

# *Class structure and inequality during the industrial revolution: lessons from England's social tables, 1688–1867*

By ROBERT C. ALLEN\*

This article 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 article 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.

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 GDP.<sup>1</sup> Progress has been substantial but less definitive when it comes to tracking changes in the class structure, the distribution of income, and overall inequality.<sup>2</sup> This article 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 the following: 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 'Kuznets curve' of rising and then falling inequality during the industrial revolution? How was the history of overall inequality related to the shifting fortunes of the principal social classes?

\* Author's Affiliation: New York University Abu Dhabi, and Nuffield College, Oxford.

<sup>1</sup> Wrigley and Schofield, *Population history*; Deane and Coale, *British economic growth*; Crafts, 'English economic growth'; Broadberry, Campbell, Klein, Overton, and van Leeuwen, *British economic growth*.

<sup>2</sup> Perkin, *Origins*; Lindert and Williamson, 'Revising'; eisdem, 'Reinterpreting'; Lindert, 'Three centuries'; Broadberry et al., *British economic growth*, pp. 307–39.

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.<sup>3</sup> The first social table for England was drawn up by Gregory King to show the state of the country in 1688.<sup>4</sup> 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.<sup>5</sup> 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.<sup>6</sup> 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 highly inaccurate. Massie had even less information to work with. Historians have addressed this problem by amending the tables with recently compiled information on 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 is the revisions made by Lindert and Williamson in the early 1980s, and they are the starting point for this article.<sup>7</sup>

Why revise Lindert and Williamson further? The first goal is to make explicit the size and character of the workforce. 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.<sup>8</sup> 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

<sup>3</sup> Hoppit, '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.

<sup>4</sup> Barnett, *Two tracts*.

<sup>5</sup> Massie, *Computation*; Colquhoun, *Treatise*; Smee, *Income tax*; Baxter, *National income*.

<sup>6</sup> Deane, 'Implications'; eadem, 'Contemporary estimates'; Lindert and Williamson, 'Revising'; eisdem, 'Reinterpreting'; Holmes, 'Gregory King'; Cooper, 'Social distribution'; Mathias, 'Social structure'.

<sup>7</sup> Lindert and Williamson, 'Revising'; eisdem, 'Reinterpreting'. I am indebted to Peter Lindert for sharing his spreadsheet 'Baxter E&W UK 1867' with me. This was invaluable in my analysis of his estimates. Lindert has now posted his spreadsheets for all of the social tables online: Lindert, 'Baxter'.

<sup>8</sup> The 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.

this information to compute household income, and this must be done in a way that makes the tables as comparable as possible with those of King, Massie, and Colquhoun.

The second goal of this article 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 UK. The analysis of this article thus describes England and Wales rather than Great Britain or the UK.

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.

## I. 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.<sup>9</sup> Some issues still remain, however, and these come to light in Broadberry et al.'s *British economic growth* when their new estimates of national incomes are compared to the tables, especially those of Massie and Colquhoun.<sup>10</sup>

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 per cent. 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.<sup>11</sup> I have, therefore, followed Broadberry et al. and made the same upward adjustment to Massie's incomes.

<sup>9</sup> Lindert and Williamson, 'Revising'.

<sup>10</sup> Broadberry et al., *British economic growth*, pp. 321–8.

<sup>11</sup> My 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 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 craftsman and a labourer in all three cases. These series are available in Allen, 'London', wage page, cols. 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 London—using the agricultural shares in Allen, 'Economic structure', p. 8, and the London population in Wrigley, 'Urban growth', pp. 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 London was divided

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.<sup>12</sup> Broadberry et al. propose to close the gap by increasing all of Colquhoun's incomes by 42.5 per cent.<sup>13</sup> I cannot follow Broadberry in this regard. The time period is tricky. Agricultural prices rose by 77 per cent 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.<sup>14</sup> 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.<sup>15</sup>

## II. Size of the workforce: servants

A first goal of this article 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.<sup>16</sup> 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 shopkeepers and tradesmen, manufacturers (that is, people who were employed in handicraft manufacturing), the building trades, and miners. These groups amounted to 28 per cent 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.<sup>17</sup> This figure included

into equal quantities; one representing northern England and the other southern England outside 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 London. As is evident from this description, the wage index is a rough and ready construction.

<sup>12</sup> Lindert 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. The calculations in this article are limited to England and Wales.

<sup>13</sup> Broadberry et al., *British economic growth*, p. 326.

<sup>14</sup> Feinstein, 'Pessimism', pp. 652–3.

<sup>15</sup> In section VI, I explain how I extracted the GDP of England and Wales from Broadberry's series for Great Britain.

<sup>16</sup> See app. tab. A1.

<sup>17</sup> Laslett, 'Size and structure', p. 200.

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 larger households. They also employed servants.<sup>18</sup>

Hollingsworth studied the demography of English ducal families, including the size of their households, by reconstituting them from family trees. Hollingsworth's data show 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.<sup>19</sup> 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.<sup>20</sup> Clark came to similar conclusions.<sup>21</sup>

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.

### III. 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 per cent, is much less than the ratio of the occupied to the total population (45 per cent) that Deane and Cole surmised for Great Britain in that year (and which was very stable across the first half of the nineteenth century).<sup>22</sup> Applying this percentage to Colquhoun's population total implies an additional 1,869,078 occupied people. We have already discovered 724,057 of them, 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 take up paid work. Also the naval and army officers, soldiers, and 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.

<sup>18</sup> Ibid., pp. 221–2.

<sup>19</sup> Hollingsworth, 'Ducal families', p. 19.

<sup>20</sup> Wrigley, Davies, Oeppen, and Schofield, *Family reconstitution*, p. 614.

<sup>21</sup> Clark, *Farewell*, pp. 116–21; idem, *Son*, p. 133.

<sup>22</sup> Deane and Cole, *British economic growth*, pp. 8, 143.

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.<sup>23</sup> The rest of the income must have come from other family members. Baxter's analysis of manual occupations showed that only about 40 per cent of workers in manufacturing were men.<sup>24</sup> 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.<sup>25</sup> 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, generally £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 engaged in paid work.

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 per cent for labour, 15 per cent for capital, and 46 per cent for land.<sup>26</sup> 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 among the tenant farmers and the greater freeholders, and only one working among the lesser freeholders.

It seems 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

<sup>23</sup> See the sources cited in Feinstein, 'Wage-earnings'.

<sup>24</sup> Baxter, *National income*, pp. 88–95.

<sup>25</sup> 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.

<sup>26</sup> 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.



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 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.

#### IV. 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,<sup>27</sup> 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.<sup>28</sup> 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

<sup>27</sup> Baxter, *National income*, pp. 88–95.

<sup>28</sup> *Abstract* (P.P. 1844, XXVII), image 58–62.

earnings are plausible.<sup>29</sup> 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 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.<sup>30</sup> I rely entirely on Lindert's spreadsheet and conclusions for middle- and upper-class income in 1867.<sup>31</sup> Smee's estimates of middle- and upper-class income for Great Britain have been scaled down in proportion to population to obtain 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.<sup>32</sup> (His treatment of the middle and upper classes is consistent with that assumption.) Therefore I retabulated the 1867 data in the format of an eighteenth-century table.<sup>33</sup> 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.

<sup>29</sup> Feinstein, 'Pessimism'; idem, 'Wage-earnings'.

<sup>30</sup> Lindert and Williamson, 'Reinterpreting', pp. 94–5.

<sup>31</sup> Lindert, 'Baxter', Main: A2 . . . AB50.

<sup>32</sup> I 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.

<sup>33</sup> Leaving 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.



## V. Consistent occupational classification

The various social tables break the population down in ways that are not immediately comparable. In part this reflects differences in the sources used, and in part 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 divide the early modern economy neatly 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 A1–A6. '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 the work of King, Massie, and Colquhoun, this group includes the titled aristocracy as well as 'gentlemen'—that is, 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 the work of 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 per cent of the rental value of the agricultural land in the country, on the presumption that the other 20 per cent accrued to owner-occupying farmers.<sup>34</sup> My estimate of the total income of the landed classes omits the value of urban real estate and non-agricultural 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 (£1,055,000), little merchants (£1 million), and manufacturers (£1 million) on the assumption that the trustees were drawn from these groups.

<sup>34</sup> Mingay, *Landed society*, p. 26; Thompson, 'Social distribution'; Beckett, 'Pattern'.

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, the 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 that of Baxter, who made similar estimates two decades later and who was in most respects more careful and 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, theatre, lunatics, 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 per cent of the lowest income category among the upper and middle classes that they delineated.<sup>35</sup> 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 200,000, which Lindert and Williamson reduced to 134,160, a figure which

<sup>35</sup> More 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.

I adopt.<sup>36</sup> 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.<sup>37</sup> 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-scale owner-occupying farmers in the eighteenth century.

The share of rent received by the owner-occupying farmers declined less steeply. It fell from 35 per cent in 1688 to 31 per cent in 1759 and to 28 per cent in 1798, after which the share was presumed to have remained at 20 per cent. These proportions are in close agreement with Thompson's summary of the land belonging to owner-occupying smallholders.<sup>38</sup>

With Smee, the farmer households included all of the non-wage-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.<sup>39</sup>

### *Workers*

With King, Massie, and Colquhoun, I defined 'workers' as the manufacturing workforce, the building trades, miners, labourers and outservants, soldiers, seamen, domestic servants, and farm servants. In King, the 'manufacturing workforce' in turn was taken to be 'manufacturers'; in Massie, it meant manufacturers except for 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 minus 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.<sup>40</sup>

<sup>36</sup> Lindert and Williamson, 'Revising', p. 397.

<sup>37</sup> A below-average family size was chosen since family size increased with income.

<sup>38</sup> Thompson, 'Social distribution', p. 513.

<sup>39</sup> Baxter, *National income*, p. 25.

<sup>40</sup> See the totals for manual workers in Lindert, 'Baxter', in cell 'main:V11' and 'main:X30'.

Working-class income equalled these totals minus 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 the poor.<sup>41</sup>

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.<sup>42</sup>

## VI. 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 and 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 per cent of the landed income was rent and 10 per cent 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, and so on, and I assumed that the annual salary of a greater merchant was £60 and a lesser £30. These were increased by 13 per cent in Smee's table, and were raised to £70 and £35 in Colquhoun's table.<sup>43</sup> 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.

<sup>41</sup> Perkin, *Origins*, p. 421, n. 3; Porter, *Progress*, p. 64.

<sup>42</sup> Porter, *Progress*, pp. 63, 67.

<sup>43</sup> On 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.

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*.<sup>44</sup> 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 highest-earning group.<sup>45</sup>

## VII. Validating comparisons

Revising the social tables involves a good deal of conjecture, as extraneous information of varying degrees of reliability is 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.<sup>46</sup> 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?<sup>47</sup> 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 shown in figure 1. Assuming that Colquhoun's estimate applies to 1798 rather than 1801 brings the social table into conformity with the annual series.

<sup>44</sup> Afton and Turner, 'Rent', p. 1920.

<sup>45</sup> A division along these lines is required for a plausible rate of return to capital.

<sup>46</sup> For the comparisons discussed here, nominal GDP for England and Wales was worked out as follows. Broadberry et al., *British economic growth*, pp. 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.

<sup>47</sup> The 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 UK debt charges have been deducted in fig. 1. See Deane and Coale, *British economic growth*, pp. 389–91, 396–7, for debt service charges. England & Wales were assumed to be 85% of Great Britain in the eighteenth century, and 77% and 82.3% of the UK 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 fig. 1.

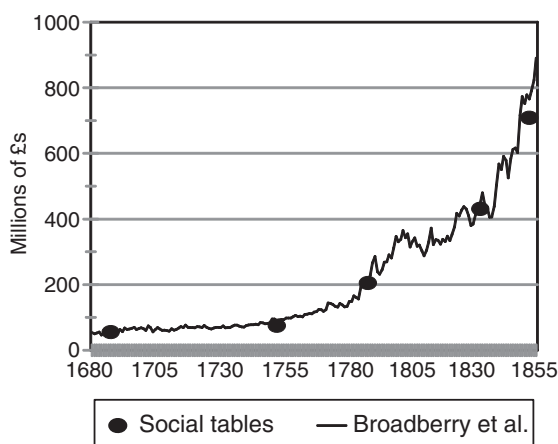


Figure 1. *Nominal national income, England and Wales, from social tables and Broadberry et al.*

Sources: For Broadberry et al., see section VI. For social tables, see app. tabs. A1–A3 and A6, and Lindert, ‘Baxter’.

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 10-year intervals beginning in 1801.<sup>48</sup> The ratio of the occupied to the total population was fairly stable, ranging between 44 per cent and 47 per cent over the nineteenth century.

The revised social tables imply similar percentages: 48 per cent in the case of King, 49 per cent in Massie, 49 per cent in Colquhoun, 41 per cent in Smee, and 46 per cent in Baxter. Smee’s ratio is on the low side while Massie’s and Colquhoun’s are slightly high, but on average the labour force participation rate implied by the social tables is consistent with Deane and Cole’s estimates.<sup>49</sup>

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 index.<sup>50</sup> 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

<sup>48</sup> Deane and Cole, *British economic growth*, pp. 8, 143.

<sup>49</sup> It should be noted that 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.

<sup>50</sup> Feinstein, ‘Pessimism’; Lindert and Williamson, ‘Living standard’.



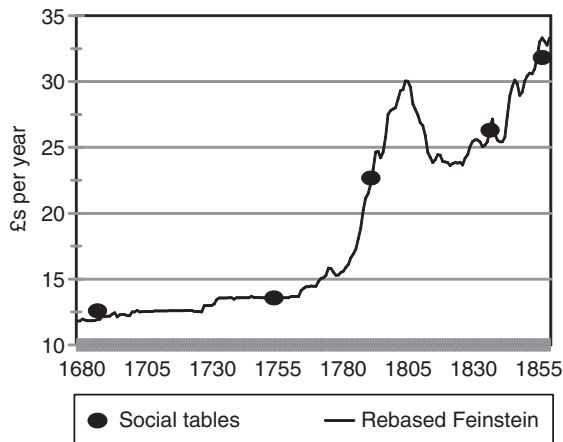


Figure 2. *Nominal annual earnings per worker (£s) from social tables and Feinstein*

Source: For Feinstein, see section VI. For social tables, see tab. 4.

for all workers in 1851 as calculated by Deane and Cole.<sup>51</sup> The extrapolated value for 1867 turns out to be within 4 per cent 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.

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.<sup>52</sup> The rate of profit rose from a pre-industrial level of 9.2 per cent in 1688 and 9.1 per cent in 1759 to 16.8 per cent in 1798. The rate continued to rise gradually, reaching 17.6 per cent in 1846 and 20.3 per cent in 1867.<sup>53</sup> 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.<sup>54</sup>

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 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

<sup>51</sup> Deane and Cole, *British economic growth*, pp. 143, 152.

<sup>52</sup> Feinstein, 'Capital formation', p. 33, idem, 'Sources', p. 427. Giffen's figures are reported by Feinstein.

<sup>53</sup> Interest 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.

<sup>54</sup> Harley, 'Prices and profits'; Hudson, *Genesis*, pp. 235–41, 272, 277; Allen, 'Engels' pause', p. 421.

Table 1. *Agricultural output, England and Wales (millions of £s)**A. Income from social tables*

	<i>King (1688)</i>	<i>Massie (1759)</i>	<i>Colquhoun (1798)</i>		<i>Smee (1846)</i>	<i>Baxter (1867)</i>
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

Sources of direct estimates: 1700–1850: Allen, 'English and Welsh', p. 36.

1867: Turner, *After the famine*, p. 127, puts UK final agricultural output at £179 million in 1867–71 and Irish at £38.6 million, so the 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% ( $=0.784 \times 0.85$ ) 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.

a reality in which, over the course of the year, labourers worked more than one job—farming, carting, or weaving, for instance—in more than one sector, so their labour cannot be allocated easily. However, following Broadberry, Campbell, and van Leeuwen approximately, I assumed that 64 per cent of the labourers and their income were agricultural.<sup>55</sup> This division means that 64 per cent of the work and income of labourers in total came from agriculture, regardless of how each worker split his time. Sectoral allocation, however, is problematic.

In the 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 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.<sup>56</sup> This study estimated the net output of the principal agricultural commodities in England and Wales at benchmark dates from the middle ages to 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 estimate for the UK multiplied by the share of England and Wales in UK agriculture.<sup>57</sup>

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

<sup>55</sup> Broadberry et al., 'When did Britain industrialize?', pp. 20–1.

<sup>56</sup> Allen, 'English and Welsh', p. 36.

<sup>57</sup> Feinstein, *Statistical tables*, T60.

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

Source: See section VI.

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 per cent, while the labour force share was 39 per cent. In 1867, agriculture accounted for only 15 per cent of GDP but 20 per cent of the workforce.

The surprising feature of this result is that the value added share in 1688 was greater than the labour force share. Kuznets's investigations of less developed countries in the twentieth century indicated the reverse.<sup>58</sup> He found that the agricultural labour force share was higher than the value added share, and this indicated that GDP would rise if labour were 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 Kuznets's 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 per cent.) 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.

### VIII. Implications: size and incomes of the social classes

The object of harmonizing 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 article.

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

The 'landed classes' were never more than 2 per cent of the population, and the proportion stayed roughly constant over time. The increase from 30,000 to 50,000 shown in table 3 probably reflects the inclusion in 1846 and 1867 of female property owners, who were left out of the earlier counts.

The 'bourgeoisie', which included 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

<sup>58</sup> Kuznets, *Economic growth*, pp. 111, 203, 208–16.

Table 3. *Social structure from social tables, England and Wales**A. No. of families*

	1688	1759	1798	1846	1867
Landed	31,626	29,070	38,704	52,986	50,695
Bourgeoisie	60,128	84,000	95,879	363,932	436,493
Lower middle class	114,602	188,000	252,640	649,396	884,450
Farmers	402,440	379,008	320,000	243,130	223,271
Workers	980,863	1,128,247	1,804,567	2,598,299	3,668,936
Cottagers and paupers	161,672	192,310	439,897	320,648	317,726
Total	1,751,331	2,000,635	2,951,687	4,228,393	5,581,571

*B. % distribution of families*

	1688	1759	1798	1846	1867
Landed	1.8	1.5	1.3	1.3	0.9
Bourgeoisie	3.4	4.2	3.2	8.6	7.8
Lower middle class	6.5	9.4	8.6	15.4	15.8
Farmers	23.0	18.9	10.8	5.7	4.0
Workers	56.0	56.4	61.1	61.4	65.7
Cottagers and 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.

*Sources:* See section VII, app. tabs. A1–A6, and Lindert, 'Baxter'.

share of the population increased from 3 per cent to about 8–9 per cent 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 200,000 smallholdings held by husbandmen and yeoman and cultivated by them and their families. The other 200,000 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. This 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 non-agricultural. The character of work changed significantly as the independent craftsperson working with manual 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.

Table 4. *Average annual income per earner in £ per year, England and Wales*

	1688	1759	1798	1846	1867
Landed	271.49	452.78	756.49	603.93	678.57
Capitalists	175.38	145.37	525.45	441.23	466.29
Shopkeepers	24.47	27.17	64.79	111.64	75.00
Farmers	15.89	21.57	48.75	121.39	159.22
Workers	12.59	13.58	22.68	26.31	31.83
Cottagers and paupers	3.15	3.62	3.67	5.31	7.20
Average	19.91	23.14	40.29	57.30	65.66

Sources: As for tab. 3.

Table 5. *Average real annual income per person, England and 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 and paupers	1.02	1.02	1.17	1.98	2.43
Average	4.90	5.16	7.77	9.43	11.07

Sources: As for tab. 3.

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 2,100 calories from the least expensive foods (primarily oatmeal) and other bare necessities, which is intended to represent the lowest-cost way of surviving.<sup>59</sup> 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).

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 they 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 such as quail and port and hired builders, servants, and jewellery-makers, who effectively consumed the baskets (or upgraded versions) for them. By the 1860s, table 5 probably understates the income of this

<sup>59</sup> The 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), and fuel (2 million BTUs). In addition, the cost of these items was increased by 5% as an allowance for rent. See Allen, 'American exceptionalism'.

group since it assumes they were only receiving agricultural rent and thus excludes their earnings from urban property and non-agricultural 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 in comparison to industry. In 1688 the agricultural rent received by the landed classes amounted to 16 per cent of the national income. By 1867, their rental income had dropped to 5 per cent.

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 'farmers' category 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 smallholders 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 four 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 seven 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?<sup>60</sup> 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.<sup>61</sup> Like the upper classes, English workers did not consume three times the oatmeal specified in the subsistence diet but instead upgraded 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.<sup>62</sup>

<sup>60</sup> Humphries, 'Lure'; Allen, 'Restatement'; Humphries and Schneider, 'Spinning the industrial revolution'; Stephenson, "Real" wages?.

<sup>61</sup> Allen, Bassino, Ma, Moll-Murata, and van Zanden, 'China'; Allen, Murphy, and Schneider, 'Colonial origins'; Allen, 'American exceptionalism'.

<sup>62</sup> Floud, Fogel, Harris, and Hong, *Changing body*, p. 69; Allen, 'Restatement'.



Table 6. *Factor shares from the social tables, England and Wales, 1688–1867 (%)*

	<i>Labour</i>	<i>Capital</i>	<i>Land</i>
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 n. 51. 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.

*Sources:* See section V.

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.<sup>63</sup> Stagnation returned in the first half of the nineteenth century as working-class consumption per head edged downward by half a percent, while overall consumption rose 21 per cent, with the farmers and lower middle class reaping gains of over 50 per cent. In 1688 the average worker's consumption was 67 per cent of the national average. The ratio dropped to 63 per cent in 1759, then to 56 per cent in 1798, and bottomed out at 46 per cent in 1846. The working class began to catch up between 1846 and 1867 by posting a consumption gain of 42 per cent 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 per cent in this period. Working-class consumption per person rebounded to 56 per cent 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.

## IX. 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

<sup>63</sup> Gilboy, *Wages*.

table gives equivocal support to the values commonly used in growth accounting (labour at 50 per cent, capital at 35 per cent, and land at 15 per cent),<sup>64</sup> 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 per cent in 1688 to 38.6 per cent in 1867, while land’s fell from 24.0 per cent to 6.3 per cent 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 shares of labour and capital were somewhat greater than the changes in the nominal shares.<sup>65</sup> 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.

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 coefficient is computed from the earnings of a representative sample of individuals. Such data do not exist for Britain during the industrial revolution. Gini coefficients 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 et al., who used social tables to measure inequality in pre-industrial and early industrializing societies, present a decomposition of the society-wide Gini coefficient into terms measuring between-group inequality, within-group inequality, and inequality due to the overlap of groups.<sup>66</sup> 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 I use here) that shows it was 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 such as 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 et al. 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 coefficients 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.

<sup>64</sup> Beginning with Crafts, *British economic growth*.

<sup>65</sup> 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.

<sup>66</sup> Milanovich, Lindert, and Williamson, ‘Pre-industrial inequality’.

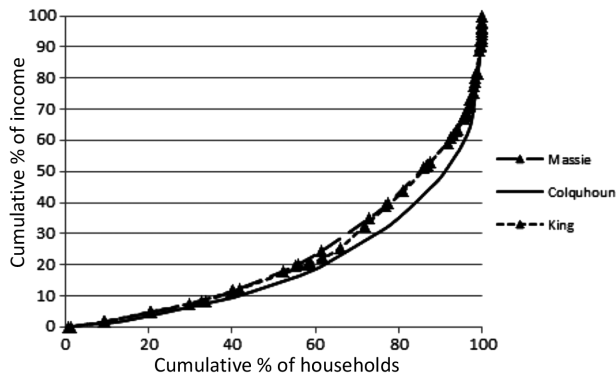


Figure 3. *Lorenz curves for eighteenth-century England and Wales*

Source: See section VIII.

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 per cent of the population received half of the total income. In 1798, the poorest 80 per cent got only 35 per cent of the total.

It is useful to look at this from another angle. In 1688 and 1759, half of the total income accrued to the richest 20 per cent of households, as noted. In 1798, half of the income accrued to the richest 9 per cent of households. Income was concentrated at the top of the distribution in the last 40 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.

The shifts in the Lorenz curves are summarized by Gini coefficients. A low-lying curve like Colquhoun's in 1798 has a large Gini coefficient, indicating greater income inequality. The Gini coefficient was 0.54 in 1688, and 0.53 in 1759. By 1798, the Gini coefficient had jumped to 0.60 and it remained elevated at 0.58

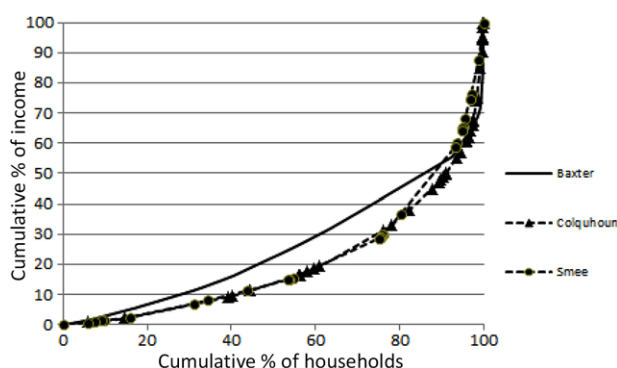


Figure 4. *Lorenz curves for nineteenth-century England and Wales*  
 [Colour figure can be viewed at [wileyonlinelibrary.com](http://wileyonlinelibrary.com)]

Source: See section VIII.

in 1846. By 1867, it had dropped to 0.48.<sup>67</sup> 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.<sup>68</sup>

In recent years, inequality has risen in Britain, as elsewhere, and that increase has called into question Kuznets's optimistic—and evidently simplistic—theory. Inequality remained at the 1867 level until the First World War, dropped dramatically as the Gini coefficient dipped below 0.3 in the interwar and early postwar periods, and has been rising since then with the Gini coefficient now equal to about 0.4. The history of the Gini coefficient in Britain is not unusual when compared to other countries.<sup>69</sup>

## X. Conclusion

Social tables are a long-standing tool for analysing changes in social structure and income inequality. The more fully the tables are elaborated, the more powerfully they illuminate social change. In this article, I 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. I 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 a long way 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

<sup>67</sup> While Lindert did not calculate a Gini from Smee's table, he calculated them for the other social tables discussed here, and my Ginis are very close to his final calculations; Lindert, 'Three centuries', p. 175.

<sup>68</sup> Kuznets, 'Economic growth'.

<sup>69</sup> Milanovic, *Global inequality*, pp. 70–91.

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 rollercoaster, 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 per cent of the overall average in 1688 to 56 per cent in 1798 and then bottomed out at 46 per cent in 1846.

Fifth, the relative standing of workers improved dramatically between 1846 and 1867 as working-class consumption per head grew by 42 per cent. In this period, they had the most rapidly rising income of any group. Their relative consumption rose from 46 per cent to 56 per cent 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 0.54. It jumped to 0.6 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 0.48. At last, the benefits of economic growth were trickling down to the working class.

*Date submitted*

*19 July 2016*

*Revised version submitted*

*10 September 2017*

*Accepted*

*18 September 2017*

DOI: 10.1111/ehr.12661

#### Footnote references

- Afton, B. and Turner, M., 'Rent and land values', in E. J. T. Collins, ed., *Agrarian history of England and Wales*, vol. VII, pt. 2 (Cambridge, 2000), pp. 1914–39.
- Allen, R. C., 'Economic structure and agricultural productivity in Europe, 1300–1800', *European Review of Economic History*, 4 (2000), pp. 1–26.
- Allen, R. C., 'English and Welsh agriculture, 1300–1850: output, inputs, and income' (2005), <https://www.nuffield.ox.ac.uk/users/Allen/unpublished/AllenEandW.pdf> (15 July 2017).
- Allen, R. C., 'Engels' pause: technical change, capital accumulation, and inequality in the British industrial revolution', *Explorations in Economic History*, 46 (2009), pp. 418–35.
- Allen, R. C., 'American exceptionalism as a problem in global history', *Journal of Economic History*, 74 (2014), pp. 309–50.
- Allen, R. C., 'The high wage economy and the industrial revolution: a restatement', *Economic History Review*, 68 (2015), pp. 1–22.
- Allen, R. C., 'London' (2015), <https://www.nuffield.ox.ac.uk/people/sites/allen-research-pages> (accessed on 22 Jan. 2018).

- Allen, R. C., Bassino, J.-P., Ma, D., Moll-Murata, C., and van Zanden, J. L., 'Wages, prices, and living standards in China, 1738–1925: in comparison with Europe, Japan, and India', *Economic History Review*, 64 (2011), pp. 8–38.
- Allen, R. C., Murphy, T. E., and Schneider, E. B., 'The colonial origins of divergence in the Americas: a labor market approach', *Journal of Economic History*, 72 (2012), pp. 863–94.
- Barnett, G. E., *Two tracts by Gregory King* (Baltimore, Md., 1936).
- Baxter, R. D., *National income. The United Kingdom* (1868).
- Beckett, J. V., 'The pattern of landownership in England and Wales, 1660–1880', *Economic History Review*, 2nd ser., XXXVII (1984), pp. 1–22.
- Broadberry, S., Campbell, B. M. S., Klein, A., Overton, M., and van Leeuwen, B., *British economic growth: 1270–1870* (Cambridge, 2015).
- Broadberry, S., Campbell, B. M. S., and van Leeuwen, B., 'When did Britain industrialise? The sectoral distribution of the labour force and labour productivity in Britain, 1381–1851', *Explorations in Economic History*, 50 (2013), pp. 16–27.
- Clark, G., *A farewell to alms: a brief economic history of the world* (Princeton, NJ, 2007).
- Clark, G., *The son also rises: surnames and the history of social mobility* (Princeton, NJ, 2014).
- Colquhoun, P., *A treatise on indigence* (1806).
- Cookson, J. E., 'Political arithmetic and war in Britain, 1793–1815', *War and Society*, 1 (1983), pp. 37–60.
- Cooper, J. P., 'The social distribution of land and men in England, 1436–1700', *Economic History Review*, 2nd ser., XX (1967), pp. 419–60.
- Crafts, N. F. R., 'English economic growth in the eighteenth century: a re-examination of Deane and Cole's estimates', *Economic History Review*, 2nd ser., XXIX (1976), pp. 226–35.
- Crafts, N. F. R., *British economic growth during the industrial revolution* (Oxford, 1985).
- Deane, P., 'The implications of early national income estimates for the measurement of long-term economic growth in the United Kingdom', *Economic Development and Cultural Change*, 4 (1955), pp. 3–38.
- Deane, P., 'Contemporary estimates of national income in the first half of the nineteenth century', *Economic History Review*, 2nd ser., VIII (1956), pp. 339–54.
- Deane, P. and Cole, W. A., *British economic growth: 1688–1959* (Cambridge, 1969).
- Feinstein, C. H., *Statistical tables of national income, expenditure and output of the U.K. 1855–1965* (Cambridge, 1972).
- Feinstein, C. H., 'Capital formation in Great Britain', in P. Mathias and M. M. Postan, eds., *Cambridge economic history of Europe*, VII: *The industrial economies: capital, labour, and enterprise*, pt. I: *Britain, France, Germany, and Scandinavia* (Cambridge, 1978), pp. 28–96.
- Feinstein, C. H., 'Pessimism perpetuated: real wages and the standard of living in Britain during and after the industrial revolution', *Journal of Economic History*, 58 (1988), pp. 625–58.
- Feinstein, C. H., 'Sources and methods of estimation for domestic reproducible fixed assets, stocks and works in progress, overseas assets, and land', in C. H. Feinstein and S. Pollard, eds., *Studies in capital formation in the United Kingdom, 1750–1920* (Oxford, 1988), pp. 258–471.
- Feinstein, C. H., 'Wage-earnings in Great Britain during the industrial revolution', in I. Begg and S. G. B. Henry, eds., *Applied economics and public policy* (Cambridge, 1988), pp. 181–208.
- Floud, R., Fogel, R. W., Harris, B., and Hong, S. C., *The changing body: health, nutrition, and human development in the western world since 1700* (Cambridge, 2011).
- Gilboy, E. W., *Wages in eighteenth century England* (Cambridge, Mass., 1934).
- Harley, C. K., 'Prices and profits in cotton textiles during the Industrial Revolution', Oxford Univ. discussion papers in economic and social history, no. 81 (2010).
- Hollingsworth, T. H., 'A demographic study of the British ducal families', *Population Studies*, 11 (1957), pp. 4–26.
- Holmes, G. S., 'Gregory King and the social structure of pre-industrial England', *Transactions of the Royal Statistical Society*, 5th ser., 27 (1977), pp. 41–68.
- Hoppit, J., 'Political arithmetic in eighteenth-century England', *Economic History Review*, XLIX (1996), pp. 516–40.
- Hudson, P., *The genesis of industrial capital: a study of the West Riding wool textile industry, c. 1750–1850* (Cambridge, 1986).
- Humphries, J., 'The lure of aggregates and the pitfalls of the patriarchal perspective: a critique of the high wage economy interpretation of the British industrial revolution', *Economic History Review*, 66 (2013), pp. 693–714.
- Humphries, J. and Schneider, B., 'Spinning the industrial revolution', Oxford Univ. discussion papers in economic and social history, no. 145 (2016).
- Innes, J., 'Power and happiness: empirical social enquiry in Britain, from "political arithmetic" to "moral statistics"', in J. Innes, *Inferior politics: social problems and social policies in eighteenth-century Britain* (Oxford, 2009), pp. 109–75.
- Kuznets, S., 'Economic growth and income inequality', *American Economic Review*, 45 (1955), pp. 1–28.
- Kuznets, S., *Economic growth of nations: total output and production structure* (Cambridge, Mass., 1971).
- Laslett, P., 'Size and structure of the household in England over three centuries', *Population Studies*, 23, (1969), pp. 199–223.



- Lindert, P. H., 'Baxter E&W UK 1867' (1997), <http://economics.ucdavis.edu/people/fzlinger/peter-linderts-webpage/data-and-estimates/britains-social-tables-1688-on> (accessed on 22 Sept. 2017).
- Lindert, P. H., 'Three centuries of inequality in Britain and America', in A. B. Atkinson and F. Bourguignon, eds., *Handbook of income distribution* (Amsterdam, 2000), pp. 167–216.
- Lindert, P. H. and Williamson, J. G., 'Revising England's social tables, 1688–1812', *Explorations in Economic History*, 19 (1982), pp. 385–408.
- Lindert, P. H. and Williamson, J. G., 'English workers' living standards during the industrial revolution: a new look', *Economic History Review*, 2nd ser., XLVI (1983), pp. 1–25.
- Lindert, P. H. and Williamson, J. G., 'Reinterpreting Britain's social tables, 1688–1913', *Explorations in Economic History*, 20 (1983), pp. 94–109.
- Massie, J., *A computation of the money that hath been exorbitantly raised upon the people of Great Britain by the sugar planters* (1760).
- Mathias, P., 'The social structure in the eighteenth century: a calculation by Joseph Massie', *Economic History Review*, 2nd ser., X (1957), pp. 30–45.
- Milanovic, B., *Global inequality: a new approach for the age of globalization* (Cambridge, Mass., 2016).
- Milanovic, B., Lindert, P. H., and Williamson, J. G., 'Pre-industrial inequality', *Economic Journal*, 121 (2011), pp. 255–72.
- Mingay, G. E. *English landed society in the eighteenth century* (1963).
- Perkin, H., *The origins of modern English society, 1780–1880* (1969).
- Porter, G. R., *The progress of the nation*, F. W. Hirst, ed. (rev. edn., 1912).
- Smee, W. R., *The income tax* (1846).
- Stephenson, J. Z., '"Real" wages? Contractors, workers, and pay in London building trades, 1650–1800', *Economic History Review* (Early View, 2017), pp. 1–26, <https://doi.org/10.1111/ehr12661.12491>.
- Thompson, F. M. L., 'The social distribution of landed property in England since the sixteenth century', *Economic History Review*, 2nd ser., XIX (1966), pp. 505–17.
- Turner, M., *After the famine: Irish agriculture, 1850–1914* (Cambridge, 1996).
- Wrigley, E. A., 'Urban growth and agricultural change: England and the Continent in the early modern period', *Journal of Interdisciplinary History*, 15 (1985), pp. 683–728.
- Wrigley, E. A., Davies, R. S., Oeppen, J. E., and Schofield, R. S., *English population history from family reconstitution, 1580–1837* (Cambridge, 1997).
- Wrigley, E. A. and Schofield, R. S., *The population history of England, 1541–1871: a reconstruction* (1981).

#### Official publication

*Abstract of the Answers and Return . . . for Taking an Account of the Population; Occupation Abstract M.DCCC.XLI*, pt. I: *England and Wales* (P.P. 1844, XXVII).

Appendix

Table A1. *King social table (revised), England and Wales, 1688*

	<i>Families = men</i>	<i>Women &amp; children</i>	<i>People per family</i>	<i>Total of people</i>	<i>Servants per family</i>	<i>Total of servants</i>	<i>People minus servants</i>
Temporal lords	200		40	8,000	35.5	7,100	900
Spiritual lords	26		20	520	15.5	403	117
Baronets	800		16	12,800	11.5	9,200	3,600
Knights	600		13	7,800	8.5	5,100	2,700
Esquires	3,000		10	30,000	5.5	16,500	13,500
Gentlemen	15,000		8	120,000	3.5	52,500	67,500
Greater offices	5,000		8	40,000	3.5	17,500	22,500
Lesser offices	5000		6	30,000	1.5	7,500	22,500
Law	8,062		7	56,434	2.5	20,155	36,279
Clergy, greater	2,000		5	10,000	0.5	1,000	9,000
Clergy, lesser	10,000		5	50,000	0.5	5,000	45,000
Sciences and liberal arts	12,898		5	64,490	0.5	6,449	58,041
Merchants, sea, greater	2,000		8	16,000	3.5	7,000	9,000
Merchants, sea, lesser	8,000		6	48,000	1.5	12,000	36,000
Merchants, land, greater	3,264		6	19,584	1.5	4,896	14,688
Merchants, land, lesser	13,057		6	78,342	1.5	19,586	58,757
Shopkeepers and tradesmen	101,704	101,704	4.5	457,668			457,668
Artisans and craftsmen	6,745		4	26,980			26,980
Manufacturers	162,863	244,295	4.5	732,883.5			732,884
Building trades	73,018	73,018	4.5	328,581			328,581
Miners	14,240		4.5	64,080			64,080
Freeholders, greater	27,568	27,568	7	192,976	2.5	68,920	124,056
Freeholders, lesser	96,490	96,490	5	482,450	0.5	48,245	434,205
Farmers	103,382	103,382	5	516,910	0.5	51,691	465,219
Husbandmen	175,000	175,000	4	700,000			700,000
Naval officers	5,000		4	20,000			20,000
Military officers	4,000		4	16,000			16,000
Common seamen	50,000		3	150,000			150,000
Common soldiers	35,000		2	70,000			70,000
Labourers and outservants	284,997	71,249	3.5	997,490			997,490
Cottagers and paupers	138,183	138,183	3.25	449,095			449,095
Vagrants	23,489		1	23,489			23,489
Totals	1,390,586	731,831		5,820,572		360,745	5,459,827
Domestic servants	191,889					191,889	
Farm servants	168,856					168,856	
Grand totals	1,751,331			5,820,572		360,744.5	5,459,827

Table A1. *Continued*

	<i>Average family income</i>	<i>Average net family income</i>	<i>Total family income</i>	<i>Total net family income</i>	<i>Rents</i>	<i>Profits</i>	<i>Wages</i>	<i>Residual wages per worker</i>
Temporal lords	6,060	5,741	1,212,000	1,148,100	1,148,100			
Spiritual lords	1,300	1,161	33,800	30,173	30,173			
Baronets	1,500	1,397	1,200,000	1,117,200	1,117,200			
Knights	800	724	480,000	434,100	434,100			
Esquires	563	513	1,687,500	1,539,000	1,539,000			
Gentlemen	280	249	4,200,000	3,727,500	3,727,500			
Greater offices	240	209	1,200,000	1,042,500			1,042,500	209
Lesser offices	120	107	600,000	532,500			532,500	107
Law	154	132	1,241,548	1,060,153			1,060,153	132
Clergy, greater	72	68	144,000	135,000	135,000			
Clergy, lesser	50	46	500,000	455,000	455,000			
Sciences and liberal arts	60	56	773,880	715,839			715,839	56
Merchants, sea, greater	400	369	800,000	737,000		617,000	120,000	60
Merchants, sea, lesser	200	187	1,600,000	1,492,000		1,252,000	240,000	30
Merchants, land, greater	400	387	1,305,600	1,261,536		1,065,696	195,840	60
Merchants, land, lesser	200	187	2,611,400	2,435,131		2,043,421	391,710	30
Shopkeepers and tradesmen	45	45	4,576,680	4,576,680		1,525,560	3,051,120	15
Artisans and craftsmen	200	200	1,349,000	1,349,000		1,146,650	202,350	30
Manufacturers	38	38	6,188,794	6,188,794			6,188,794	15
Building trades	25	25	1,825,450	1,825,450			1,825,450	13
Miners	15	15	213,600	213,600			213,600	15
Freeholders, greater	91	69	2,508,688	1,888,408	1,153,996	376,303	358,108	6
Freeholders, lesser	55	51	5,306,950	4,872,745	2,441,197	796,043	1,635,506	8
Farmers	43	38	4,393,735	3,928,516		1,220,482	2,708,034	13
Husbandmen	12	12	2,100,000	2,100,000	966,000	315,000	819,000	2
Naval officers	80	80	400,000	400,000			400,000	80
Military officers	60	60	240,000	240,000			240,000	60
Common seamen	20	20	1,000,000	1,000,000			1,000,000	20
Common soldiers	14	14	490,000	490,000			490,000	14
Labourers and outservants	15	15	4,274,955	4,274,955			4,274,955	12
Cottagers and paupers	7	7	898,190	898,190			898,190	3
Vagrants	2	2	46,978	46,978			46,978	2
Total			55,402,748	52,156,047				
Domestic servants		9		1,726,997			1,726,997	9
Farm servants		9		1,519,704			1,519,704	9
Total			55,402,748	55,402,748	13,147,266	10,358,154	31,897,327	
Factor shares					24%	19%	58%	

Sources: Lindert and Williamson, 'Revising', p. 393, and text.

Table A2. *Massie's social table (revised), England and Wales, 1759*

	<i>Families = men</i>	<i>Women and children</i>	<i>People per family</i>	<i>Total people</i>	<i>Servants per family</i>	<i>Total servants</i>	<i>People minus servants</i>
Temporal lords	150		40	6,000	35.5	5,325	675
Spiritual lords	160		20	3,200	15.5	2,480	720
Baronets	320		16	5,120	11.5	3,680	1,440
Knights	640		13	8,320	8.5	5,440	2,880
Esquires	800		10	8,000	5.5	4,400	3,600
Gentlemen	16,000		8	128,000	3.5	56,000	72,000
Offices	16,000		7	112,000	2.5	40,000	72,000
Law	12,000		7	84,000	2.5	30,000	54,000
Clergy, greater	2,000		5	10,000	0.5	1,000	9,000
Clergy, lesser	9,000		5	45,000	0.5	4,500	40,500
Sciences and liberal arts	18,000		5	90,000	0.5	9,000	81,000
Merchants, sea, greater	1,000		8	8,000	3.5	3,500	4,500
Merchants, sea, lesser	2,000		6	12,000	1.5	3,000	9,000
Merchants, land, greater	10,000		6	60,000	1.5	15,000	45,000
Merchants, land, lesser	17,500		6	105,000	1.5	26,250	78,750
Shopkeepers and tradesmen	170,000		4.5	765,000			765,000
Capitalists	17,500		5	87,500	0.5	8,750	78,750
Manufacturers	222,975	334,463	4.5	1,003,388		0	1,003,388
Building trades	111,477	111,477	4.5	501,647			501,647
Miners	14,300	14,300	4.5	64,350			64,350
Freeholders, greater	60,373	60,373	7	422,611	2.5	150,933	271,679
Freeholders, lesser	80,498	80,498	5	402,490	0.5	40,249	362,241
Farmers	103,977	103,977	5	519,885	0.5	51,989	467,897
Husbandmen	134,160	134,160	4	536,640			536,640
Naval officers	6,000		4	24,000			24,000
Military officers	2,000		4	8,000			8,000
Common seamen	60,000		3	180,000			180,000
Common soldiers	18,000		2	36,000			36,000
Labourers and outservants	240,000	60,000	3.5	840,000			840,000
Cottagers and paupers	178,892	178,892	3.25	581,399			581,399
Vagrants	13,418		1	13,418			13,418
Totals	1,539,140			6,670,967			6,209,472
Domestic servants	209,575					209,575	
Farm servants	243,170					243,170	
Grand totals	1,991,885			6,670,967			

Table A2. *Continued*

	<i>Average family income</i>	<i>Average net family income</i>	<i>Total family income</i>	<i>Total net family income</i>	<i>Rents</i>	<i>Profits</i>	<i>Wages</i>	<i>Residual wages per worker</i>
Temporal lords	12,177	11,816	1,826,532	1,772,377	1,772,377			
Spiritual lords	6,088	5,931	974,150	948,929	948,929			
Baronets	3,044	2,927	974,150	936,725	936,725			
Knights	1,522	1,436	974,150	918,826	918,826			
Esquires	1,218	1,162	974,512	929,764	929,764			
Gentlemen	472	436	7,546,592	6,977,072	6,977,072			
Offices	68	42	1,084,800	678,000			678,000	42
Law	226	201	2,712,000	2,406,900			2,406,900	201
Clergy, greater	113	108	226,000	215,830	215,830			
Clergy, lesser	56	51	508,500	462,735	462,735			
Sciences and liberal arts	68	63	1,220,400	1,128,870				
Merchants, sea, greater	678	642	678,000	642,405		574,605	1,128,870	63
Merchants, sea, lesser	452	437	904,000	873,490		805,690	67,800	68
Merchants, land, greater	226	211	2,260,000	2,107,450		1,429,450	678,000	34
Merchants, land, lesser	194	178	3,390,000	3,123,037		2,529,787	593,250	34
Shopkeepers and tradesmen	51	51	8,599,300	8,599,300		2,836,300	5,763,000	17
Capitalists	97	92	1,700,000	1,611,013		1,017,763	593,250	34
Manufacturers	35	35	7,720,289	7,720,289			7,720,289	14
Building trades	29	29	3,221,023	3,221,023			3,221,023	14
Miners	26	26	371,657	371,657			371,657	13
Freeholders, greater	115	89	6,913,082	5,378,099	3,180,018	1,036,962	1,161,119	10
Freeholders, lesser	43	38	3,456,584	3,047,252	1,590,029	518,488	938,735	6
Farmers	58	53	6,026,301	5,497,578		1,673,973	3,823,606	18
Husbandmen	18	18	2,425,613	2,425,613	1,115,782	363,842	945,989	4
Naval officers	90	90	542,400	542,400			542,400	90
Military officers	113	113	226,000	226,000			226,000	113
Common seamen	23	23	1,356,000	1,356,000			1,356,000	23
Common soldiers	16	16	284,760	284,760			284,760	16
Labourers and outservants	20	20	4,746,000	4,746,000			4,746,000	16
Cottagers and paupers	7	7	1,313,962	1,313,962			1,313,962	4
Vagrants	2	2	30,325	30,325			30,325	2
Totals			75,187,082	70,493,678				
Domestic servants	10		2,220,365	2,220,365			2,220,365	
Farm servants	10		2,473,039	2,473,039			2,473,039	
Grand totals			75,187,082	75,187,082	19,048,085	12,786,859	43,352,137	
Factor shares					25%	17%	58%	

Sources: Lindert and Williamson, 'Revising', pp. 396–7, and text.

Table A3. *Colquhoun's social table (revised), England and Wales, 1798*

<i>Group</i>	<i>Families = men</i>	<i>Women and children</i>	<i>People per family</i>	<i>Total people</i>	<i>Servants per family</i>	<i>Total servants</i>	<i>People minus servants</i>
Peers	287		25	7,175	20.5	5,884	1,292
Bishops	26		15	390	10.5	273	117
Baronets	540		15	8,100	10.5	5,670	2,430
Knights	350		10	3,500	5.5	1,925	1,575
Esquires	6,000		10	60,000	5.5	33,000	27,000
Gentlemen	20,000		8	160,000	3.5	70,000	90,000
High offices	2,000		7	14,000	2.5	5,000	9,000
Low offices	10,500		5	52,500	0.5	5,250	47,250
Eminent clergy	1,000		6	6,000	1.5	1,500	4,500
Lesser clergy	10,000		5	50,000	0.5	5,000	45,000
Dissenting clergy	2,500		5	12,500	0.5	1,250	11,250
Lawyers	11,000		5	55,000	0.5	5,500	49,500
University teachers	500		4	2,000	0	0	2,000
School teachers	20,000		6	120,000	1.5	30,000	90,000
Liberal arts	16,300		5	81,500	0.5	8,150	73,350
Theatre	1,000		4	4,000	0	0	4,000
Lunatics	40		10	400	5.5	220	180
Merchants, greater	2,000		10	20,000	5.5	11,000	9,000
Merchants, lesser	13,000		7	91,000	2.5	32,500	58,500
Shopkeepers	74,500	74,500	5	372,500	0.5	37,250	335,250
Clerks	60,000	60,000	5	300,000	0.5	30,000	270,000
Shipowners	5,000		5	25,000	0.5	2,500	22,500
Warehouse owners	500		6	3,000	1.5	750	2,250
Publicans	50,000	50,000	5	250,000	0.5	25,000	225,000
Peddlers	800	800	5	4,000	0.5	400	3,600
Manufacturers	25,000		6	150,000	1.5	37,500	112,500



Table A3. *Continued*

<i>Group</i>	<i>Families = men</i>	<i>Women and children</i>	<i>People per family</i>	<i>Total people</i>	<i>Servants per family</i>	<i>Total servants</i>	<i>People minus servants</i>
Shipbuilders	300		6	1,800	1.5	450	1,350
Tailors, etc.	25,000	25,000	5	125,000	0.5	12,500	112,500
Engineers	5,000		5	25,000	0.5	2,500	22,500
Workers in manufacturing	445,726	668,589	4.5	2,005,767	0	0	2,005,767
Labourers in mines	40,000	40,000	4.5	180,000	0	0	180,000
Freeholders, greater	40,000	40,000	5.5	220,000	1	40,000	180,000
Freeholders, lesser	120,000	120,000	5	600,000	0.5	60,000	540,000
Farmers	160,000	160,000	6	960,000	1.5	240,000	720,000
Naval officers	7,000		5	35,000	0.5	3,500	31,500
Military officers	13,064		5	65,320	0.5	6,532	58,788
Naval personnel	52,906		3	158,718	0	0	158,718
Merchant sailors	49,393		3	148,179	0	0	148,179
Soldiers	121,985		2	243,970	0	0	243,970
Male and female agricultural labourers	340,000	100,000	4.5	1,530,000	0	0	1,530,000
Paupers at work	260,179		4	1,040,716	0	0	1,040,716
Vagrants	175,218		1	175,218	0	0	175,218
Debtors	2,000		5	10,000	0.5	1,000	9,000
Lunatics	2,500		1	2,500	0	0	2,500
King	1		50	50	45.5	45.5	4.5
Half-pay officers	4,015		5	20,075	0.5	2,007.5	18,068
Pensioned soldiers	30,500		1	30,500		0	30,500
Totals	2,227,630			9,430,378		724,056.5	8,706,322
Farm servants	340,000					340,000	
Domestic servants	384,057					384,057	
Grand totals	2,951,687			9,430,378			

Table A3. *Continued*

<i>Group</i>	<i>Average family income</i>	<i>Average net family income</i>	<i>Total family income</i>	<i>Total net family income</i>	<i>Rents</i>	<i>Profits</i>	<i>Wages</i>	<i>Residual wages per worker</i>
Peers	8,000	7,590	3,296,000	3,178,330	1,860,497	1,317,833		
Bishops	4,000	3,790	104,000	98,540	88,686	9,854		
Baronets	3,000	2,790	1,620,000	1,506,600	1,355,940	150,660		
Knights	1,500	1,390	525,000	486,500	437,850	48,650		
Esquires	1,500	1,390	9,000,000	8,340,000	7,506,000	834,000		
Gentlemen	700	630	15,000,000	13,600,000	11,240,000	2,360,000		
High offices	800	750	1,600,000	1,500,000			1,500,000	750
Low offices	200	190	2,100,000	1,995,000			1,995,000	190
Eminent clergy	500	470	500,000	470,000				
Lesser clergy	120	110	1,200,000	1,100,000	470,000			
Dissenting clergy	120	110	300,000	275,000	1,100,000			
Lawyers	350	340	3,850,000	3,740,000			275,000	110
University teachers	600	600	300,000	300,000			3,740,000	340
School teachers	150	120	3,000,000	2,400,000	300,000			
Liberal arts	260	250	4,238,000	4,075,000			2,400,000	120
Theatre	200	200	200,000	200,000			4,075,000	250
Lunatics	500	390	20,000	15,600			200,000	200
Merchants, greater	2,600	2,490	6,255,000	6,035,000			15,600	390
Merchants, lesser	800	750	11,400,000	10,750,000		5,735,000	300,000	150
Shopkeepers	150	140	11,175,000	10,430,000		8,800,000	1,950,000	150
Clerks	75	65	4,500,000	3,900,000		4,842,500	5,587,500	38
Shipowners	500	490	2,500,000	2,450,000			3,900,000	33
Warehouse owners	800	770	400,000	385,000		2,075,000	375,000	75
Publicans	100	90	5,000,000	4,500,000		347,500	37,500	75
Peddlers	40	30	32,000	24,000		750,000	3,750,000	38
Manufacturers	800	770	21,000,000	20,250,000		16,500,000	24,000	15
							3,750,000	150

Table A3. *Continued*

<i>Group</i>	<i>Average family income</i>	<i>Average net family income</i>	<i>Total family income</i>	<i>Total net family income</i>	<i>Rents</i>	<i>Profits</i>	<i>Wages</i>	<i>Residual wages per worker</i>
Shipbuilders	700	670	210,000	201,000		156,000	45,000	150
Tailors, etc.	150	140	3,750,000	3,500,000		1,625,000	1,875,000	38
Engineers	200	190	1,000,000	950,000			950,000	190
Workers in manufacturing	55	55	24,514,930	24,514,930			24,514,930	22
Labourers in mines	40	40	1,600,000	1,600,000			1,600,000	20
Freeholders, greater	200	180	8,000,000	7,200,000	4,000,000	880,000	2,320,000	29
Freeholders, lesser	90	80	10,800,000	9,600,000	5,400,000	1,188,000	3,012,000	13
Farmers	120	90	19,200,000	14,400,000		4,224,000	10,176,000	32
Naval officers	149	139	1,043,000	973,000			973,000	139
Military officers	139	129	1,815,896	1,685,256			1,685,256	129
Naval personnel	38	38	2,010,428	2,010,428			2,010,428	38
Merchant sailors	40	40	1,975,720	1,975,720			1,975,720	40
Soldiers	29	29	3,537,565	3,537,565			3,537,565	29
Labourers in agriculture	31	31	10,540,000	10,540,000			10,540,000	24
Paupers at work	10	10	2,601,790	2,601,790			2,601,790	10
Vagrants	10	10	1,752,180	1,752,180			1,752,180	10
Debtors	45	35	90,000	70,000		70,000		
Lunatics	30	30	75,000	75,000		75,000		
King	200,000	199,090	200,000	199,090	199,090			
Half-pay officers	45	35	180,675	140,525			140,525	
Pensioned soldiers	20	20	610,000	610,000			610,000	
Totals			204,622,184	190,141,054				
Farm servants				6,800,000			6,800,000	
Domestic servants				7,681,130			7,681,130	
Totals			204,622,184	204,622,184	33,958,063	51,988,997	118,675,124	
Factor shares					17%	25%	58%	

Sources: Lindert and Williamson, 'Revising', pp. 400–1, and text.

Table A4. *Smee's data retabulated for England and Wales: men, 1846*

	Total males, 20 years and over	Working-class males, 20 years and over	Working-class weekly earnings (s.)	Males, 20 years and over, paying income tax, £467/year	Males, 20 years and over, paying no tax, £100/year	Boys earning 5s./week
Trade, commerce, and manufacturing	1,872,637	1,094,720	15	91,393	686,524	340,724
Farmers and graziers	242,251			16,123	226,129	2,843
Agricultural labourers	826,117	826,117	8			167,793
Gardeners and florists	46,550	45,672	15		879	2,380
Non-agricultural labourers	516,471	516,471	11			91,145
Army	32,592	30,877	5	1,225	490	6,744
Navy and merchant	93,992	92,155	5	918	918	7,865
Professionals	53,898			25,500	28,398	2,032
Other educated	87,068			60,061	27,007	11,382
Government civil servants	14,274			9,976	4,297	234
Police and parochial officers	21,352	18,742	15	2,610		343
Domestic servants	160,505	160,505	11	62,885	64,111	89,371
Independent	126,996					5,448
Alms and pensions	69,469	69,469				30,015
Residue	255,744					3,141,255
Minors				10,132	168,875	
Total	4,419,916	2,854,728		280,825	1,207,628	3,899,573

*Sources:* See section IV.

Table A5. *Smee's data retabulated for England and Wales: women, 1846*

	Total females, 20 years and over	Working-class females, 20 years and over	Working-class weekly earnings (s.)	Females, 20 years and over, paying income tax, £200 /year	Females, 20 years and over, paying no tax, £80/year	Other middle class, £40/year	Girls earning 4s. /week
Trade, commerce, and manufacturing	418,649	321,445	10	16,201	81,004		170,540
Farmers and graziers	20,514	0		1,244	19,270		0
Agricultural labourers	30,161	30,161	5				9,839
Gardeners and florists	1,166	789	10		378		135
Non-agricultural labourers	105,746	105,746	7				7,735
Army							
Navy and merchant							
Professionals	824	419	10		405		
Other educated	32,164	9,117	15		23,047		1,936
Government civil servants	551	221	15		330		15
Police and parochial officers	1,965	1,965	7				14
Domestic servants	509,407	509,407	11				309,699
Independent	329,625		15				15,121
Alms and pensions	64,220	64,220		127,528	86,167	115,930	24,837
Residue	3,273,505						3,377,724
Total	4,788,497	1,043,489		144,972	210,601	115,930	3,917,593

*Sources:* See section IV.

Table A6. *Smee's incomes, England and Wales, 1846*

	<i>Working-class wages</i>	<i>Upper-class income</i>	<i>Middle-class income</i>	<i>Pauper income</i>	<i>Total income</i>
Trade, commerce, and manufacturing	57,254,663	45,920,905	75,132,680		178,308,248
Farmers and graziers	36,959	7,778,043	24,154,475		31,969,477
Agricultural labourers	19,838,962				19,838,962
Gardeners and florists	1,834,032		118,096		1,952,128
Non-agricultural labourers	17,960,968				17,960,968
Army	458,195	572,257	49,016		1,079,468
Navy and merchant	1,208,103	428,846	91,830		1,728,779
Professionals	37,310	11,908,586	2,872,175		14,818,071
Other educated	523,667	28,048,546	4,544,440		33,116,654
Government civil servants	11,824	4,659,000	456,133		5,126,957
Police and parochial officers	771,315	1,218,639			1,989,955
Domestic servants	23,140,221				23,140,221
Independent		54,872,795	13,306,105		68,178,900
Alms and pensions				1,336,890	1,336,890
Remaining population					0
Minors		2,026,498	3,377,497		5,403,996
Other middle-class property income			25,058,100		25,058,100
Total	123,096,220	157,434,116	149,160,546	1,336,890	431,027,773

*Sources:* See section IV.