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Class Structure and Inequality during the Industrial Revolution:
Lessons from England's Social Tables, 1688-1867

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Abstract

This paper measures the size and incomes of six major social classes across the Industrial Revolution using social tables for England and Wales in 1688, 1759, 1798, 1846, and 1867. Lindert and Williamson famously revised these tables, and this paper extends their work in three directions: First, servants are removed from middle and upper class households in the tables of King, Massie, and Colquhoun and tallied separately. Second, estimates are made for the same tables of the number and incomes of women and children employed in the various occupations, and, third, incomes are broken down into rents, profits, and employment income. These extensions to the tables allow variables to be computed that can be checked against independent estimates as a validation exercise. The tables are retabulated in a standardized set of six social groups to highlight the changing structure of society across the industrial revolution. Gini coefficients are computed from the social tables to measure inequality. These measures confirm that Britain traversed a 'Kuznets curve' in this period. Changes in overall inequality are related to the changing fortunes of the major social classes.

keywords: social table, industrial revolution, national income, income distribution

JEL codes: N13, N33, N53

Measuring the changes in Britain's economy and society over the course of the Industrial Revolution has been a challenge for economists and historians for many decades. The most progress has been made in measuring the population and GDP¹. Progress has been substantial but less definitive when it comes to tracking changes in the class structure, the distribution of income and overall inequality.² This paper revises and extends social tables for England to measure the sizes and incomes of the major social groups between 1688 and 1867. These new tables embody answers to many questions including: How did the sizes of the upper, middle, and working classes change during the Industrial Revolution? How prosperous was Britain before and during the Industrial Revolution and how far down the social hierarchy did that prosperity extend? Did all groups share in the growth of income during the Industrial Revolution or were gains confined to only a few? Did British history trace out a 'Kuznetz curve' of rising and then falling inequality during the Industrial Revolution? And how was the history of overall inequality related to the shifting fortunes of the principal social classes?

Social tables are a tempting way to answer these questions. In a social table, society is divided into status or occupational groups, and the numbers of households in each group and their average incomes are specified.³ The first social table for England was drawn up by Gregory King to show the state of the country in 1688.⁴ King's table was well known and defined the genre. Massie updated King's work for 1759, Colquhoun revised it extensively to describe England as revealed by the first census in 1801, and Smee and Baxter made further revisions using the occupational data in the censuses of 1841 and 1861, as well as information from income tax returns.⁵ These tables present the historian with the tantalizing possibility of comparing not only the average income of the country across the Industrial Revolution, but also its distribution across social classes.

Well-known difficulties, however, stand in the way.⁶ The investigators had varying sources of information, and some of it was unreliable, especially in the early tables. While King's population estimate was close to the mark, probably because he had access to the hearth tax returns and so had a reasonably correct idea of the number of inhabited houses, his occupational breakdown was very inaccurate. Massie had even less information to work with. Historians have addressed this problem by amending the tables with recently compiled

¹Wrigley and Schofield, *Population history*, Deane and Coale, *British economic growth*, Crafts, 'English Economic Growth,' Broadberry et al, *British economic growth*.

²Perkin, *Origins*, Lindert and Williamson, 'Revising,' 'Reinterpreting,' Lindert 'Three centuries,' Broadberry et al. *British economic growth*, pp.307-39.

³Hoppit, 'Political arithmetic,' and Innes, 'Power and happiness' discuss the history of social tables in the eighteenth century and set them in wider context. Cookson, 'Political arithmetic' discusses the French wars.

⁴ Barnett, *Two tracts*.

⁵Massie *Computation*, Colquhoun *Treatise*, Smee, *Income tax*, and Baxter, *National Income*.

⁶Deane, 'Implications,' 'Contemporary estimates,' Lindert and Williamson, 'Revising,' 'Reinterpreting,' Holmes, 'Gregory King,' Cooper, 'Social Distribution.' Mathias, 'Social structure.'

information on the occupational distributions. Incomes are another source of concern, for some of them look distinctly odd, and again the solution has been to incorporate newly collected information. A milestone in this process of correction are the revisions made by Lindert and Williamson in the early 1980s, and they are the starting point for this paper.⁷

Why revise Lindert and Williamson further? The first goal is to make explicit the size and character of the work force. The ‘reporting unit’ of King’s and Massie’s tables was the ‘family;’ in the later tables, it was the household. The ‘family’ included not just kin relations but also servants. These need to be excised and shown separately in order to measure the labour force. In addition, families are grouped by the husband’s occupation and a total family income given. No details of working wives or children are shown.⁸ These need to be inferred.

In working with the tables of Smee and Baxter, we face problems that are the reverse of those presented by the eighteenth century tables. The tables of Smee and Baxter were based on the 1841 and 1861 censuses, which provided occupational breakdowns for all men, women, and children—without showing how they were combined in households. How to combine them is a problem we take up later. In addition, Smee and Baxter had to estimate the labour incomes from wage data and property incomes from the yield of the income tax. We must aggregate this information to compute household income, and this must be done in a way that makes the tables are comparable as possible with those of King, Massie, and Colquhoun.

The second goal of this paper is to group the occupations and statuses in a way that is socially and economically meaningful and that can be applied uniformly across the tables. In that way, changes in the social structure can be tracked across the Industrial Revolution. The difference in sources of information used by the various investigators poses a challenge since it affects the degree to which a consistent breakdown can be constructed.

The third goal has been to standardize coverage as much as possible. The tables of King, Massie, and Colquhoun describe England (not Britain). I retabulated Smee’s table, which did describe Britain, with the corresponding data for England and Wales to bring it in line with the eighteenth century tables. For the same reason, Lindert’s version of Baxter’s English table was used instead of the table for the United Kingdom. The analysis of this paper, thus, describes England and Wales rather than Great Britain or the United Kingdom.

The fourth goal has been to compare the tables to other information to assess their reliability. The comparisons include nominal GDP, agricultural income, share of the population that had an occupation, rate of return on capital, and nominal wages.

Once the tables have been extended, standardized, and validated, they can be used to track changes in the social structure and incomes across the Industrial Revolution.

⁷Lindert and Williamson, ‘Revising,’ ‘Reinterpreting’. I am indebted to Peter Lindert for sharing his spreadsheet ‘Baxter’ with me. This was invaluable in my analysis of his estimates. Lindert has now posted his spreadsheets for all of the social tables online. <http://economics.ucdavis.edu/people/fzlinger/peter-linderts-webpage/data-and-estimates/britains-social-tables-1688-on>

⁸The problem runs deeper. King, Massie, and Colquhoun show all men as household heads and all households as headed by men. They report, in other words, no female headed households. There surely were such, but their members and incomes are imputed to men.

Preliminary: Incomes and Dates

Lindert and Williamson made many modifications to the incomes in the tables of King, Massie, and Colquhoun, and the changes greatly improved them.⁹ Some issues still remain, however, and these come to light in Broadberry et al's *British Economic Growth* when their new national incomes estimates are compared to the tables, especially those of Massie and Colquhoun.¹⁰

Massie's national income estimate (as revised by Lindert and Williamson) is substantially below Broadberry et al's estimate based on their output and price indices. To close the gap, they increased most of Massie's incomes (as revised by Lindert and Williamson) by 13.3%. An increase of this order is, indeed, in line with King's estimates when they are raised by the increase in male wages between 1688 and 1759.¹¹ I have, therefore, followed Broadberry et al and made the same upward adjustment to Massie's incomes.

Colquhoun's national income total is even further out of alignment with Broadberry et al's estimate of nominal GDP in 1801, the year of the census that is the basis of Colquhoun's calculations and the date to which his social table is usually ascribed.¹² Broadberry et al

⁹Lindert and Williamson, 'Revising'

¹⁰Broadberry et al, *British economic growth*, pp. 321-8.

¹¹My index of male wages rose by 13.8% over the period. An index of men's wages is appropriate in view of the patriarchal character of these social tables. The wage index is a weighted average of wage rates for agricultural labourers, London building workers, building workers outside of London in southern England, and northern building workers. In these calculations, the wage rate of a building worker was the average of the wage of a craftsmen and a labourer in all three cases. These series are available on the wage page of the London spreadsheet on <https://www.nuffield.ox.ac.uk/People/sites/Allen/SitePages/Biography.aspx> in columns E, F, G, C, D, J, and K, respectively.

The weights reflected the relative populations in the sectors. The English population was first divided into three parts--agricultural, London, and the non-agricultural population outside of London--using the agricultural shares in Allen, 'Economic structure,' p. 8, and the London population in Wrigley, 'Urban growth,' p. 686, 688, for benchmark years. Non-benchmark years were interpolated. The agricultural population was divided into farmers and labourers on the assumption that three quarters were farmers in 1500 and only 10% in 1800. Intervening values were interpolated. The non-agricultural population outside of London was divided into equal quantities--one representing northern England and the other southern England outside of London. The weights were the numbers of people in the four groups: agricultural labourers, London, non-agricultural in northern England, and non-agricultural southern England outside of London.

As is evident from this description, the wage index is a rough and ready construction.

¹²Lindert and Williamson, 'Revising' revised Colquhoun's table for England and Wales. Broadberry et al., *British economic growth*, expanded the revised table to include Scotland and reconciled the resulting British national income with their independent estimates of British income. We limit our calculations in this paper to England and Wales.

propose to close the gap by increasing all of Colquhoun's incomes by 42.5%.¹³ I cannot follow Broadberry in this regard. The time period is tricky. Agricultural prices rose by 77% between 1798 and 1801, and this is the reason that Broadberry et al's nominal GDP figure is so high. However, wages did not keep pace with this inflation—labour incomes grew very little in these years.¹⁴ Probably windfall profits were earned by grain traders, farmers, and perhaps landowners, depending on the terms of rental agreements. My interpretation is that these windfalls were left out of Colquhoun's accounting, and that his table is, therefore, based on the income levels a few years previous. I have consequently dated his social table to 1798. His national income is in agreement with Broadberry's for that year.¹⁵

size of the workforce: servants

A first goal of this paper is to form estimates of the size of the workforce from the early social tables. Servants are tallied as family members in the tables of King, Massie, and Colquhoun. In King's table, for instance, the temporal lords are shown as having an average of 40 people per family. Most of these were domestic servants, and it is necessary to remove them and list them separately to measure the labour force. I did this by estimating the average number of kin per family and classifying any additional household members as servants.

In the tables of King and Massie, there were 4.5 people per household in the categories of shop keepers and tradesmen, manufacturers (i.e. the people who were employed in handicraft manufacturing), the building trades, and miners. These groups amounted to 28% of the population in King's table. Some households were smaller, in particular, those of labourers and out servants, cottagers and paupers, and those in the military and merchant marine. All other groups had families with more than 4.5 people. Since the groups with an average family size of 4.5 probably did not keep servants, that is a plausible value for the average number of kin in a household.

This conjecture is corroborated by studies of the average size of a household in early modern England. Laslett analysed information on 100 communities and found that the average household contained 4.75 people.¹⁶ This figure included servants, so the number of kin per household was smaller. Labourers had virtually no servants in their households, and the average size of a labourer's household was 4.51, thus substantiating our assumption. Paupers had fewer kin in a household, which is also in line with King, while husbandmen, yeomen, and higher status groups had bigger households. They also employed servants.¹⁷

Hollingsworth studied the demography of English ducal families including the size of their households by reconstituting them from family trees. Hollingsworth's data show

¹³Broadberry et al, *British economic growth*, p. 326..

¹⁴ Feinstein, 'Pessimism,' pp. 652-3.

¹⁵In the section on 'validating comparisons,' I explain how I extracted the GDP of England and Wales from Broadberry's series for Great Britain,

¹⁶Laslett, 'Size and structure,'p. 200.

¹⁷Ibid., pp. 221-2.

considerable fluctuation over time and are not reported in a way that permits exact comparison with Laslett's. However, mean family size for 'completed' families where the wife lived past 45 years of age are consistent with the assumption of 4.5 kin per family.¹⁸

Wills point in the same direction. Wrigley et al found that the average male testator had 2.58 surviving children, which suggests a family of 4.58 including both parents.¹⁹ Clark came to similar conclusions.²⁰

In view of this evidence, I adopted the value of 4.5 kin per household in all social groups above the paupers, who had smaller families. If the average size of a family was greater than 4.5, the difference between the average size and 4.5 was, therefore, assumed to equal the number of servants. In the case of freeholders and farmers, these were taken to be farm servants; otherwise, they were assumed to be domestic servants. Families with less than 4.5 members were also assumed to have no servants.

The application of these principles to King's table yielded 191,889 domestic servants and 168,856 farm servants. In the case of Massie, the corresponding figures were 209,575 and 243,170, and with Colquhoun the result was 384,057 domestic servants and 340,000 farm servants.

Size of the workforce: women and children

In the tables of King, Massie, and Colquhoun, the population is divided into status and occupational groups that reflected the husband's status. In 1798, these totalled 2,227,630 compared to a total population of 8,379,739 as tallied in the table. The ratio, 27%, is much less than the ratio of the occupied to the total population (45%) that Deane and Cole surmised for Great Britain in that year (and which was very stable across the first half of the nineteenth century).²¹ Applying this percentage to Colquhoun's population total implies an additional 1,869,078 occupied people. 724,057 of them we have already discovered, namely, the servants. The rest were presumably women and children. The question is how many of them were there really and in what sectors?

I assume that the wives and children of the landed classes and the upper strata of the middle class—namely those with an income above that of a shopkeeper—did not work. Also the naval and army officers, soldiers, seamen, who are credited with very small families, if any, are assumed not to have had working wives or children. That leaves the lower middle class and working class. It is clear from the incomes of many of these groups that the families must have had multiple earners. Thus in 1798, the very large group of employees in manufacturing and building had an average income of £55 per year. However, exceptional circumstances aside, a fully employed man could have earned at most £30 - £35 in those sectors.²² The rest of the income must have come from other family members. Baxter's

¹⁸Hollingsworth, 'Ducal families,' p. 19.

¹⁹Wrigley et al, *Family reconstitution*, p. 614.

²⁰Clark, *Farewell*, pp. 116-21, *Son*, p. 133.

²¹Deane and Cole, *British economic growth*, pp. 8, 143.

²²See the sources cited in Feinstein, 'Wage-earnings.'

analysis of manual occupations showed that only about 40% of workers in manufacturing were men.²³ The rest were women and children. Hence, total employment in manufacturing was 2.5 times male employment with the additions being women and children. Assuming the same ratio obtained in Colquhoun's table implies that the average earnings of a worker in manufacturing was £22 per year, which is slightly more than the average earnings of all workers in cotton mills in that year.²⁴ The result is not implausible. The wives (but not the children) of shopkeepers, clerks, publicans, peddlers, and tailors were also assumed to have worked in their husbands' businesses, and this reduces the earnings per worker to a plausible amount, general £37.5 per year. The lower middle class was earning more than the average worker but not a lot more. The wives of miners were also assumed to have worked.

Initially, the labour force participation of family members among the freeholders and farmers was explored with the same considerations in mind. The execution was complicated since farms were businesses and the family members the residual claimants. The aim was to set the number of family members working in the business such that the net business income per working family member equalled the wage of a farm labourer. Farm income was analysed as follows: The income of farmers and freeholders in the social tables was assumed to exclude the (generally cash) payments to labourers but to include the income of servants, much of which was paid to them in kind. Allen's reconstruction of England's agricultural accounts points to factor shares for agriculture of 39% for labour, 15% for capital, and 46% for land.²⁵ These shares were applied to the total income of freeholders and husbandmen (assumed to be owner occupying cultivators) to split it into returns to labour, capital, and land. Farmers were assumed to be tenants, so their income was divided between labour and capital in the ratio of 39:15. The earnings of servants were subtracted from the labour income derived in this way, and the residual was divided by the assumed number of family members working on the farm to compute annual wage income per worker. In the tables of King and Massie, the calculations imply that two family members were working in the case of tenant farmers. However, in the case of freeholders and husbandmen only one family member was working. In Colquhoun's table, the calculations point to two family members working amongst the tenant farmers and the greater freeholders and only one working amongst the lesser freeholders.

It seemed very odd that wives were working on tenanted farms but not on freehold farms. If we assume that wives were working on all types of farms, then wage income per family member was very low on the freehold farms and among the husbandmen. However, the cash flow of these enterprises was in reality much higher since they are assumed to be owner-occupied, so the farm families were also receiving the rental value of the property as income. If we calculate net business income including land rental value per working family member, we find that the earnings of each family member approximately equalled the wage

²³ Baxter, *National income*, pp. 88-95.

²⁴ Assuming a 50 week year, a weighted average of the earnings of men, women, and children in cotton spinning in 1797 was £21-1s.-9d. according to Feinstein, 'Wage-earnings,' p. 190.

²⁵ In this calculation, the inputs are valued at exogenous supply prices, so the shares do not include supernormal profits such as those earned in 1801. Allen, 'English and Welsh,' p. 41.

of an agricultural labourer. Based on these results, I decided to assign two family members as the workforce on all types of farms. In the case of the husbandmen and freeholders, this means that the average product of labour equalled the agricultural wage, while the marginal product of labour was much less. From a resource allocation point of view, there was too much labour in the agricultural sector in England during the eighteenth century. This is a typical situation at the start of industrial development. The misallocation was disappearing by 1800 and had vanished by 1846.

Occupations, incomes, and households in Smee and Baxter

Smee and Baxter based their national income estimates on the occupational returns in the 1841 and 1861 censuses. This procedure creates issues with respect to occupations, incomes, and household definition. These should be dealt with in a way that ensures comparability with the earlier tables.

Since Smee and Baxter wanted to estimate the national income in 1846 and 1867, respectively, they increased the occupational counts for 1841 and 1861 by assumed rates of population growth. The subdivisions of the occupied population in the censuses included not only bricklayers and weavers but also landed proprietors, capitalists, and those with independent incomes—anyone with an income. How can the incomes of these occupations be determined? Both Smee and Baxter proceeded in a similar way. They distinguished the upper classes from the working class. The income of the latter was estimated by assigning a wage to each working class occupation and then calculating total annual wage income. Baxter did this with great care and worried over how many weeks were worked each year, who was unemployed, the age at which people stopped working, and so forth. The 1861 census tabulated occupations by industries, so he could readily assign wages to occupations. Baxter presents two complementary lists of occupations and earnings,²⁶ and I have combined them to produce his overview of employment and labour earnings in England and Wales broken down by detailed industry and distinguishing men, women, boys, and girls.

Smee's work was much more summary. The 1841 census has an alphabetical listing of occupations. In principle this could be retabulated on an industrial basis like the 1861 census, but the task is forbidding, and no one has yet done so. Instead, Smee relied on the rather gross breakdown of occupations in the *Occupation Abstract* of the 1841 census and assigned labour incomes accordingly.²⁷ His weekly wages look to have been chosen to correspond to the annual labour earnings he used on the assumption that people worked 52 weeks per year. This was surely not true. Comparison with other data, however, indicates that the annual earnings are plausible.²⁸ When weekly wages are calculated on the assumption that people worked as Baxter assumed, the weekly earnings also fall into line with other evidence. Smee's tabulations were for Great Britain. I have followed Smee's procedures and recreated his table using only the occupational returns for England and Wales to bring the results into conformity with the other social tables. It turns out that more detail is available on the breakdown of children's employment than Smee availed himself of, and this

²⁶Baxter, *National income*, pp. 88-95.

²⁷*Occupation Abstract*, (P.P. 1844, 587, image 58-62.).

²⁸Feinstein, 'Pessimism,' 'Wage-earnings.'

information is used in my reworking of Smee.

In the cases of both Smee and Baxter, middle and upper class incomes were estimated separately using the aggregate records of income tax paid. The tax was reported on various schedules, which had a loose correspondence to type of economic activity. There was a tax threshold, and another difficulty is that lower middle class income was below the threshold, so had to be estimated with cruder procedures. Baxter's work is again the most thorough, and it has been carefully examined by Lindert and Williamson.²⁹ I rely entirely on Peter Lindert's spreadsheet and conclusions for the middle and upper class income in 1867.³⁰ Smee's estimates of middle and upper class income for Great Britain have been scaled down in proportion to population to get values for England and Wales.

While Baxter's work is more thorough than Smee's in most respects, there is one way in which Smee provides more detail, and that is in the assignment of middle class income to industries. Smee makes that assignment, while Baxter does not, and that presents challenges for consistent comparison, as we will see.

The census-based approach of Smee and Baxter throws up a final issue, namely, how the data on men, women, and children, which are tabulated separately, should be combined to form households that are comparable to those in the eighteenth century tables. Lindert has taken the most careful approach, and he identifies a considerable number of female headed households within the working class. The total income earned by all non-household heads was apportioned evenly across the household heads. In contrast, among the middle and upper classes, Lindert assumed that all income earned by non-household heads accrued to household heads in the same income class.

A limitation of Lindert's approach, as applied to the working class, is that it does not correspond to the eighteenth century patriarchal assumption that all households were headed by men.³¹ (His treatment of the middle and upper classes is consistent with that assumption.) I, therefore, retabulated the 1867 data in the format of an eighteenth century table.³² It is very fortunate that this change in procedure has virtually no impact on measured inequality: The Gini coefficients were virtually identical in the two cases. Reassured by this result, I tabulated Smee's occupational and income data in the eighteenth century patriarchal manner.

Consistent occupational classification

The various social tables break the population down in ways that are not immediately

²⁹Lindert and Williamson, 'Reinterpreting,' pp. 94-5.

³⁰Lindert, 'Baxter,' Main:A2..AB50.

³¹I violated this assumption in the case of female servants who were entered in the social table as independent households (as were male servants). This convention is followed in all of the social tables.

³²Leaving aside female servants who remain a separate category, the earnings of women and children in the working class were divided by the number of men in the working class (omitting male servants who are also a separate category). The earnings of each man in the working class (other than male servants) was then increased by this average to estimate his household's income.

comparable. Partly this reflects differences in the sources used and partly it reflects the evolution of the economy. While the 1861 census, for instance, distinguishes food manufacturers from food retailers, these activities were united in King's 'shopkeepers and tradesmen.' The butcher's shop, for instance, combined an abattoir, which is manufacturing, with retail sales. This renders meaningless attempts to neatly divide the early modern economy into 'agriculture,' 'manufacturing,' and 'services.'

I have classified the occupations and incomes in all of the tables into six categories: landed classes, bourgeoisie, lower middle class, farmers, workers, and paupers. Numbers and incomes appear in Appendix Tables 1-6. 'Earners' refers to those who work or to whom property income or poor relief accrued. 'People' refers to household members excluding servants. Servants are treated as single member households.

Landed classes

In King, Massie, and Colquhoun, this group includes the titled aristocracy as well as 'gentlemen,' ie the gentry. The landed classes also include the clergy of the Church of England, who were supported by glebe estates, and university teachers who were also supported with landed property.

In Smee and Baxter, the number of households in the landed classes was taken to equal the sum of men and women returned in the 1841 and 1861 censuses as landed proprietors plus the numbers of Church of England clergy and university teachers. The income of the landed classes was taken to be 80% of the rental value of the agricultural land in the country on the presumption that the other 20% accrued to owner occupying farmers.³³ My estimate of the total income of the landed classes omits the value of urban real estate and nonagricultural investments.

Bourgeoisie

In my summary of King, Massie, and Colquhoun, the bourgeoisie includes state office holders, lawyers, dissenting clergy, merchants big and small, ship owners, warehouse owners, capitalists, shipbuilders, naval and military officers, and half pay officers. To judge by their incomes, 'manufacturers' in King were handicraft workers, while in Colquhoun they were capitalists. Massie produces a breakdown by income of manufacturers, so those who were large scale employers could be separated from the handicraft workers.

Colquhoun listed 50,000 people as trustees of funds. The corresponding income has been divided among the peers (£1 million), gentlemen (£1 million), big merchants (£1055000), little merchants (£1000000), and manufacturers (£1000000) on the assumption that the trustees were drawn from these groups.

In the case of Smee, the bourgeoisie includes the non-wage earning men and women in all income categories in the occupations of trade, manufacturing, and commerce, the army, navy, merchant marine, professionals, other educated people, government civil servants, police and parochial officers, and men of independent incomes less the number in the landed classes and in the lower middle class (defined below).

It should be noted that Smee reports an unusually large number of women and children in the middle class with independent incomes. These people may have been under enumerated in the earlier tables. Smee's number considerably exceeds Baxter's, who made similar estimates two decades later and who was in most respects more careful and

³³Mingay, *Landed society*, p. 26, Thompson, 'Social Distribution,' Beckett, 'Pattern.'

systematic. The result is to inflate considerably the number of middle class earners in 1846.

In my analysis of Baxter, the bourgeoisie is measured indirectly. Baxter divided the population and the corresponding income into the manual working class, on the one hand, and the middle and upper classes on the other. I specify the bourgeoisie to equal Baxter's middle and upper class minus my measures of the landed classes, the lower middle class, and the farmers.

Lower middle class

The number of occupations in this group expanded over time. In King's and Massie's tables, it consisted of shopkeepers and tradesmen plus those in science and the arts. The latter might have been assigned to the bourgeoisie but were put in the lower middle class in view of their income. With Colquhoun, the definition of lower middle class was expanded to include the newly distinguished occupations of school teachers, theater, lunatic asylums, clerks, publicans, peddlers, tailors, and engineers.

Both Smee and Baxter divided the population into the working class, on the one hand, and the middle and upper classes, on the other. The problem is extracting the lower middle class from the latter. I set the lower middle class equal to 80% of the lowest income category among the upper and middle classes that they delineated.³⁴ The implication of this is that the lower middle class amounted to about two-thirds of the middle and upper classes and was much the poorest grouping of that assemblage. As it happens, the lower middle class came to a similar fraction of the middle and upper classes in Colquhoun's table even though it was constructed on a very different basis.

Farmers

The category of farmers includes greater and lesser freeholders and farmers in the tables of King, Massie, and Colquhoun. Massie also distinguished the category of husbandmen. These were small scale cultivators. Massie shows their number at 200 thousand, which Lindert and Williamson reduced to 134,160, a figure which I adopt.³⁵ King does not report husbandmen, although they were present in the country. I expect they were tallied as cottagers in his table. I have assumed there were 175,000 husbandmen in 1688 and removed that number from the cottager category. I assumed the average family income of husbandmen was £12 and the average family consisted of four members. Colquhoun also lists no husbandmen, but the total of the freeholders and farmers in his table (320,000) is greater than the 250,000 farmers who cultivated England in the 1830s and so apparently includes perhaps 70,000 husbandmen. There was a substantial decline in the number of small owner-occupying farmers in the eighteenth century.

³⁴More precisely, in the case of Smee, the lower middle class households were assumed to equal 80% of the non-wage earning men, 20 years and older, in the £50-£150 per year range, in the categories of trade, manufacturing, and commerce, the army, navy, merchant marine, professionals, other educated people, government civil servants, police and parochial officers, and men of independent incomes. With Baxter, the number of households in the lower middle class was taken to equal 80% of the 'small incomes (2)' category with an average income of £75.

³⁵Lindert and Williamson, 'Revising', p. 397.

The share of rent received by the owner-occupying farmers declined less steeply. It fell from 35% in 1688 to 31% in 1759 to 28% in 1798, after which the share was presumed to have remained at 20%. These proportions are in close agreement with Thompson's summary of the land belonging to owner-occupying small holders.³⁶

With Smee, the farmer households included all of the nonwage-earning men in the occupations 'farmers & graziers' and 'florists & gardeners.' In the case of Baxter, I assumed that the number of farmers was the number of 'farmers & graziers' and 'florists & gardeners' returned for England and Wales in the 1861 census, and the corresponding income was farmers' profits as recorded on Schedule B of the income tax.³⁷

Workers

With King, Massie, and Colquhoun, I defined 'workers' as the manufacturing workforce, the building trades, miners, labourers and out servants, soldiers, seamen, domestic servants, and farm servants. In King, the 'manufacturing workforce,' in turn, was taken to be 'manufacturers;' in Massie, it meant manufacturers less those with high incomes who were assumed to be capitalists, and, in Colquhoun, it meant 'workers in manufacturing.'

Smee calculated the number of working class men and women separately for each industry, as the number of adult men and women assigned to that industry less his estimate of middle class men or women in that industry. He assumed that the boys and girls reported for each industry were in the working class and made a separate, global estimate of middle and upper class minors receiving property income. He estimated working class income by choosing a representative wage for men, women, boys, and girls in each industry. His weekly wages are plausible if they are assumed to equal annual wages divided by 52.

The 1861 census tabulated the occupations by industry and was, therefore, much easier to work with than the 1841 census with its alphabetical listing of occupations. Baxter tabulated the occupational data by industry and assigned industry specific wage rates to occupations. He carefully considered the question of how many weeks people actually worked and annual wage income was calculated accordingly.³⁸ Working class income equalled these totals less the number of paupers and their income.

The poor

In the cases of King and Massie, I specify the 'poor' to include the categories of 'cottagers and paupers' plus 'vagrants.' In the case of King, this number was reduced by the 175,000 assumed to be husbandmen.

With Colquhoun, the 'poor' included 'paupers at work,' 'vagrants,' 'debtors' and 'lunatics.' The number is approximately the number of people relieved under the poor law, and the total income that Colquhoun assigns them approximated the annual expenditure on

³⁶Thompson, 'Social Distribution, p. 513.

³⁷Baxter, *National income*, p. 25.

³⁸See the totals for manual workers in Peter Lindert's spreadsheet *Baxter E&W UK 1867*, in cell 'main:V11' and 'main:X30.'

the poor.³⁹

Smee's estimate of the number of paupers was the number returned in the 1841 census category of 'alms, pensioners, paupers, lunatics, prisoners.' This is manifestly too small. I have instead set the number of poor equal to the number of people relieved under the poor law, and their income equal to the cost of poor relief. Working class numbers and income were adjusted accordingly. The same procedure was followed with Baxter. In both cases, the cost of poor relief and the number relieved were estimated by applying the national rates per thousand given in Porter's *Progress of the nation* for the closest year to the appropriate populations of England and Wales.⁴⁰

Breaking Income Down into Rents, Wages, and Profits

It is important to break down the incomes of the social groups into returns to land, labour, and capital. This is essential to validate the tables, to reconstruct the size of the agricultural sector, and it throws light on the political economy of the period. The tables of King, Massie and Colquhoun present different problems from those of Smee and Baxter. In my reconstruction of the tables of King and Massie, the landed classes were assumed to derive all of their incomes from land rents. In Colquhoun's table, it was assumed that 90% of the landed income was rent and 10% was profits. The earnings of workers, artisans, and labourers were all tallied as wages. The incomes of employers in the bourgeoisie were assumed to be a mixture of profits and salaries. They were distinguished by assuming salaries for each occupation and computing profits as the residual. King usually distinguished 'greater' from 'lesser' merchants, etc., and I assumed that the annual salary of a greater merchant was £60 and a lesser £30. These were increased by 13% in Smee's table, and were raised to £70 and £35 in Colquhoun's table.⁴¹ Groups that were not designated greater or lesser were assigned the salary that seemed appropriate given the activity and total income. The incomes of farmers, freeholders, and husbandmen were divided into factor earnings using agricultural factor shares as explained earlier.

Smee and Baxter distinguished working class wages from middle and upper class incomes. The difficulties arise in breaking the middle and upper class incomes down into rent, profits, and salaries. Returns to agricultural land were estimated extraneously from data in the *Agrarian History of England and Wales*.⁴² In the case of Smee, the remaining income was divided on the assumption that salaries were £50 per year for men, most of whom correspond to those earning £35 per year in 1798, and two-thirds of that for women. The salary was increased to £75 in the case of Baxter and £100 for the small number in the

³⁹Perkin, *Origins*, p. 421,ftn 3, Porter, *Progress*, p. 64.

⁴⁰Porter, *Progress*, pp. 63, 67.

⁴¹On the one hand, these salaries are arbitrary, and they are low relative to the income of these groups. On the other hand, salaries of this magnitude are unavoidable. The remaining income of the bourgeoisie was profits, and they amounted to approximately three quarters of the profits in the economy. Higher salaries would have implied lower profits, and lower profits, in turn, would have implied an implausibly low rate of return to capital.

⁴²Afton and Turner, 'Rent' p. 1920.

highest earning group.⁴³

validating comparisons

Revising the social tables involves a good deal of conjecture as extraneous information of varying degrees of reliability are incorporated in the amendments. How reliable are the resulting social tables? One way to answer that question is to work out the implications of the social tables for issues that can be approached with other sources of information. If the implications of the social tables agree with the other sources, then there is some reason to have confidence in the revised social tables. I examine five indicators.

The first indicator is nominal GDP. Broadberry et al. have estimated annual GDP for England and Wales in 1688 and Great Britain for the years of the later social tables.⁴⁴ Their estimates are based on wholly different sources—physical output indices multiplied by price indices. How do the revised social tables compare to their series?⁴⁵ Figure 1 shows that agreement is quite close. Broadberry et al made similar comparisons for King, Massie, and Colquhoun. Massie's incomes were raised to bring them into conformity with the annual estimates—an adjustment that is warranted by the wage history of the period—and Colquhoun's was raised even more dramatically to the same end. I have followed their lead in dealing with Massie but not with Colquhoun, as Broadberry et al's adjustment is not in accord with the wage data. Their procedure amounts to raising Colquhoun's estimate to hit the transitory peak in 1801 show in Figure 1. Assuming that Colquhoun's estimate applies to 1798 rather than 1801 brings the social table into conformity with the annual series.

<Figure 1 about here>

⁴³A division along these lines is required for a plausible rate of return to capital.

⁴⁴For the comparisons discussed here, nominal GDP for England and Wales was worked out as follows. Broadberry et al, *British economic growth*, p p. 201, 227-44, reported nominal GDP for England and Wales in 1688 and 1700 and nominal GDP for Great Britain in 1700. Nominal GDP for Great Britain in subsequent years was then computed by increasing the 1700 nominal value by the proportional change in the index of real GDP multiplied by the proportional change in the index of the price level. This nominal GDP series for Great Britain was then used to extrapolate the nominal GDP estimate for England and Wales in 1700 to later years.

⁴⁵The incomes in the social tables include transfer payments from the state—namely interest on the national debt and poor law support—without corresponding deductions for taxes. Since most taxes were indirect, no straightforward deductions are possible. Transfer payments must be excluded in comparing the total income in the social tables with GDP. Poor law payments in England & Wales and their share of the United Kingdom debt charges have been deducted in Figure 1. See Deane and Coale, *British economic growth*, pp.389-91, 396-7) for debt service charges. England & Wales assumed to be 85% of Great Britain in the eighteenth century, 77% and 82.3% of the United Kingdom in 1846 and 1867, respectively, in accord with the country's share of UK GDP. These adjustments have only a minor impact on the comparisons in Figure 1.

The second indicator is the labour force participation rate. This is an important check in view of the large number of servants and women and children who have been added to the labour force by my procedures. Deane and Cole estimated the occupied population of Great Britain at ten year intervals beginning in 1801.⁴⁶ The ratio of the occupied to the total population was fairly stable ranging between 44% and 47% over the nineteenth century.

The revised social tables imply similar percentages: 48% in the case of King, 49% in Massie, 49% in Colquhoun, 41% in Smee, and 46% in Baxter. Smee's ratio is on the low side while Massie's and Colquhoun's are a bit high, but on average the labour force participation rate implied by the social tables are consistent with Deane and Cole's estimates.⁴⁷

The third indicator is annual wage income averaged across all manual workers (earners in the social tables). Feinstein's series is widely cited, and it agrees with Lindert and Williamson's, which is the other broadly based index⁴⁸. For the purposes of comparison, Feinstein's nominal wage series has two limitations. First, it only begins in 1770. I have extended it back to 1688 with a weighted average of the wages of building craftsmen and labourers in London, southern English towns, and northern England, as well as farm labourers, as previously described. Second, Feinstein's series overstates average earnings. While it is about right for cotton textiles where he averaged the full spectrum of male, female, and child wages, in most other industries Feinstein's series was calculated mainly from the earnings of adult men. I have rebased Feinstein's nominal wage series to equal average earnings for all workers in 1851 as calculated by Deane and Cole.⁴⁹ The extrapolated value for 1867 turns out to be within 4% of Baxter's calculation for all manual workers for that year—£34.07 versus £32.72 in Baxter. Figure 2 compares the extended Feinstein nominal wage series to the average wages per earner implied by the social tables. The agreement is close.

<Figure 2 about here>

The fourth indicator is the rate of return on capital. The social tables imply total profits in the economy. Dividing total (nominal) profits by the nominal capital stock yields a rate of return to capital. Giffen estimated the stock of reproducible capital in 1688, and Feinstein estimated capital stocks for Great Britain and the UK that can be used to work out the capital stock in England and Wales at the dates of the social tables.⁵⁰ The rate of profit

⁴⁶Deane and Cole, *British economic growth*, pp. 8, 143.

⁴⁷It should be noted Broadberry et al, *British economic growth*, pp. 352-60, presented estimates derived from King, Massie, and Colquhoun that imply ratios of the occupied population to the total of 34%, 33%, and 31% respectively. Deane and Cole's, *British economic growth*, pp. 8, 143, estimate for 1801 implies a rate of 45%. I prefer Deane and Cole.

⁴⁸Feinstein, 'Pessimism,' Lindert and Williamson, 'Living standard.'

⁴⁹Deane and Cole, *British economic growth*, pp. 143, 152.

⁵⁰Feinstein, 'Capital formation, p. 33, Feinstein, 'Sources,' p. 427.

rose from a pre-industrial level of 9.2% in 1688 and 9.1% in 1759 and to 16.8% in 1798. The rate continued to rise gradually reaching 17.6% in 1846 and 20.3% in 1867.⁵¹ The rates of return are higher than interest rates on government debt and mortgages but in line with estimates of the return on business investments and with aggregate calculations of the real rate of return by Allen.⁵²

The fifth indicator is agricultural income. Since agricultural occupations and income sources can be identified in the social tables, total agricultural income can be calculated. With King, Massie, and Colquhoun, I compute agricultural income as the agricultural rental income of the landed classes plus the incomes of the farmers, freeholders, husbandmen, farm servants, and agricultural labourers. All of these are separately identified except for agricultural labourers in the tables of King and Massie, which report the number and income of labourers in all sectors of the economy. The indefiniteness of King and Massie in this regard may reflect a reality in which, over the course of the year, labourers worked more than one job—farming, carting, weaving, for instance—in more than one sector, so their labour cannot be easily allocated. However, following Broadberry, Campbell, and van Leeuwen approximately, I assumed that 64% of the labourers and their income were agricultural.⁵³ This division means that 64% of the work and income of labourers in total came from agriculture, however each worker split his time. Sectoral allocation, however, is problematic.

In cases of Smee and Baxter, agricultural income was calculated as the sum of the incomes of the landed classes, farmers, and farm labourers. Total agricultural income is shown in Table 1.

< Table 1 about here.>

Table 1 also shows direct estimates of agricultural income for comparison. The estimates corresponding to the social tables of King, Massie, Colquhoun, and Smee are taken from Allen's agricultural reconstruction.⁵⁴ This study estimated the net output of the principal agricultural commodities in England and Wales at benchmark dates from the middle ages through the Industrial Revolution. Output was valued with prices prevailing at the time. The quantities of farm inputs were also estimated and their values calculated. Many uncertainties surround this exercise, but they can be reduced by ensuring that total agricultural income equalled the value of net production. This is an important check on reliability. Social tables were not used in this exercise. The independent estimate for 1867 is Feinstein's (1972, T60) estimate for the UK multiplied by the share of England & Wales in

⁵¹Interest on the national debt is included in household income in the social tables. It is not a return to land or labour and so ends up in 'profits' when the income in the social tables is split into factor returns. Interest on the national debt is deducted from 'profits' so calculated in the rate of return calculations presented here..

⁵²Harley, 'Cotton textiles,' Hudson, *Genesis*, pp. 235-41, 272, 277, Allen, 'Engels' Pause,' p. 421.

⁵³ Broadberry et al, *British economic growth*, pp. 20-1.

⁵⁴ Allen, 'English and Welsh,' p. 36.

UK agriculture.⁵⁵

In the event, most of the direct estimates match up with the incomes in the social tables. Allen's estimate for 1800 is higher than Colquhoun's, probably because Colquhoun's applies to 1798 when farm prices were lower. The discrepancy between the 1850 estimate and Smee's does not have an obvious explanation.

The incomes and employment levels in the social tables imply trajectories for the declining importance of agriculture during the industrial revolution. This can be measured either as the ratio of agricultural value added to GDP or as the ratio of the agricultural labour force to the total occupied population. Table 2 summarizes the evidence in the social tables. By both measures agriculture declined during the Industrial Revolution. However, there is an unexpected twist in the tale, namely, the decline was greater by the value added measure than by the labour force measure. In 1688, the agricultural share of GDP was 46%, while the labour force share was 39%. In 1867, agriculture accounted for only 15% of GDP but 20% of the work force.

<Table 2 about here.>

The surprising feature of this result is that the value added share in 1688 was greater than the labour force share. Kuznets' investigations of less developed countries in the twentieth century indicated the reverse.⁵⁶ He found that the agricultural labour force share was higher than the value added share, and this indicated that GDP would rise if labour was reallocated from agriculture to manufacturing. How could England have been different in 1688? From a numerical point of view, the answer is clear. Wages were somewhat lower in agriculture than in other sectors—this is in accord with the Kuznets view—however, this effect was outweighed by the vast amount of rent generated in agriculture. It is the rent taken by the gentry and aristocracy that increases the share of agriculture in the economy when measured by value added. (Leaving out the rent reduces the value added share of agriculture to 23%.) England in 1688 was unusual compared to many peasant societies in terms of the comprehensiveness and efficiency with which its aristocracy extracted income from the farming population.

Implications: size and incomes of the social classes

The object of harmonising the social tables is to permit comparisons of key variables across the Industrial Revolution. Some comparisons are shown in accompanying tables, and more can be worked out from the information reported in this paper.

Table 3 shows the numbers of people reported in the six major social groups. Their relative sizes changed greatly over the Industrial Revolution.

<Table 3 about here>

The 'landed classes' were never more than 2% of the population, and the proportion

⁵⁵ Feinstein, *Statistical Tables*, T60.

⁵⁶Kuznets, *Economic Growth*, pp. 111, 203, 208-16.

stayed roughly constant over time. The increase from 30,000 to 50,000 shown in Table 3 probably reflects the inclusion of female property owners in 1846 and 1867 who were left out of the earlier counts.

The 'bourgeoisie,' which included the large scale capitalists, bankers, merchants, lawyers, high officials, and investors, already outnumbered the landed classes in 1688, and this stratum grew seven-fold during the Industrial Revolution. Their share of the population increased from 3% to about 8-9% over the Industrial Revolution.

The third group was the lower middle class. This category increased almost eight-fold from 1688 to 1867.

The fourth group, farmers, formed a declining share of the population. In 1688 there were close to 200 thousand small holdings held by husbandmen and yeoman and cultivated by them and their families. The other 200 thousand were larger farms mainly leased from great estates and cultivated by hired labour. The number of farms declined in the eighteenth and early nineteenth centuries as yeoman holdings were amalgamated into large farms. Agriculture was a declining sector during the Industrial Revolution.

The fifth group was the workers. It was the largest group in the English economy, and it increased by a factor of almost four during the Industrial Revolution. Most of the new jobs were nonagricultural. The character of work changed significantly as the independent craftsman working with hand equipment in his or her cottage gave way to machine operators employed in the new factories.

The poorest group were only partially employed, if they worked at all. In 1688 this group comprised almost one tenth of the families. The share of the population who were paupers was constant to 1759 and then increased as the population expanded, the employment opportunities for women as spinners declined, and food prices rose as agricultural output lagged behind population. The decline in the number of poor shown in the table between 1798 and 1846 was the consequence of reforms to the Poor Law, which made it harder to get relief. The decline is thus spurious. However, the further decline to 1867 in the fraction who were poor probably reflects a rising demand for labour.

We can also use the social tables to track the incomes of these groups. This can be done either in terms of earnings or purchasing power. Table 4 shows the average income of an *earner* in each group. Households could, and did, have multiple earners, for instance, when the husband wove, his wife spun, and their son toiled in a mill. The standard of living implied by these earnings depended on the prices of the goods that people consumed. There are many ways to measure those prices, and here we measure it as the cost of the basket of subsistence goods that provides 2100 calories from the least expensive foods (primarily oatmeal) and other bare necessities, and it is intended to represent the least cost way of surviving.⁵⁷ Dividing earnings per *person* in the household by the cost of the basket adjusts earnings for price changes and shows how many baskets each person could consume in a year (Table 5).

<Tables 4 and 5 about here>

⁵⁷The basket includes oats (170 kg), beans (20 kg), meat (5 kg), butter (3 kg), soap (1.3 kg), cotton cloth (3 metres), candles (1.3 kg), lamp oil (1.3 kg), fuel (2 million BTUs). In addition, the cost of these items was increased by 5% as an allowance for rent. See Allen, 'American exceptionalism.'

Table 5 shows how real incomes changed over the Industrial Revolution. The landed classes were always well off. They could consume 30 baskets each in 1688, and their consumption possibilities increased to 50 in 1800 after which it remained stable. In reality, no one consumed 50 times the quantity of oatmeal in the subsistence basket. They upgraded their food consumption to more expensive sources of calories like quail and port and hired builders, servants, and jewellery makers, who effectively ate the baskets (or upgraded versions) for them. By the 1860s, Table 5 probably understates the income of this group since it assumes they were only receiving agricultural rent and thus excludes their earnings on urban property and nonagricultural investments, which were becoming important.

The landed classes consumed at a high level across the Industrial Revolution, but their relative position slowly eroded as agriculture declined vis-a-vis industry. In 1688 the agricultural rent received by the landed classes amounted to 16% of the national income. By 1867, their rental income had dropped to 5%.

The bourgeoisie were the second richest group. They were not far behind the landed classes. Their real incomes grew fairly steadily across the Industrial Revolution. The bourgeoisie ended up slightly ahead of the landed classes with 51.39 baskets in 1867 versus 50.98.

The incomes of the lower middle class and the farmers were between those of the upper classes and the workers. In the eighteenth century, the average earner in the lower middle class earned at least twice as much as the average worker. In 1688, the average member of the category of 'farmers' earned only a quarter more than the average worker. The 'farmer' group average was depressed by the low earnings of the husbandmen and yeoman. As the small holders disappeared, the group average rose to twice that of workers in 1798. In the first half of the nineteenth century, as the nominal incomes of the landed classes and the capitalists sagged, the lower middle class and the farmers surged ahead. After 1846, the farmers continued to advance in the age of 'high farming,' while the shopkeepers and clerks experienced a fall in incomes. Their consumption standard was generally comfortable. Farmers tripled their incomes from 4 to almost 12 baskets over the Industrial Revolution. The shopkeepers and clerks started with five baskets in 1688, reached 12 in 1846 and then dropped back to 7 in 1867. This was scarcely above the earnings of a skilled craftsman.

The standard of living of the working class has been a particularly contentious issue in the historiography of the industrial revolution. The classic debate centred on the first half of the nineteenth century and concerned the impact of industrialization. More recently, attention has turned to the eighteenth century: Was Britain a high wage economy in the run-up to the industrial revolution?⁵⁸ The social tables of King, Massie, and Colquhoun summarize what these social observers believed wage levels to have been. In their eyes, England was definitely a high wage economy. English workers were always very well off by international standards: The average member of a working class family in England always got more than three subsistence baskets each year (Table 5), while many Europeans, Latin Americans, and Asians were lucky to get one.⁵⁹ Like the upper classes, English workers did not consume three times the oatmeal specified in the subsistence diet but instead upgraded

⁵⁸Humphries, 'Lure, Allen, 'Restatement,' Humphries and Schneider, 'Spinning,' Stephenson' "'Real" wages?'

⁵⁹Allen, Bassino, Ma, Moll-Murata, and van Zanden, 'China,' Allen, Murphy, and Schneider, 'Colonial Origins,' Allen, 'American exceptionalisms.'

their consumption to bacon, beer, and white bread. For this reason, English men were also taller than their counterparts elsewhere in Europe, Asia, and Latin America.⁶⁰

While English workers enjoyed a high standard of living at the start of the Industrial Revolution, it was a long time before they realized substantial gains. There was no change in consumption per person between 1688 and 1759, but it then rose from 3.27 to 4.39 baskets in 1798. This was a period in which there was considerable wage convergence in Britain as wages in the North, which had been lower than those in London and the South generally, advanced to their level.⁶¹ Stagnation returned in the first half of the nineteenth century as working class consumption per head edged downward by half a percent, while consumption over all rose 21%, with the farmers and lower middle class reaping gains of over 50%. In 1688 the average worker's consumption was 67% of the national average. The ratio dropped to 63% in 1759, then to 56% in 1798 and bottomed out at 46% in 1846. The working class began to catch up between 1846 and 1867 by posting a consumption gain of 42% as consumption per head jumped from 4.37 to 6.21 baskets. Growth in working class purchasing power was well above the national average of 17% in this period. Working class consumption per person rebounded to 56% of the national average in 1867.

The poor were at the bottom of the income distribution. Their income rose gradually during the Industrial Revolution. Between 1688 and 1798, there was very little growth in either their nominal income or their standard of living. In the eighteenth century, the average poor person got just one subsistence basket per year. The poor did better, however, in the nineteenth century, and by 1867 each poor person got the equivalent of almost two and a half subsistence baskets. It is striking that the real consumption of the average poor person increased by a factor of 2.38 between 1688 and 1867, which almost exactly equals the factor (2.26) by which average consumption increased for the English population as a whole over the same period.

Implication: overall inequality

The changing fortunes of the different social classes can be summarized with economy-wide statistics. One candidate is the functional distribution of income indicated by the shares of GDP going to labour, capital, and land (Table 6). The table gives equivocal support to the values commonly used in growth accounting (labour at 50%, capital at 35%, and land at 15%),⁶² but calls into question the corresponding assumption of a Cobb-Douglas production function, for the shares were certainly not constant. Labour's share had a slight downward trend, while the most dramatic changes were in the shares of capital and land. Capital's share rose from 18.8% in 1688 to 38.6% in 1867, while land's fell from 24.0% to 6.3% over the same period. These trends in nominal shares are the same direction as the trend in real shares computed by Allen, although the magnitudes of the changes in the real

⁶⁰Floud, Fogel, Harris, and Hong, *Changing Body*, p. 69, Allen, 'Restatement.'

⁶¹Gilboy, *Wages*.

⁶²Beginning with Crafts, *British economic growth..*

shares of labour and capital were somewhat greater than the changes in the nominal shares.⁶³ The share of capital increased a little at the expense of labour but mainly at the expense of land. The shift from land to capital represents a redistribution of income at the top of the income distribution, which renders the factor share approach a blunt instrument for measuring changes in inequality. In addition, labour's share includes salary income going to the middle and upper classes, and so it is a misleading indicator of the fortunes of the working class. Working class consumption per head compared to the national average is a better indicator, as just discussed.

<Table 6 about here>

The Gini coefficient is another statistic that measures society-wide inequality and it is also better suited to the task than factor shares. Ideally, the Gini is computed from the earnings of a representative sample of individuals. Such data do not exist for Britain during the Industrial Revolution. Gini's can be computed from the earnings of the various social groups in a social table, although such calculations omit the effect of the variation of incomes within a group since the earnings of each individual are replaced by the group average. Milanovich, Lindert, and Williamson (2011), who used social tables to measure inequality in pre- and early industrializing societies, present a decomposition of the society-wide Gini into terms measuring between group inequality, within group inequality, and inequality due to the overlap of groups.⁶⁴ They argue that between group inequality dominates the overall measure for two reasons. First, they calculate bounds on within group inequality (using many of the tables we use here) that shows it to have been small. Second, they contend that the aim of the compilers of the tables was to measure the important social cleavages, and that objective was served by highlighting between group inequality. Their conclusion is that tables like those used here, in which society is divided into a substantial number of groups, should reveal broad trends in inequality. Although it should be remembered that actual inequality might have been greater than measured inequality, I follow Milanovich, Lindert, and Williamson in using the social tables to gauge overall inequality across the Industrial Revolution. A further reason for having confidence in the results is that the trends in the Gini's make sense in terms of the group patterns we have already discussed.

Conceptually, the first step in measuring inequality is to rank the individual households from richest to poorest. From this ordering, the Lorenz curve is drawn. Starting from the poorest, it shows the cumulative share of the total income received by the cumulative proportion of the population. Figure 3 shows Lorenz curves for England in 1688, 1759, and 1798. The curves for 1688 and 1759 lie virtually on top of each other indicating there was no change in inequality between those dates. The curve for 1798 lies below these. That means that income was less equally distributed. In 1688 and 1759, the poorest 80% of the population received half of the total income. In 1798, the poorest 80% got only 35% of

⁶³ Allen, 'Engels' pause.' The nominal shares are more indicative of elasticities of output with respect to inputs since the nominal prices (not the real prices) are those which firms are assumed to take as exogenous when costs are minimized in the usual production theory interpretation of the data. The nominal shares are, therefore, the appropriate shares for growth accounting.

⁶⁴Milanovich, Lindert, and Williamson, "Pre-Industrial inequality.'

the total.

<Figure 3 about here>

It is useful to look at this from another angle. In 1688 and 1759, half of the total income accrued to the richest 20% of households, as noted. In 1798, half of the income accrued to the richest 9% of households. Income was concentrated at the top of the distribution in the last forty years of the eighteenth century. The immediate cause of this is clear from Table 4, namely, the dramatic rise in the income of the bourgeoisie from £145 per earner per year in 1759 to £525 in 1798. Possibly this concentration of income in the capitalist class made a useful contribution to financing the Industrial Revolution, but this is an implication that we cannot explore here.

Inequality moderated in the middle of the nineteenth century. Figure 4 shows the Lorenz curves for 1798, 1846, and 1867. Not much changed in the first half of the century, for the curves of Colquhoun and Smee lie for the most part on top of each other. The only difference is that the 1846 Lorenz curve shows slightly less concentration of income at the very top of the distribution. Evidently, in this period the surging incomes of farmers and the lower middle class did not change the rank ordering greatly. Inequality was much lower in 1867, however. In this case, the increase in wages meant that the bottom deciles of the income distribution took in a larger fraction of the total than they had previously received, and this increase is reflected in the steeper slope of the Lorenz curve for the poorer strata of society. The steeper slope lifted the Lorenz curve for 1867 above those for 1798 and 1846.

<Figure 4 about here>

The shifts in the Lorenz curves are summarized by Gini coefficients. A low lying curve like Colquhoun's in 1798 has a large Gini indicating greater income inequality. The Gini coefficient was .54 in 1688, and .53 in 1759. By 1798, the Gini had jumped to .60 and it remained elevated at .58 in 1846. By 1867, it had dropped to .48.⁶⁵ By this measure, England really did trace out a Kuznets curve with inequality rising in the late eighteenth century, remaining at a high value for the next half century, and then falling to 1867.

In recent years, inequality has risen in Britain as elsewhere, and that increase has called into question Kuznets' optimistic—and evidently simplistic—theory. Inequality remained at the 1867 level until the First World War, dropped dramatically as the Gini dipped below .3 in the interwar and early post-war periods, and has been rising since then with the Gini now equal to about .4. The history of the Gini in Britain is not unusual when compared to other countries.⁶⁶

Conclusion

Social tables are a long standing tool for analysing changes in social structure and

⁶⁵While Lindert did not calculate a Gini from Smee's table, he calculated them for the other social tables discussed here, and my Gini's are very close to his final calculations. Lindert, 'Three centuries,' p. 175.

⁶⁶Milvanovic *Global Inequality*, p. 70-91.

income inequality. The more fully the tables are elaborated, the more powerfully they illuminate social change. In this paper, we have extended the English social tables covering the industrial revolution by separating servants from the households in which they served and by quantifying the employment and earnings of women and children. These emendations allow many more economy wide variables to be calculated. We have also grouped occupations and statuses into a consistent set of categories to trace the fortunes of different social groups across the industrial revolution.

The social tables throw light on many of the important questions concerning the industrial revolution.

First, the tables confirm that England was a very prosperous country in the eighteenth century. Prosperity extended far down the social scale, in particular, the average member of the working class consumed over three baskets of subsistence goods per year, in a period when workers in much of the rest of the world consumed little more than one. Only the paupers and vagrants in England, who made up the poorest decile of the population, had incomes that low.

Second, across the industrial revolution, the landed classes remained roughly constant in size, while the number of farmers declined modestly. On the other hand, the bourgeoisie grew by a factor of seven, the lower middle class by eight, and the working class quadrupled between 1688 and 1867. The poor were on a roller coaster as their number tripled in the eighteenth century and then fell during the nineteenth.

Third, in the eighteenth century the greatest income gains were made by the landed classes and the bourgeoisie, the two richest groups in society. The incomes of the landed classes stabilized at a high level, while the average income of the bourgeoisie continued to rise throughout the industrial revolution and caught up with the landed classes by 1867.

Fourth, during the first half of the nineteenth century, the greatest income gains were realized by the lower middle class and farmers. The average real income of workers, on the other hand, stagnated. The ratio of the average consumption per head among workers slid from 67% of the overall average in 1688 to 56% in 1798 and then bottomed out at 46% in 1846.

Fifth, the relative standing of workers improved dramatically between 1846 and 1867 as working class consumption per head grew by 42%. In this period, they had the most rapidly rising income of any group. Their relative consumption rose from 46% to 56% of the overall average.

Sixth, the changes in the size and incomes of the main social groups translated into rising and then falling inequality. In 1688 and 1759, the Gini coefficient was about .54. It jumped to .6 in 1798 as income was concentrated among the landed classes and the bourgeoisie. Inequality remained at this elevated level in the first half of the nineteenth century and then dropped between 1846 and 1867 when the Gini declined to .48. At last, the benefits of economic growth were trickling down to the working class.

Table 1

Agricultural Output, England & Wales
(Millions of £s)

A. Income from Social Tables

	King	Massie	Colquhoun		Smee	Baxter
rent	13.1	19.0	34.0	Landlords	36.9	34.4
profits	2.7	3.6	6.3	Farmers	33.9	35.6
wages	9.8	12.4	29.6	Labourers	19.9	37.3
Total	25.6	35.0	69.8		90.6	107.3

B. Direct Estimates

	1700	1750	1800		1850	1867
value output	27.4	34.5	77.3		103.1	107.0

price index

real output

Sources of direct estimates:

1700-1850: Allen, 'English and Welsh,' p. 36.

1867: Turner, *After*, p. 127, puts UK final agricultural output at £179 million in 1867-71 and Irish at £38.6 million, so British share was 78.4% of UK output. The Scottish agricultural employment share in Great Britain was the same as its population share—15%. This suggests the agricultural output of England and Wales was 67% ($=.784*.85$) of the UK total.

According to Feinstein, *Statistical Tables*, T60, UK farm income in 1867 was £160 million, so farm income in England and Wales was £107 million.

Table 2

The share of agriculture in the English economy

	1688	1759	1798	1846	1867
value added	46%	46%	35%	21%	15%
labour force	39%	38%	33%	20%	20%

Table 3

Social Structure from Social Tables, England & Wales

A. number of families					
	1688	1759	1798	1846	1867
landed	31626	29070	38704	52986	50695
bourgeoisie	60128	84000	95879	363932	436493
lower middle	114602	188000	252640	649396	884450
farmer	402440	379008	320000	243130	223271
workers	980863	1128247	1804567	2598299	3668936
cottagers & paupers	161672	192310	439897	320648	317726
total	1751331	2000635	2951687	4228393	5581571
B. percentage distribution of families					
landed	1.8%	1.5%	1.3%	1.3%	0.9%
bourgeoisie	3.4%	4.2%	3.2%	8.6%	7.8%
lower middle	6.5%	9.4%	8.6%	15.4%	15.8%
farmer	23.0%	18.9%	10.8%	5.7%	4.0%
workers	56.0%	56.4%	61.1%	61.4%	65.7%
cottagers & paupers	9.2%	9.6%	14.9%	7.6%	5.7%

Note: Colquhoun's estimates are usually dated 1801 as the population count derives from the census of that year. However, 1801 was a time of exceptional prices. Comparison of the incomes in Colquhoun's table to other series suggests his incomes reflect the situation a few years earlier, so I have dated his figures to 1798.

Table 4

Average annual income per earner in £s per year, England & Wales

	1688	1759	1798	1846	1867
landed	271.49	452.78	756.49	603.93	678.57
capitalist	175.38	145.37	525.45	441.23	466.29
shop	24.47	27.17	64.79	111.64	75.00
farmer	15.89	21.57	48.75	121.39	159.22
workers	12.59	13.58	22.68	26.31	31.83
cottagers & paupers	3.15	3.62	3.67	5.31	7.20
average	19.91	23.14	40.29	57.30	65.66

Table 5

Average real annual income per person, England & Wales
(Multiples of subsistence income)

	1688	1759	1798	1846	1867
landed	30.92	45.42	53.57	49.97	50.98
bourgeoisie	20.58	14.74	37.16	32.43	51.39
lower middle class	5.26	5.19	8.40	12.74	7.25
farmers	3.80	4.50	6.89	10.91	11.96
workers	3.27	3.27	4.39	4.37	6.21
cottagers & paupers	1.02	1.02	1.17	1.98	2.43
average	4.90	5.16	7.77	9.43	11.07

Table 6

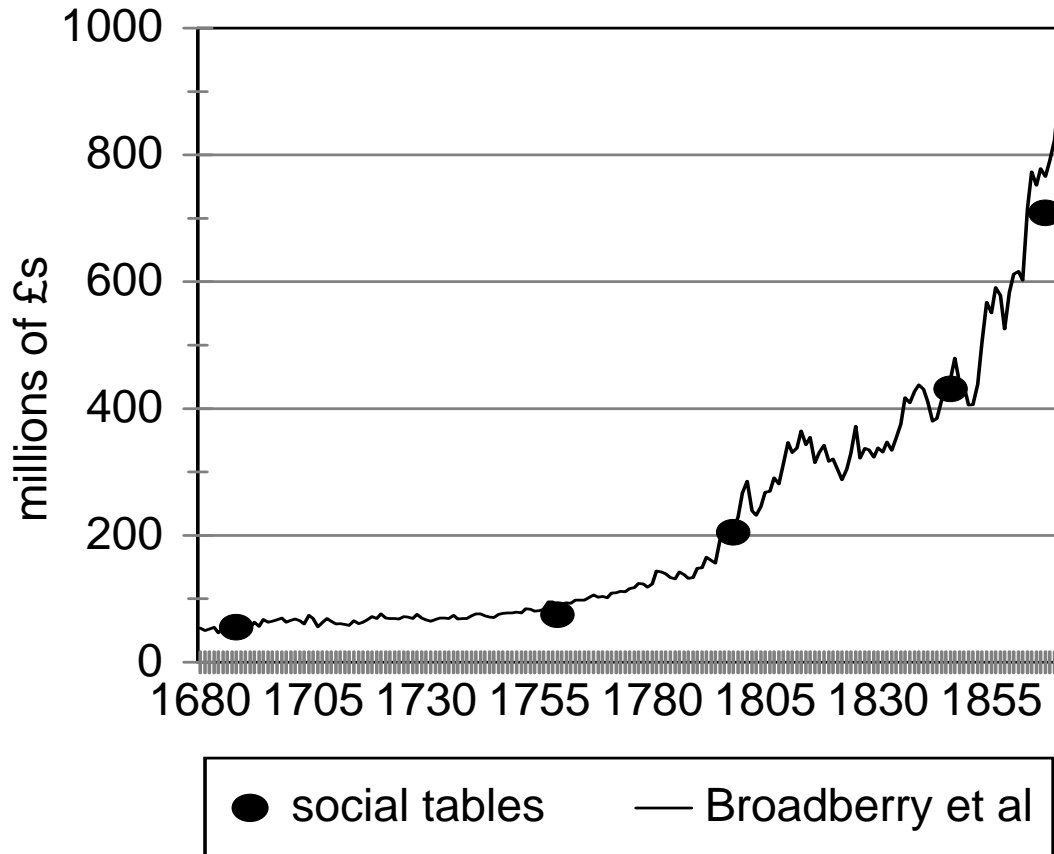
Factor Shares from the Social Tables, England & Wales, 1688-1867

	Labour	Capital	Land
1688	57.2%	18.8%	24.0%
1759	59.1	14.3	26.6
1798	56.6	25.4	18.0
1846	56.6	33.2	10.2
1867	55.1	38.6	6.3

Note: These shares exclude interest on the national debt and poor law support, as described in footnote 21. Interest on the national debt was otherwise tallied as capital income and poor law support as labour income. These adjustments have only minor impacts on the shares.

Figure 1

Nominal National Income, England & Wales, from Social Tables and Broadberry et al



Source: See text.

Figure 2

Nominal annual earnings per worker (£s) from Social Tables and Feinstein
Source: See text.

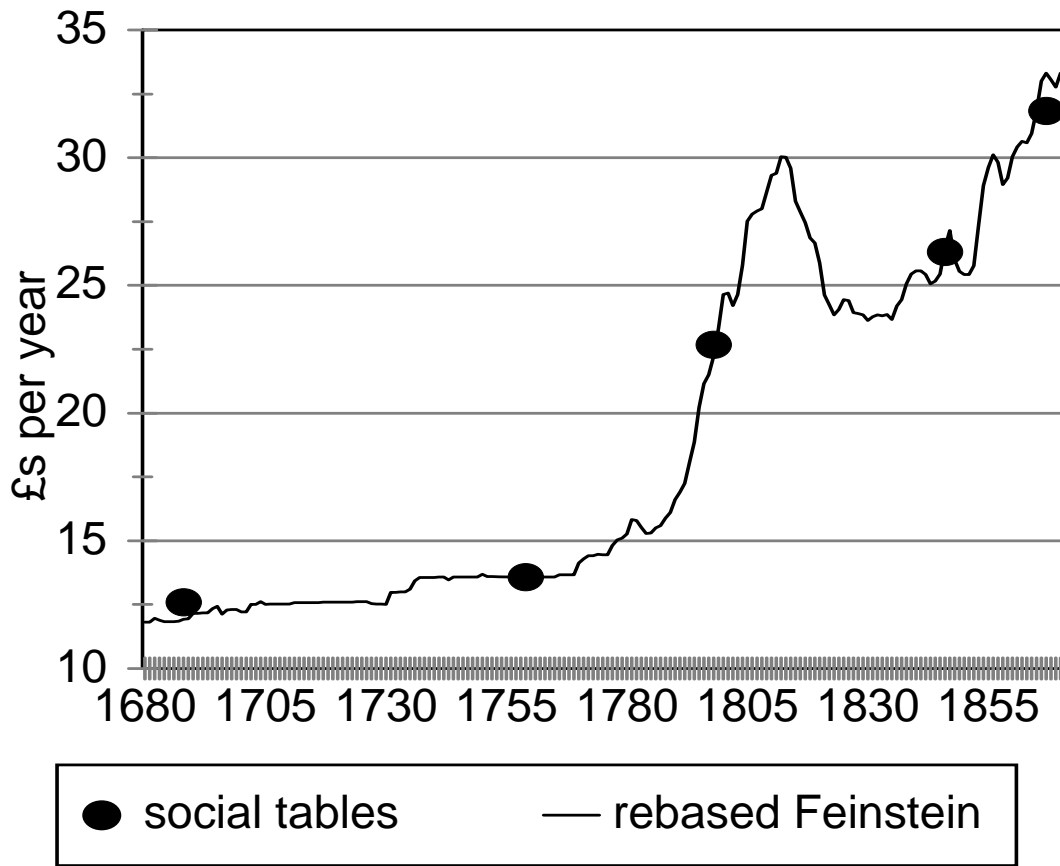
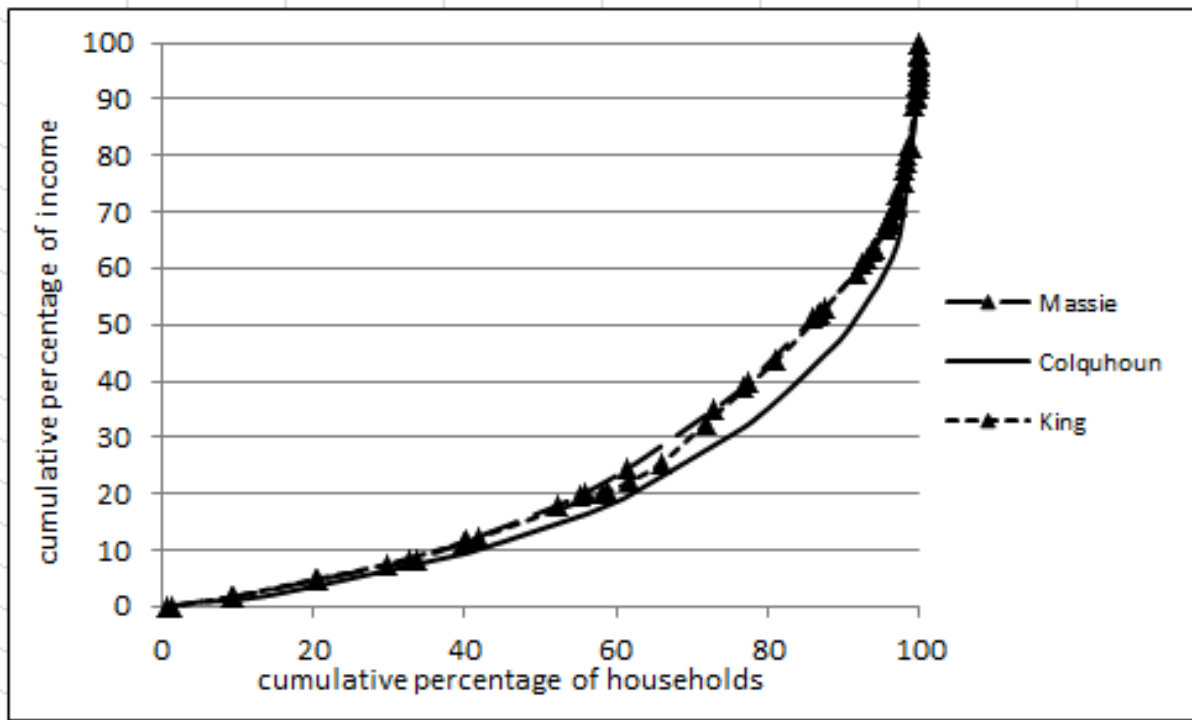


Figure 3

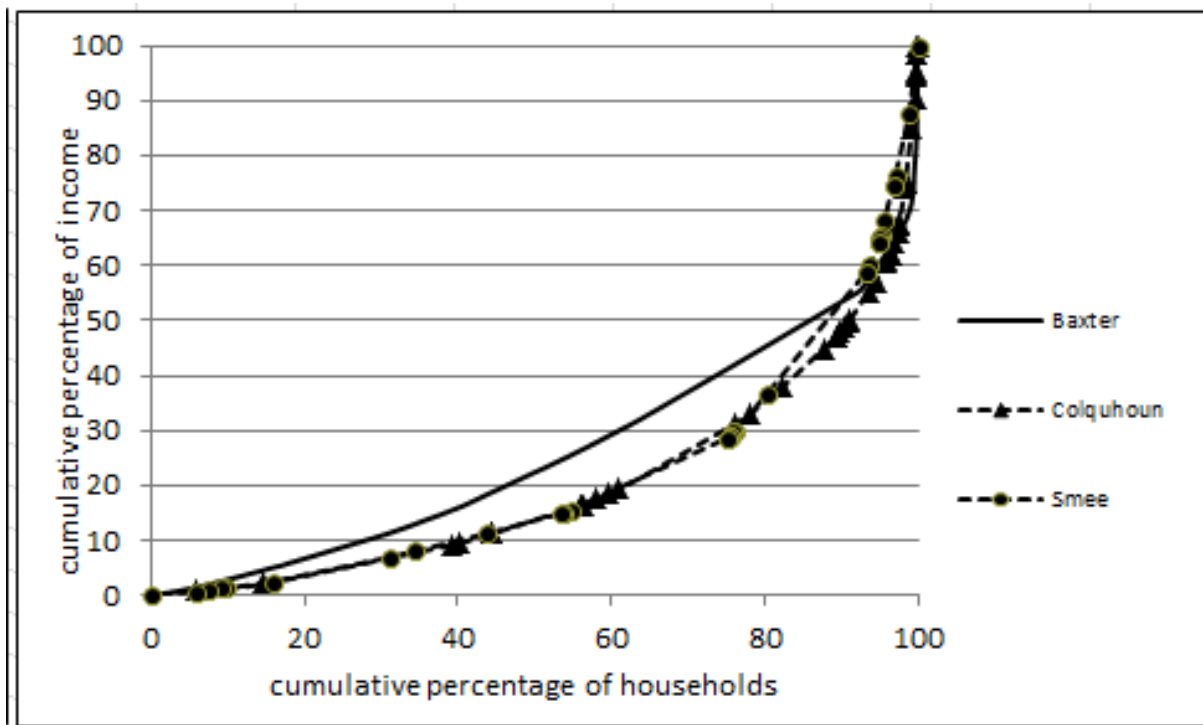
Lorenz curves for eighteenth century England & Wales



Source: See text.

Figure 4

Lorenz curves for nineteenth century England & Wales



Source: See text.

Appendix Table 1

King Social Table (Revised), England & Wales, 1688

	families = men	women & children	people per family	total of people	servants per family	total of servants	people minus servants
temporal lords	200		40	8000	35.5	7100	900
spiritual lords	26		20	520	15.5	403	117
baronets	800		16	12800	11.5	9200	3600
knights	600		13	7800	8.5	5100	2700
esquires	3000		10	30000	5.5	16500	13500
gentlemen	15000		8	120000	3.5	52500	67500
great offices	5000		8	40000	3.5	17500	22500
lesser offices	5000		6	30000	1.5	7500	22500
law	8062		7	56434	2.5	20155	36279
clergy, greater	2000		5	10000	0.5	1000	9000
clergy, lesser	10000		5	50000	0.5	5000	45000
science & liberal arts	12898		5	64490	0.5	6449	58041
merchants, sea, great	2000		8	16000	3.5	7000	9000
merchants, sea, less	8000		6	48000	1.5	12000	36000
merchants, land, great	3264		6	19584	1.5	4896	14688
merchants, land, small	13057		6	78342	1.5	19586	58757
shopkeepers & tradesmen	101704	101704	4.5	457668			457668
artisans, handy crafts	6745		4	26980			26980
manufacturers	162863	244295	4.5	732883.5			732884
building trades	73018	73018	4.5	328581			328581
miners	14240		4.5	64080			64080
freeholders, greater	27568	27568	7	192976	2.5	68920	124056
freeholders, lesser	96490	96490	5	482450	0.5	48245	434205
farmers	103382	103382	5	516910	0.5	51691	465219
husbandmen	175000	175000	4	700000			700000
naval officers	5000		4	20000			20000
military officers	4000		4	16000			16000
common seamen	50000		3	150000			150000
common soldiers	35000		2	70000			70000
labourers & out servants	284997	71249	3.5	997490			997490
cottagers & paupers	138183	138183	3.25	449095			449095
vagrants	23489		1	23489			23489
totals	1390586	731831		5820572		360745	5459827
domestic servants	191889					191889	
farm servants	168856					168856	
grand totals	1751331			5820572		360744.5	5459827

Appendix Table 1 continued

	average					profits	wages	residual wages per worker
	average net family income	family income	total family income	total net family income	rents			
temporal lords	6060	5741	1212000	1148100	1148100			
spiritual lords	1300	1161	33800	30173	30173			
baronets	1500	1397	1200000	1117200	1117200			
knights	800	724	480000	434100	434100			
esquires	563	513	1687500	1539000	1539000			
gentlemen	280	249	4200000	3727500	3727500			
great office	240	209	1200000	1042500			1042500	209
lesser office	120	107	600000	532500			532500	107
law	154	132	1241548	1060153			1060153	132
clergy, gt	72	68	144000	135000	135000			
clergy, less	50	46	500000	455000	455000			
science/arts	60	56	773880	715839			715839	56
merchants, sea, gt	400	369	800000	737000		617000	120000	60
merchants, sea, less	200	187	1600000	1492000		1252000	240000	30
merchants, land, gt	400	387	1305600	1261536		1065696	195840	60
merchants, land, sm	200	187	2611400	2435131		2043421	391710	30
shops/trades	45	45	4576680	4576680		1525560	3051120	15
artisans,handys	200	200	1349000	1349000		1146650	202350	30
manufacturers	38	38	6188794	6188794			6188794	15
building trades	25	25	1825450	1825450			1825450	13
miners	15	15	213600	213600			213600	15
freeholders,gt	91	69	2508688	1888408	1153996	376303	358108	6
freeholders,sm	55	51	5306950	4872745	2441197	796043	1635506	8
farmers	43	38	4393735	3928516		1220482	2708034	13
husbandmen	12	12	2100000	2100000	966000	315000	819000	2
naval officers	80	80	400000	400000			400000	80
military officers	60	60	240000	240000			240000	60
common seamen	20	20	1000000	1000000			1000000	20
common soldiers	14	14	490000	490000			490000	14
labourers/outservants	15	15	4274955	4274955			4274955	12
cottagers/paupers	7	7	898190	898190			898190	3
vagrants	2	2	46978	46978			46978	2
total			55402748	52156047				

35

domestic servants	9	1726997		1726997	9	
farm servants	9	1519704		1519704	9	
total		55402748	55402748	13147266	10358154	31897327
factor shares				24%	19%	58%

Appendix Table 2

Massie's Social Table (Revised), England & Wales, 1759

	families = men	women & children	people per family	total of people	servants per family	total of servants	people minus servants
temporal lords	150		40	6000	35.5	5325	675
spiritual lords	160		20	3200	15.5	2480	720
baronets	320		16	5120	11.5	3680	1440
knights	640		13	8320	8.5	5440	2880
esquires	800		10	8000	5.5	4400	3600
gentlemen	16000		8	128000	3.5	56000	72000
offices	16000		7	112000	2.5	40000	72000
law	12000		7	84000	2.5	30000	54000
clergy, gt	2000		5	10000	0.5	1000	9000
clergy, less	9000		5	45000	0.5	4500	40500
science/arts	18000		5	90000	0.5	9000	81000
merchants, sea, greater	1000		8	8000	3.5	3500	4500
merchants, sea, lesser	2000		6	12000	1.5	3000	9000
merchants, land, greater	10000		6	60000	1.5	15000	45000
merchants, land, lesser	17500		6	105000	1.5	26250	78750
shopkeepers & tradesmen	170000	170000	4.5	765000			765000
capitalists	17500		5	87500	0.5	8750	78750
manufacturers	222975	334463	4.5	1003388		0	1003388
building trades	111477	111477	4.5	501647			501647
miners	14300	14300	4.5	64350			64350
freeholders, greater	60373	60373	7	422611	2.5	150933	271679
freeholders, lesser	80498	80498	5	402490	0.5	40249	362241
farmers	103977	103977	5	519885	0.5	51989	467897
husbandmen	134160	134160	4	536640			536640
naval officers	6000		4	24000			24000
military officers	2000		4	8000			8000
common seamen	60000		3	180000			180000
common soldiers	18000		2	36000			36000
labourers & out servants	240000	60000	3.5	840000			840000
cottagers & paupers	178892	178892	3.25	581399			581399
vagrants	13418		1	13418			13418
totals	1539140			6670967			6209472
domestic servants	209575					209575	
farm servants	243170					243170	
grand totals	1991885			6670967			

Appendix Table 2 continued

	average		total		total net		residual	
	average	net	total	total net			wages	wages
	family	family	family	family	rents	profits	wages	per
	income	income	income	income				worker
temporal lords	12177	11816	1826532	1772377	1772377			
spiritual lords	6088	5931	974150	948929	948929			
baronets	3044	2927	974150	936725	936725			
knights	1522	1436	974150	918826	918826			
esquires	1218	1162	974512	929764	929764			
gentlemen	472	436	7546592	6977072	6977072			
offices	68	42	1084800	678000			678000	42
law	226	201	2712000	2406900			2406900	201
clergy, gt	113	108	226000	215830	215830			
clergy, less	56	51	508500	462735	462735			
science/arts	68	63	1220400	1128870			1128870	63
merchants, sea, greater	678	642	678000	642405		574605	67800	68
merchants, sea, lesser	452	437	904000	873490		805690	67800	34
merchants, land, greater	226	211	2260000	2107450		1429450	678000	68
merchants, land, lesser	194	178	3390000	3123037		2529787	593250	34
shopkeepers & tradesmen	51	51	8599300	8599300		2836300	5763000	17
capitalists	97	92	1700000	1611013		1017763	593250	34
manufacturers	35	35	7720289	7720289			7720289	14
building trades	29	29	3221023	3221023			3221023	14
miners	26	26	371657	371657			371657	13
freeholders, greater	115	89	6913082	5378099	3180018	1036962	1161119	10
freeholders, lesser	43	38	3456584	3047252	1590029	518488	938735	6
farmers	58	53	6026301	5497578		1673973	3823606	18
husbandmen	18	18	2425613	2425613	1115782	363842	945989	4
naval officers	90	90	542400	542400			542400	90
military officers	113	113	226000	226000			226000	113
common seamen	23	23	1356000	1356000			1356000	23
common soldiers	16	16	284760	284760			284760	16
labourers & outservants	20	20	4746000	4746000			4746000	16
cottagers & paupers	7	7	1313962	1313962			1313962	4
vagrants	2	2	30325	30325			30325	2
totals			75187082	70493678				
domestic servants	10			2220365			2220365	
farm servants	10			2473039			2473039	
grand totals			75187082	75187082	19048085	12786859	43352137	
factor shares					25%	17%	58%	

Appendix Table 3

Colquhoun's Social Table (Revised), England & Wales, 1798

group	families = men	women & children	people per family	total of people	servants per family	total of servants	people minus servants
peers	287		25	7175	20.5	5884	1292
bishops	26		15	390	10.5	273	117
baronets	540		15	8100	10.5	5670	2430
knights	350		10	3500	5.5	1925	1575
esquires	6000		10	60000	5.5	33000	27000
gentlemen	20000		8	160000	3.5	70000	90000
high office	2000		7	14000	2.5	5000	9000
low office	10500		5	52500	0.5	5250	47250
eminent clergy	1000		6	6000	1.5	1500	4500
lesser clergy	10000		5	50000	0.5	5000	45000
dissenting clergy	2500		5	12500	0.5	1250	11250
lawyers	11000		5	55000	0.5	5500	49500
univ teach	500		4	2000	0	0	2000
school teach	20000		6	120000	1.5	30000	90000
liberal arts	16300		5	81500	0.5	8150	73350
theatre	1000		4	4000	0	0	4000
lunatic asylums	40		10	400	5.5	220	180
merchants, big	2000		10	20000	5.5	11000	9000
merchants, little	13000		7	91000	2.5	32500	58500
shopkeepers	74500	74500	5	372500	0.5	37250	335250
clerks	60000	60000	5	300000	0.5	30000	270000
shipowners	5000		5	25000	0.5	2500	22500
warehouse	500		6	3000	1.5	750	2250
pubs	50000	50000	5	250000	0.5	25000	225000
peddlers	800	800	5	4000	0.5	400	3600
manufacturers	25000		6	150000	1.5	37500	112500
shipbuilders	300		6	1800	1.5	450	1350
tailors, etc	25000	25000	5	125000	0.5	12500	112500
engineers	5000		5	25000	0.5	2500	22500
workers in manufacturing	445726	668589	4.5	2005767	0	0	2005767
labourers in mines	40000	40000	4.5	180000	0	0	180000
freeholders-big	40000	40000	5.5	220000	1	40000	180000
freeholders-small	120000	120000	5	600000	0.5	60000	540000
farmers	160000	160000	6	960000	1.5	240000	720000
naval officers	7000		5	35000	0.5	3500	31500
military officers	13064		5	65320	0.5	6532	58788
naval personel	52906		3	158718	0	0	158718
merchant sailors	49393		3	148179	0	0	148179
soldiers	121985		2	243970	0	0	243970
labourers in agric & females	340000	100000	4.5	1530000	0	0	1530000
paupers at work	260179		4	1040716	0	0	1040716

vagrants	175218	1	175218	0	0	175218
debtors	2000	5	10000	0.5	1000	9000
lunatics	2500	1	2500	0	0	2500
king	1	50	50	45.5	45.5	4.5
half pay officers	4015	5	20075	0.5	2007.5	18068
pensioned soldiers	30500	1	30500		0	30500
totals	2227630		9430378		724056.5	8706322
farm servants	340000				340000	
domestic servants	384057				384057	
grand totals	2951687		9430378			

Appendix Table 3 continued

group	average				rents	profits	wages	residual wages per worker
	average family income	net family income	total family income	total net family income				
peers	8000	7590	3296000	3178330	1860497	1317833		
bishops	4000	3790	104000	98540	88686	9854		
baronets	3000	2790	1620000	1506600	1355940	150660		
knights	1500	1390	525000	486500	437850	48650		
esquires	1500	1390	9000000	8340000	7506000	834000		
gentlemen	700	630	15000000	13600000	11240000	2360000		
high office	800	750	1600000	1500000			1500000	750
low office	200	190	2100000	1995000			1995000	190
eminent clergy	500	470	500000	470000	470000			
lesser clergy	120	110	1200000	1100000	1100000			
dissenting clergy	120	110	300000	275000			275000	110
lawyers	350	340	3850000	3740000			3740000	340
univ teach	600	600	300000	300000	300000			
school teach	150	120	3000000	2400000			2400000	120
liberal arts	260	250	4238000	4075000			4075000	250
theatre	200	200	200000	200000			200000	200
lunatic asylums	500	390	20000	15600			15600	390
merchants, big	2600	2490	6255000	6035000		5735000	300000	150
merchants, little	800	750	11400000	10750000		8800000	1950000	150
shopkeepers	150	140	11175000	10430000		4842500	5587500	38
clerks	75	65	4500000	3900000			3900000	33
shipowners	500	490	2500000	2450000		2075000	375000	75
warehouse	800	770	400000	385000		347500	37500	75
pubs	100	90	5000000	4500000		750000	3750000	38
peddlers	40	30	32000	24000			24000	15
manufacturers	800	770	21000000	20250000		16500000	3750000	150
shipbuilders	700	670	210000	201000		156000	45000	150
tailors, etc	150	140	3750000	3500000		1625000	1875000	38
engineers	200	190	1000000	950000			950000	190
workers in manufacturing	55	55	24514930	24514930			24514930	22
labourers in mines	40	40	1600000	1600000			1600000	20
freeholders-big	200	180	8000000	7200000	4000000	880000	2320000	29
freeholders-small	90	80	10800000	9600000	5400000	1188000	3012000	13
farmers	120	90	19200000	14400000		4224000	10176000	32
naval officers	149	139	1043000	973000			973000	139
military officers	139	129	1815896	1685256			1685256	129
naval personnel	38	38	2010428	2010428			2010428	38
merchant sailors	40	40	1975720	1975720			1975720	40
soldiers	29	29	3537565	3537565			3537565	29
labourers in agriculture	31	31	10540000	10540000			10540000	24
paupers at work	10	10	2601790	2601790			2601790	10

vagrants	10	10	1752180	1752180		1752180	10
debtors	45	35	90000	70000		70000	
lunatics	30	30	75000	75000		75000	
king	200000	199090	200000	199090	199090		
half pay officers	45	35	180675	140525		140525	
pensioned soldiers	20	20	610000	610000		610000	
totals			204622184	190141054			
farm servants				6800000		6800000	
domestic servants				7681130		7681130	
totals			204622184	204622184	33958063	51988997	118675124
factor shares					17%	25%	58%

Appendix Table 4

Smee's data retabulated for England & Wales—men, 1846

	total males 20 years & over	working class males 20 years & over	working class weekly earnings shillings	males 20 years & over upper class paying income tax £467/year	middle class paying no tax £50-£150 £100/year	boys earning 5s/week	
trade,com, manuf	1872637	1094720		15	91393	686524	340724
farmers & graziers	242251				16123	226129	2843
agricultural labourers	826117	826117		8			167793
gardeners & florists	46550	45672		15		879	2380
nonagricul labourers	516471	516471		11			91145
army	32592	30877		5	1225	490	6744
navy & merchant	93992	92155		5	918	918	7865
professionals	53898				25500	28398	2032
other educated	87068				60061	27007	11382
govt civil servants	14274				9976	4297	234
police &parochial officers	21352	18742		15	2610		343
domestic servants	160505	160505		11			89371
independent	126996				62885	64111	5448
alms, pensions, residue	69469 255744	69469					30015 3141255
minors					10132	168875	
total	4419916	2854728			280825	1207628	3899573

Appendix Table 5

Smee's data retabulated for England & Wales—women, 1846

	total females 20 years & over	working class females 20 years & over	working class weekly earnings shillings	females 20 years plus upper class paying income tax £200/year	years plus middle class paying no tax £50-£150 £80/year	other middle class £40/year	girls earning 4s/week
trade,com, manuf	418649	321445	10	16201	81004		170540
farmers & graziers	20514	0		1244	19270		0
agricultural labourers	30161	30161	5				9839
gardeners & florists	1166	789	10		378		135
nonagricul labourers	105746	105746	7				7735
army							
navy & merchant							
professionals	824	419	10		405		
other educated	32164	9117	15		23047		1936
govt civil servants	551	221	15		330		15
police &parochial officers	1965	1965	7				14
domestic servants	509407	509407	11				309699
independent	329625		15	127528	86167	115930	15121
alms, pensions, residue	64220 3273505	64220					24837 3377724
total	4788497	1043489		144972	210601	115930	3917593

Appendix Table 6

Smee's incomes, England & Wales, 1846

	working class wages	upper class income	middle class income	pauper income	total income
trade,com, manuf	57254663	45920905	75132680		178308248
farmers & graziers	36959	7778043	24154475		31969477
agricultural labourers	19858962				19858962
gardeners & florists	1834032		118096		1952128
nonagricul labourers	17960968				17960968
army	458195	572257	49016		1079468
navy & merchant	1208103	428846	91830		1728779
professionals	37310	11908586	2872175		14818071
other educated	523667	28048546	4544440		33116654
government civil servants	11824	4659000	456133		5126957
police & parochial officers	771315	1218639			1989955
domestic servants	23140221				23140221
independent		54872795	13306105		68178900
alms, pensions, remaining population				1336890	1336890
minors		2026498	3377497		5403996
other middle property			25058100		25058100
total	123096220	157434116	149160546	1336890	431027773

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