2.58
Lamp Oil	1335-1800	189	Gallon	10.7	31.0	2.55
Paper*	1356-1867	1,288	Quire	6.1	9.0	2.17
Wax Candles	1261-1839	631	Lb.	7.6	26.9	2.12
Cutting Tools	1209-1845	836	Axe	6.05	23.5	1.91
Beer	1209-1869	1,571	Gallon	2.0	8.1	1.85
Farm Output	1209-1869	-	Index	10.7	51.8	1.54
Barley	1209-1869	5,804	Bushel	5.26	25.7	1.53
Farm COL	1209-1869	-	Index	12.9	63.7	1.52
Pewter Goods	1220-1856	1,185	Lb	2.33	12.4	1.39
Linen Cloth	1209-1866	2,836	Ell	3.29	18.7	1.31
Brasswares	1276-1848	264	Lb	3.70	21.3	1.30
Wheat	1209-1869	18,743	Bushel	8.0	47.4	1.26
Nutmeg	1286-1831	1,363	Lb.	18.1	120.0	1.14
Farm Wage	**1209-1869**	**30,000**	**Day**	**1.45**	**10.2**	**1.06**
Cinnamon	1265-1856	723	Lb.	15.6	111.7	1.00
Building Wage Ave.	**1209-1869**	**29,000**	**Day**	**2.46**	**18.4**	**1.00**
Building Laborer	**1209-1869**		**Day**	**1.70**	**14.6**	**0.87**

Notes: *Earlier prices from 1350-99.
Sources: Domestic Farm Prices, Clark (2004a). Farm Wages, Clark (2004c). Building Wages, Clark (2004b).

Table 4: Percentage of Inventories with Given Objects, 1675-1725

Social Group	Number	Books (%)	Looking glasses (%)	Silverware (%)	Pewter (%)	Pictures (%)
Gentry	122	39	62	61	93	33
Merchants and professionals	152	45	62	51	95	35
Husbandmen and laborers	360	4	16	2	89	0

Source: Weatherill (1993), p. 222.

Table 5: Broad Categories of Expenditure, Laborers 1800 versus Modern Consumers

	Farm Laborers, c. 1800	UK c. 2000	Reweighted UK 2000
Food	74.5	18	26.0
Lodging	6	24	35.0
Fuel	5	2	3.0
Light	3.5	1	1.5
Soap	0.5	1	1.5
Clothing, Textiles	9	6.5	10.0
Silk	0	1	1.5
Leather	1	1	1.5
Books, newspapers	0	4	5.6
Paper	0	1	1.4
Personal Services	0.5	9	13.0
ALL	100	68.5	100

Notes: Cinema and theater (0.3%), sports events (0.8%) and TV, videos and computers (2.2%) were placed in the "book" category. Educational expenses (2%) were divided into books (0.5%), paper (0.5%), and services (1%).

Lodging includes rent and mortgage interest, maintenance expenditures, and expenditures on furnishings other than textiles.

The omitted categories in 2000 which cannot be priced for the years before 1800 include most notably automobiles and travel (14%), vacations (5.5%), telephones (2.1%), pets (0.8%)

Source: United Kingdom, Office of National Statistics, Family Expenditure Survey

Table 6: Food Consumption Patterns of British Consumers, 2000, per week

Food	Unit	Consumption At home (per week)	Implied Total Consumption (per week)	Implied Food Expenditure Shares, 1700-59 at constant weights
Cereals	g.	1,508	1,689	8.0
Potatoes	g.	929	1,040	-
Sugars:				
Sugar, preserves	g.	139	156	8.4
Confectionary	g.	64	72	-
Soft Drinks	g. equiv.	107	120	-
Dairy:				
Milk and Cream	ml. milk equiv.	2,081	2,331	5.5
Cheese	g.	110	123	0.9
Meat, Fish, Eggs:				
Meat, meat products	g.	966	1,082	12.2
Fish	g.	143	160	1.8
Eggs	Number	1.75	1.96	0.001
Fats, oils				
Butter	g.	39	44	1.94
Lard	g.	11	12	1.94
Vegetable Fats	g.	89	100	-
Vegetable Oils	ml.	47	53	-
Vegetables	g.	1,077	1,206	-
Fruits:				
Fresh	g.	745	834	-
Preserved	g.	73	82	-
Fruit Juices	ml.	303	339	-
Alcohol:				
Beer	ml.	220	1,558	10.3
Wine	ml.	146	312	-
Other	ml.	69	116	-
Drink:				
Tea	g.	34	68	48.0
Coffee	g.	15	34	-
Cocoa, etc	g.	4	4	-
Spices:				
Salt	g.	-	84	0.30
Pepper	g.	-	4	0.33
Ginger	g.	-	3.4	0.18
Tobacco:	g.	-	2.8	0.14

Sources: DEFRA, National Food Survey, 2000, Office of National Statistics, Family Expenditure Survey, 2000.

Table 7: Budget shares assumed for the two social groups before 1869 (% of expenditure)

Category of Expenditure	Farm Laborer (Clark, 2004b)	Average Household, UK, 2000	Assumed here
All Food and Drink:	74.5	18.0	26.00
Bread and flour	0.0	-	0.0
Wheat	32.0	-	4.3
Barley	3.0	-	0.0
Oats and oatmeal	2.5	-	0.0
Peas	2.5	-	0.0
Potato	4.0	0.30	0.0
Rice	0.0	-	0.0
Meat	9.5	1.86	4.4
Bacon	1.0	0.23	0.5
Fish	0.0	0.38	0.9
Eggs	0.5	0.10	0.2
Lard	1.0	-	0.6
Milk	4.3	0.88	2.0
Cheese	2.3	0.33	0.8
Butter	5.1	0.08	0.6
Vegetable Oils	0.0	0.40	0.0
Sugar	3.0	1.36	3.2
Tea	3.3	0.13	0.3
Coffee, Cocoa	0.0	0.18	0.0
Beer, Cider	4.7	1.94	5.4
Wine, liquor	0.0	1.81	-
Tobacco	0.0	1.54	2.2
Salt	0.5	-	0.2
Spices	0.0	-	0.4
Vegetables	0.0	0.83	0.0
Fruits and Nuts	0.0	0.71	0.0
Prepared Foods, Restaurant Meals	0.0	3.40	0.0

Table 7 (cont.): Budget shares for the two social groups before 1869 (% of expenditure)

Category of Expenditure	Farm Laborer (% expenditure)	Average Household, UK, 2000	Assumed here
House Rent	5.4	-	23.0
Pewter and Tin Wares	0.4	-	1.5
Silverwares	-	-	3.0
Glasswares	-	-	3.0
Copper and Brasswares	-	-	1.5
Paint	-	-	3.0
Housing, Decoration	**6.0**	**24.0**	**35.0**
Fuel	5.0	2.0	3.0
Tallow candles	3.5	-	0.0
Lamp Oil	0.0	-	0.5
Wax candles/Gas	0.0	-	1.0
Light	**3.5**	**1.0**	**1.5**
Soap	0.5	1.0	1.5
House Furnishing Textiles	3.5	2.38	4.0
Silk	0.0	-	1.5
Clothing	5.5	5.12	6.0
Leather Goods	1.0	1.13	1.5
Paper	0.0	1.0	1.4
Books/Newspapers/TV	0.0	4.0	5.6
Services	0.5	9.0	13.0

Sources: Farm Laborers, Clark (2004c), DEFRA, National Food Survey, 2000, Office of National Statistics, Family Expenditure Survey, 2000.

Table 8: The Components of the Living Costs of Farm Workers (1860-9 = 100)

Decade	Food (.745)	Lodging (0.06)	Fuel (0.05)	Light (0.035)	Soap (0.005)	Clothing/ Textiles (0.10)	Services (0.005)	COL
1270	11.2	-	12.2	31.7	13.5	18.9	5.5	12.1
1280	9.9	10.5	13.4	28.9	18.6	21.2	5.4	11.3
1290	11.7	24.0	14.5	31.8	25.6	19.2	5.5	13.3
1300	10.4	21.2	15.0	39.2	29.0	23.0	5.7	12.6
1310	14.3	19.7	17.6	43.3	19.1	26.0	6.2	15.8
1320	13.3	16.2	17.7	44.8	22.4	22.5	6.3	14.8
1330	11.0	16.0	16.6	39.1	24.2	22.0	6.3	12.7
1340	10.6	14.6	18.9	38.8	24.7	20.0	5.7	12.3
1350	13.6	8.8	26.0	42.9	26.1	29.1	8.2	15.3
1360	14.1	10.1	24.2	45.5	27.5	30.2	9.4	15.9
1370	14.3	11.5	25.4	44.0	27.5	31.0	9.8	16.0
1380	10.9	10.0	23.5	42.3	27.5	30.8	9.8	13.2
1390	11.8	9.9	21.7	38.6	27.5	27.5	9.6	13.6
1400	12.0	11.1	20.5	39.2	27.5	27.0	10.3	13.9
1410	12.7	11.0	19.1	36.7	27.5	27.2	10.4	14.4
1420	11.1	10.3	19.7	34.0	28.5	27.6	10.9	13.1
1430	13.7	8.1	19.0	32.7	30.3	27.5	11.2	14.5
1440	10.9	7.9	17.6	32.5	40.4	26.9	11.5	12.5
1450	11.6	7.5	17.6	27.9	42.3	25.8	11.8	12.9
1460	11.2	7.8	17.5	29.5	38.1	27.2	11.3	12.7
1470	11.4	8.2	16.2	28.0	29.3	27.4	11.5	12.8
1480	12.5	8.4	14.2	27.6	32.6	27.2	11.3	13.7
1490	11.5	8.8	14.8	23.4	33.8	26.6	11.2	12.8
1500	11.8	8.1	15.3	22.6	28.7	28.1	11.1	13.1
1510	12.2	9.0	16.4	24.9	35.5	26.1	11.4	13.5
1520	15.2	8.8	17.7	25.9	40.3	28.0	11.9	16.0
1530	16.0	9.8	17.4	26.7	51.1	29.9	12.2	17.0
1540	18.6	9.3	18.3	29.9	49.7	31.1	13.0	18.6
1550	30.2	12.3	26.5	38.7	82.6	36.6	17.7	29.0
1560	29.7	19.5	30.8	50.7	102.2	43.2	19.7	30.7
1570	31.6	15.1	35.6	53.6	89.3	51.1	20.6	32.5
1580	36.0	19.9	38.6	58.7	78.3	54.3	22.1	37.0
1590	48.9	25.1	41.3	79.0	92.4	56.5	22.4	47.7

Table 8: The Components of the Living Costs of Farm Workers (cont.)

Decade	Food (.26)	Lodging (0.35)	Fuel (0.05)	Light (0.035)	Soap (0.005)	Clothing Textiles/ (0.10)	Services (0.005)	COL
1600	49.3	26.0	46.9	80.6	97.9	61.7	24.5	49.2
1610	57.2	30.0	54.7	85.4	101.4	66.5	26.1	56.5
1620	56.2	27.2	55.3	86.3	101.2	71.7	27.1	55.8
1630	65.3	33.3	58.2	93.5	120.6	84.0	29.6	64.6
1640	66.6	28.8	73.4	101.9	120.1	92.9	32.9	66.4
1650	67.4	26.7	71.6	100.1	112.4	91.1	36.3	66.3
1660	65.3	31.7	76.9	102.2	108.6	90.9	37.6	65.9
1670	63.1	34.3	80.3	94.3	95.3	84.1	38.7	64.2
1680	59.0	38.3	80.3	88.0	95.3	81.9	40.5	61.2
1690	69.2	33.5	86.5	98.8	131.9	85.0	42.0	69.1
1700	58.6	39.7	88.8	90.7	108.9	84.2	43.6	61.3
1710	65.1	33.4	85.3	111.5	146.7	88.0	43.3	66.6
1720	64.1	35.6	84.2	106.2	150.5	87.6	43.3	66.1
1730	56.6	34.9	84.4	99.8	143.4	86.3	43.8	59.9
1740	58.3	30.2	95.1	120.2	159.1	89.0	43.6	61.5
1750	64.0	34.0	96.1	115.9	151.7	93.5	43.6	66.8
1760	68.6	34.7	96.4	125.0	162.8	97.2	45.8	70.9
1770	77.4	40.4	103.1	132.4	160.5	95.3	48.7	78.7
1780	79.3	39.5	103.2	138.4	174.6	94.9	49.8	80.2
1790	93.4	49.4	116.1	152.1	193.4	97.2	57.8	92.9
1800	131.3	72.1	146.4	196.6	236.4	110.9	76.6	126.5
1810	145.4	91.6	158.7	211.2	267.8	122.1	93.6	141.2
1820	110.0	91.9	142.5	129.3	191.8	115.7	87.7	111.5
1830	100.9	91.7	132.4	110.4	173.8	111.5	88.8	103.3
1840	100.3	85.0	117.7	104.5	125.9	108.8	88.8	101.1
1850	96.6	87.5	103.6	97.8	107.7	96.5	89.5	96.2
1860	100.0	100.0	99.9	100.0	100.0	100.0	100.0	100.0

Table 9: The Components of the Living Costs of Prosperous Consumers (1860-9 = 100)

Decade	Food (.26)	Lodging (0.35)	Fuel (0.03)	Light (0.015)	Soap (0.015)	Clothing /Textiles (0.13)	Services (0.13)	Books (0.056)	Paper/ Parchment (0.014)	COL
1270	23.9	-	40.7	31.7	13.5	-	5.5	331.3	14.4	-
1280	25.7	13.3	44.4	28.9	18.6	23.0	5.4	331.3	18.3	19.1
1290	24.0	25.5	57.6	31.8	25.6	21.2	5.5	331.3	23.7	25.3
1300	28.6	24.0	52.3	39.2	29.0	24.8	5.7	331.3	19.9	25.2
1310	26.3	22.8	54.8	43.3	19.1	27.7	6.2	417.0	23.4	26.2
1320	29.8	18.6	52.3	44.8	22.4	24.4	6.3	417.0	26.8	24.2
1330	30.1	18.4	43.9	39.1	24.2	23.9	6.3	417.0	19.9	24.2
1340	31.7	16.9	50.3	38.8	24.7	22.0	5.7	417.0	27.9	23.4
1350	32.9	12.3	64.8	42.9	26.1	30.6	8.2	417.0	36.1	23.5
1360	40.2	14.6	57.8	45.5	27.5	31.6	9.4	183.2	80.0	25.2
1370	37.1	15.9	49.1	44.0	27.5	32.3	9.8	183.2	57.9	26.5
1380	40.1	14.3	48.1	42.3	27.5	32.2	9.8	183.2	57.9	25.1
1390	38.0	13.1	45.2	38.6	27.5	29.1	9.6	183.2	35.9	23.3
1400	35.5	15.4	49.2	39.2	27.5	28.6	10.3	183.2	29.5	23.9
1410	30.7	15.2	55.4	36.7	27.5	28.9	10.4	184.1	23.4	24.9
1420	37.0	14.3	51.5	34.0	28.5	29.2	10.9	184.1	21.5	23.8
1430	32.5	11.8	54.1	32.7	30.3	29.1	11.2	184.1	20.5	22.3
1440	32.5	11.7	54.5	32.5	40.4	28.5	11.5	184.1	18.8	21.7
1450	29.1	10.8	50.7	27.9	42.3	27.5	11.8	184.1	20.2	21.3
1460	28.9	12.2	49.2	29.5	38.1	28.8	11.3	251.8	17.8	21.8
1470	27.0	11.8	58.1	28.0	29.3	29.0	11.5	251.8	18.5	21.3
1480	25.9	12.6	57.5	27.6	32.6	28.8	11.3	251.8	18.4	21.6
1490	25.4	12.1	61.8	23.4	33.8	28.3	11.2	251.8	16.8	20.9
1500	24.0	11.7	53.1	22.6	28.7	30.4	11.1	251.8	15.7	19.4
1510	22.5	12.8	56.3	24.9	35.5	27.3	11.4	104.4	15.4	20.0
1520	24.6	12.7	60.8	25.9	40.3	28.7	11.9	70.6	16.4	20.3
1530	28.1	13.2	57.1	26.7	51.1	30.6	12.2	36.9	16.0	20.9
1540	29.4	16.1	56.5	29.9	49.7	33.7	13.0	33.4	18.3	24.2
1550	35.1	17.5	96.6	38.7	82.6	38.9	17.7	35.7	23.2	29.9
1560	49.6	24.7	104.1	50.7	102.2	45.1	19.7	39.5	27.0	36.2
1570	51.8	20.1	102.5	53.6	89.3	52.3	20.6	50.8	28.1	35.3
1580	54.1	25.6	103.6	58.7	78.3	57.4	22.1	59.2	25.7	39.8
1590	58.5	29.2	127.3	79.0	92.4	59.3	22.4	54.5	25.4	43.7

Table 9: The Components of the Living Costs of Prosperous Consumers (cont.)

Decade	Food (.26)	Lodging (0.35)	Fuel (0.03)	Light (0.015)	Soap (0.015)	Clothing /Textiles (0.13)	Services (0.13)	Books (0.056)	Paper/ Parchment (0.014)	COL
1600	75.9	31.2	46.9	119.2	97.9	65.0	24.5	42.6	28.5	47.0
1610	84.1	35.7	54.7	131.1	101.4	69.5	26.1	63.9	26.7	52.9
1620	80.8	35.7	55.3	131.1	101.2	75.5	27.1	33.2	29.8	51.4
1630	90.0	38.5	58.2	141.9	120.6	86.7	29.6	39.9	30.5	56.8
1640	86.1	34.5	73.4	142.5	120.1	94.8	32.9	36.2	34.4	55.6
1650	80.6	34.8	71.6	140.8	112.4	93.1	36.3	56.3	36.7	56.7
1660	87.6	38.2	76.9	138.8	108.6	92.0	37.6	30.8	38.9	58.2
1670	78.1	40.2	80.3	178.5	95.3	85.9	38.7	59.8	35.9	59.5
1680	72.7	43.3	80.3	155.9	95.3	83.0	40.5	53.9	41.4	59.6
1690	90.2	40.7	86.5	140.4	131.9	85.6	42.0	38.9	76.4	62.0
1700	75.0	46.5	88.8	134.3	108.9	84.6	43.6	37.8	79.2	61.9
1710	75.1	43.8	85.3	150.6	146.7	88.0	43.3	43.2	72.4	61.6
1720	70.9	46.3	84.2	160.4	150.5	86.4	43.3	59.7	85.6	63.1
1730	63.5	45.0	84.4	185.7	143.4	86.3	43.8	56.1	75.6	60.5
1740	70.0	42.3	95.1	187.0	159.1	88.7	43.6	58.3	76.5	61.4
1750	70.8	44.6	96.1	190.6	151.7	92.7	43.6	59.7	60.3	63.0
1760	74.6	47.9	96.4	216.9	162.8	95.9	45.8	67.0	61.1	66.8
1770	83.7	51.9	103.1	230.4	160.5	95.4	48.7	62.8	60.4	71.2
1780	88.1	53.3	103.2	294.5	174.6	93.3	49.8	36.9	67.9	71.2
1790	100.4	60.4	116.1	305.9	193.4	97.2	57.8	87.5	85.6	83.5
1800	137.7	81.2	146.4	366.9	236.4	110.9	76.6	107.5	153.3	114.3
1810	155.8	94.0	158.7	624.1	267.8	122.1	93.6	85.6	168.9	127.5
1820	127.2	91.9	142.5	265.0	191.8	115.7	87.7	127.8	143.6	116.5
1830	107.8	89.1	132.4	221.4	173.8	111.5	88.8	109.2	130.4	106.6
1840	102.1	84.0	117.7	175.8	125.9	108.8	88.8	104.8	112.6	99.1
1850	96.9	86.1	103.6	110.1	107.7	96.5	89.5	97.7	93.0	92.9
1860	100.0	100.0	99.9	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Figure 1: The Real Day Wages of Farm Laborers, England, 1200-1869

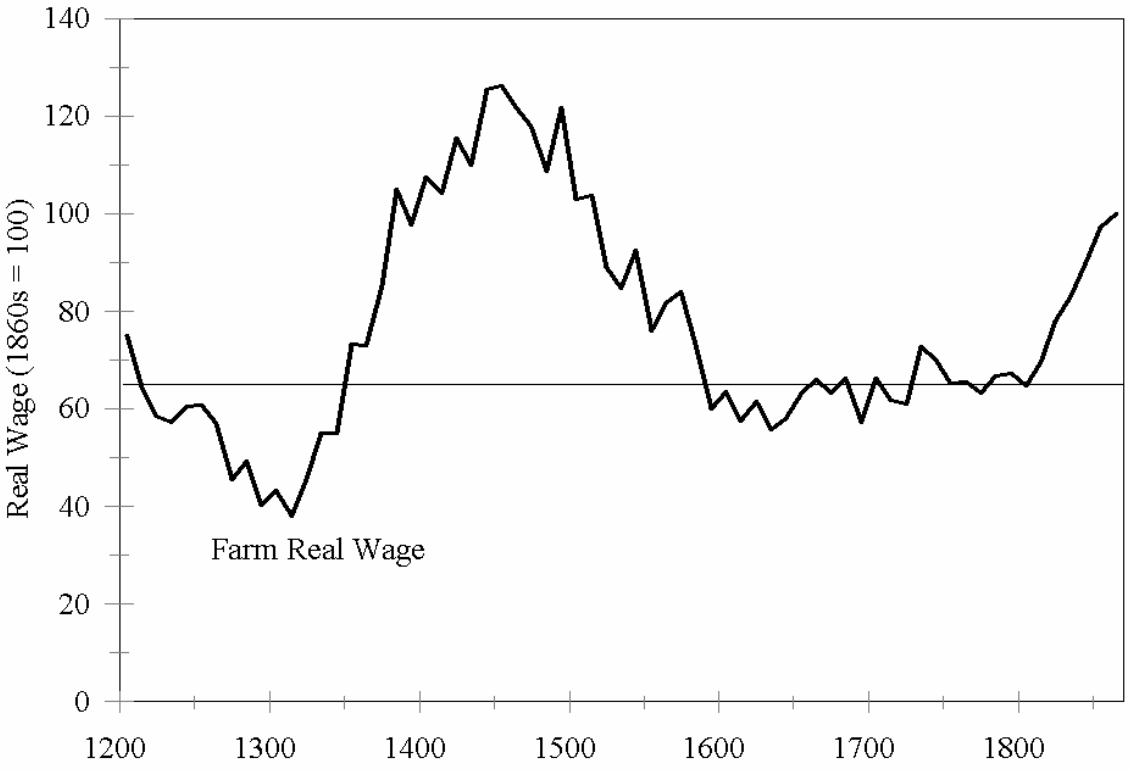


Figure 2: The Marginal Product of Labor in English Agriculture versus Population, 1200-1869

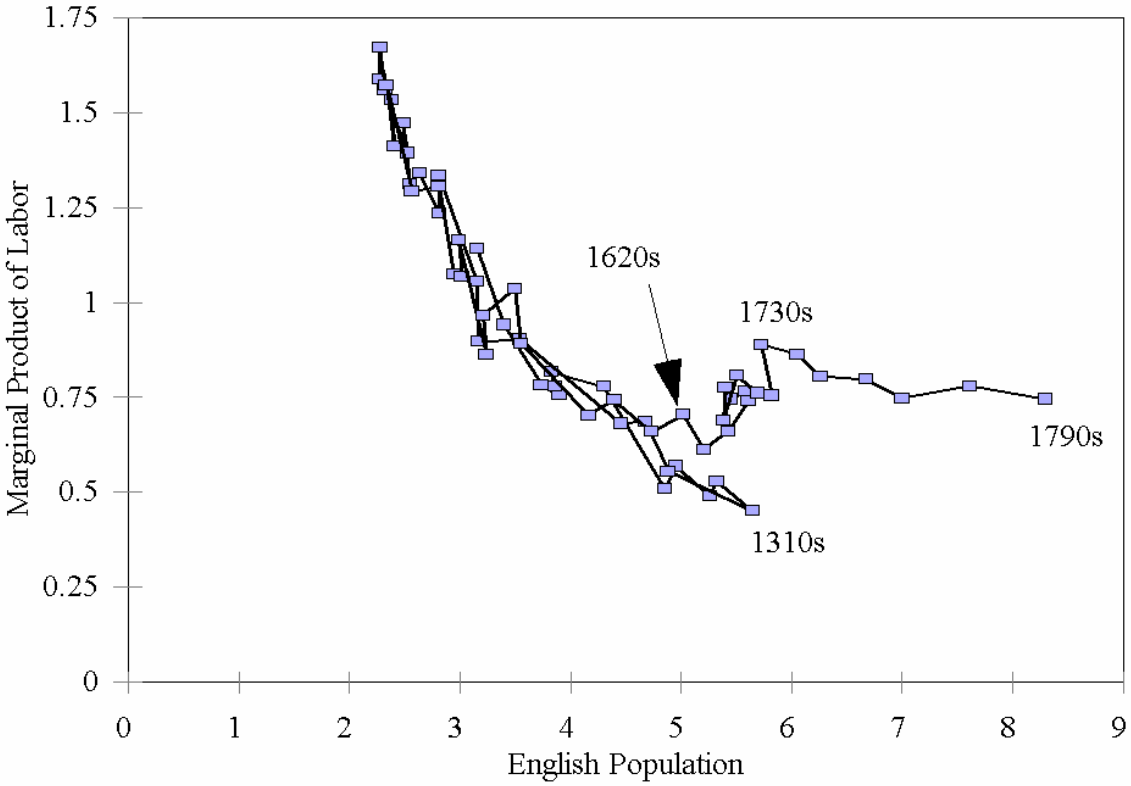


Figure 3: The Rise in Wheat Prices in England, 1200-1869 (by decade)

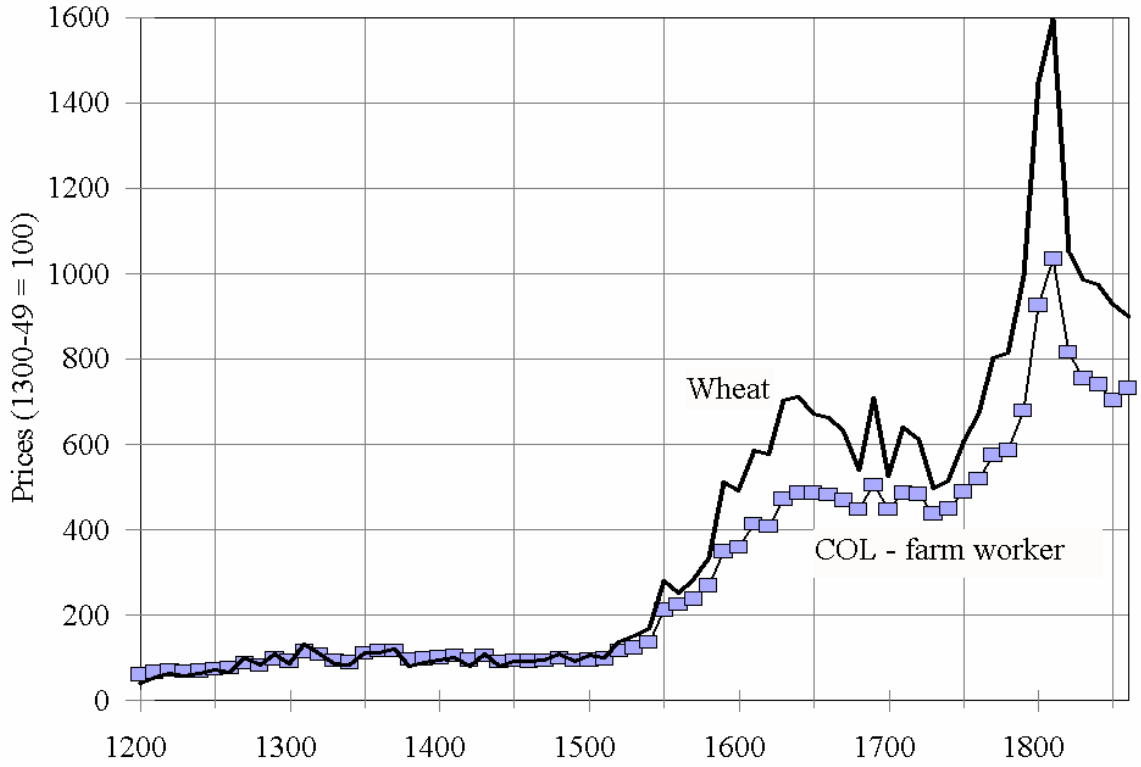


Figure 4: The Price of Books, Sugar and Tobacco relative to Building Workers Wages

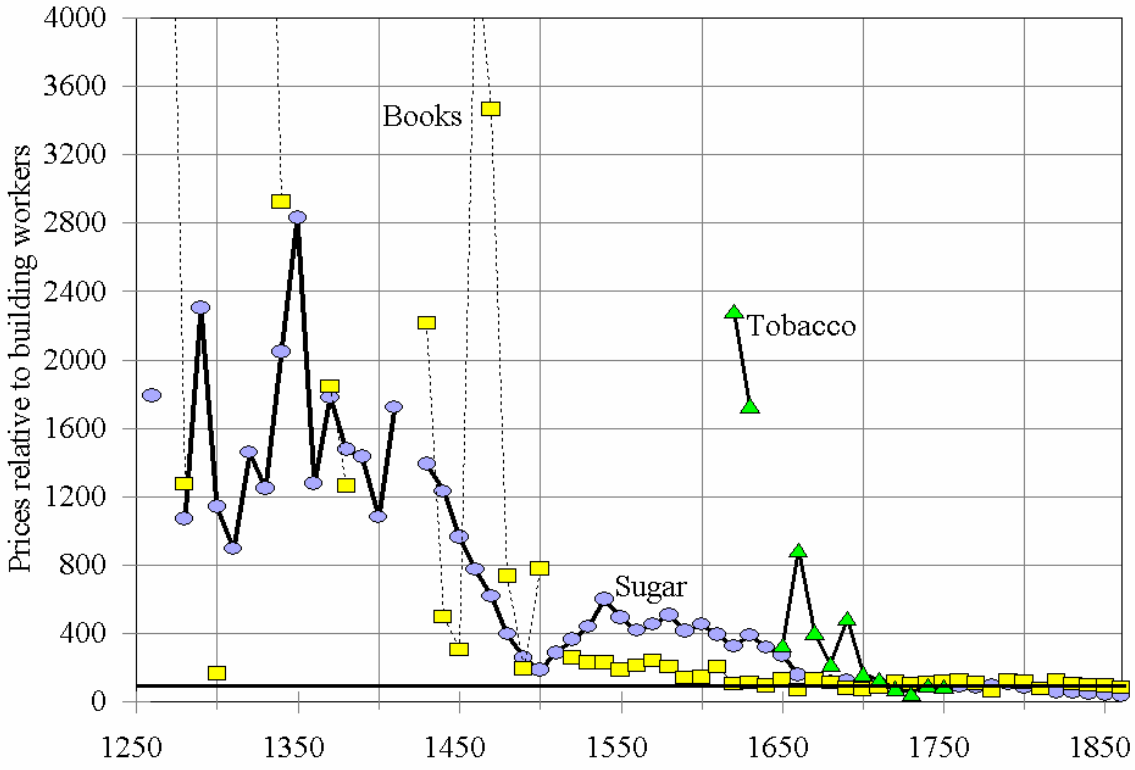


Figure 5: The Price of Paper and Parchment relative to Building Workers Wages

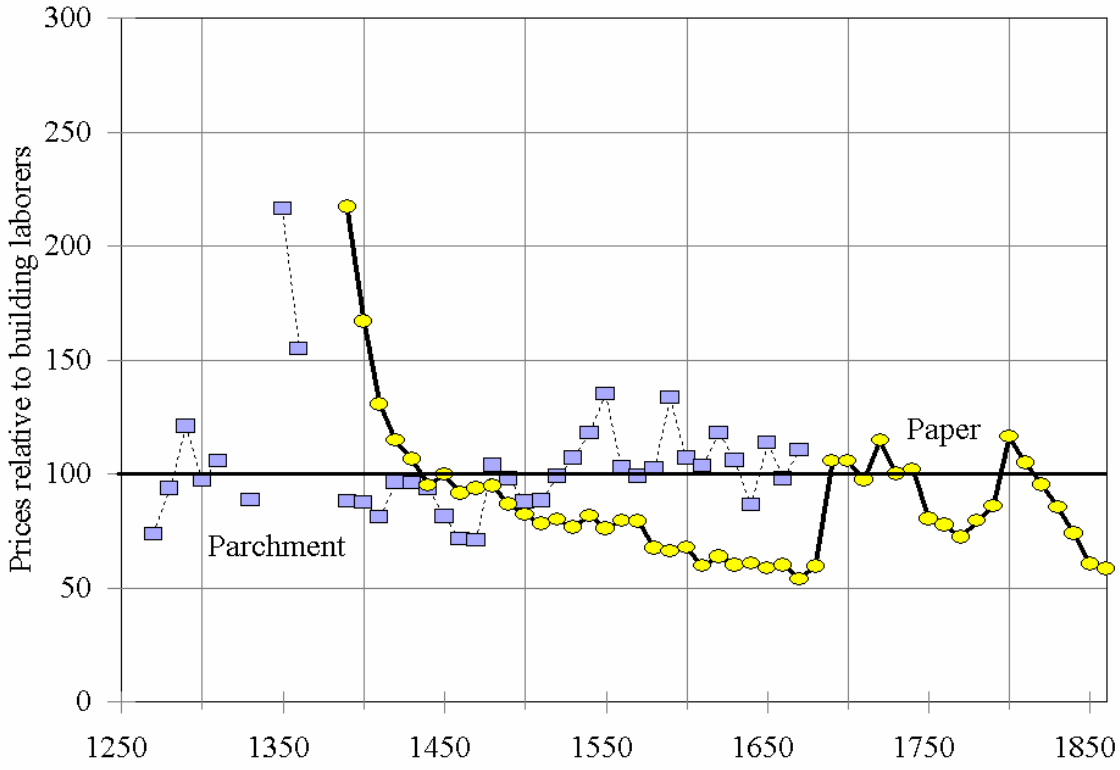


Figure 6: Spice Prices relative to Building Workers Wages

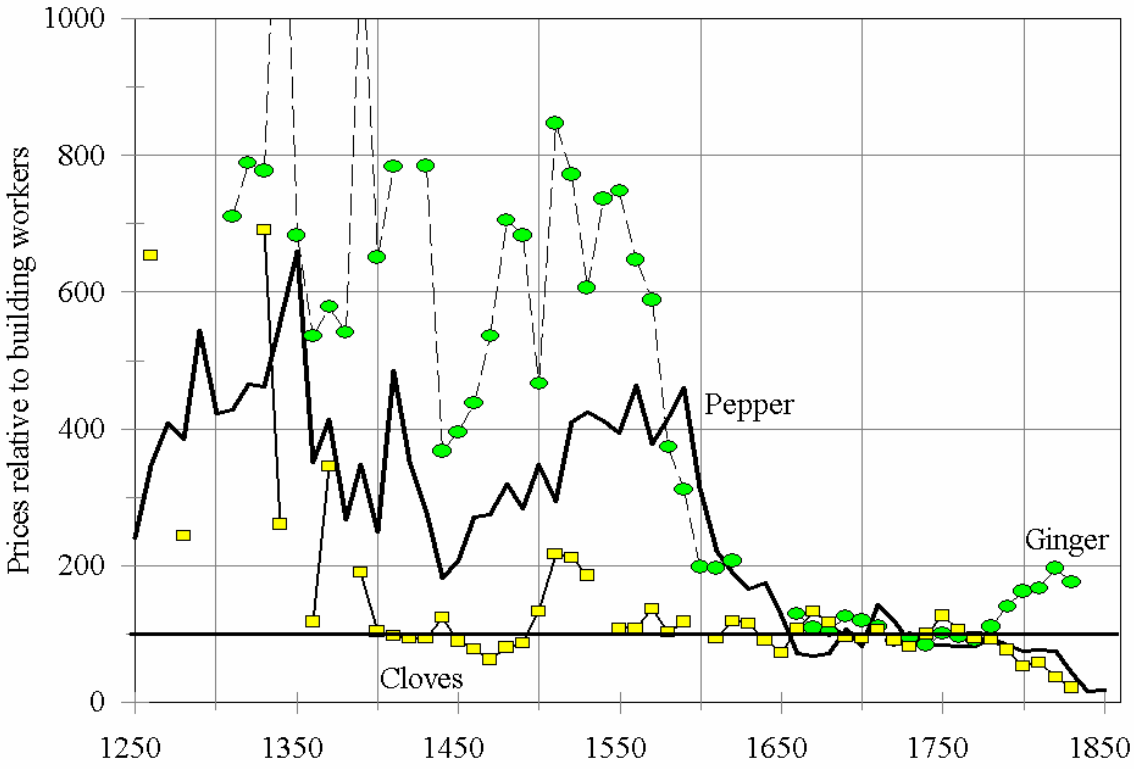


Figure 7: Spice Prices relative to Building Workers Wages

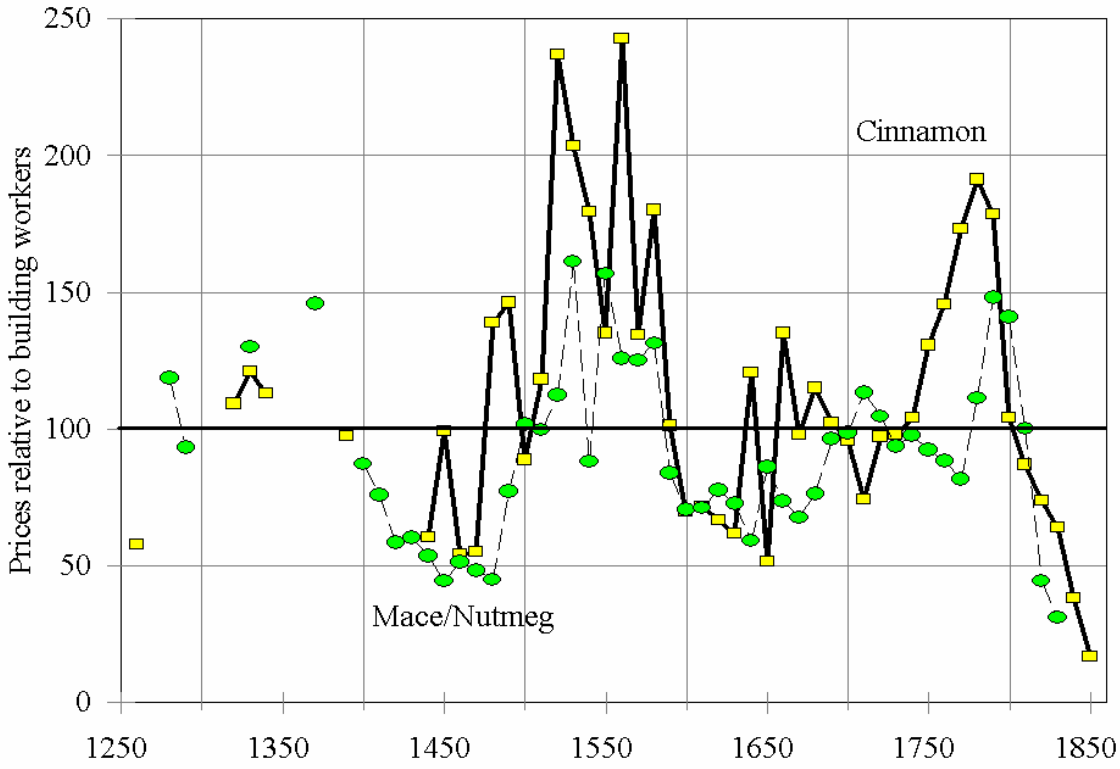


Figure 8: Gunpowder, Cutting Tool and Nail Prices relative to Building Workers Wages

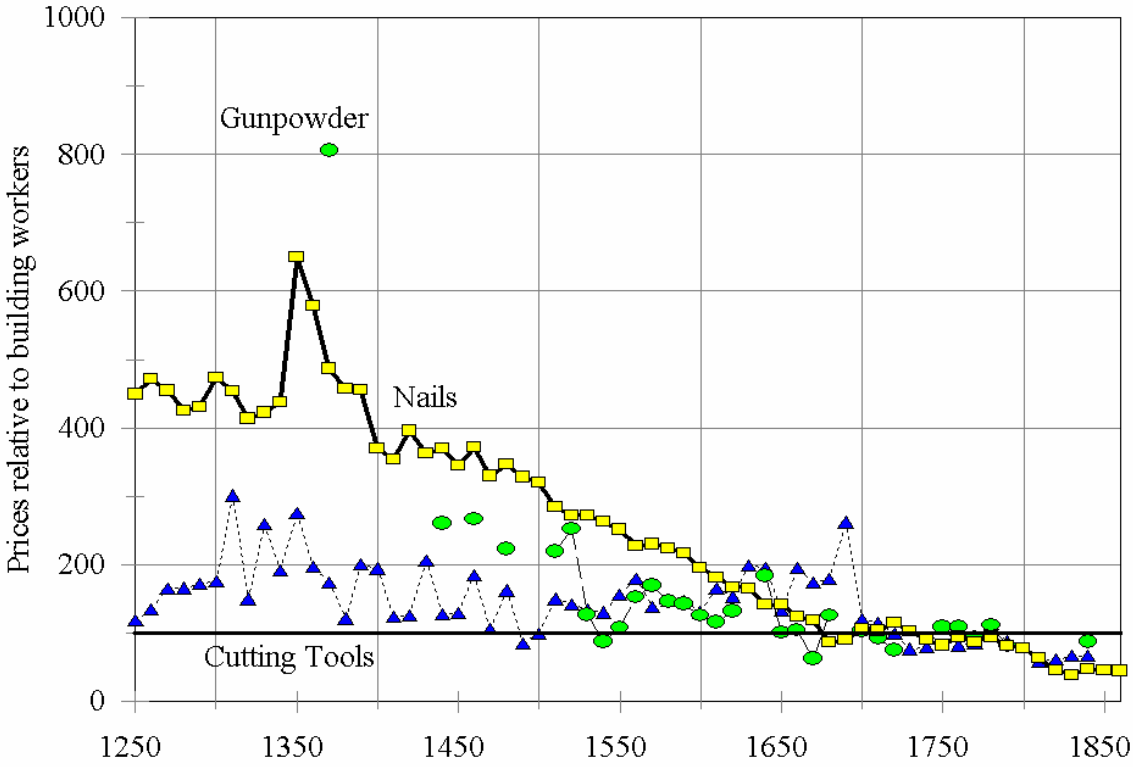


Figure 9: Housing and House Decoration.

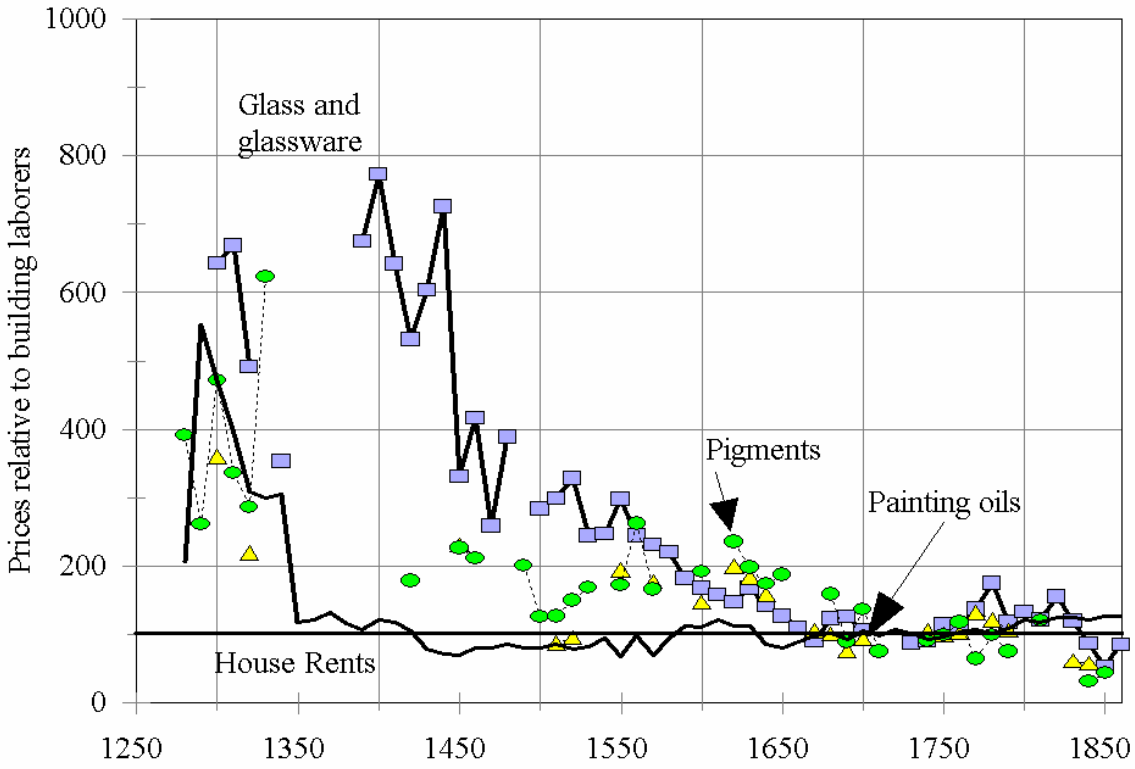


Figure 10: Textile Prices relative to Building Workers Wages

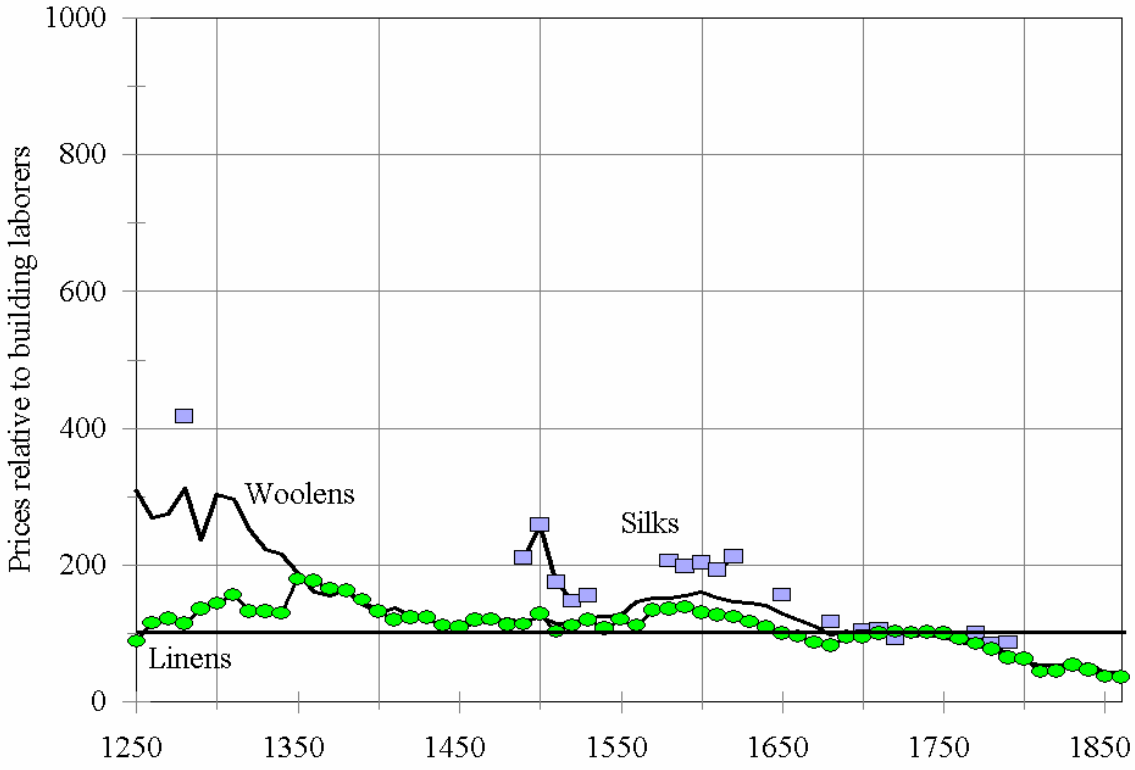


Figure 11: Metal Housewares Prices relative to Building Workers Wages

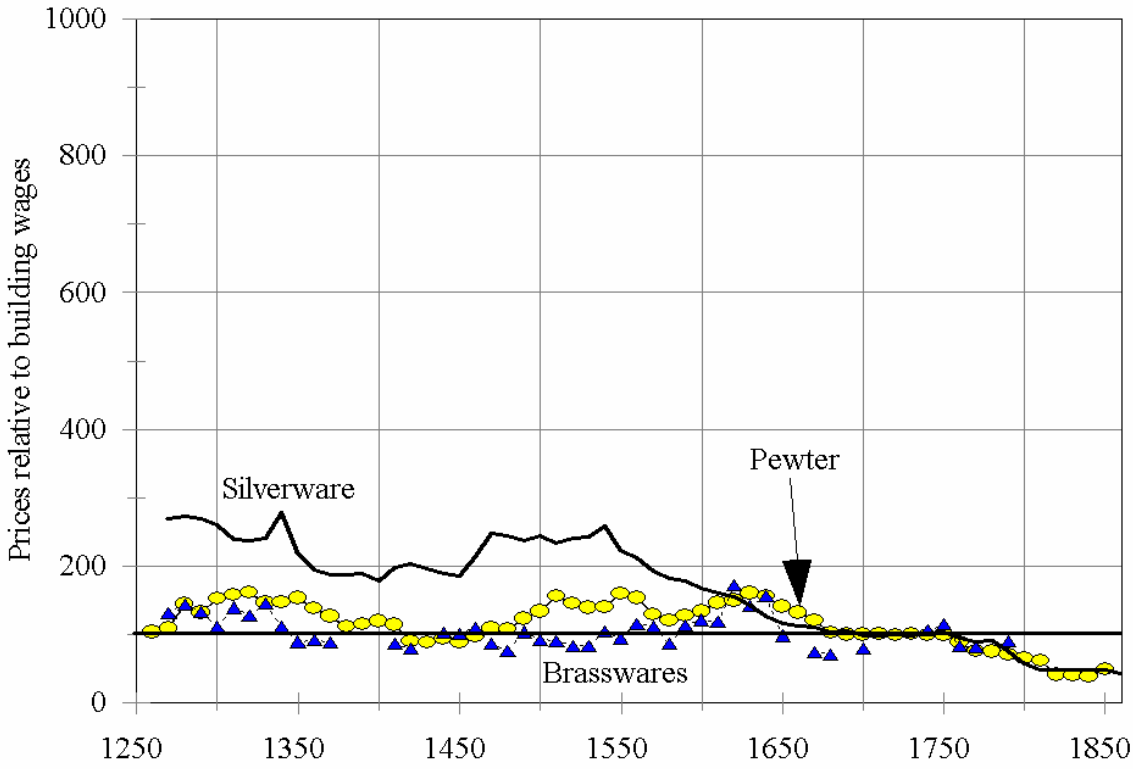


Figure 12: The Costs of Light relative to Building Workers Wages

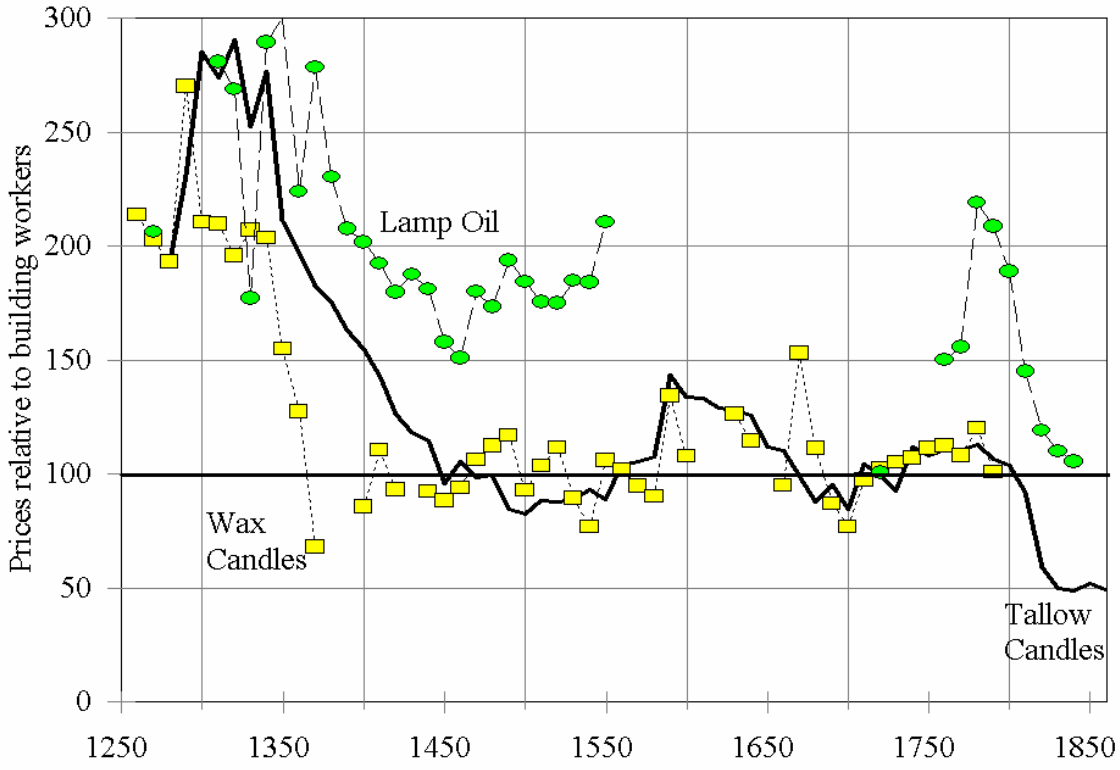


Figure 13: The Relative Cost of Food and Lodging, modern consumption versus farm workers (1700-59 = 1.00)

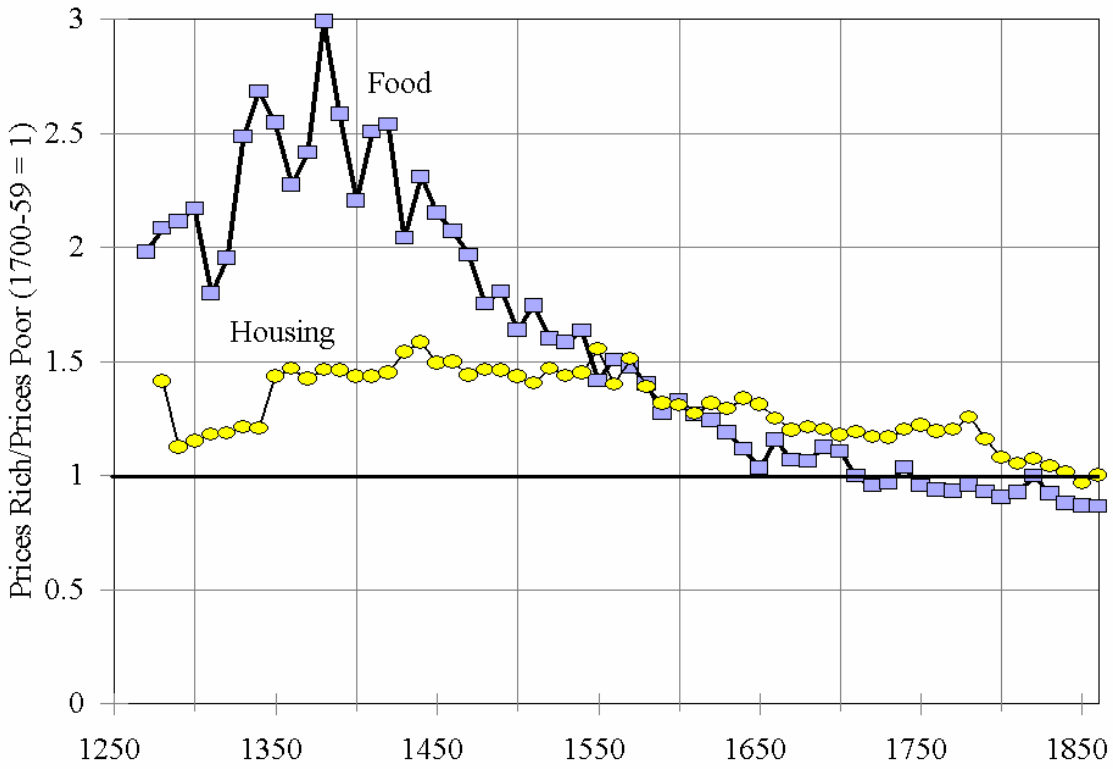
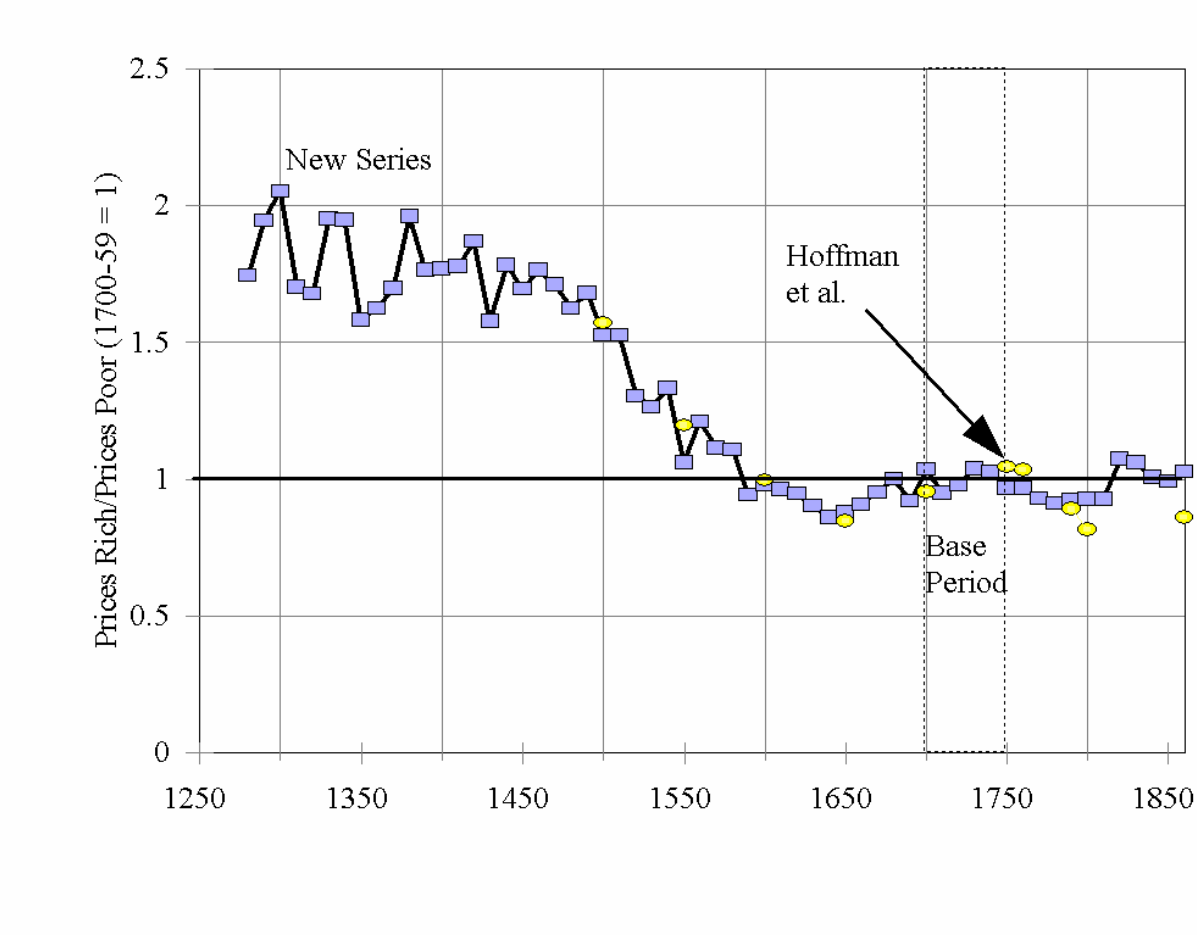


Figure 14: The Relative Cost of Living, modern consumption versus farm workers (1700-59 = 1.00)



Sources: Hoffman et al. (2002), p. 342.

Figure 15: Real Wages of Farm Workers and, Hypothetically, Modern Consumers (1860-9 = 100)