Unequal English Wealth since 1670

Peter H. Lindert

University of California, Davis

New data on probated wealth, landownership, debts, and occupations extend our view of the distribution of English wealth back from 1911 to 1670. There were widening gaps in mean wealth between the top landed-plus-merchant classes and the middle classes across the Industrial Revolution century. Size distributions for individual assets also widened. So did those for income or total wealth (including human). But nonhuman net worth did not become more unequal because of important shifts in the land share. All inequality measures before 1914 exceeded all those since 1950. The estimates illuminate classical theories of distribution.

I. Introduction and Conclusions

Beliefs about trends in the distribution of income and wealth have long been central to damnations and defenses of capitalism. The

This research was made possible by grants SOC76-80967 and SOC79-09631 from the National Science Foundation and grant RO-26772-78-19 from the National Endowment for the Humanities, with supplemental aid from the Agricultural History Center, University of California, Davis. It is part of a larger research project on British inequality, pursued in collaboration with Jeffrey G. Williamson of Harvard University. Access to data required the active cooperation of officials in the Principal Probate Registry (Somerset House); the Registrar General's office (St. Catherine's House); archivists in most of the county record offices of England, particularly those yielding probate and landownership data (Public Record Office, Greater London Record Office, Cambridgeshire Record Office, West Suffolk Record Office, Lichfield Joint Record Office, and the Borthwick Institute); and the Cambridge Group for the History of Population and Social Structure. I particularly wish to thank Linda White Lindert, Ricardo A. Silveira Rocha, and Janet Sullivan Steiner for hundreds of hours of patient gathering and sifting; Hal Grade for computer assistance; and William Hunt, Lee Ding-Wei, Nikki Mandell, Thomas Renaghen, and Donald Wooten for additional research assistance. Helpful comments were received from an anonymous referee and from seminar participants at Berkeley, Birkbeck College (London), Chicago, Cornell, Harvard, Indiana, and Yale. All errors are mine. A much longer working paper version of this paper (Lindert 1985) can be obtained from the Agricultural History Center, University of California, Davis.

[*Journal of Political Economy*, 1986, vol. 94, no. 6]
 0022-3808/86/9406-0006$01.50

socialist critique has always leaned heavily on the allegation that the gaps between rich and poor have been widening in the leading capitalist countries, particularly Britain. Concentration of wealth underlay the very definition of the system Marx and Engels abhorred: "in extant society, private property has been abolished for nine-tenths of the population; it exists only because these nine-tenths have none of it" (Marx and Engels 1930, p. 46). George Bernard Shaw's definition of socialism was also based on the polarizing tendency of capitalism: "It is in this phase of capitalistic development, attained in Great Britain in the 19th century, that Socialism arises as a revolt against a distribution of wealth that has lost all its moral plausibility. . . . The inequalities [have] become monstrous" (Shaw 1929, p. 896).[1] The same beliefs have been voiced repeatedly in the political arena, as when Philip Snowden railed in the House of Commons that "the working people are getting poorer. The rich are getting richer. . . . They are getting enormously rich. They are getting shamefully rich. They are getting dangerously rich" (December 31, 1911; cited in Whittaker 1914, p. 44).

Two kinds of defenders of private wealth tried to throw cold water on such flames. One tradition had it that the concentration of wealth has been and should be constant. People get the economic rewards they deserve, aside from random luck, and vague natural forces have kept society near this equilibrium degree of concentration. A second defense emerged across the nineteenth century and the early twentieth: the gaps between rich and middle and poor were no longer viewed as eternal constants but were narrowing in modern Britain. This view was shared by Porter (1847), Giffen (1904/1971), Marshall (1910), and others. Its assertion of narrowing gaps was bolder, yet its tone more muted and vaguely empirical, than the earlier insistence on a constant hierarchy. Sir Robert Giffen mustered a few miscellaneous statistics to show that between 1830 and 1880 "the rich have become more numerous, but not richer individually; the 'poor' are, to some smaller extent, fewer; and those who remain 'poor' are, individually, twice as well off on the average as they were fifty years ago. The 'poor' have thus had almost all the benefit of the great material advance of the last fifty years" (1971, 1:419). A generation later, Alfred Marshall saw the same trends continuing: "It is doubtful whether the aggregate of the riches of the very rich are as large a part of the total national wealth, . . . in the United States or in England, now as they have been in some earlier phase of civilisation. . . . [Various official returns] indicate that middle-class incomes are increasing faster than those of the professional classes, and that the wages of healthy and vigorous

[1] I am indebted to my colleague John Roemer for this reference.

unskilled labourers are increasing faster even than those of the average artisan" (1910, p. 687). Thus every possible assertion about inequality trends since the onset of the Industrial Revolution was current before World War I.

They were all bluffing, of course. None of them cited any serious size distributions of income or wealth, nor even any believable average incomes or wealth holdings for major economic classes. No official statistics gave the right kind of information until the twentieth century. There were informed guesses about the size distribution of income by some earlier scholars, but these were ignored until recently. And the published probate returns used casually by Porter, Marx, and Giffen covered only a minority of the rich. Even the relative returns on land and on capital vis-à-vis wage rates were left unmeasured, despite the rich classical tradition of theorizing about rents, profits, and wages. With so few inconvenient facts blocking the way, any conclusion could be reached—or dismissed.

Clashes of values and self-interest guarantee that the long-standing debate over the causes and welfare meaning of inequality trends will continue. Fresh facts cannot eliminate a debate so stubbornly rooted, but they can limit it by promoting consensus about the empirical record.

Fortunately, better evidence is now at hand. Postwar scholarship, aided by better archives, cheaper copying, and the computer, has been able to shed new light on movements in the distribution of income since the late seventeenth century. The early conjectural income distributions by Gregory King, Joseph Massie, Patrick Colquhoun, Dudley Baxter, and Arthur Bowley have been revised and compared with each other (Lindert and Williamson 1982, 1983*b*). These income distributions have been buttressed by some indirect clues. The structure of wage and salary rates has been documented extensively (Phelps Brown and Hopkins 1955; Phelps Brown 1977; Williamson 1980, 1982). The fortunes of the superrich since 1800 have been sketched with the help of probate and tax data (Rubinstein 1981). The relative position of landlords is beginning to be documented with carefully adjusted measures of the inequality of landownership and with a rough chronology of farmland rents since the sixteenth century (Lindert 1983*a*, 1983*b*).

Yet our view of the income distribution remains tentative, and the distribution of wealth is still almost completely obscured before 1911. Each of the income-relevant materials just cited is subject to errors that may be large enough to distort our view of long-run trends.

Our view is particularly blurred for the nonemployee classes, for whom we have no wage or salary data. Only for the highest-income propertied groups can we use tax returns to cross-check the income

guesses from Colquhoun's and Baxter's nineteenth-century social tables. There is currently no independent set of information for checking the social tables' guesses about the relative incomes or wealth of capitalists or of those large self-employed middling groups: shopkeepers, farmers, yeomen, and husbandmen. To discover whether capitalists gained ground on persons of landed title or whether yeomen and others became more proletarianized, we need a data source sampling these groups heavily, a source that also allows us to construct an overall size distribution of income or wealth.

This study quadruples the length of our historical view of the distribution of English wealth and property income. The long period from a preindustrial 1670 to the onset of satisfactory published data in 1911 is spanned with the help of newly processed data on probated wealth, landownership, debts, and occupation.

Careful handling of the data yields six kinds of results. (1) The social strata moved further apart in their average personal wealth (excluding real estate) between 1740 and 1875. Merchants and persons of landed title accumulated wealth (and gained income) much faster than the rest of society over this era of Industrial Revolution. Middling groups, such as yeomen, shopkeepers, and craftsmen, accumulated less. The classic image of widening class inequality does fit these wealth-by-class movements. Yet the middling classes did gain in real wealth and income and were not replaced by any rising share of more proletarian occupations. (2) Wealth other than real estate, or gross "personal estate," became more unequally held during the Industrial Revolution era, within each region studied as well as in the national estimates. (3) When the distributions of personal estate, real estate, and debts are combined, the resulting distributions of net worth show a high level of wealth inequality in Victorian England. They do not, however, show that it had increased over the two preceding centuries as Victorian critics had implied, even though the ownership of individual types of assets had become more concentrated. (4) Shifts in age distribution played minor roles in the observed movements in wealth inequality. The shift to a younger adult population contributed to the slight inegalitarian drift from the late seventeenth century to the late nineteenth. The aging of the adult population made only a minor contribution to the pronounced leveling of the wealth distribution in this century. (5) It is possible to reconcile the apparent lack of a trend toward more concentrated net worth before 1875 with the inegalitarian trends in income, personal estate, and even total wealth (including human). The reconciliation rests on the share of wealth or income taken by land, a highly concentrated asset even today. The secular decline in land's share of wealth or income after 1740 gave a more egalitarian twist to the distribution

of net worth than it did to income or total wealth because land value has always been a higher share of nonhuman net worth. Since the distributions of income and total wealth are better measures of inequality of living standard than the distribution of nonhuman net worth, the best tentative trend summary about the inequality of English living standards is the Kuznetsian pattern: an inegalitarian trend for the Industrial Revolution era followed by a greater shift toward equality since World War I. (6) Focusing on rents, profit rates, and wage rates as the key to distribution gave the main classical economists some valid insights into the extraordinarily unequal English economy in which they lived. Incomes from rents, profits, and wages were much more segregated across size distribution classes in the nineteenth century than today. The relative neglect of human capital differences as a basis for inequality was less serious in a world in which they accounted for only about 15 percent of national income as compared with about 52 percent for Britain today. Yet their implicit belief that a rise in land rents relative to wage rates meant greater inequality was misleading. Average wealth and income did rise faster for landowners (and capitalists) than for others over the Industrial Revolution era, but the shift of population, income, and wealth away from land was imparting a subtle egalitarian trend even before the classical treatises were written.

II. Data Sets and Estimation Strategy

To measure private wealth in England and Wales before the twentieth century, one must put several kinds of puzzle pieces together. The best starting point is the probate inventory, the only kind of document that consistently measured wealth for persons from all classes above paupers.[2] Under ecclesiastical and civil law, English probate appraisers were given consistent instructions to value all personal estate, or "personalty," which was all gross nonhuman assets with one annoying exception: real estate was omitted before 1894, aside from the value of current leases. This study thus begins by estimating the distribution of personalty alone from probate samples, securing some clear initial results about wealth patterns by occupational class and their links to overall inequality. Adding real estate and debts takes some labor and some wide margins of error. For 1873–75, it has been possible to link about half of real estate with individual personal estates, using the estate-multiplier methods described below. Assump-

[2] Even pauper inventories do exist, however (Cornford 1970). For more detailed discussions of the nature and availability of probate inventories, see Jones (1977) and Lindert (1981).

tions are added about the other half of real estate. For earlier dates, realty and personalty are hooked differently, using mean ratios of the one to the other for each occupational class, as inferred from the probate samples and the revised income tables of 1688, 1759, 1803, and 1867 (using Lindert and Williamson 1982, 1983*b*). The resulting view of gross nonhuman wealth is then converted into distributions of net worth with limited information on how debts varied across the classes of gross assets.

The key probate data survive in abundance for England and Wales from the early seventeenth century to the mideighteenth and from 1796 on. For the period 1660–1740, detailed probate inventories survive for about a fifth of all dying household heads.[3] Church administration of the technical probate requirement then became completely lax, leaving almost no inventories for the late eighteenth century. Then a light probate tax was imposed from 1797 on, remaining below 2 percent even for millionaires until the 1880s (Soward and Willan 1919).[4] While there is no public access to samples of detailed inventories from the nineteenth or twentieth centuries, summary calendar entries give names, occupations, estate values, places of residence, and a few other details for the probate population, which was again nearly a fifth of dying household heads.

To sample probates from the available periods, I have selected four regions and six benchmark dates. The choice of regions is dictated by research convenience and a desire to include regions with varied economic history. The first region, London-Middlesex, could not be avoided in any serious study of English inequality, given the gravita-

[3] In what follows the population of potential wealth holders will be referred to as "households," meaning males over 20 plus females with stated occupations and widows and spinsters (for 1858 and 1875, just widows and spinsters over 35). Other population concepts are possible, of course, and tables 3 and 4 below switch to the total adult population in order to match the concept used in most twentieth-century estimates. No attempt has been made here to divide each household's wealth by a measure of household size or adult consumer equivalents. Doing so would probably reinforce the present conclusions about trends.

[4] In such low-tax settings, there should also have been little reason to give inter vivos transfers in a way that would confound an attempt to infer the wealth distribution of the living from wealth at death. The mere existence of inter vivos transfers between generations does not impart any bias per se: the more the transfers, the greater the relative wealth of the young, a tendency accurately reflected in an age-adjusted probate sample. A distortion could arise only if the approach of death itself greatly increased inter vivos transfers, perhaps doing so differently for different wealth classes. But in the absence of heavy estate taxes, the main incentive should have been to retain ownership and control until death. One could still fear that high medical costs just before death might make the wealth of decedents a poor measure of the wealth of the living. But this fear also seems misplaced. We all have to go sometime, and the medical costs to be incurred in the approach of death should in fact be deducted from any concept of the wealth of the living, even if death is not imminent. Such costs were, in any case, very small before the medical changes of the twentieth century.

tion of the rich and poor toward the metropolis. A single archive at Lichfield offered probates for four counties in the West Midlands (Derby, Shropshire, Staffordshire, and Warwickshire). Another covered the East and West Ridings of Yorkshire, and Cambridgeshire was added to include a rural southern county. For these regions the entire probate population was drawn for four benchmark dates: 1,354 probates for "1670" (1669–70, excluding Yorkshire), 1,915 for "1700" (1699–1700), 1,488 for "1740" (1739–41), and 4,245 for 1810. For 1875, 1:4 samples were drawn for the same regions, except that the full probate population was again taken for Cambridgeshire, giving 3,579 probates in all. Finally, an obscure Parliamentary tabulation (Great Britain, House of Commons 1861) gives details on the whole probate population of England and Wales for 1858 (28,753 probates).

Converting the probate materials into national distributions of personal estate requires a whole Bayesian strategy for dealing with a wide range of likely errors and biases. Sampling error is the least of our worries: with samples in the thousands, even a 50 percent standard error in wealth appraisal at the level of the individual gives only a negligible error in aggregate inequality statistics. Much more serious are systematic social biases in the probates and uncertainties about how personalty, realty, and debts were correlated across individuals.

The probate population is a socially biased segment of society, overrepresenting the elderly, the middling agricultural classes, and merchants (Main 1974; Smith 1975; Lindert 1981). Most of the social biases can be removed by using the estate-multiplier method to magnify each probate sample cell by its own ratio of true to probate population. This is done here, using large numbers of cells defined by five wealth-determining dimensions (sex, occupation, region, date, and age). But biases may remain. Perhaps the ratio of true living persons to probated persons still varies systematically with wealth within cells, biasing any measure of the mean or dispersion of wealth based on cell magnification alone. Or the numbers of living persons for the different cells may be misestimated.[5] Or the wrong multipliers may be assigned to sample regions when trying to synthesize England and Wales from four regions.

So serious are the biases just mentioned, and some lesser obstacles faced below, that a cataloging of the main types of error in the estate-multiplier estimates and the ways of limiting them needs to precede any results. The estimation procedure is detailed in the Appendix and summarized briefly here.

[5] The occupational distributions of the living, by sex and date, were estimated for England and Wales with wide ranges of error in Lindert (1980) and in underlying calculations for all regions.

Mapping the distribution of wealth begins with a simple distinction between probated personal estate (w_{pi}) and the unknown true personal estate of the same ith probate person (w_{ti}). The two differ by the percent error e_i:[6] $w_{pi} = w_{ti} + e_i$. As long as e_i has a zero mean, the best estimate of w_{ti} is simply the probated wealth w_{pi}.

Each ith probated person will be allowed to represent m_i persons in the overall population. The head count multiple m_i depends on i's observable attributes (i.e., on sex, occupation, region, date, and age). As noted above, the wealth of the ith probated person is probably not a fair portrayal of the wealth of the m_i living persons having the same attributes. For every jth living person in this group of m_i persons ($j = 1, \ldots, m_i$), true personal wealth (w_{ji}) departs from the true wealth of his/her probated representative by the cell-specific bias s_i and the individual random influence e_j. That is,

$$w_{ji} = w_{ti} + s_i + e_j,$$

so that

$$w_{ji} = w_{pi} + s_i + e_j - e_i.$$

The three errors separating the living person's wealth (w_{ji}) from the probated representative's wealth (w_{pi}) are not of equal importance. As noted above, the probate samples are large enough for us to set aside the probate sampling error e_i in judging aggregate distributions. The other random error, the e_j specific to an individual in the overall population, will also dwindle away in practice. Little true variance is lost by aggregating the living population into groups as numerous as the probated persons, given that the groups are defined by those attributes (sex, occupation, region, date, and age) capturing a high proportion of wealth differences.

More formidable is the task of deciding what values to assign to the systematic bias terms, the head count multiples (m_i) and the systematic wealth distortions (s_i). The possible errors here are too special in their likely patterns to submit to classical statistical inference. We must introduce outside (nonsample) information to get confidence interval bounds on the m_i's and s_i's. These bounds must be "conservative" in the sense of yielding defensible outer bounds on inequality statistics. In what follows, wealth inequality will be portrayed by three sets of estimates: *too equal* estimates virtually certain to understate each wealth inequality parameter, *too unequal* estimates virtually certain to

[6] The terms w_{pi} and w_{ti} are viewed as logarithms of wealth here so that the error terms can be thought of as approximate percentages. No results depend on this minor convenience.

err in the opposite direction, and *preferred*, or best-guess, estimates. At several steps in the estimation process,[7] detailed in the Appendix, clearly biased assumptions are used in the too equal and too unequal estimates. The combination of several such biases, each in the same too equal or too unequal direction, should suffice to outweigh any other errors that have gone unquantified here. The bounds succeed in being narrow enough to reject many null hypotheses about personal estate in Section III, but in the later sections on net worth, available data leave bounds so wide that most further conclusions are based on best predictions alone, without firm rejection of several competing hypotheses.

III. Unequal Personal Estates, 1670–1875

The procedures sketched above and in the Appendix are first applied to the distribution of personal estate alone, without real estate or debts, before turning to the distribution of overall net worth. While personalty alone is not the most welfare-relevant of wealth measures, it has the advantage of being based on the probate samples, which also yield micro data on sex, region, occupation, and (for 1875) age. Using the more limited wealth measure establishes some patterns that could not have been seen so clearly had I relied solely on tentative measures of net worth or income.

Some of the trends shown by the preferred (best-guess) estimates of personal estate conform to expectation. The aggregate values of personalty approximate the values implied by past aggregate wealth studies. The average values per household head, in constant prices, rose only moderately before 1740 and much faster thereafter, as one would expect during accelerating industrialization. Women came to own a rising share of personal wealth in their own names, both because they were a rising share of household heads and because the average wealth of female household heads advanced from about 35 percent of the male average in the seventeenth century to about 65 percent in 1875. And after 1740, the Midlands and North accumulated personal wealth faster than London and the South, as narrative accounts have long suggested.

[7] One particular source of possible error was left unquantified by the steps taken in the App. Errors in the estimated occupational counts (from Lindert 1980; 1985, tables C1–C6, C14) were not embodied in the too equal and too unequal estimates for want of a convenient specification of bounds. Yet none of the possible occupational miscounts I have examined and discussed would shift wealth inequality parameters enough to violate the outer bounds set here.

A. *Occupational Gaps*

More controversy has surrounded the changing relationship of wealth to socioоccupational class. The different classes of England and Wales shared very unequally in the national gains in personal estate. Table 1 and figure 1 reveal that merchants and persons of landed title had accumulated personalty much faster than the rest of society between 1740 and 1875.[8] These two classes will continue to stand out, both in wealth level and in rate of accumulation, after we have added real estate and considered debt patterns. The top percentile of household heads consisted almost entirely of titled persons and "merchants" (including financiers and industrialists) throughout the two centuries spanned here. Any explanation of overall inequality movements must include why these two occupational groups, each a slowly declining share of all households, acquired personal wealth so much faster than the rest of society between 1740 and 1875.

The timing of the personal wealth gains of the titled and merchant classes may well have followed the course suggested by figure 1 and table 1. Neither gained much during the relative stagnation and rising taxation of the late seventeenth century. By 1740, the merchants had gained on the more landed titled class, both in the personal wealth shown here and in their likely realty holdings, as befits a period of return to relative peace and declining terms of trade for agriculture. The change from 1740 to 1810 accompanied the opposite conditions: a shift to wartime trade barriers, dear food, and rising land rents. Perhaps for these reasons merchants, especially those in London, failed to stand out in the 1810 probates. Across the early and mid-nineteenth century, these two elites soared above the rest of society. The gain is particularly pronounced for the merchant group, which is defined to include financiers and industrial capitalists whenever the data gave labels allowing us to separate the latter from other industrial occupations. By the middle of Victoria's reign, the pattern was stark: wealth, and income as well,[9] accrued to those who made their living from property itself, far more than to those whose occupational labels bespoke human earnings.

[8] Part, but only part, of this widening may have been artificial. It may be that the accepted definition of merchant or titled status may have become more a function of total wealth itself in the nineteenth century than it had been earlier. Or part of the occupational widening may stem from inadvertent biases in data processing. Yet the apparent widening seems to have been too marked to have been a complete mirage. Nor was it merely the result of a twist in class saving rates unrelated to the distribution of incomes since the class income averages moved in the same manner as class wealth averages.

[9] On the concentration of income into propertied classes, see Baxter (1868) and table 6 below for 1867, and Lindert and Williamson (1982, 1983*b*) for earlier dates.

TABLE 1

ESTIMATED AVERAGE PERSONAL ESTATES OF LIVING MEN AND WOMEN IN SELECTED OCCUPATIONS: ENGLAND AND WALES, 1670–1875

Occupation	1670	1700	1740	1810	1858	1875
	Average Personal Estate (£ at prices of 1875)					
Titled (gentlemen and up)	552	453	563	2,032	3,036	9,855
Merchants	296	307	573	608	5,917	11,804
Professionals	. . .*	. . .	. . .	607	1,063	1,201
Farmers, yeomen, husbandmen	120	117	164	220	411	581
Farmers	. . .	. . .	. . .	354	595	800
Yeomen	199	153	178	256	314	465
Husbandmen	60	82	96	. . .	247	. . .
Shopkeepers	149	160	195	304	641	606
Industrial trades	101	101	110	345	687	523
Building trades	. . .	. . .	. . .	160	316	330
Laborers	(22)†	22	(27)†	101	81	143
All men (including others)	100	108	135	303	571	636
Female household heads	37	37	67	173	382	405
	Estimated Numbers of Household Heads (1,000's)					
Titled	23.0	22.6	27.3	21.9	22.5	25.1
Merchants	30.9	30.1	40.1	41.7	52.0	61.1
Professionals	50.5	49.4	57.0	73.8	245.2	299.0
Farmers, yeomen, husbandmen	219.2	227.4	254.2	320.0	330.9	407.6
Farmers	. . .	. . .	112.5	160.0‡	144.5	134.4
Yeomen	72.1	68.6	81.9	40.0‡	62.3	57.6
Husbandmen	147.1	158.8	59.8	120.0‡	124.1	155.6
Shopkeepers	100.7	112.8	94.9	111.4	107.8	155.3
Industrial trades	222.4	197.9	245.6	415.1	2,055.4	2,343.7
Building trades	68.3	115.6	95.2	232.6	476.9	492.0
Laborers and paupers	525.6	446.3	572.0	779.9	1,384.8	1,503.5
All men (including others)	1,379.0	1,373.8	1,512.3	2,328.5	5,005.2	6,189.4
Female household heads	206.1	233.6	258.4	311.3	746.9	911.5

SOURCE.—Lindert (1985), tables 3, C1–C6, C14, E7, E8, Z7–Z10, app. F.

NOTE.—To calculate nominal values from these 1875 price values, multiply by the following price deflators: 1670 = .7543, 1700 = .8768, 1740 = .8416, 1810 = 1.8513, and 1858 = .9646, where 1875 = 1.0000. The numbers of men in each occupational group are *very* rough estimates. They represent compromises between three approaches, as described in Lindert (1985, app. table C14): (1) the approach described in this study, expanding from regression-based estimates to the four regions; (2) aggregates from regression-based estimates for all counties, as reported in Lindert (1980); and (3) gleanings from the revised tables in Lindert and Williamson (1982).

* Not reported because this group left too few probate inventories for a reliable average.

† Average value based on fewer than 28 probates and therefore cited here as only a vague suggestion.

‡ The definitional distinctions between farmers, yeomen, and husbandmen are different in the source materials for 1811 from the distinctions drawn for earlier dates.

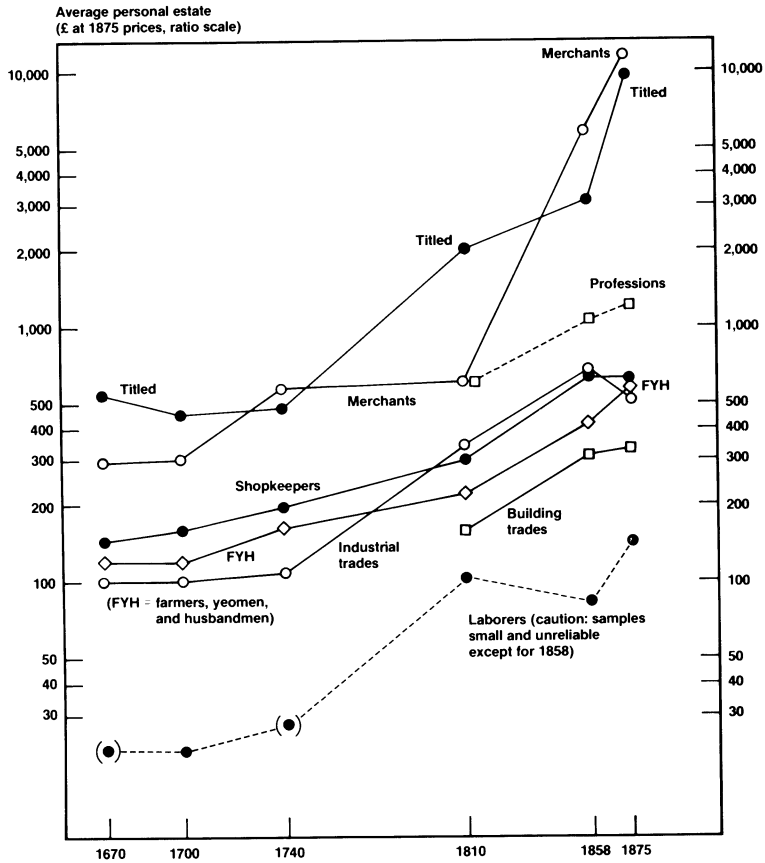

FIG. 1.—Average personal estate of living men in selected occupations, 1670–1875. See notes to table 1.

What of the "middle classes" below merchants and top capitalists? Marx and Engels saw them as sinking inexorably: "Those who have hitherto belonged to the lower middle class—small manufacturers, small traders, minor recipients of unearned income, handicraftsmen, and peasants—slip down, one and all, into the proletariat" (1930, p. 35). Giffen and Marshall said exactly the opposite later in the nineteenth century, as quoted above. The wealth results force revisions of both views.

If we judge the position of a middle-class occupation by what happened to the average absolute personal wealth of men in that occupation, figure 1 shows an optimistic picture. For shopkeepers, craftsmen, and the middle agricultural classes (farmers, yeomen, and husbandmen), average personal estate more than doubled across the century of Industrial Revolution. This represented an acceleration

over the preindustrial era, to judge from the slower progress of 1670–1740. The progress of occupational wealth supports the assertions of Giffen and Marshall about absolute advance, though they were clearly wrong about the relative advances of upper and middle classes.

When generations are being compared, however, it might be misleading to compare the fortunes of persons within the same occupation. In what sense were the yeomen or shopkeepers of 1875 the descendants of the yeomen and shopkeepers of 1740? The whole population grew, some occupations grew faster than others, and individual family lines rose and fell through the occupational ranks. Marx, Engels, and other pessimistic critics might have been on the mark if the lowest-ranked occupations were a rising share of the labor force, netting many of the descendants of the previous middle classes.

The occupational counts in the lower half of table 1 address the possibility that some classes replaced others over the course of these two centuries. The available guesses do not show a rising share of workers and paupers. Rather their share fell, especially in the nineteenth century. So if the declining share of farmers, yeomen, husbandmen, and shopkeepers found their descendants in another occupational category, the most likely destination would be those industrial trades with similarly middling wealth, not the ranks of poverty. As best as I can tell from personal estate data and from wobbly guesses about the numbers of laborers and paupers, the middle classes could not have sunk in absolute wealth in any net sense. This result will be sustained when I come to the issue of landownership below.

The average wealth of that large laboring class at the bottom of the social ranks is hard to judge from probate data. As mentioned above, very few probate appraisals survive for laborers, and the surviving ones may have been atypical. At face value, the average for laborers in figure 1 shows large improvement between 1740 and 1810 and curious inconsistency of trend in the nineteenth-century figures. The series for laborers cannot be taken at face value, however. Only the 1858 national sample drew a large number of laborers. For the moment, I can say only that the probate results put the laborers on the bottom, as one would expect, with no clear confirmation or contradiction of living standard trends already documented by wage and other data (Lindert and Williamson 1983*a*).

B. Inequality Movements

The overall inequality in personal estate (still excluding real estate) can now be summarized on the basis of the procedures spelled out

above. Of the various summary size distribution measures, the ones used here are the shares of wealth held by the top 1, 5, and 10 percent of the population. Such top quantile shares are less sensitive than other summary measures to estimation errors within the lower reaches of the Lorenz curve, where accuracy is less certain. Wealth will prove so concentrated in England and Wales, especially when all assets and debts are considered, that the shares held by the top 1, 5, and 10 percent suffice to stake out almost the entire Lorenz curve.

The inequality results for personal estate are consistent and robust. The same movements show up in all three types of estimates (preferred, too unequal, and too equal) for all four sample regions and for either men alone or household heads of both sexes together. Table 2 gives the top quantile shares of personal estate. There was no clear trend in the preindustrial era 1670–1740. However, during the Industrial Revolution era, 1740–1858, the gap between the rich and the rest of society widened. The top 1 percent gained enormously, while the share going to the bottom 95 percent dropped. The ratio of the average personal estate of the top 1 percent to that of the bottom 95 percent jumped from 32 in 1740 to 92 in 1858 and 106 in 1875.

The inegalitarian trend in the distribution of personal estate is unmistakable despite the ranges of possible error in each estimate. If one picks any one set of consistent assumptions about estimation biases—the too equal, too unequal, or preferred—the same shift stands out in all regions or (in table 2) for the nation, and for one or both sexes. The only way to pare down the increase in inequality is to imagine that the biases discussed in the Appendix shifted perversely, from too unequal biases toward too equal biases, between 1740 and 1810 and again between 1810 and 1858. Even with such an unlikely perversity, the inequalities of 1858–75 would exceed either those of 1700–1740 or those of the 1970s. Thus far, we seem to have a pattern like the famous Kuznets curve for income inequality (Kuznets 1955), with the period of rising inequality encompassing the lifetime of Marx.

IV. From Personalty to Net Worth

By focusing on the distribution of personal estate alone, Section III was able to reach clear conclusions about overall inequality and its correlation with gaps in average wealth between the occupational classes. It is likely that our future view of historic trends in the inequality of net worth, total wealth (including human), and income will resemble the trends shown in tables 1 and 2. For the present, however, this pattern will emerge only as a suggestion, without strong confidence bound results, when real estate and debts have been added to personal estate, to develop tentative estimates of how net

TABLE 2

TOP QUANTILE SHARES OF GROSS PERSONAL ESTATE, HOUSEHOLD HEADS OF BOTH SEXES, ENGLAND AND WALES, 1670–1875

	1670	1700	1740	1810	1858	1875
	A. Share (%) of Total Personal Estate Held by the Top 10 Percent					
Too equal estimates	47.8	59.6	50.4	58.9	70.1	68.4
Preferred estimates	58.3	60.4	57.7	60.9	77.1	76.7
Too unequal estimates	83.9	85.5	76.2	85.9	92.1	92.4
	B. Share (%) Held by the Top 5 Percent					
Too equal estimates	32.7	37.3	37.1	47.5	59.1	55.2
Preferred estimates	42.8	41.6	41.8	47.8	65.1	65.7
Too unequal estimates	60.5	68.2	52.7	64.4	75.9	77.7
	C. Share (%) Held by the Top 1 Percent					
Too equal estimates	15.9	17.3	18.2	23.8	30.5	26.4
Preferred estimates	24.1	19.6	19.4	24.5	33.7	38.3
Too unequal estimates	29.4	33.1	23.9	33.4	39.4	50.8
	D. Total Personal Estate (£ Millions, Current Prices)					
Too equal estimates	112.6	146.6	228.9	1,482.7	3,374.6	4,069.2
Preferred estimates	109.2	137.2	185.3	1,403.5	3,033.2	4,306.9
Too unequal estimates	60.6	72.4	122.7	1,161.8	3,429.3	3,755.1

SOURCE.—Lindert (1985), tables 2, 6, apps. E, F.

NOTE.—By comparison, the top quantile shares of personal estate (still excluding real estate) among potential wealth holders in Great Britain in 1973 were (Royal Commission on the Distribution of Income and Wealth 1975, pp. 79–82): top 1 percent holding 16.6 percent of personalty, top 5 percent holding 27.8 percent, and top 10 percent holding 35.1 percent. (These are slight underestimates, however, since they are based on data grouped by net worth class rather than personal estate class.)

worth was distributed. Turning to net worth temporarily complicates the view of inequality trends in another way as well: it yields results that seem at first to cancel any trend toward inequality after 1740. This section presents the subtleties of inequality of net worth, and Section V aligns them with other evidence about the distribution of overall material well-being.

A. *Adding Real Estate*

The personal wealth covered by the probate-based estimates rose as a share of all household assets, from about 39 percent in the late seventeenth century to about 58 percent in 1875. The remaining share is real estate, or land and the structures affixed to it.

Twentieth-century scholars have worked carefully on the ownership of land between the sixteenth century and the nineteenth, generally concluding that it became more concentrated over the two centuries surveyed here, especially during the enclosure waves,

though most studies have rightly warned that firm conclusions still elude us. The sources and methods used in this literature have some limitations calling for adjustments here. First, most of the literature covers only land, and usually only rural land. Second, past authors have pursued measures of "concentration" that are not appropriate to charting the size distribution of ownership, such as shares held by certain classes of undetermined size, or measures of acreage ownership rather than value ownership. Finally, the published Modern Domesday returns used for 1873 are based on misleading aggregations and need to be reworked.

The available evidence on realty ownership has been reworked at length to allow limited conjectures about changes in its concentration and its distribution across social classes since the seventeenth century. I have reworked the unique 1873 Modern Domesday return and combined it with fresh information on who owned metropolitan London (Lindert 1983*b*). For earlier dates I have exploited three kinds of information: the class incomes of the revised social tables for 1688–1803, our knowledge about which occupational classes depended on rental incomes, and recent estimates of the freeholder electorate.

The ownership of realty was highly concentrated before this century, more concentrated than the ownership of personalty. Indeed, Marx and Engels would have been almost on target if they had meant *real estate* in England and Wales when charging that "private property has been abolished for nine-tenths of the population." No clear trend can be identified in the figures for 1688–1873, however, despite a rich literature on the rising concentration of landownership. The absence of a clear trend stems largely from the wide span of the upper- and lower-bound estimates.

Since 1873, real estate ownership has diffused greatly. Homeownership has spread from less than a sixth of all households in 1873 to half of all households today. Curiously, the ownership of land, as best as the available data can measure it, appears just as concentrated today as it was when the issue of concentrated landownership was hotly debated a century ago.[10] It is fair for critics to decry what still

[10] The top quantile shares of landownership and realty ownership among potential wealth holders in Great Britain in 1973, ranked by net worth, compare with those for realty in England and Wales in 1873 as follows (Royal Commission on the Distribution of Income and Wealth 1975, pp. 81–82; Lindert 1985, table 7):

	England and Wales Realty 1873	Great Britain Realty 1973	Great Britain Land 1973
Share owned by top:			
1% of households	60.8	12.7	62.8
5% of households	78.6	27.5	83.4
10% of households	92.5	40.9	92.4

looks like a very unequal pattern of landownership (Norton-Taylor 1982, pp. 17–58). But this traditional concern for landownership overlooks a larger point brought out by table 3. The land so unequally held has dwindled from almost half of household net worth in the late seventeenth century to 18 percent in the 1870s and less than 5 percent in the 1970s. Its concentration thus becomes less and less important, rather like the concentration of ownership of Britain's oxen into the hands of a (shockingly?) small number of owners today. As we shall see, the same shift away from land has had a visible effect on the overall distribution of wealth and income.

With realty more unequally held than personalty but declining as a share of all wealth, care must be taken in estimating how the two major asset groups were correlated across individuals. The procedures used to combine the two are sketched in the Appendix. From 1670 through 1810, I have used rough data on the distribution of realty rents across occupational classes, capitalized these at historically observed capitalization rates, and compared them with the probate-based estimates of the distribution of personalty. The resulting ratios of realty to personalty by class were then applied to all individuals within each class, and the estate-multiplier technique was repeated. For the 1873–75 benchmark, it was possible to collate some realty with the personalty of its owners and make varying assumptions about the ownership of other realty, again yielding a distribution of gross assets.

B. Debts and Net Worth

Since "wealth" is usually meant to refer to nonhuman net worth, debts must be estimated and subtracted from gross assets to chart wealth inequality.

There is very little information on what individual households owed to others before the twentieth century, partly because debts owed by the deceased were typically recorded separately from the probate inventories. What we have are six local data sets from the seventeenth and eighteenth centuries along with tabulations of the relationship of debts to assets for 1913–14 and later (Lindert 1985, app. L; Rothenberg 1985). Even these materials must be treated carefully. The paucity and possible biases of the available data on debts force us to widen the confidence bounds on aggregate inequality. To regain narrower confidence bands like those shown for per-

---

While the figures are not perfectly comparable, combining them with the decline in land's share in table 3 does show that little of the decline in the inequality of real estate ownership could have come from a more equal ownership of land.

TABLE 3

PREFERRED ESTIMATES OF THE COMPOSITION OF TOTAL HOUSEHOLD NET WORTH IN ENGLAND AND WALES, 1670–1973

						GREAT BRITAIN	
	1670	1700	1740	1810	1875	1960	1973
Shares of net worth (%):							
Realty	66.7	65.6	73.6	53.7	47.0	23.8	43.4
Land	47.1	47.8	55.8	37.3	18.0	2.1	4.3
Buildings	19.6	17.8	17.8	16.4	29.0	21.7	39.1
Personalty	44.1	42.0	32.1	58.7	63.8	84.6	66.0
Debts	−10.8	−7.6	−5.8	−12.4	−10.8	−8.4	−9.4
Net worth (£ millions)	242.8	313.1	557.1	2,393.1	6,370.6	51,600.0	163,900.0

SOURCE.—Lindert (1985), table 9, apps. G–L; Royal Commission on the Distribution of Income and Wealth (1975), pp. 79–82.

NOTE.—Readers are reminded of the wide range of possible error in each of these figures. The figures on debt are especially fragile. For example, I know of no reason why the share of net worth owed as household debts should have risen so much between 1740 and 1810.

sonalty alone, we must await future evidence on the distribution of debts.

The best ("preferred") estimates do, however, reveal a tentative history of English wealth inequality, one that promises a number of insights into the sources of inequality movements during the process of modern economic growth. Table 4 and the top curve in figure 2 plot this history. The net worth results look quite different from those seen for personal estate alone. The only general rise in inequality of net worth occurred between 1700 and 1740, before the Industrial Revolution. Between 1740 and 1875, the main discernible trend lies within the top 5 percent, where the top percentile gained at the expense of the next richest 4 percent. Beyond this, there is no clear

TABLE 4

DISTRIBUTION OF HOUSEHOLD NET WORTH, ENGLAND AND WALES, BOTH SEXES, 1670–1875

	1670	1700	1740	1810	1875
	Share of Net Worth Held by the Top 10 Percent of Households				
Too equal	61.3	66.4	70.3	61.4	61.2
Preferred	82.7	80.8	86.0	83.4	83.8
Too unequal	97.7	97.7	99.0	97.0	94.7
	Share Held by the Top 5 Percent of Households				
Too equal	45.8	50.5	54.2	50.7	51.3
Preferred	73.4	71.4	73.6	74.3	74.1
Too unequal	89.5	90.1	83.3	86.2	84.7
	Share Held by the Top 1 Percent of Households				
Too equal	22.1	24.5	29.3	26.1	29.9
Preferred	48.9	39.3	43.6	54.9	61.1
Too unequal	57.4	71.2	71.8	68.4	64.6
	Share Held by the Top 5 Percent of Adults				
Too equal	64.0	68.1	71.8	63.8	61.4
Preferred	84.6	81.9	86.9	85.3	84.0
Too unequal	99.2	98.6	99.6	99.0	94.7
Percentage of households	(11.2)	(10.7)	(10.6)	(11.6)	(10.1)
	Total Net Worth (£ Millions)				
Too equal	244.5	311.9	613.0	2,517.7	6,222.9
Preferred	242.8	313.1	557.1	2,393.1	6,370.6
Too unequal	200.8	265.0	493.4	2,436.9	6,377.0

SOURCE.—Lindert (1985), apps. J, K, L, table 9. The twentieth-century estimates in fig. 2 are from Atkinson and Harrison (1978, pp. 139, 159) and refer to the top 5 percent of adults defined as persons over a threshold age that dropped from 25 for 1911–13 to 18 for 1972. Two of the estimates are 87 percent for 1911–13 (Royal Commission 1975) and 56 percent for 1972 (Atkinson and Harrison 1978).

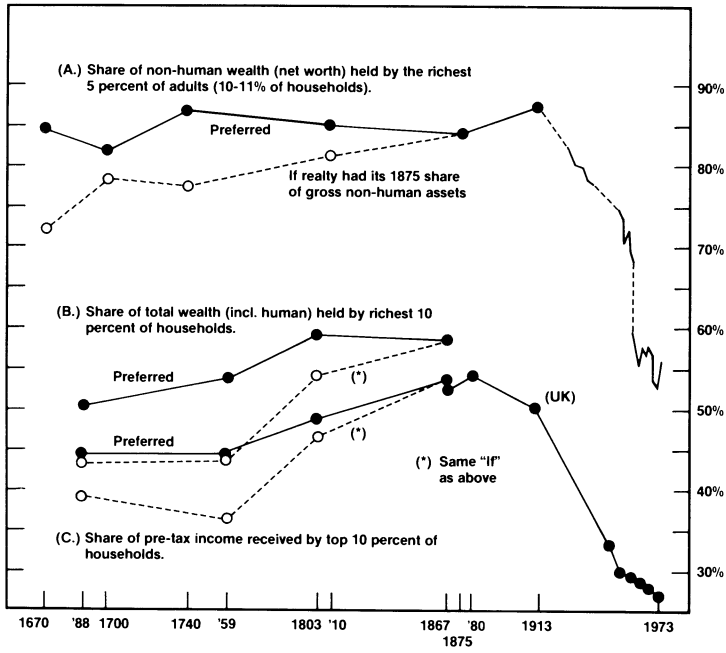

FIG. 2.—Shares of nonhuman wealth, total wealth, and income received by the top 10 percent of households, both sexes, England and Wales, 1670–1973. See notes to table 5.

widening (or narrowing) of the distribution of net worth between 1740 and 1913. The pronounced leveling within the twentieth century has brought a distribution in the 1970s and 1980s that is clearly less unequal than any now documented for England and Wales before World War I.

Extending our view of inequality of net worth from the old twentieth century frontier (1911–13) to 1670 has helped resolve a classic debate. To the extent that the debate between opposing ideological camps was a debate about the distribution of wealth, we get a mixed pattern.

Defining social inequality strictly in terms of gaps between class mean levels of net worth would yield a Marxian tale of sharply widening gaps across the century of Industrial Revolution. This widening, already shown for personal estate, would also show up in the distribution of net worth by class since there was no great diffusion of real estate away from the titled and merchant classes and no rise in their relative indebtedness. Marx wrote at a time when class wealth divisions in England were higher than they had been over the two

preceding centuries. This trend reversed dramatically, of course, over the century after he wrote.

Defining social inequality in terms of the shares of nonhuman wealth held by the richest and the poorest, however, gives a very different result. Now that realty, personalty, and debts are all brought into the picture, the rise of (size distribution) wealth inequality after 1740 has been confined to a shift of relative wealth into the top percentile from the second to the fifth percentiles.

The lack of a clear trend between 1740 and 1911–13 does not give much comfort to either the pessimists or the optimists in the Victorian debate over trends in wealth inequality since both sides were asserting a net change. The optimists, such as Porter, Giffen, and Marshall, were probably wrong in implying that the gaps were narrowing across the Industrial Revolution and the nineteenth century. Marx, Engels, Shaw, and other critics were probably wrong in asserting a pronounced rise in wealth inequality.

Part of our empirical harvest, however, is a net set of puzzles. Why should the occupational, or "class," wealth gaps have behaved so differently from the size distribution of net worth before the twentieth century? And why should net worth inequality have moved so differently from income inequality? The full answer awaits a comprehensive causal accounting that weights the contributions of different exogenous change in the structure of the economy. Initial answers can be given in this paper, however.

The apparent quiescence of trends in net worth inequality before this century resulted from the near balancing of two strong trends: a broad-based tendency toward greater concentration of both income and wealth versus the egalitarian consequences of the diminishing importance of land and of the titled-landed class. The rising concentration of wealth implied by the widening of gaps between class averages was no mirage. But its impact on net worth was offset by the egalitarian effect of the pronounced shift away from real estate, especially land, summarized in table 3.

The role of the shift away from realty can be quantified with an accounting exercise. Suppose that the aggregate share of realty in total gross assets had not changed over the last three centuries. If it had been fixed at its 1875 level, yet the separate distributions of realty, personalty, and debts, and their correlations across individuals, had varied over time as the data have revealed, the (hypothetical) share of net worth held by the richest 5 percent of adults would have shown a trend different from that documented in table 4. The actual and hypothetical trends in net worth inequality diverge sharply between 1740 and 1875, as shown at the top of table 5 and figure 2. It

was in this Industrial Revolution setting that realty fell sharply as a share of private wealth.[11] Its fall imparted an egalitarian twist to the trend in wealth distribution, changing the movement of the top 5 percent share by over 9 percent of all net worth, more than offsetting what would have been a rise in that share by 6 percent of all net worth. In no other period did the realty share make so much difference. Before 1740 there was little trend in wealth inequality, with or without movements in the share of realty in all wealth. The share of realty also had little net effect on the degree of equalization within the twentieth century, though the shift within realty holdings from land values to building values was a shift from a very concentrated to a very widely owned asset.[12]

V. Wealth and Income Inequality

Yet when we turn to the distribution of income, at the bottom of table 5 and figure 2, we see once again a rise in inequality across a century of Industrial Revolution, here represented by 1759–1867. Why

[11] Before 1740 the share of real estate in net worth was actually rising, creating a bias toward rising inequality of net worth. The rise of realty's share was the result of a rise in the "number of years' purchase" or the purchase price of real estate divided by its annual rental. This capitalization ratio, discussed further in the notes to table 5, rose from 18 years in the late seventeenth century to 25 years by the mideighteenth century, to 28 years around 1800, and to 30 years around the midde of the nineteenth century. What caused this rise in years' purchase, and why it should have raised the realty share of all assets, can be seen by considering the equilibrium condition that tends to prevail between owning and renting. One can rent an asset for the annual rental R (£/year, net of property tax) or own it at an annual cost depending on its purchase price P_k, the nominal rate of interest i, the rate of depreciation and repair d, and the expected rate of price appreciation p_k. The equilibrium tendency between the rental cost and the ownership cost is (with some twentieth-century tax complexities ignored)

$$R = P_k(i + d - p_k), \text{ or } R = P_k[(i - p_c) + d - (p_k - p_c)],$$

where p_c is the expected inflation in the price of consumables and $(p_k - p_c)$ is the expected appreciation in the real purchase price of the property. Thus the reciprocal of the number of years' purchase, or R/P_k, varies with the real interest rate, the depreciation rate, and the expected real appreciation of the asset price. A dominant change from the late seventeenth century to the early nineteenth was a decline in the real rate of interest (cf. Homer 1977; Phelps Brown and Hopkins 1956). This should have lowered R/P_k and raised the number of years' purchase. Further, it should have raised the ratio of real estate to personal estate purchase value since realty had a lower d and a higher expected real price appreciation than such typical personalty items as livestock and furniture.

[12] The effect of the shift away from land on the distribution of net worth was quantified for 1875–1973 by repeating the same kind of accounting exercise mentioned in the text. The top 5 percent of adults in Great Britain in 1973, who held 49.5 percent of net worth as estimated by the Royal Commission on the Distribution of Income and Wealth, would have held 55.5 percent if all land had been marked up from the true 4.3 percent of net worth to the 18.0 percent it commanded back in 1875. Thus the shift from land took about 6 percent of all net worth from the top 5 percent of adults between 1875 and 1973.

TABLE 5

SHARES OF WEALTH AND INCOME HELD BY TOP 5 PERCENT OF ADULTS AND TOP 10 PERCENT OF HOUSEHOLDS, BOTH SEXES, ENGLAND AND WALES, 1670–1973

A. SHARE OF NONHUMAN WEALTH (Percentage of Net Worth) OWNED BY TOP 5 PERCENT OF ADULTS (Top 10–11 Percent of Household Heads)

	1670	1700	1740	1810	1875	Great Britain 1973
Preferred estimates	84.7	81.9	86.9	85.3	84.0	49.5
If realty share fixed at 1875 level*	72.3	78.6	77.6	81.5	84.0	49.2

B. SHARE OF TOTAL (Human and Nonhuman) WEALTH OWNED BY TOP 10 PERCENT OF HOUSEHOLDS (%)

	1688	1759	1803	1867
Preferred estimates	50.6	53.9	59.1	58.6
If realty share fixed at 1875 level	43.7	43.9	54.2	58.6

C. SHARE OF PRETAX INCOME RECEIVED BY TOP 10 PERCENT OF HOUSEHOLDS (%)

	1688	1759	1803	1867
Preferred estimates	44.1	44.1	48.8	53.4
If realty share fixed at 1875 level	39.2	36.6	46.4	53.4

SOURCES AND NOTES.—The shares of nonhuman wealth (net worth) are from table 4. The preferred shares of total wealth and pretax income before 1914 are based on detailed breakdowns underlying the revised social tables in Lindert and Williamson (1983*b*, pp. 94–109). The 1867 figure refers to the estimates for England and Wales "with paupers," in the terminology of Lindert and Williamson (1983*a*). The pretax income shares shown for 1949–1973/74 for tax units in the United Kingdom are from Atkinson (1975, p. 51) and Royal Commission on the Distribution of Income and Wealth (1977, p. 30).

To calculate the hypothetical distributions with realty's share of the value of gross nonhuman assets fixed at its 1875 level, I multiplied every figure on realty rental or value by the multiple that would give the 1875 realty share at each date. This involved multiplying realty values as follows: multiply all 1670 realty by .4816, all 1700 realty by .4519, all 1740 realty by .3364, all 1810 realty by .7972, and all 1973 realty for Great Britain by 1.0642. With realty thus rescaled, the main estimation procedures of this study were repeated, with the new hypothetical results reported here.

Total wealth was computed from the occupational income figures in the revised social tables by applying different capitalization ratios to realty rents and to all other incomes. For realty, I used the historically observed mean capitalization ratios: 18 years' purchase for 1688, 25 for 1759, 28 for 1803, and 30 for 1867. For other incomes, human and otherwise, I began at 1688 with 10 years' purchase, the lower end of the range Gregory King thought appropriate for capitalizing human earnings for the age distribution of his time. For later dates the number of years' purchase should have risen since humans began to live longer and real interest rates dropped. To quantify this likely rise, I made use of the simple equilibrium tendency $R/P_k = (i + d)$, where R is the rental price of an asset, P_k is its capitalized purchase price, i is the real rate of interest, and d is the rate of depreciation per annum (net of expected real price appreciation and after allowing for relevant taxes, of which none loomed large before this century). For a nearly permanent asset like land, the real interest rate i is well proxied by R/P_k, or the reciprocal of the number of years' purchase (i.e., 5.55 percent for 1688, 4.00 percent for 1759, 3.57 percent for 1803, and 3.33 percent for 1867). Let us assume that the depreciation rate d was fixed for all assets other than realty between the seventeenth century and the nineteenth, with the longer life expectancy of humans offset by their rising accumulation of faster depreciating personal estate (livestock, furniture, etc.). For Gregory King's 1688, our reasoning thus far implies that $d = [(1/10) - .555] = 4.44$ percent for nonrealty assets. Fixing this d for all dates, we get the following numbers of years' purchase, or $(P_k/R) = 1/(i + d)$: 10.00 years for 1688, 11.84 years for 1759, 12.48 for 1803, and 12.76 for 1867.

In this way, the assumption of a constant depreciation rate gap between realty and all other assets implies a widening gap in the absolute number of years' purchase. This assumption may be wrong, however. If the gap narrowed, under the influence of longer human life expectancy and a rise in the share of realty that is in depreciable structures rather than land, then the number of years' purchase for human assets and personal estate should have risen faster than I have assumed. If this was true, I have understated the egalitarian effect of the shift away from realty, and both total wealth curves in fig. 2 should have risen more steeply between 1670 and 1875.

* If realty took the same aggregate share of gross nonhuman assets as in 1875.

should the trends in net worth inequality and in income inequality have differed for the era on which most controversy has centered?

For any given share of realty in total nonhuman assets, wealth inequality and income inequality followed roughly the same path, as shown in figure 2. Neither rose before the middle of the eighteenth century. Then both rose until the middle of the nineteenth. Between about 1870 and 1913, there were no strong movements, though the distribution of income showed some sign of leveling. Both incomes and wealth became more equal after 1913 than (apparently) ever before.

As a corollary, we can conclude that the difference in trends between net worth inequality and income inequality was caused by a drift in the proportions in which different assets are combined. The concentrated asset, realty, always took a greater share of nonhuman wealth than of income. Accordingly, wealth was always more unequally distributed than income, and the decline in realty's share of the economy before 1875 brought an equalization that could mask any trend toward concentration of net worth but not the trend toward more unequal incomes.

If net worth and income had different inequality trends and were affected by the decline of land to different degrees, which of them is more appropriate as a measure of overall inequality? The debate over the gaps between the rich and poor was always vague, willing to slip between wealth measures and income measures without noting the distinction.

If we take care to define wealth broadly enough, the distinction between wealth and income matters very little. To be a measure of living standards, wealth must capitalize all assets yielding resources that can be consumed or bequeathed. Suppose that all human earnings were capitalized at some rate appropriate to assets with their degree of risk, depreciation, and illiquidity. Gregory King thought human earnings should be capitalized at 10–15 years' purchase (i.e., at 6⅔–10 percent per annum) (Laslett 1973, p. 248). While any choice of a discount rate is highly arbitrary when capitalizing human wealth that could be only rented and never sold, almost any reasonable rate would still make human capital approach, or surpass, half of all capital anytime in the last three centuries. With human capital at least matching nonhuman, the rising inequality of earnings across the Industrial Revolution century would have brought a rising concentration of true total wealth, just as it made income more unequal. Once wealth is defined broadly enough to pose as a true measure of material well-being, its historic inequality trends were essentially those shown by the top quantile *income* share, as can be seen by the movements of the measure of total wealth in table 5 and figure 2. Only the

narrower concept of nonhuman wealth was dominated by real estate enough to show a different time profile.

One might try to argue that the narrower measure of nonhuman wealth was really what past social debaters had in mind more than total wealth or income. To the extent that it was, Marx and other critics were wrong about the trend in wealth concentration. Yet to the extent that they were talking about material well-being, the appropriate measure is either total wealth or total income. The inequality of material well-being followed a Kuznetsian pattern: it rose somewhat over the Industrial Revolution era, changed only slightly between the 1870s and 1913, and then equalized dramatically over the next 60 years. And there was a clear net change: no time between 1670 and 1913 found income or wealth as equally shared as they have been since the 1950s.

VI. Age and Wealth Inequality

Before further lessons are drawn from the estimates, we must address the possibility that all the movements observed are a mirage created by shifts in age distribution. To judge the distribution of material well-being, one must judge it over the life cycle. As several scholars have pointed out, inequality might remain the same, or might not even exist, for each age range yet appear to widen or contract in an aggregate cross-section just because of movements in the age distribution.[13] Shifts in the adult age distribution could distort the overall distribution of wealth in two ways. A shift toward (or away from) age groups with more varied wealth could seem to raise (or lower) aggregate wealth inequality. Or a shift toward (or away from) age groups with extremely high and low wealth could artificially raise (or lower) inequality. For Britain in the nineteenth or twentieth century, wealth rises monotonically with age, even after age 60, so that wealth inequality would be affected by movements of the adult population toward or away from the middle age range.

It is possible to test for artificial age twists behind the apparent trends in English wealth inequality using the unique features of my 1875 data set. Ages at death, personal estate values, and holdings of real estate over one acre have been linked up for most of the 1875 probate sample. To quantify the effect of changes in the age distribution, one could ask the following kind of question: How far would the wealth distribution have departed from its (estimated) 1875 inequality if the same 1875 patterns of distribution within age groups were combined with the age distribution of some other setting?

[13] See, e.g., Atkinson (1971), Paglin (1975), and the subsequent exchange between Paglin and critics.

The first such accounting experiment compares the "true" (preferred estimate) England and Wales of 1875 with a hypothetical England and Wales having the same patterns from 1875 but the age distribution of England and Wales in 1696. In this case, it turns out that the wealth share of the top 5 percent of adults in the hypothetical England would have been 1.15 percent lower with the older 1696 age distribution than with the actual 1875 distribution. That is, the shift to a younger population between 1696 and 1875 artificially raised the top 5 percent wealth share by 1.15 percent between 1696 and 1875. This is enough shift to explain all of the modest 1 percent rise in the top group's share of gross assets, or about two-thirds of the slightly greater rise in a similar group's share of net worth, and smaller shares of the rise in the inequality of total wealth or income. Thus a noteworthy part, at least, of the observed rise in English inequality before 1875 was due to age shifts alone.[14]

Understanding the effect of differences in age distribution also helps us interpret the differences in wealth distribution between England and the United States. Among Americans in 1860, the top 10 percent of adult males, which about matches the top 5 percent of all adults, held only 73 percent of gross assets versus the 80.7 held by their English and Welsh counterparts in 1875. Gallman (1972) has argued that the United States would appear to have been more egalitarian than Edward Pessen implied if we could somehow adjust for the fact that the U.S. adult population was younger. While Pessen's assertions were not based on any hard data comparing countries or times and Gallman's counterargument used only hypothetical figures, we now have enough data to pass judgment. Gallman's conjecture was correct. If the English age-wealth patterns for 1875 were projected onto the white U.S. age distribution of 1860 (or 1870, with or without blacks), they would have given an extra 1 percent of wealth to the top 5 percent of adults. That is, the U.S.-age-adjusted version of English inequality would have been even *further* above the actual U.S. inequality, supporting Gallman's contention that the United States would have looked even more egalitarian when the age difference is factored out.

Thus far, we have seen, age comparisons suggest that a younger adult population has more unequal wealth than an older one for any given inequality in wealth at each stage of the adult life cycle. By

[14] The wealth measure reweighted by different age weights is total personal estate in 1875 plus the probated individual's identified holdings of realty summing over an acre in area. The latter figure is the 1873 Modern Domesday rental times 30 years' purchase. In this measure, the top 5 percent of adults in 1875 held 67.77 percent of "wealth," while reweighting according to the 1696 age distribution gave them only 66.62 percent.

implication, the aging of the English and Welsh population since 1875 should have contributed an artificial wealth leveling to the trends mapped in figure 2. It did, cutting the top 5 percent share of total wealth by around 3 percent. While this adjustment for age is a necessary part of any interpretation of trends of wealth inequality, it falls far short of explaining the observed 1875–1972 drop of almost 30 percent of total wealth held by the richest 5 percent. The revolution in wealth inequality since Victorian times has been too great to be a mirage caused by age shifts.[15]

VII. The Victorian Heights and Classical Economics

The economic disparities debated in Victorian and Edwardian times were clearly much greater than those in Britain today, and probably as great as those in any other major country anytime before World War I.[16] As we have seen, these economic gaps were not new, having widened only slowly (in the case of total wealth or income) or not at all (in the case of nonhuman wealth) since before the Industrial Revolution. Pessimists seeing an inexorable tendency for income and wealth to become concentrated into fewer and fewer hands were guilty of overstatement. The estimates are even less generous to Porter, Giffen, Marshall, and other optimists who thought that wealth and income were being spread more and more equally over the nineteenth century: the disparities were not narrowing, and those in income or total wealth were probably widening somewhat.

There is more to learn, however, about classical thinking on the subject of distribution than just that they misjudged inequality trends. Most classical treatises in political economy, in fact, said little about the size distribution of wealth or income itself. We must remember

[15] Readers wishing further tests of the effect of age shifts on trends of wealth inequality may compare the present results with those found for the United States in Williamson and Lindert (1980).

[16] Nineteenth-century British inequality stands out in all the available comparisons for wealth or income. *Wealth:* Comparisons are complicated by differences in the asset coverage of other studies. Some cover real estate only, some all gross assets, with little attention to debts. Some could not collate different realty holdings of the same owner, understating ownership inequality. Yet the studies for other countries are fairly consistent in sticking to males over 20 as the population base. As best as I can compare, the wealth shares of the top 1 percent, 5 percent, and 10 percent for England and Wales in 1810 or 1875 exceeded those for Denmark in 1789, Sweden in 1800, Finland in 1800, Prussia in 1908, or the United States at any of four prewar dates (1798, 1850, 1860, and 1870). Among probated estates alone, British returns were more unequal than French returns on the eve of World War I (Soltow 1984, 1985; Williamson and Lindert 1980; and worksheets underlying this study). *Income:* England and Wales in 1867 had a higher top 5 percent share than Prussia in 1875, Saxony in 1880, the German Empire in 1913, Denmark in 1870, or the United States in 1917–19 (Lindert and Williamson 1983*b*).

how Malthus, Ricardo, Mill, and Marx simplified society: to describe and explain wealth and poverty, they focused on the three main factors of production. Ricardo introduced his *Principles of Political Economy and Taxation* as an exploration of what distributed income and wealth among these three classes (in McCulloch 1871, p. 5):

> The produce of the earth—all that is derived from its surface by the united application of labour, machinery, and capital, is divided among three classes of the community, namely, the proprietor of the land, the owner of the stock or capital necessary for its cultivation, and the labourers by whose industry it is cultivated. . . .
>
> To determine the laws which regulate this distribution, is the principal problem in Political Economy.

The task of explaining the functional distribution of income derived its urgency from the fact that these classes had clear economic rankings. In Mill's words, the three "requisites of production" were also the three "main classes of society." Rich landlords got a further "accession of riches" from the labor and investment of others, which bid up the value of their land while they slept (Mill 1929, esp. pp. 818–19 and bk. 2). Malthus and Marx similarly devoted themselves to theories of wages, profits, and rent, without having to remind themselves or readers which of these three rewards was the lot of the poor and which were the competing roads to riches. And each classical treatise was used to justify ways of redistributing income and wealth.

The stylized division of the economic ranks into three factors of production fit the British economy in which the classical economists lived far better than it fits today. Many writers have suspected as much, but the paucity of data and the frequent scholarly emphasis on the difference between status and wealth in English society threaten to obscure the point. This study has begun to quantify just how well one could frame the rich, middle, and poor classes with the classic triad of land, capital, and labor. The titled and merchant classes, already far richer than the rest of society, widened their advantage across the Industrial Revolution century, in the way Malthus, Ricardo, Mill, and Marx deplored.

Just how closely the economic ranks were tied to the three classic factors of production in the last century, and how much things have changed since, is underlined by table 6. In Victorian England and Wales, all clues suggest that nearly all land was owned by the top income decile, which also got far more of its income from capital, and far less from labor, than the rest of society. In such a world, one could well offer explanations of movements in the size distribution of income or wealth in terms of rent, profits, and wages. A century later,

TABLE 6

APPROXIMATE SHARES OF NATIONAL INCOME AND OF TOP DECILE INCOME TAKEN BY THE THREE CLASSIC FACTORS OF PRODUCTION, ENGLAND AND WALES, 1867, AND UNITED KINGDOM, 1972–73 (%)

	SHARES OF NATIONAL INCOME, ENGLAND AND WALES, 1867			SHARES OF TAXABLE PERSONAL INCOME, UNITED KINGDOM, 1972–73		
	Top 10%	Lower 90%	All	Top 10%	Lower 90%	All
Land rents	13	1	5	0–1.5	0–0.1	0–0.5
Profits, etc.	51–87	26–35	36–55	8.5–22	3–16	4.5–18
Labor earnings	0–36	64–73	40–59	78–90	84–97	82–95
All factors	100	100	100	100	100	100
Quantile share	38	62	100	27	73	100

SOURCES AND NOTES.—*England and Wales, 1867:* The chief source is Baxter's distribution of income among earners, as revised by Lindert and Williamson (Baxter 1868; Lindert and Williamson, 1983*b*). The estimates for land rents are .3823 times the realty rents of 1873. The share .3823 is the Schedule A share of land rents in all realty rents, as reported by Stamp (1922, pp. 49–50). Here as in table 5, realty rents were allocated to quantile classes by first assuming that the top income recipients are the top holders of Modern Domesday realty over an acre in size and then giving out the average underacre rentals to the next band of income recipients until all realty rentals were allocated. Next labor earnings were estimated. To the earnings of Baxter's "manual labor class" was added a range of possible returns to labor from within his "upper and middle classes." These included at least Schedule E income, and less than these plus all Schedule D income. The share of these top labor earnings falling within the top decile of earners was assumed to be between zero and the top decile's share of "middle and upper class" incomes of all types. Capital incomes ("profits, etc.") were the residual, varying with the different assumptions about labor earnings. Included in capital incomes were all rentals on buildings plus incomes in Schedules B and C and the nonlabor part of Schedule D.

The Distribution of Taxable Incomes among Tax Units in the United Kingdom, 1972–73: The main source is Royal Commission on the Distribution of Income and Wealth (1977, pp. 18, 40, 258, 261). This report breaks taxable income down into net earnings (minus deductions) and net investment income for the top decile, for other quantile groups, and for all tax units. For all tax units, there is the further breakdown of investment (property) income into imputed rents of owner-occupied realty vs. all other investment incomes. As a first approximation, these subdivision shares were applied to the top decile and the bottom 90 percent as well as to the total. We can start the division of incomes by giving employee earnings (over 75 percent of the total in all cases) to the labor income category. It also receives an unknown share of self-employment income—maybe 0 percent, maybe 100 percent. Land is reported as a separate asset in wealth distributions, but not as a separate rent in income distributions. Its rental share would clearly be lower than its asset share because of its low depreciation rate. Setting the lower bound on land's share of income at zero, let us pursue its upper bound. Let land's share of all nonlabor income be as high as its share of net worth (an overestimate), both for the top decile and overall (again, see Royal Commission on the Distribution of Income and Wealth 1975, pp. 79–82). The resulting land income figure might still be low, in view of evidence that the official estate-multiplier estimates may have seriously understated the land holdings of the household sector (pp. 73–87). To overstate the land income share of nonlabor income, let it equal the land holdings of the whole United Kingdom in non-estate-duty estimates divided by estate-duty estimates of the household net worth in Great Britain. This procedure yields the upper bounds on the land share. Again, capital income is derived as the residual. It consists of rentals on buildings, profits, and net interest and dividends for the household sector.

the economic ranks have become homogenized as far as the three factors are concerned. Now the top decile gets almost none of its income from land, and the share it gets from other property incomes is not that different from the share that property contributes to the incomes of the poorer 90 percent. Macroeconomic theories of rent, profits, and wages can no longer explain much change in the size distribution of income or wealth.

As a corollary, we can extend our relativistic appreciation of classical economists' distribution theory to their (relative) neglect of human

capital differences as a source of income inequality. The return to human skill above the level of common labor accounted for a much smaller share of English and Welsh incomes in the last century than it does today. If we measure this return (the average price of skills times its quantity) as $(w_{ave} - w_u) \cdot N$, where w_{ave} is the average wage, w_u the unskilled wage rate, and N the man-hours of labor employed, then in 1867 the return to skilled labor was between 5 and 25 percent of national income. A century later, with the same definition, skills received between 46 and 58 percent of pretax household income.[17] Ignoring the sources of inequality of skills was thus less of a handicap in explaining overall income distribution than it would be today.

We could even spare some slight appreciation for some of their conjectures about secular trends in unit land rents, profits, and wages. While the pessimistic belief that wages rates were pinned to subsistence should have been abandoned by midnineteenth century, real wages had not risen much before 1820 (Lindert and Williamson 1983*a*). Agricultural land rents had also risen faster than wage rates for three centuries, as Malthus and Ricardo guessed (Lindert 1983*a*), and there is even a look of the "declining rate of profit" in the decline of real interest rates and the rental/purchase ratio on land noted earlier in this paper, though the residual share of profits in national income did not decline.

The classical treatises, however, were unable to pursue the distributional implications of the drift in factor income shares. The drift toward human skills and away from land had already begun in the eighteenth century. It imparted an egalitarian drift in a society originally dominated by landed wealth, even though no leveling could be seen by the unaided eye before this century. True, the price of land was rising faster than wage rates or returns on capital until the latter half of the nineteenth century. But Malthus, Ricardo, Mill, and (to a lesser extent) Marx may have focused too much on factor prices—those rents, profit rates, and wage rates—and not enough on the rates of factor quantity growth or factor income shares. Even Marshall had to wrestle with his lingering Malthusian-Ricardian intuition that land would still dominate national income and check growth someday. It

[17] For 1867, unskilled labor was defined as Baxter's bottom group, accounting for 28.9 percent of all earners. Its average income of £24.85 was extended to all earners (skilled or not) to calculate returns to unskilled labor, amounting to 34.50 percent of all earnings. The returns to skill are the part of the total labor income in table 6 not taken by this unskilled base. Similarly, for 1972–73, unskilled labor was defined as the bottom 30 percent of tax units, getting about 11.24 percent of all pretax income. Projecting this rate of earning to all tax units gives an unskilled-labor base of 36.7 percent of all pretax income. The remainder of labor income, or 46–58 percent of all pretax household income, is the part attributed to skills.

remained for Schultz (1953, chap. 8) to underline the unmistakably "declining economic importance of . . . land," which this paper links to the egalitarian trend evident since 1914 or earlier. It remains for future research to weigh the underlying causal forces behind the shift from land toward skills and the secular leveling of income and wealth.[18]

Appendix

Estimation Procedures

The many separate steps in estimating the distribution of English and Welsh private wealth are listed in schematic form below. Far more detail is available in my two-volume working paper (Lindert 1985). The following shorthand is used to distinguish the different procedures used in the three parallel estimates: *a* = too equal estimates of the wealth distribution; *b* = preferred estimates; *c* = too unequal estimates; *all* = all three estimates.

Step	Details
I. Estimate the Occupational Structure (Lindert 1980; 1985, app. C)	
Use parish-level censuses and burial records to judge occupational shares by region for 1811 and earlier; use census for midnineteenth century.	For each of three early epochs before 1811 use regional cross-section regressions to "predict" occupational mix from attributes of place (*all*).
II. Estimate the Distribution of Personal Estate	
A. *Head Count Multipliers (the* m_i*'s Introduced in the Text)*	
i. Divide probate and living populations into cells for each benchmark date.	(*All*) The cells are defined by sex, by 16 occupations for males, by four regions (except 1858), and by nine age groups for 1875 only.
ii. Convert probate populations into living household heads.	(*All*) Magnify each probated person by living/probates ratio for his or her cell.
iii. Transfer wealth of probated men with no occupation to others.	(*All*) Magnify man with an occupation by $1/(1 - \text{NOOCC})$, where NOOCC is the share of probated men in his estate value class having no occupation.

[18] Major inroads have already been made, thanks to Williamson's (1985) modeling of the sources of change in the British earnings distribution from the late eighteenth to the early twentieth century.

iv. Extend four sample regions to synthesize all of England and Wales.	(*a*) Make all the rest of England and Wales a replica of some sample region so as to minimize inequality for England and Wales. (*b*) Make the rest of England a realistic mixture of regions and make Wales as poor as the poorest sample region. (*c*) Polarize the rest of England and Wales into more of London plus the poorest sample region.

B. Correct Systematic Estate Value Bias (the s_i*'s)*

i. Age twist, extended to all dates from 1875, the only one giving age date.	(*All*) Multiply all estate values by the living/probated estate value ratio for the individual's sex, region, and occupation in 1875, a ratio differing by sex-region-occupation because of differing age distributions of the living and the dying.
ii. For the nineteenth century, replace estate value bracket (e.g., £100–150) with a single estate value (e.g., £125).	(*a*) Use bracket median values for low brackets, bottom values for high. (*b*) Use bracket bottom values throughout since the unprobated were generally poorer than the probated. (*c*) Use bottom values for low brackets and bracket medians for high brackets.
iii. Assume estate levels for three kinds of thin samples: 32 unprobated cells out of 304 male cells in the regional samples; Cambridgeshire military for 1810, misrepresented by two officers; and the very rich in the nineteenth century.	All three estimates use the same values for unprobated cells and for the Cambridgeshire military of 1810. They differ in their use of a smoothed wealth curve for the very rich (data from Rubinstein [1981]; details in Lindert [1985, tables C12, C13]).
iv. Mark down the wealth of the poorer 90 percent of households.[19]	(*a*) and (*b*) No adjustment. (*c*) Discount the gross assets of the poorer 90 percent according to Pareto's false law.

[19] The purpose here is to overstate the unknown extent to which the poorer 90 percent of the living had fewer assets than probates would reveal. A safe way to do so is to assume that a log-linear Pareto curve fits the poorer 90 percent. All wealth curve studies show otherwise. The true Pareto curve has to be concave toward the origin. Applying a log-linear Pareto curve to the poorer 90 percent has the effect of pushing unrealistically many from the middle wealth classes down toward poverty.

III. Estimate the Distribution of Real Estate (Lindert 1983*b*; 1985, apps. G–I)

A. 1670–1810

i. Number of realty owners (drawing on class numbers from Lindert and Williamson [1982]).	(*c*) County-franchised freehold classes. (*b*) These plus some urban classes. (*a*) Every class possibly franchised.
ii. Distribution of rent among owning classes. (Accounting constraint: realty rents add up to best national aggregate guesses.)	(*c*) Land rents equal total income for landed upper classes, only £2 for yeomen; building rents tacked on. (*b*) All rents equal 90 percent of income for landed uppers, under half of income for other owners. (*a*) Rents equal same share of income for all owners.

B. 1873–75

i. Household ownership of non-London properties over an acre.	(*All*) Rework the Modern Domesday return of 1873 for sample regions collating the properties of over 60,000 owners.
ii. Household ownership of under-acre non-London properties.	(*a*) All owners equal; all are households. (*b*) All equal; 8.6 percent not households. (*c*) Owners divided into two extremes, and 17.2 percent not households, as with overacre owners.
iii. Household ownership of London realty, based on my mapping of London site ownership in the 1890s.	(*a*) Specific assumptions making ownership very diffuse and unrelated to owners of non-London realty. (*b*) Fair assumptions about ownership of sites and buildings. (*c*) Assume concentrated ownership of London realty by the top owners of non-London realty.

IV. Link Real Estate to Personal Estate (Lindert 1985, apps. J, K)

A. By Occupation for 1670–1810

Apply each occupation-specific realty/personalty ratio to every probated person in that occupation and repeat the estate-multiplier estimation.	The three sets of estimates combined their respective assumptions above.

B. Match Realty Owners with Persons Probated in 1875

Match individuals probated in 1875 with their overacre non-London holdings in 1873 and add assumptions about London and underacre realty.	(*All*) Same matching of personalty with overacre realty. (*a*) Assume other realty distributed in proportion to assets already covered. (*b*) Match London properties with richest Londoners; assume uniform shares of owners and average holdings of underacre property outside London for all wealth classes. (*c*) Match all London and underacre properties with those persons already richest.

C. Then Repeat Estate-Multiplier Calculations

V. Add Debts

Use scattered data to infer rough outlines of how debts are correlated with gross assets. Estimate ratios of debts to personalty (D/P) for the top decile of households and for the poorer 90 percent.	(*a*) Assume same D/P for both groups up through 1810, then D/P only slightly lower for top 10 percent later. (*b*) Make most realistic assumptions about how D/P declines with personal estate. (*c*) Assume the highest D/P for the poorer 90 percent that the accounting constraints will allow.

Result: Three sets of distributions of net worth.

References

Atkinson, Anthony B. "The Distribution of Wealth and the Individual Life-Cycle." *Oxford Econ. Papers* 23 (July 1971): 239–54.

———. *The Economics of Inequality.* Oxford: Clarendon, 1975.

Atkinson, Anthony B., and Harrison, Allan J. *Distribution of Personal Wealth in Britain.* Cambridge: Cambridge Univ. Press, 1978.

Baxter, R. Dudley. *National Income.* London: Macmillan, 1868.

Cornford, Barbara. "Inventories of the Poor." *Norfolk Archaeology* 35, no. 1 (1970): 118–25.

Gallman, Robert. "Professor Pessen on the 'Egalitarian Myth.' " *Soc. Sci. Hist.* 2 (Winter 1978): 194–208.

Giffen, Robert. *Economic Inquiries and Studies.* 2 vols. 1904. Reprint. Shannon: Irish Univ. Press, 1971.

Great Britain. House of Commons. *Sessional Papers.* Vol. 18. 1861.

Homer, Sidney. *A History of Interest Rates.* 2d ed. New Brunswick, N.J.: Rutgers Univ. Press, 1977.

Jones, Alice Hanson. *American Colonial Wealth: Documents and Methods.* 2d ed. 3 vols. New York: Arno, 1977.

Kuznets, Simon. "Economic Growth and Income Inequality." *A.E.R.* 45 (March 1955): 1–28.

Laslett, Peter, ed. *The Earliest Classics: John Graunt . . . Gregory King.* London: Gregg, 1973.

Lindert, Peter H. "English Occupations, 1670–1811." *J. Econ. Hist.* 40 (December 1980): 685–712.

———. "An Algorithm for Probate Sampling." *J. Interdisciplinary Hist.* 11 (Spring 1981): 649–88.

———. "Some Economic Consequences of English Population Growth, 1541–1913." Working Paper no. 14. Davis: Univ. California, Agricultural Hist. Center, August 1983. (*a*)

———. "Who Owned Victorian England?" Working Paper no. 12. Davis: Univ. California, Agricultural Hist. Center, February 1983. (*b*)

———. "Lucrens Angliae: The Distribution of English Private Wealth since 1670." Working Paper nos. 18 and 19. Davis: Univ. California, Agricultural Hist. Center, February 1985.

Lindert, Peter H., and Williamson, Jeffrey G. "Revising England's Social Tables, 1688–1812." *Explorations Econ. Hist.* 19 (October 1982): 385–408.

———. "English Workers' Living Standards during the Industrial Revolution: A New Look." *Econ. Hist. Rev.*, 2d ser. 36 (February 1983): 1–25. (*a*)

———. "Reinterpreting Britain's Social Tables, 1688–1913." *Explorations Econ. Hist.* 20 (January 1983): 94–109. (*b*)

McCulloch, John Ramsay, ed. *The Works of David Ricardo.* London: Murray, 1871.

Main, Gloria L. "The Correction of Biases in Colonial American Probate Records." *Hist. Methods Newsletter* 8 (December 1974): 10–28.

Marshall, Alfred. *Principles of Economics.* 6th ed. London: Macmillan, 1910.

Marx, Karl, and Engels, Friedrich. *The Communist Manifesto.* New York: Internat. Publishers, 1930.

Mill, John Stuart. *Principles of Political Economy, with Some of Their Applications to Social Philosophy.* London: Longmans Green, 1929.

Norton-Taylor, Richard. *Whose Land Is It Anyway?* Wellingborough: Turnstone, 1982.

Paglin, Morton. "The Measurement and Trend of Inequality: A Basic Revision." *A.E.R.* 65 (September 1975): 598–609.

Phelps Brown, Ernest Henry. *The Inequality of Pay.* Oxford: Oxford Univ. Press, 1977.

Phelps Brown, Ernest Henry, and Hopkins, Sheila V. "Seven Centuries of Building Wages." *Economica* 22 (August 1955): 195–206.

———. "Seven Centuries of the Prices of Consumables, Compared with Builders' Wage-Rates." *Economica* 23 (November 1956): 296–314.

Porter, George R. *The Progress of the Nation, in Its Various Social and Economical Relations, from the Beginning of the Nineteenth Century.* London: Murray, 1847.

Rothenberg, Winifred B. "The Emergence of a Capital Market in Rural Massachusetts, 1730–1838." *J. Econ. Hist.* 55 (December 1985): 781–809.

Royal Commission on the Distribution of Income and Wealth. *Report No. 1: Initial Report on the Standing Reference.* London: Her Majesty's Stationery Office, 1975.

———. *Report No. 5: Third Report on the Standing Reference.* London: Her Majesty's Stationery Office, 1977.

Rubinstein, William D. *Men of Property: The Very Wealthy in Britain since the Industrial Revolution.* New Brunswick, N.J.: Rutgers Univ. Press, 1981.

Schultz, Theodore W. *The Economic Organization of Agriculture.* New York: McGraw-Hill, 1953.

Shaw, George Bernard. "Socialism: Principles and Outlook." In *Encyclopaedia Britannica,* 14th ed., vol. 20 (1929), pp. 895–97.

Smith, Daniel Scott. "Underregistration and Bias in Probate Records: An Analysis of Data from Eighteenth-Century Hingham, Massachusetts." *William and Mary Q.* 32 (January 1975): 100–110.

Soltow, Lee. "Wealth Inequality in the United States in 1798 and 1860." *Rev. Econ. and Statis.* 66 (August 1984): 444–51.

———. "The Swedish Census of Wealth at the Beginning of the 19th Century." *Scandinavian Econ. Hist. Rev.* 33, no. 1 (1985): 1–24.

Soward, Alfred W., and Willan, W. E. *The Taxation of Capital.* London: Waterlow, 1919.

Stamp, Josiah C. *British Incomes and Property: The Application of Official Statistics to Economic Problems.* London: King, 1922.

Whittaker, Sir Thomas P. *The Ownership, Tenure and Taxation of Land: Some Facts, Fallacies and Proposals Relating Thereto.* London: Macmillan, 1914.

Williamson, Jeffrey G. "Earnings Inequality in Nineteenth-Century Britain." *J. Econ. Hist.* 40 (September 1980): 457–75.

———. "The Structure of Pay in Britain, 1710–1911." In *Research in Economic History,* vol. 7, edited by Paul Uselding. Greenwich, Conn.: JAI, 1982.

———. *Did British Capitalism Breed Inequality?* London: Allen and Unwin, 1985.

Williamson, Jeffrey G., and Lindert, Peter H. "Long-Term Trends in American Wealth Inequality." In *Modeling the Distribution and Intergenerational Transmission of Wealth,* edited by James D. Smith. Chicago: Univ. Chicago Press (for N.B.E.R.), 1980.