Real Inequality in Europe since 1500

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Introducing a concept of real, as opposed to nominal, inequality of income or wealth suggests some historical reinterpretations, buttressed by a closer look at consumption by the rich. The purchasing powers of different income classes depend on how relative prices move. Relative prices affected real inequality more strongly in earlier centuries than in the twentieth. Between 1500 and about 1800, staple food and fuels became dearer, while luxury goods, especially servants, became cheaper, greatly widening the inequality of lifestyles. Peace, industrialization, and globalization reversed this inegalitarian price effect in the nineteenth century, at least for England.

> *[U]ne grande princesse à qui l'on disait que les paysans n'avaient pas de pain, . . . répondit: Qu'ils mangent de la brioche.*
> Jean-Jacques Rousseau[1]

The rich, the poor, and the middle-income ranks consume very different bundles of goods and services. By definition, staples bulk large in the consumption of the poor, whereas luxury goods and services comprise a bigger share of what the rich consume, generation after generation. Any strong historical trend that makes staples more expensive relative to luxuries should widen the inequalities in real living standards. Conversely, a fall in the relative price of staples should mitigate real inequalities.

Yet past explorations of inequality trends have not given this point its due.[2] We have been content to trace the history of economic inequality

[1] Rousseau, *Les Confessions*, book 6 (a quip later attributed, falsely, to Marie Antoinette).

[2] A direct predecessor to this study is Kula, *Economic Theory*, pp. 119–31. In Kula's pioneering exercise, we see the first good sketch of the importance of differences in cost-of-living movements, though without any link-up with income measures and with some limitations of commodity coverage and geographic coverage. Kula offered stylized "terms of trade" measures. His stylized nobility sold only rye, divided by a useful price series for a "basket of goods" consisting of good-quality cloth, good-quality paper, French wine, pepper, coffee, and sugar. Absent from this list were any meat, drink other than wine, or labor services, a luxury purchase we have emphasized. His stylized peasants sold a mixture of rye, oats, butter, and eggs, in exchange for cloth, nails, and salt.

Aside from Kula, the closest approach to some of our present points was made by Wilhelm Abel (*Crises agraires*), but he mentioned only food versus other goods, and left the price effects unquantified.

around trends in the shares of nominal income or wealth at current prices, without exploring what the movements of relative prices implied about inequality of real purchasing power.[3] This article lays the foundation for a new history of European inequality trends over the last five centuries. Our estimates support four tentative conclusions.

First, before 1914, and especially before 1815, changes in inequality within and between European nations were more pronounced than has been appreciated. Introducing the concept of real, as opposed to nominal or conventional, income inequality reveals these pronounced trends.

Second, between 1500 and 1815 the prices of staple foods rose much more than the prices of what the rich consumed. This greatly magnified the rise in real income inequality, because in those days the poor and the rich depended more heavily on buying services from each other than is true today. The poor needed land-intensive food and housing, and land was owned by the rich. The rich, in turn, hired labor services much more than today, so that the fall in workers' real wages became a fall in the cost of an affluent lifestyle.

Third, the opposite happened between 1815 and 1914, for two main reasons. One is that real wages rose, and servants became more expensive. The other is that globalization cut the price of grains relative to other goods and services.

Fourth, since 1914, relative price movements have had little effect on trends in income inequality. The earlier price effects were not repeated, because the budget shares spent by rich and poor on different categories of goods and services have become less starkly different than they were in earlier times. The poor now spend only a tiny share of their income on food, and the rich cannot afford many servants. Thus, the main swings in relative prices, such as the oil shocks since 1973, have had similar effects on purchasing power up and down the income spectrum.

Our exploration of these issues dwells mainly on the period before 1815. It was between 1500 and the war era 1790–1815 that the poor depended critically on the affordability of food, and food rose in price relative to luxuries. Accordingly, we shall concentrate on the early modern era, with the period since 1815 receiving briefer treatment. We begin with some issues of early modern historiography, emphasizing some contradictions and puzzles that the concept of real income inequality can help to resolve.

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[3] A laudable exception is Williamson, "American Prices," which explored movements in real income based on different cost-of-living indexes for the different U.S. income classes since 1820. Williamson's study, like this one, found that movements in relative prices typically accentuated the movements in nominal income inequality. The U.S. relative-price effects he studied were, however, less dramatic than those revealed here.

RETHINKING EARLY MODERN INEQUALITY

Two promising but difficult paths are leading toward a new appreciation of the growing inequality in living standards from the early sixteenth century through the early nineteenth. One path explores that great global divergence in the average living standards of countries and continents; the other explores economic inequality within societies. Authors following the first path are concluding that global divergence between European countries emerged in this era, and that Europe as a whole began to pull ahead of Asia in the late eighteenth and early nineteenth centuries.[4] Following the second path, the present study will reinforce the conclusion that inequality was also rising *within* countries before 1815.

Neither path is easy to clear in a prestatistical era, but both are leading toward a new history of inequality. In this new history, the highly unequal world of the early nineteenth century was neither inherited from antiquity nor created by the Industrial Revolution. Rather, both paths are leading us toward the suspicion that humans were not yet as starkly unequal when Vasco de Gama and Columbus set sail as their descendants were to become in the early nineteenth century. On balance, the long era from about 1500 to the 1820s was indeed an era of rising global inequality, like the era since the 1820s.[5]

Measures of early income inequality between nations may have been particularly distorted by the working-class bias in the literature. Driven by social concerns and a partial database, scholars have concentrated on comparing the abilities of ordinary workers to buy ordinary food. This leads to the anomaly that in the very era where we suspect that Western Europe is starting to pull ahead of Eastern Europe and Asia, our only measures—those conventional food-wage measures—imply that Western Europe was actually growing impoverished. In all likelihood, it was the rise of middle- and upper-class incomes that pulled Western Europe's product per capita far ahead of the rest of the world before the 1820s.

As this conjecture implies, inequality *within* the nations of Western Europe rose greatly. In fact, the *real* gaps widened even more greatly than the

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[4] See Allen, "Great Divergence"; Pomeranz, *Great Divergence*; and Van Zanden, "Tracing."

[5] "The 1820s" here represent a compromise postwar benchmark. In some cases, the phrase means the initial postwar era of recovery on the Continent and agricultural depression in England, 1815–1820. It also serves as a link to Angus Maddison's estimates for 1820 in his study of the world economy (*Monitoring*), and to the argument by O'Rourke and Williamson ("When Did Globalization Begin?") that international price convergence may not have progressed between the sixteenth century and the 1820s. In other cases it refers to the 1831 output benchmark date for the United Kingdom or to the Morrisson–Snyder benchmark estimates of French inequality in 1836 ("Income Inequality"). And for some Continental countries the disruption of the French War era 1790–1815 will require stopping the evidence at 1790 instead of the 1820s.

Similarly, we will at times equate the 1640s or even the early seventeenth century with 1650, and the 1740s with 1750, as turning points. The dating of turning points has to be flexible, since different series changed trends at different times.

widening of nominal income gaps can reveal. What makes the concept of real inequality compelling for the period before the 1820s is a basic difference between the price history of this period and anything experienced in the twentieth century. The cost of living for the poor rose and fell dramatically relative to the cost of living for the rich. The relative price of staple foods rose sharply between 1500 (or earlier) and the 1640s, fell in some countries from the 1640s to the 1740s, and rose again in most countries between the 1740s and 1815. After 1815 staple foods became much cheaper. Calculations for England, France, and Holland will suggest how much upward tilt this relative price effect gave to the trend in inequality before the 1820s. The swings in real income inequality within nations were often contemporaneous with, but more dramatic than, swings in nominal inequality.

The magnified swings in real inequality, and their correlation with the rental–wage ratio, were caused by the interaction of population growth with concentrated land ownership and Engel's Law. Concentrated land ownership and Engel's Law together meant that the poor and the rich depended greatly on each other's factor services. Population growth, by supplying more labor and demanding more food, tipped the terms of interclass trade against workers.

WHOSE REAL INCOME? WHOSE COST OF LIVING? WHAT PRICES?

To see how real inequality could have had even more dramatic swings than nominal inequality, we need to start with differences in consumption styles and how they interacted with the remarkable swings in relative prices between 1500 and the 1820s.

A first step is taken in Table 1's sampling of class differences in expenditure patterns. Note how much more familiar are the working-class budget shares at the top of each panel than the middle- and upper-class shares that follow. In expenditure studies, as in studies of income and prices, scholars have fixed their attention on the working class and the poor. We are accustomed to historical household budgets that are spent mostly on food. Even as late as the eve of World War I, Britain's cost of living was still published as an index giving 60-percent weight to food, when in fact food was only 27 percent of consumer expenditures.[6] The food share of working-class budgets has always exceeded the national average, which in turn exceeded food's share of consumption by the middle- and upper-income groups, who spent more on servants, clothing, and miscellaneous luxuries. That income-class contrast is the essence of Engel's Law, which stipulates an inverse correlation between income level and the share of income spent on foodstuffs; the correlation obtains over time as well as across nations.

[6] See Bowley, *Prices*, p. 67; and Feinstein, *National Income*, p. T61.

TABLE 1
SELECTED HOUSEHOLD EXPENDITURE SHARES SINCE 1500
(percentage shares of total expenditures)

	Bread	Other Grain	Meat, Fish, etc.	Dairy	Salt & Spices	Drink & Sugar	All Food & Drink	Fuel & Light	Clothing	Rent	Servants	Other	Total
England and Wales													
Workers and the poor before 1840													
Bottom 40%, 1688 (King–R. Stone)	9.9	24.7	7.8	13.0		6.1	69.2		18.5	12.3	0.0		100.0
Phelps Brown–Hopkins (1981)	5.7	14.3	25.0	12.5		22.5	80.0	7.5	12.5		0.0		100.0
Poor, 1787/96 (Davies–Eden)	14.2	35.3	12.7	5.0		5.0	72.1	7.3	6.4	14.2	0.0		100.0
Workers, 1788/92 (Feinstein)	13.8	31.1	9.0	8.3		16.9	79.0	5.0	6.0	10.0	0.0		100.0
Workers, 1828/32 (Feinstein)	16.3	22.8	10.4	9.1		17.5	76.0	5.0	8.0	11.0	0.0		100.0
Middle and upper classes, 1688 (King–R. Stone)													
Median-income household	6.1	15.2	9.7	8.8		8.8	55.4		24.6	14.2	0.0	5.8	100.0
Households in the top 20%	2.4	6.0	17.2	5.4		10.8	41.8		25.0	14.2	17.7	1.3	100.0
Households in the top 10%	1.7	4.2	10.1	4.9		10.1	37.3		25.3	14.2	23.0	0.2	100.0
Households in the top 5%	1.2	3.0	15.8	4.5		9.1	33.6		24.9	14.2	22.5	4.8	100.0
National expenditures, 1688													
National expenditures, 1688	4.5	11.4	10.2	7.5		9.8	50.4		23.5			26.1	100.0
Working class, 1937–1939	4.4	3.2	12.8	8.1		5.4	39.6	7.3	9.2	12.3		31.6	100.0
Middle class, 1938–1939	3.7	4.8	7.5	4.8		3.6	26.9	5.9	9.0	12.3		45.9	100.0
Official consumer price weights, 1986							31.1	6.2	7.5	15.3		39.9	100.0
France													
Workers and the poor:													
Rural worker, 1832	49.0		14.7			5.9	69.6	1.6	16.1	6.5	0.0	6.2	100.0
Urban worker, 1832	34.5		21.2			10.6	66.4	4.7	16.3	5.8	0.0	6.9	100.0
Urban artisan, c. 1700	23.3		20.9	11.6		27.9	83.7				0.0	16.3	100.0
Rural worker, 1763	30.8		15.4	13.0		15.4	61.6	11.0	14.9	8.4	0.0	4.1	100.0
Urban worker Abbeville, 1764	23.1	5.4	7.4	13.0	8.0		56.8	12.8	16.8	7.2	0.0	6.4	100.0
Strasbourg, 1745/54 (Allen)	21.9	6.0	14.0	9.3		20.8	72.0	20.9	5.3			1.8	100.0

TABLE 1 — continued

	Bread	Other Grain	Meat, Fish, etc.	Dairy	Salt & Spices	Drink & Sugar	All Food & Drink	Fuel & Light	Clothing	Rent	Servants	Other	Total
France — continued													
Middle and upper classes:													
Duc de Saulx-Tavanes, 1788	0.7	1.0	5.3	1.8		4.1	13.3	6.7	36.9	13.7	21.1	8.3	100.0
Rural noble 1410, (i)	7.7		9.0	3.1	0.4	14.8	35.0					65.0	100.0
Rural noble 1410, (ii)	2.9		3.4	1.2	0.1	5.6	13.3					86.7	100.0
Parisian bourgeois family, 1880–1919	1.8	1.1	8.2	5.0		5.8	26.4	4.0	11.0	14.5	7.0	37.1	100.0
Parisian bourgeois family, 1920–39	1.2	0.8	7.2	4.2		3.5	22.0	4.1	10.0	14.0	7.0	42.9	100.0
Parisian bourgeois family, 1938–54	1.0	0.8	8.4	4.7		2.7	23.8	4.0	8.0	13.6	4.0	46.7	100.0
Composition of gross national product (PIB), France, 1781–90 (Toutain)							49.1[a]		28.8[b]		22.2[c]		100.0
Netherlands													
Holland laborer, 15th century	40.0		15.0	5.0		10.0	75.0	7.0	9.0	7.0	0.0[d]	2.0	100.0
Holland laborer, 18th century	30.0		5.0	5.0		5.0	60.0	11.0	15.0	11.0	0.0[d]	3.0	100.0
Netherlands elite, 1800/52	22.1		5.2	5.9		4.1	60.8	8.9	15.4	11.4	0.0[d]	3.5	100.0
Netherlands elite, 1806/62	16.0		12.0	9.0		9.0	56.0	1.0	10.0	7.0	8.0[d]	18.0	100.0
Other nations													
Germany (Palatinate), 1500–1700	36.0		11.0	9.0		6.0	68.0	8.0	12.0	8.0		4.0	100.0
Spain, 16th century	20.0		23.5			10.0	60.5	5.0	4.5			30.0	100.0

[a] Food and agriculture.
[b] Industry, excluding food.
[c] Services.
[d] Consumer services.

Notes and Sources: Here 0.0 = believed to be zero, and blank = either excluded or implicit in some other category. Following the established convention, all these consumer price index estimates exclude taxes and savings.

England and Wales: The weights for the bottom–40 percent, median-income, top–20 percent, and top–5 percent income groups' average consumption patterns start from Gregory King's notebooks (Laslett, "Classics"), with extensions by R. Stone ("Seventeenth Century Econometrics"). They have been modified further here, first by splitting out a bread share and then by adding rents. The overall grains category was divided into 2/7 bread and 5/7 other grains, a division suggested by the Davies-Eden sample

TABLE 1 — continued

of 1787–1796 (Davies, *Labourers*; and Eden, *State of the Poor*). This division is assumed to apply to all the bread-and-farinaceous shares for 1688. The English series assume that the rich paid as great a share in rent as the poverty population in the Davies–Eden sample in 1787–1796. The total for all food and drink includes expenditures for fruits, vegetables, and miscellaneous foods. The estimates for workers 1788–1792 and 1828–1832 are from Feinstein, "Pessimism." The working- and middle-class shares for 1937–1939 are based on two large household surveys, as explained in Prais and Houthakker, *Analysis*. Of the survey respondents, 74 percent were working-class, 8 percent were middle-class, and no class was specified for the remaining 18 percent.

   France: Urban artisan (and family), c1700, is from Morineau, "Budgets populaires," p. 236. Rural worker, 1763 = *colon aunisien* 1763 from Morineau, "Budgets populaires," pp. 214–17. Urban worker Abbeville, 1764, from Morineau, "Budgets," pp. 218–19. Since the budget leaves family with a surplus but no expenditures for clothing, the present calculations assume that half of surplus is saved and the rest spent on clothing. The Strasbourg weights are those estimated in Allen, "Great Divergence." Duc de Saulx-Tavanes 1788: this calculation adds 12 times January 1784 expenditures for speciality foods to a 5,000 *livre* annual budget for basic foods (from Forster, *House of Saulx-Tavanes*), and assumes that basic food is broken down as for top 5 percent in England. Rural noble 1410, (i) = Guillaume de Murol, noble in Auvergne, from Charbonnier, "Une autre France," 1: 128–33. The accounts give food expense only; the present calculation assumes a 35-percent total food expenditure share. Rural noble 1410, (ii) is the same, but assuming 13.3-percent total food expenditure. Paris bourgeois family shares are from Singer-Kérel, *Le coût de la vie*, pp. 420–21.

   Netherlands: The total for food and drink includes expenditures for potatoes, peas, and other vegetables not listed separately. The "other" category includes soap and "other (industrial)." The source is Van Zanden, "Toward a Second Generation."

   Other nations: The source for the Palatinate is Phelps Brown and Hopkins, "Further Evidence," p. 28; for sixteenth-century Spain it is Hamilton, *American Treasure*, p. 276.

These disparate consumption patterns mean that any comparisons in real purchasing power depend on which prices are used. The choice matters greatly. The early modern world had greater spatial and temporal variations in relative prices than any seen in the twentieth century, at least until the two oil shocks of the 1970s. Historians of early modern prices have fallen victim to this challenge, following a few series out of proportion to their shares of expenditures. Specifically, they have focused on staples (especially food) at the expense of luxuries; standardized, older products at the expense of novelties; traded goods at the expense on nontradables; wholesale at the expense of retail prices; goods at the expense of services; and resource- and capital-intensive goods at the expense of labor-intensive ones.

There are two good reasons for this widespread bias. One reason is that scholars care more about some categories than others, particularly life-sustaining staples and the traded goods over which nations went to war. The other reason is that some prices are more available than others. The price series that are most available for constant product definitions over many decades are those for standardized staples in wholesale trade. Yet the more elusive price series must get a larger share of our attention if our historical numbers are to reflect the realities of early modern inequality.

REVISING THE INTERNATIONAL DIVERGENCE OF REAL INCOMES,
1500–1830

There are three ways in which the historiographical bias in expenditures and prices has distorted our view of international differences in average income. First, using common wage rates as proxies for national income per person has hidden the contribution of property income to the overall rise of national income. Second, focusing on food prices has probably hidden part of the rise of real income per person in Western Europe for the long periods 1500–1640 and 1740–1815, when food prices rose dramatically relative to other prices. Missing the fact that luxuries became relatively cheap means underestimating the rise in the relative purchasing power of the leading Western European countries, which consumed relatively more of the cheapening luxuries and relatively less of the increasingly expensive staple foods. Third, a "purchasing power parity" (PPP) bias in international price comparisons may have overstated the levels of international real-income differences, as has happened consistently in the second half of the twentieth century. Recent work has already supported this third point about PPP bias in the sixteenth through eighteenth centuries.[7] Here we reinforce the first two points, those relating to the overemphasis on ordinary workers' wages and on food prices.

Workers versus Nations

As long as we continue to draw our living-standards data from the poor and from ordinary workers, we are unlikely to find any real-income advantage of living in Western Europe before the 1820s. The consumption of food and clothing and the availability of warmth will look no greater than in Poland or China. Such an impression is reinforced by the decline in real wages in Western Europe from the sixteenth century through the eighteenth.[8] Yet the global divergence of real incomes, now dated from the 1820s,[9] probably began in the mid-eighteenth century or even earlier. What most international comparisons have missed is the unmistakable rise of property incomes after 1750, and in some cases from 1500 on. When prosperity in the upper strata of society is combined with the stagnation or decline in real wages, the net result will be a greater rise in real national income per person in Western Europe than elsewhere before the nineteenth

[7] See Van Zanden, "Wages"; and Allen, "Great Divergence."

[8] For the robust conclusion that workers' abilities to purchase food were declining in most European countries across the second half of the eighteenth century or longer, see Phelps Brown and Hopkins, "Wage-Rates," "Builders' Wage-Rates," and *Perspective*; Braudel and Spooner, "Prices"; Van Zanden, "Wages"; and Allen, "Great Divergence."

[9] The monotonic rise of global income inequality since 1820 is documented by Bourguignon and Morrisson, "Size Distribution."

century. The possible magnitude of this adjustment will be sketched when we come to the real inequality trends within England, France, and Holland.

Cheaper Luxuries, Greater Divergence between Nations

A second point about income-class differences in spending patterns also suggests that we may have understated the rise in global inequality before the 1820s. Luxury goods became cheaper relative to staple foods over most of the period from 1500 to 1820. Part of this cheapening took the form of consumer gains from the first introduction of new luxury goods. This early modern phenomenon is well known.[10] Yet its importance for real incomes is as hard to quantify for that period as it is for today's officials who try to introduce new goods and services into cost-of-living indices as promptly as possible.[11] In fact, for fashion goods, luxuries are *intended* to change constantly, frustrating our search for consistent time series.

How can the role of new goods be quantified? Much can be done by working from both ends of this stretch of the path. Quantitative social historians can continue estimating the values of new consumer durables from probate inventories and other archival documents. Economists can apply new developments in index-number theory that allow us to put bounds on the consumer-welfare gains from the arrival of new goods.[12] While the ultimate magnitudes of the welfare gains from new goods are unknown, they presumably helped the rich more than the poor.

New goods aside, the available time series on the prices of a few older goods and services show that the prices of necessities generally rose faster than the prices of other goods and services between the early sixteenth and late eighteenth centuries. The International Price History Project of the interwar years revealed the price trends of a dozen major nonstaple products of consumption from 1500 (or earlier) through 1790 (or later) in a few dozen European cities and regions. We have summarized the trends in the "real" prices of nonstaples, relative to a foodgrain or bread, in Table 2 and Figure 1.

The general pattern in relative price trends over the whole period 1500–1790 is fairly clear, despite the variations by place and by era. As sketched in Table 2, unskilled labor definitely fell in price (wage) relative to the cost

[10] See Van der Woude and Schuurman, *Probate Inventories*; Wetherill, *Consumer Behavior*; Shammas, *Pre-Industrial Consumer*; Brewer and Porter, *Consumption*; and Jardine, *Worldly Goods*.

[11] This is not to imply that all new goods were luxuries. The New World introduced the potato and other new foods that were to become staples. Yet the introduction of these was not sufficient in its impact to prevent the rise in the real price of staple foods relative to luxuries before 1820. Two other likely exceptions were health-related: cotton clothing and other aids to sanitation might have helped the poor as much as the middle- and upper-income groups. Even these new goods had a not-so-egalitarian side, to the extent that they raised the labor supply, bidding wages down and rents up.

[12] For example, see Feenstra, "New Product Varieties" and "Exact Hedonic Price Indexes."

TABLE 2
TRENDS IN PRICE MOVEMENTS RELATIVE TO THE PRICE OF BREAD OR GRAIN,
1500–1790

Trend of Relative Prices	Product	Cities or Regions	Median Change in Relative Prices (percentage)
Rising strongly	Cinnamon	S. England, Holland, New Castile	> 70[a]
	Housing rent	England, Paris, Holland	> 40
Rising modestly	Fuels	16 regions / cities	14
Approximately constant	Soap	5 cities / regions	−1
	Wines	7 cities / regions	−3
	Candles	W. Brabant, Edinburgh	−6
	Meats	7 cities / regions	−11
Falling strongly	Unskilled labor	13 cities / regions	−37
	Paper	8 cities / regions	−53
	Textiles[c]	9 cities / regions	−56
	Beer	4 cities / regions	−61
	Sealing wax	S. England	−65[b]
	Silver	13 cities / regions	−69
	Sugar	Barcelona, Gdansk, New Castile	−85

[a] 1600–1790.
[b] 1500–1700.
[c] Excluding Italian cities, where real prices rose slightly.
Notes: The cities and regions are Southern England, London, Edinburgh, West Brabant, Holland, Netherlands, Paris, Barcelona, New Castile, Valencia, Andalusia, Naples, Milan, Modena, Florence, Vienna, Augsburg, Frankfurt, Krakow, Lviv, Warsaw, Gdansk, and Copenhagen. The Hoffman real-price series for Paris are summarized in Table 4.
Source: WP.

of grains and bread. The overall change in this food wage varied between a modest 9 percent decline (Krakow) and drastic drops of more than 60 percent (Gdansk, Warsaw, and Spain). The declines were concentrated in the inflationary sixteenth century and the late eighteenth century.

So great was the rise in food scarcity that few items rose in price faster than basic food grains. The prices of meats, wine, soap, and candles moved in proportion to food-grain prices, neither faster nor slower. The one important category that clearly rose in price faster than food was rent, either on housing or on the land that produced that food. Another was the set of luxury spices from the distant tropics. Like the cinnamon price featured here, the prices of pepper, nutmeg, and cloves also rose faster than grain prices in many settings, the exceptions being pepper in sixteenth-century Augsburg, and ginger and saffron in eighteenth-century Warsaw. Yet spices made up only a tiny share of household expenditures, even for the rich.[13] More to the

[13] For example, in 1784–1786 spice imports were less than 1 percent of the value of imports into great Britain (Davis, *Industrial Revolution*, p. 110), or less than 0.1 percent of national income for the 1780s. Even if all the spices were consumed by the top 20 percent of families, who had 50–60 percent of national income at the time, spice consumption would have been less than 0.2 percent of those top incomes.
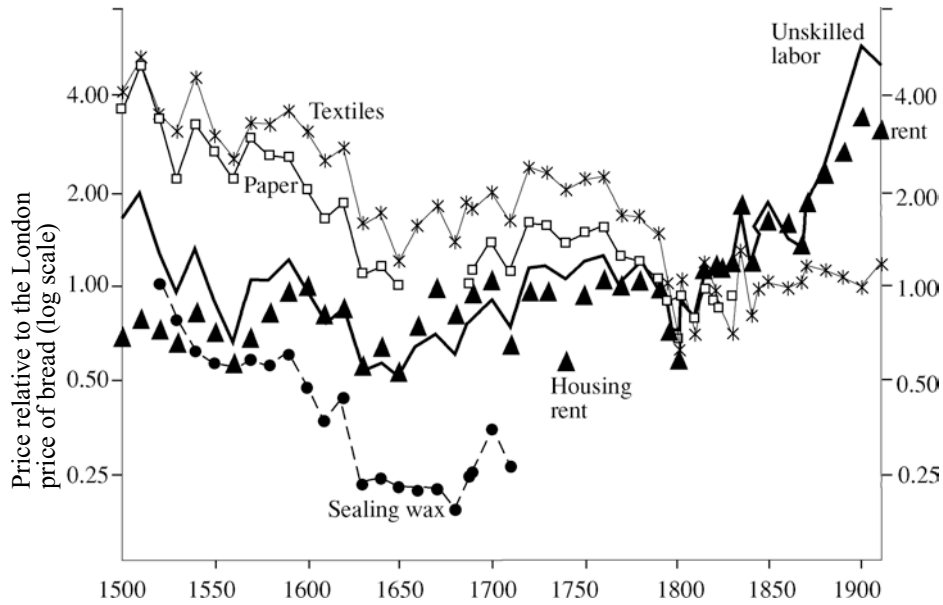
FIGURE 1A
SELECTED PRICES RELATIVE TO THE PRICE OF BREAD OR GRAIN, 1500–1910,
ENGLAND

Notes: Base years: 1770 = 1 for labor and rent; 1900 = 1 for textiles; 1520 = 1 for sealing wax;
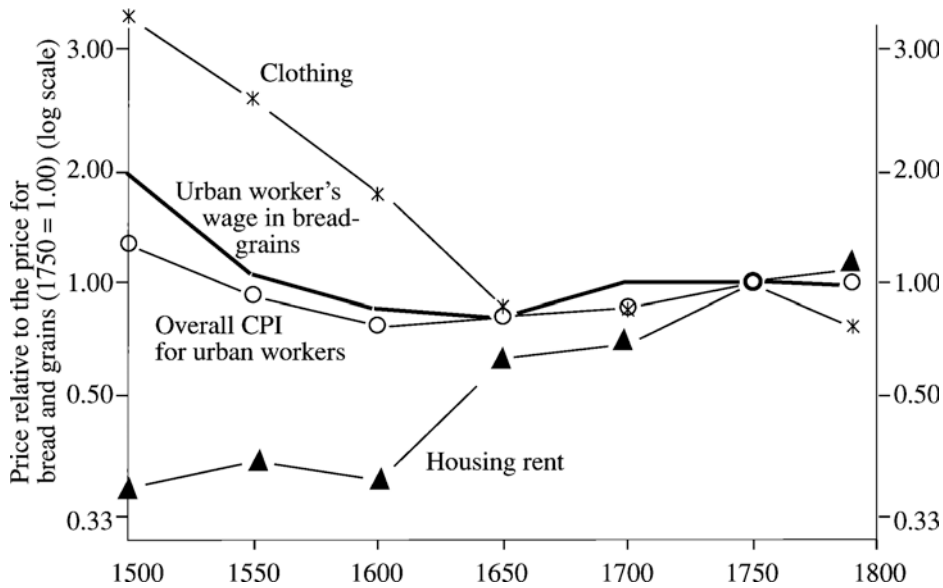1650, 1688 = 1 for the two series on writing paper.

FIGURE 1B
SELECTED PRICES RELATIVE TO THE PRICE OF BREAD OR GRAIN, 1500–1910,
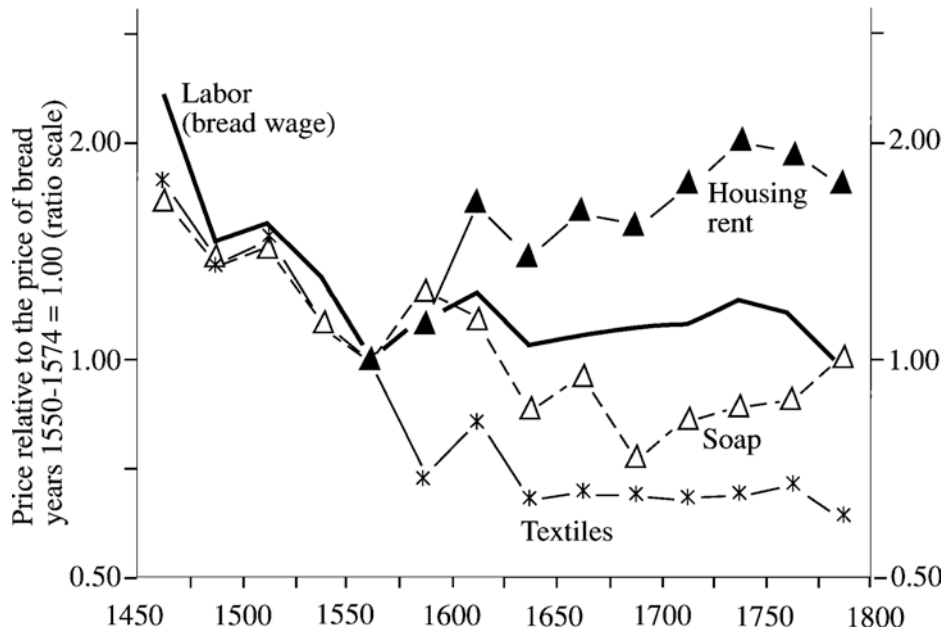PARIS

FIGURE 1C
SELECTED PRICES RELATIVE TO THE PRICE OF BREAD OR GRAIN, 1500–1910
HOLLAND

point, the cost of such fuels as firewood, charcoal, coal, and peat rose at least as fast as food prices. While the food crisis may have been greater than the fuel crisis in the sixteenth and the late eighteenth centuries, fuel scarcity was more evident than food scarcity between 1600 and 1750.

While succeeding generations of unskilled workers found it increasingly hard to afford rent, food, and fuel, other product prices rose more slowly than their wage rates. That was generally true of writing paper, beer, textiles and clothing, some miscellaneous luxuries, and sugar (see Table 2). Near the very bottom of the price-trend ranks was silver, cheapened by imports from the New World. The products falling in price relative to food had two salient features. First, their production made intensive use of factors of production that were growing cheaper across these centuries, particularly labor and capital.[14] By contrast, the main rising-real-price products—housing, fuel, and food—called for more intensive use of land (farmland, forests, and mineral reserves), the factor that was rising in price. The pattern does not fit perfectly, of course. Spices were not land-intensive in a sense that is meaningful for Western Europe, whereas increasingly-cheap sugar did use land.

[14] That labor was increasingly cheap relative to most products and the overall cost of living is evident in the real-wage studies of Van Zanden ("Toward a Second Generation"), Allen ("Great Divergence"), and earlier authors. The cheapening of capital inputs follows mainly from the drop in interest rates (Allen, "Price of Freehold Land"; Homer and Sylla, *History of Interest Rates*; and Clark, "Land Hunger").

Yet as a general rule, land intensity is lower in the lower half of Table 2's list of products. This pattern suggests a cost-side explanation for some of the price trends.

The other salient feature of the products falling in real price is that they tended to be luxuries, or at least not staples. The tendency was rough, and had its exceptions. Beer was a luxury in the working-class end of the spectrum, though sugar was not,[15] and luxury wines did not fall in price relative to food grains. Most studies find that clothing was a slightly luxurious good, which should imply the same for the textiles that were fashioned into clothing. Writing paper, chocolate, pewter, and sealing wax were surely luxury goods, and they fell considerably in price relative to food grains.[16] And as we shall note below, labor itself was a luxury, in the sense that the rich spent a greater share of their income buying it.

This interproduct pattern in real prices before 1820 brought greater real-income gains for richer nations, just as it did for the richer classes within each nation. Developing truly national cost-of-living indices, with luxuries taking a greater share of expenditure in the richer nations, would probably reveal that the global inequality of real purchasing power rose faster than the global inequality of income measured in units of any one good such as silver or wheat. It did so without a trend toward globalization. While there was enough trade integration in early modern Europe for prices to move in harmony between regions and nations, there was no secular global trend for price gaps to shrink until after the 1820s.[17]

TRENDS IN THE CLASS-SPECIFIC COST OF LIVING, 1500–1830

How has the traditional focus on wage rates, and on grain or bread prices, biased our view of real-wage trends and inequality trends *within* countries? If one just expanded the cost-of-living deflator to include such familiar nonfood goods as beverages, clothing, fuel, and light, then the traditional real-wage studies would not need a massive adjustment. We could end up seeing only that real incomes for all classes declined a bit less than past studies of the food wage have implied.

Yet the partial expansion of the cost-of-living bundle should not stop there. It should also explore how the cheapening of luxuries relative to sta-

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[15] See Clark, Huberman, and Lindert, "British Food Puzzle," p. 224.

[16] On a musical note, another luxury that became cheaper relative to bread or the overall cost of living was a London opera ticket. While other nominal prices rose between the 1720s and 1786–87, opera tickets stayed fixed at 10s 6d for boxes and the pit, and at 3 to 5s for the gallery (Hunter, "Patronizing Handel," p. 35).

[17] See Jacks, "Market Integration"; and O'Rourke and Williamson, "When Did Globalization Begin?" While more detailed price comparisons may show some net price convergence up to the 1760s, it seems likely that the rise of England's Corn Laws and especially the blockades of the French War era (1793–1815) canceled any net movement toward price convergence until after Waterloo.

ples interacts with those differences in expenditure shares illustrated in Table 1. By omitting these interactions, past studies have missed the inegalitarian feature of cost-of-living trends before the early nineteenth century. That is, difficulties in both concepts and data have caused us to underestimate the widening of the real economic gaps within nations. This is true not only of the real-wage literature, but also of the literature that has followed nominal income inequality.[18] It is time to probe more deeply into *real* income inequality.

The next step is to supplement the introduction of a few luxury goods in Table 2 And Figure 1 with further discussion of two particular differences in lifestyle between the top and bottom income classes. With these in view, we will be able to construct class-specific cost-of-living indices and measures of trends in real income inequality.

The Declining Real Cost of Servants

The real wage rate itself has a further implication about real inequality. High-income families hired labor directly, as household servants, as day servants, and as craftsmen. So the lower the real wage rates sank before 1820, the cheaper became the high-income lifestyle. Conversely, the rise in real wages after the 1820s meant that the cost of living of the rich rose faster than that of workers.[19] Since servants' nominal wages apparently followed the wage rates for the unskilled agricultural workers, which in turn tracked unskilled builders' wages before 1820, one can use an unskilled wage rate as a rough proxy for servants' wages.[20]

To the extent that upper-class employers paid their servants in kind, one could say that expenditures on servants are already built into the data on other household expenditures. That is the case for the English data, though not for the French Duc de Saulx-Tavanes (Table 1). Yet even for the English data, it makes sense that the pay in kind for servants varied in its nominal value with the nominal wage of servants, more directly than with the prices of the goods and services purchased for them. Accordingly, we have inferred the shares of food and other items implicitly paid to servants by applying low-income consumption weights to total expenditures on servants, and have deducted these from the rich-household expenditures on these other categories in Table 1. To estimate a full servant bill—both for those paid in kind and for those paid in cash—we use the unskilled wage rate as the barometer of their unit cost. The unskilled wage rate itself thus becomes a

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[18] For example, see Lindert and Williamson, "Revising" and "Reinterpreting"; and Van Zanden, "Tracing."

[19] An impression about who hired servants, and in what numbers, can be gained from a variety of sources discussed in WP, appendix A.

[20] See Snell, *Annals*, pp. 25–47, 411–17.

luxury-service price, one that greatly affects our estimates of the trend in living costs for the rich.

Selling Food or Housing to Themselves

The meaning of price movements depends critically, of course, on whether one is a buyer or a seller. Past measurements of the cost of living and real wages have assumed that households sell everything they make and buy everything they consume. That is often not the case, of course. Many households consume what they produce. Others sell more of a consumer good or service than they use, making them beneficiaries of higher prices of that good or service.

The first place where the consumption of nonpurchases intrudes into the traditional discussion is in the consumption by lower-income rural households of food and clothing they produce themselves. As Witold Kula and William Hagen have rightly warned, ordinary peasants did not experience anything like a 30-percent loss of real income when food prices rose by 30 percent relative to the wage rate.[21] In many cases, their real income was wholly unaffected. This clearly important point is hard to quantify. In England, the socio-occupational categories in the social tables of 1688– 1803 imply that among families with below-average income the share of home food consumption that was home-produced was probably between 4 and 30 percent of total income.[22] The importance of home production will have been greater in less market-integrated settings. In early modern Europe, this kind of protection against price movements was probably greater in the countryside and in the east. All subsequent discussions of real wages as measures of the real purchasing power of "the masses" must bear in mind that real wage measures overstate the fluctuations in their real incomes.

Yet the likely magnitude of home production as a share of workers' incomes would not have been as great as the share of a different kind of home production, one that affected the top income groups. The fact that high-income groups bought housing mainly from themselves needs particular attention here.

For all the narratives about the cost and condition of workers' housing, very few historical cost-of-living indices have been able to include housing rents. This is not surprising, since housing is of more variable quality than bread or coal. For housing, as for fashionable luxuries, variety and change frustrate our attempts to build long-run time series. Yet in a few cases it has

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[21] See Kula, "Economic Theory"; and Hagen, "Working for the Junker."

[22] This statement uses the social tables in Lindert and Williamson ("Revising"), and assumes that home production could have been 100 percent of income for lesser freeholders and husbandmen, and 10 percent for laborers, vagrants, paupers, and cottagers.

proven possible to produce long time series of the rental prices of housing of given quality.[23]

Housing rents, as we saw in Table 2 and Figure 1, rose at least as fast as the cost-of-living index up to the end of the eighteenth century, and they rose even faster across the nineteenth century. Over the last five centuries as a whole, housing is probably the one major consumer price that may have kept pace with the wages of labor, when quality is held constant.

If everybody spent the same share of their budget on housing, and if modern guidelines for income accounting were applied, then the movements in the relative price of housing would play little role in class differences in cost-of-living trends. Housing's share of a broad concept of total income or expenditures is indeed roughly constant across the income classes in any given year. Economists have noted that the income elasticity of housing is near enough to unity that one could use the value of occupied housing as an index of permanent income.[24] So as far as the *use* of housing is concerned, its rough proportionality to income might suggest that movements in the real price of housing should not have caused any difference in cost-of-living trends between the rich and the poor. Yet the impact of house-rent movements on the different income classes was probably far from neutral, since the rich *owned* housing and the poor typically did not. How has home ownership before the twentieth century been handled by past writers, and how might it be handled differently?

Applying the same housing-rent series and the same budget share for housing to all income classes would require some assumptions about the housing costs faced by homeowners. Some assumptions that might seem attractive are:

(a) Assuming an approximate market equilibrium in which homeowners had to incur as much expense and opportunity cost for their housing—in repairs, interest, taxes, and expected price depreciation—as would match the market rent on a house of the same quality.

(b) Assuming that this expenditure on owner-occupied homes was correctly added to assessed income by the income estimators of the past.

(c) Assuming that the income assessments have already correctly measured any pure-price gains on real estate for the most propertied classes, who owned more residences than they occupied.

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[23] We have used the Van Zanden series ("Toward a Second Generation") for Holland, Philip Hoffman's index for prerevolutionary Paris, and Gregory Clark's housing rent series extending from the mid-seventeenth to the mid-nineteenth century for London, for the rest of England, and for England as a whole. A series for Bruges from 1500 on is given by Verlinden *et al*. (*Dokumenten*). There are also thinner rent series for Milan and Lviv, but it is hard to know whether housing quality has been held constant in these cases.

[24] For an application of the unit-elasticity assumption about housing to the economic history of inequality, see Williamson (*Did British Capitalism Breed Inequality?*).

While the issue is hard to resolve without better data, we are inclined to doubt all three assumptions.

It seems unlikely that a rise in rents would raise the housing costs for an affluent homeowning household in the same proportion as the market-equilibrium assumption implies. And if that affluent household owned housing that it rented out to others—as was often the case—the jump in market rents would raise, and not lower, its real income.

The fact that housing owners were higher in the income ranks than occupants would not complicate our accounting for relative real incomes *if* the historical record of nominal incomes included all the incomes that owners received from their residential properties, including their own home. Were that the case, then any jump in real rents would be recorded correctly as a jump in their nominal income, partly offset by the fact that some of the housing they owned was consumed by themselves rather than rented out for income.

That is apparently not the case, however. None of the scholarly estimates of early high incomes makes explicit reference to an imputation for owner-occupied housing. Typically, someone like Gregory King would show awareness of owner-occupied housing only in separate discussion of the nation's housing stock, and would not carry its value over to any tabulation of income by class. Nor, as far as we can tell, did the official returns on income taxation in England and France give this point its due. Scholars' views of the real income movements of high-income groups are in danger of implicitly assuming that they had to rent all their housing from landlords, and reaped no net gains from a rise in rents. They will have stepped into that trap if they take nominal incomes, excluding imputations for owner-occupied housing, and deflate them by a cost-of-living index that implies that these affluent families had to rent all their lodging.

Any era in which rents rose faster than the composite price index on the rest of a lower-class consumer bundle was likely to have been an era in which the cost of living rose even less for the most propertied classes than even the present estimates show.[25]

Tentative Cost-of-Living Indices by Income Class

Combining the expenditure shares in Table 1 and price series like those illustrated in Table 2 and Figure 1, one can assemble rough cost-of-living indices that apply to the expenditure patterns of the different income ranks. Figure 2 summarizes the contrasts in the cost-of-living trends for the top and

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[25] Our more detailed treatment in WP (tables 4–6) sets extreme bounds on the importance of this residence-ownership effect. As warned in the text here, the bounded estimates that give maximum impact to this effect suggest that it may have heightened the rise of real inequality in rising-rent periods like the sixteenth century.

FIGURE 2A
MOVEMENTS IN THE COST OF LIVING IN TOP INCOME GROUPS, RELATIVE TO THE
COST OF LIVING IN THE BOTTOM 40 PERCENT OR IN WORKERS' HOUSEHOLDS,
ENGLAND, 1500–1986

Sources: See the notes to Table 3.

FIGURE 2B

MOVEMENTS IN THE COST OF LIVING IN TOP INCOME GROUPS, RELATIVE TO THE
COST OF LIVING IN THE BOTTOM 40 PERCENT OR IN WORKERS' HOUSEHOLDS,
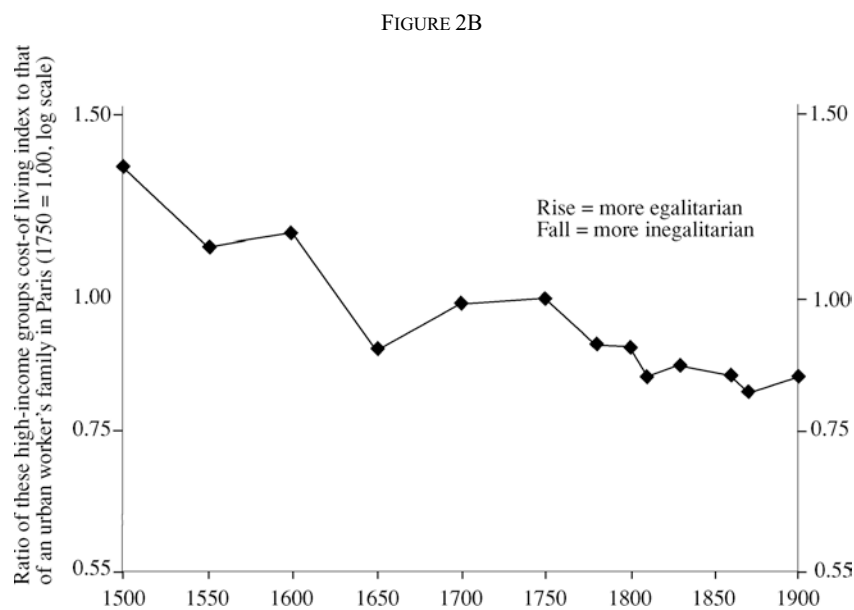FRANCE, 1500–1900
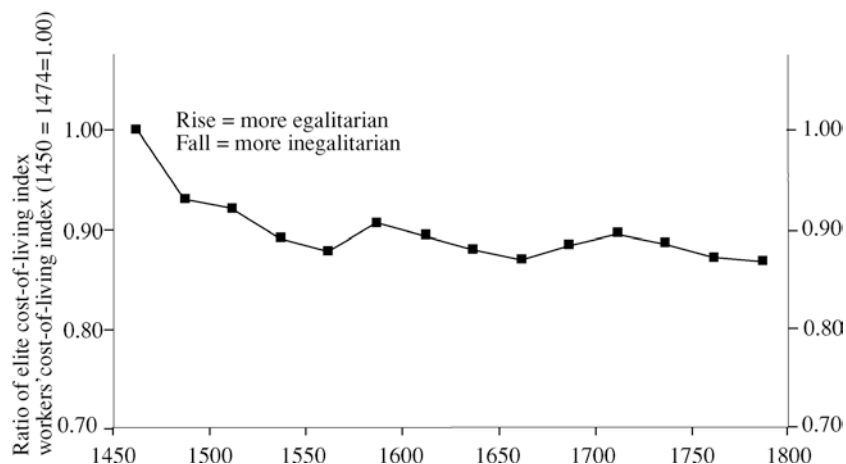
Sources: See the notes to Table 4.

FIGURE 2C
MOVEMENTS IN THE COST OF LIVING IN TOP INCOME GROUPS, RELATIVE TO THE
COST OF LIVING IN THE BOTTOM 40 PERCENT OR IN WORKERS' HOUSEHOLDS,
HOLLAND, 1450–1799

Sources: See the notes to Table 5.

bottom groups for England, the Paris Basin, and Holland. Tables 3 through
5 present the relevant price series. In Figure 2, a rise is egalitarian in that it
means that the cost of living rose more for the rich than for the poor. A
decline is inegalitarian.

The cost-of-living deflators for different income classes moved very
differently before the early nineteenth century. For England (Figure 2A), the
movements reveal historical eras that seem to match those delineated by
other inequality indicators. First, during the famous but gradual Price Revo-
lution between 1500 and 1650, England's top income groups enjoyed a
decline of about 32 percent in their relative cost of living, in the form of less
price inflation. Then, between about 1650 and about 1750, the common
people had the better of it. In the second half of the eighteenth century, this
swing was itself reversed again, so that in 1800 the relative cost-of-living
hardship of being poor was as bad as back in 1650. Then in the late nine-
teenth century the pendulum swung back in favor of workers and the poor.
In fact, it swung further their way than at any time over the previous three
centuries. In prerevolutionary France, the broad class differences in cost-of-
living trends looked similar (Figure 2 B). Relative to an urban working-class
household, a wealthy noble family had a declining cost of living up to the
1650 benchmark, especially if homeownership shielded them from the rapid
rise in housing rents. The practice of the well-to-do was not uniform in this
regard. Some rented their high-class housing, just as the Duc de Saulx-

Tavanes rented his Paris residence. Others owned their own housing, just as the Duc owned his country estate. There is again a slight egalitarian drift between 1650 and 1750 and a reversal between 1750 and 1790, though these movements were smaller than those in England.

In Holland, as in France and England, the cost of a high-income lifestyle declined relative to the cost of living in a working-class household (Figure 2C), particularly before 1650. We see only a pale reflection of England's late-eighteenth-century inegalitarian trend, however.

ROUGH ESTIMATES OF "REAL INEQUALITY" TRENDS FOR EARLY MODERN ENGLAND, FRANCE, AND HOLLAND

Real income inequality is an important index-number concept that could be fully formalized with an explicit overall welfare function that combines different people's individual well-being. One approach to specifying an aggregate welfare function is to assume a meta-utility function in which everybody has the same basic tastes. In this approach, even though the poor and the rich have the same tastes in the abstract, having very different resources means that the same price movements affect their welfare very differently. Economists have developed formal models of social welfare in this spirit.[26] Such models combine welfare changes for the poor and the rich into the same overall welfare metric. Here we follow a similar approach, but to avoid the troublesome index-number concept of overall real well-being we will illustrate real inequality movements only in ratios of the real income of the highest income ranks to the real income movements of lower ranks.[27] The ratios of real purchasing power can help answer such questions as "What happened to the relative abilities of higher and lower income ranks to buy things in the proportions typical of their lifestyles?" or "How did the real incomes of higher and lower income ranks compare with those of their counterparts in earlier generations?"

The history of real-income movements seems more volatile than is suggested by more conventional measures of nominal income inequality. The bottom panels in Tables 3–5 underline this point by reinterpreting the movement in the income ranks between benchmark dates.

In England and Wales, both the egalitarian change between Gregory King's study (1688) and Joseph Massie's (1759), and the subsequent

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[26] See Jorgenson and Slesnick, "Individual and Social Cost of Living Indexes"; Diewert, "Theory"; and Slesnick, "Empirical Approaches."

[27] This article confines itself to sketching movements in early modern inequality in income *before, rather than after, direct taxes and transfers*. The pretax-pretransfer focus avoids the difficult task of exploring fiscal incidence, a topic too vast to undertake here. So for the time being, we must perpetuate an inconsistency shared by most of the literature presenting real-income time series. We use a price deflator appropriate to disposable income—that is, after-tax and after-transfer income—as a denominator for original income, from which direct taxes and transfers have not been netted out.

TABLE 3
THE INCOME-CLASS COST OF LIVING, AND REAL INEQUALITY IN ENGLAND,
1500–1986

A. Cost-of-Living Indices for Various Income Classes (1770 = 100)

	Bottom 40%	Median	Top 20%	Top 10%	Top 5%
1500	20.7	23.5	32.4	33.3	34.7
1550	42.0	45.6	52.3	52.5	53.6
1600	72.7	74.2	77.7	77.1	77.3
1650	106.1	100.8	97.7	96.5	95.8
1688	83.0	86.0	88.4	88.4	89.0
1700	93.3	93.7	95.4	94.9	94.8
1750	85.4	88.4	94.4	94.9	95.3
1760	88.4	91.9	96.9	97.2	97.5
1790	116.0	114.6	110.8	110.6	110.2
1802	150.4	145.9	133.2	132.2	130.7
1867	159.6	158.8	146.3	147.1	146.2
1910	121.7	131.0	134.0	139.6	141.8
1927	204.7		232.6		
1937	189.4		220.6		
1947	280.2		332.5		
1957	468.3		547.0		
1967	633.7		754.6		
1977	1,974.9		2,348.1		
1986	4,109.2		4,988.1		

B. Intergroup Ratios of Average Incomes

	Nominal Share, Bottom 40 Percent	Ratio of Average *Nominal* Incomes to Bottom 40 Percent			Ratio of Average *Real* Incomes to Bottom 40 Percent		
		Top 20%	Top 10%	Top 5%	Top 20%	Top 10%	Top 5%
England and Wales, 1688	9.8	11.8	18.4	29.0	11.8	18.4	29.0
England and Wales, 1759	12.5	9.2	14.4	22.6	8.8	14.0	22.0
England and Wales, 1802	9.0	14.1	21.8	35.0	16.8	26.4	43.2
England and Wales, 1867	17.3	6.6	11.5	19.1	7.6	13.3	22.3
United Kingdom, 1867	15.7	7.3	12.3	20.9	8.4	14.3	24.5
United Kingdom, 1911	16.1	6.9	11.4	19.2	6.6	10.6	17.7
United Kingdom, 1937	19.1	5.5	8.5	13.2	5.0		
United Kingdom, 1967	20.0	4.0	5.2	7.0	3.6		

Notes and Sources: A fuller version of this table, giving indices for every decade between 1500 and 1910, is WP, appendix table B1. For any decadal year (ending in 0), or any twentieth-century figure, the figures represent five-year centered averages. Thus 1600 = 1598–1602, etc. An exception is 1500, which is an average of data-supplying years from 1500 through 1504. The underlying price indices are antilogs of sums of the products of budget shares and log-changes in prices, thus assuming unit elasticities of substitution. That is, each price index is of the Cobb–Douglas form. The budget shares are those for 1688 in Table 1. Bread = London bread, from Beveridge. Other grain = Phelps Brown–Hopkins farinaceous products. Meat and fish, butter and cheese, drink and sugar (malt, hops, sugar, tea), fuel, and textiles (blue cloth, woolen and worsted yarn, cotton cloth) are the corresponding indices from Phelps Brown and Hopkins, *Perspective*, pp. 32–59. Rent = Quality-adjusted housing rent series from Gregory Clark's current estimates, back through 1550. The earlier estimates are spliced to the Clark series at 1550 by assuming that housing rents were in proportion to the Phelps Brown–

Hopkins overall cost of living, 1500–1550. The weights for the bottom 40 percent are from R. Stone, "Econometrics," except for rent (Davies–Eden sample of the poor, 1787–1796) and servants. The weights for the median-income, top-20 percent, top-10 percent, and top-5 percent income groups' average consumption patterns start from Gregory King's notebooks (Laslett, *Classics*), with extensions by Richard Stone ("Some Seventeenth-Century Econometrics"). They have been modified further here, first by adding London bread as 2/7 of all grains and then by adding rents and servants. In Panel B, all figures 1500–1850 are centered five-year averages. The nominal shares of income received by the top 5 percent, 10 percent, and 20 percent of households are from Lindert ("Three Centuries," table 1 and underlying calculations), partly revising Lindert and Williamson ("Revising England's" and "Reinterpreting Britain's"). To allow for the possible importance of shifts in expenditure shares of different income classes after 1810, we recalculated the post-1802 real income movements using alternative circa-1860 expenditure weights that were interpolated between the pre-1810 (actually 1688) weights of Table 1 and the working-class and middle-class weights of 1937–1939 (Prais and Houthakker, *Family Budgets*, pp. 104–05). As shown in WP appendix B, this made little difference. Its main effect was to make the cheaper-food effect less important between 1867 and 1910, because using the later-era weights shrinks differences in food shares. Price effects still reduced real inequality between 1867 and 1910/11. Using the alternative weights had no noteworthy effect on the changes from 1802 to 1867. For class-specific price indices after 1910, we use the 1937–1939 "working-class" and "middle-class" expenditure weights given in Table 1. The "middle class" here is probably in the top 20 percent of households. The nominal income distributions used in Panel B give only approximate movements in income shares. "Real" means nominal ratio at the 1688 distribution base. The underlying source materials change in their definition and coverage of incomes and of population units. For the sources and caveats, see Lindert, "Three Centuries." Changes in source data definition are also the reason why we have not extended the income distributions past 1967 or the cost of living indices past 1986.

inegalitarian change up to the time of Patrick Colquhoun's (1801–1803), were apparently more intense in real terms than in nominal terms. This can be illustrated by looking at what happened to the ratio of top-decile income to the income of the bottom two-fifths between 1759 and 1802 in Table 3. In nominal terms this ratio rose by 50 percent (from 14.4 to 21.8). But in real terms, it nearly doubled (from 14.0 to 26.4). That is, the movement of real inequality proves to have been a magnification of the movement in nominal inequality. The same holds for the other periods shown in Panel B of Table 3.

In the case of eighteenth-century France, too, price movements amplified the movements in nominal income inequality. The trends were modest in this case, however, and they seem to have reversed at midcentury. As shown in Panel C of Table 4, the real-income ratios dividing rich and poor narrowed between 1700 and 1750, and did not change between 1750 and 1790. These movements are subject to wide ranges of possible error, as Morrisson and Snyder warn us.[28]

For Holland, price movements seem to have magnified a greater and more prolonged rise in inequality. The current price estimates of Jan Luiten van Zanden accentuate the inegalitarian drift in his earlier estimates of Holland's nominal income distribution.[29] Over the entire three centuries from 1500 to

[28] Morrisson and Snyder, "Income Inequality of France."
[29] Van Zanden, "Toward a Second Generation" and "Tracing."

TABLE 4
REAL PRICE MOVEMENTS, THE COST OF LIVING, AND REAL INEQUALITY IN FRANCE, 1500–1900

A. Real Prices, Relative to the Overall Cost-of-living Index of an Urban Worker in Paris (1750–1759 = 1.00)

Start of Decade	Bread	Other Grain	Meat, Fish, etc.	Dairy	Drink & Sugar	All Food & Drink	Fuel & Light	Clothing	Rent	Servants	Other	Real Wage (Unskilled Urban)
1500	0.98	0.98	1.11	0.74	2.91	0.93	0.70	3.13	0.19	1.33	1.20	1.33
1550	1.09	1.09	0.90	0.75	1.38	0.98	0.83	2.13	0.33	1.05	0.88	1.05
1600	1.16	1.16	0.72	0.76	2.21	0.99	0.72	1.88	0.49	1.16	0.89	1.16
1650	1.32	1.32	0.76	0.85	1.24	1.11	1.01	0.81	0.76	1.08	0.91	1.08
1700	1.23	1.23	0.89	0.78	1.28	1.06	0.96	0.97	0.88	1.21	0.77	1.21
1750	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1780	1.14	1.01	1.15	1.16	0.96	1.11	0.96	0.75	1.14	1.03	0.75	1.03
1800	1.13	1.08	1.43	1.13	0.77	1.15	1.23	0.60	1.02	1.49	0.71	1.49
1810	1.18	1.34	1.67	1.08	0.82	1.25	1.13	0.48	1.09	1.48	0.69	1.48
1830	1.15	1.18	1.68	1.13	0.89	1.21	1.21	0.38	1.72	1.65	0.84	1.65
1860	1.21	1.26	1.96	1.23	0.96	1.30	1.00	0.25	2.36	2.14	1.40	2.14
1870	1.28	1.13	2.20	1.42	0.85	1.37	0.92	0.21	2.35	2.27	1.65	2.27
1900	1.31	0.94	2.34	1.79	0.52	1.40	0.96	0.16	2.99	3.77	2.01	3.77

TABLE 4 — continued

B. Alternative Cost-of-Living Indices, Based on Household Budget Shares
(1750–1759 = 1.00)

Start of Decade	Urban Worker, 1764	Duc de Saulx-Tavanes, 1788
1500	0.41	0.55
1550	0.70	0.78
1600	1.06	1.23
1650	1.32	1.18
1700	1.01	1.00
1750	1.00	1.00
1780	1.19	1.08
1800	1.34	1.20
1810	1.45	1.23
1830	1.33	1.15
1860	1.44	1.22
1870	1.57	1.28
1900	1.28	1.08

C. Nominal Income Shares and Intergroup Income Ratios

	Nominal Income Shares			Real Inequality: Ratio of Average Real Incomes of Top 10 Percent and Bottom 40 Percent
Year(s)	Bottom 40%	Top 20%	Top 10%	(1750 prices)
1700	8.0	74.0	62.0	31.2
1750	11.0	63.0	46.0	17.7
1780–1790	12.0	63.0	49.5	17.6
1831	18.0		45.0	10.1
1866	16.0		48.5	13.0
1899–1901	16.0	55.0	45.0	11.3

Notes and Sources: Conventions and methods are as in Table 3. The indices are antilogs of sums of the products of budget shares and log-changes in prices, thus assuming unit elasticities of substitution. Prices are decennial averages of available data; all are retail and from Paris unless otherwise stated. Some figures are interpolated; others are taken from 25-year averages. Sources for the expenditure shares used are given in Table 1 and its notes. The price series for all food and drink is a geometric average of food subseries, using the urban worker's expenditure shares. Prices are omitted in the 1790s because the French Revolution disrupted markets and eliminated data sources. Unless otherwise stated, all prices between 1840 and 1954 were derived from the indices and base prices in Singer-Kérel, *Coût*, and prices in 1989 were calculated using indexes in France, INSEE, *Revenues et partimoine*. The bread prices for 1750–1789 are from Hauser, *Recherches et documents*, p. 135; before 1750 it is derived by splicing the price of wheat to the bread price in 1750–1759. Bread prices from 1800 to 1873 are taken from Husson, *Consummations*, pp. 175–79. The wheat prices before 1790 are from Baulant, "Prix des grains," with corrections explained in Hoffman, *Growth*, 337–38. From 1800 to 1869 they are from Labrousse, Romano, and Dreyfus, *Prix du froment*, pp. 190–91. Starting with 1869, the price of wheat is imputed from the wholesale price of flour in Singer-Kérel (*Coût*, pp. 462–63). The wheat and flour prices are thus wholesale prices, and the wheat price series serves as the price of other grains and of residual food. The price of beef serves as the price index for meat and fish. Before 1790, the price of beef is taken from 25-year national averages in d'Avenel, *Histoire*, vol. 4, p. 586. In 1800–1809, it is the cost of meat of any kind paid by Parisian institutions. From 1810 to 1849, it is an imputed retail price derived from price of cattle using the ratio of the retail price of beef to the price for cattle during the years 1845–1850; the source for these years is Husson, *Consummations*, pp. 218–19, 227. The butter prices before 1790, which are wholesale, are from Hauser, *Recherches*, pp. 136–38, and Baulant, "Salaire," p. 963. For 1800–1819 the butter price is the cost to Parisian institutions from Bienaymé,

TABLE 4 — continued

Coût, p. 39, and the 1820–1839 butter prices are from Husson, *Comsummations*, p. 363. Wine prices 1620–1819, from Lachiver, *Vin*, pp. 244–69, 288–97, 860–65, are the wholesale price at Argenteuil, plus the taxes on the initial sale that were collected before the French Revolution. The wine prices are comparable to retail prices just outside Paris, but they omit entry taxes in Paris, which were levied both before and after the Revolution. Wine prices from before 1620 are derived by taking retail prices from the Paris area for vin and vin ordinaire from d'Avenel, *Histoire*, vol. 4, pp. 181–241, and splicing the resulting series to the Argenteuil prices in the 1620s. Wine prices for 1820–1849 follow the wholesale price of ordinary-quality wine from Orleans sold in Paris from Husson, *Consummations*, pp. 292–98. Fuel and light before 1789 is a geometric average of the price of firewood in Paris from Baulant, "Salaire," p. 967, and d'Avenel, *Histoire*, vol. 5: pp. 467–793, and the price of tallow candles in Paris from d'Avenel, *Histoire*, vol. 5, pp. 436–48, and Hauser, *Recherches*, pp. 143–45, with the urban worker's expenditure shares for wood (0.60) and candles (0.40) as weights. The same geometric averaging is used for the period 1800–1849, with prices drawn from Chabert, *Essai*, p. 115; Bienaymé, *Coût*, p. 39; Chabrol, *Recherches*, table 112; and Singer-Kérel, *Coût*, pp. 345, 347, 474–75, 478–79. Many of the prices in this period are costs to institutions. After 1849, the fuel and light price is a composite of all sources for heating and lighting, using the Parisian index in Singer-Kérel, *Coût*, pp. 452–53, and the national index in France, INSEE, *Revenues et patrimoine*, pp. 289–90. Clothing prices before 1789 are national averages for common quality wool stockings from 25-year averages in d'Avenel, *Histoire*, vol. 4, pp. 596–97. From 1800 to 1839, they are interpolated, and from 1840 to 1954, they are the price of cotton stockings. Rent before 1789 is taken from the leases of a set of Parisian residential buildings that belonged to institutions; the source is Ladurie and Couperie, "Mouvement," pp. 1002–23. For 1800–1809, the figure is the average rental revenue in 1806 of residential buildings owned by hospitals, from Daumard, *Maisons*, p. 21. The change in rent between 1800–09 and 1810–19 is derived from sales prices for 1800, 1805, and 1810, assuming constant depreciation and long term interest rate; the source of the sales prices is Daumard, *Maisons*, pp. 54–55, 165–66. The change in rent from 1810–1819 through 1840–1849 derived from rent on worker's apartment using France, Statistique Général, *Salaires*, p. 105. Thereafter, rental rates are derived from changes in the Parisian index in Singer-Kérel (*Coût*, pp. 510–11) up until 1900. Servants' wages before 1789 are indexed by the daily wage of unskilled building workers in Paris. This is from Baulant, "Salaire," to 1726, and thereafter from Durand, "Recherches," by averaging his July and February modal wages. The same daily wage is used in the real wage calculation. Wages from 1800 to 1879 are derived by using Simiand's (*Salaire*, vol. 3, table 3) wage index for skilled and semiskilled workers in construction to extend Rougerie's ("Remarques," table 4) figures for a day laborers's earnings in 1847–1853. Thereafter wage increases reflect changes in Singer-Kérel's (*Coût*, pp. 538–39) weekly wage index for males in Paris. The price of other goods is that of shoes. Before 1789, shoe prices are taken from 25-year national averages for the price of common quality men's shoes, from d'Avenel, *Histoire*, vol. 4, pp. 596–97. For the years after 1840 the shoe prices are taken from Singer-Kérel's (*Coût*, pp. 394, 456–57) index of shoe prices and the 1840 price she gives for a pair of foreman's shoes. Prices between 1800 and 1839 are interpolated. The total for "all food and drink" is a geometric average, using the workers' budget shares. In calculating the indices, expenses for salt and spices were included with residual food. The Saulx-Tavanes no-rent index drops rent from their expenses, and the no-servants index drops the cost of their servants. The nominal income shares for 1790 and 1831 are the midpoints of the ranges given by Morrisson and Snyder, "Income Inequality," tables 6 and 8. For 1866 and 1899–1901, they are the midpoint of the ranges in their table 10. The real income ratios use the cost-of-living index for urban workers for the bottom 40 percent; for the richer groups, the calculations use the indices for the Saulx-Tavanes family, who were certainly in the top 10 percent of the income distribution. For 1899–1901, the cost-of-living figures are for 1900–1910. For all the other years, they are the cost-of-living index for the decade that starts with the year in question.

1808, according to his estimates (reproduced in Table 5), the rich got richer and the poor got poorer, with the gaps widening even more in real terms than in nominal terms.

TABLE 5
REAL PRICE MOVEMENTS, THE COST OF LIVING, AND REAL INEQUALITY IN
HOLLAND, 1450–1808

A. Alternative Cost-of-Living Indices (1450–1474 = 100)

Period	Eighteenth-Century Worker's	Top Income Group's
1450–1474	100	100
1475–1499	142	132
1500–1524	150	138
1525–1549	183	163
1550–1574	296	260
1575–1599	480	435
1600–1624	668	597
1625–1649	863	759
1650–1674	982	855
1675–1699	960	849
1700–1724	957	858
1725–1749	936	830
1750–1774	1,018	887
1775–1799	1,168	1,015

B. Nominal Income Shares and Intergroup Income Ratios

	Nominal Income Shares (percentage)			Ratio of Average Real Income to Bottom 50 Percent	
	Bottom 50%	Top 10%	Top 5%	Top 10%	Top 5%
1500	19	40	27	10.5	14.2
1561	16	46	34	15.1	21.9
1732	12	54	40	23.3	34.9
1808	11	52	37	25.0	34.1

Notes and Sources: The underlying price indices are from Van Zanden, "Second Generation." They are antilogs of sums of the products of budget shares and log-changes in prices, thus assuming unit elasticities of substitution. That is, each price index is of the Cobb-Douglas form. The nominal income distributions are those roughly estimated from assessments data by Van Zanden, "Tracing," who cautions that the estimates for 1500 in particular are "guesstimates." The cost-of-living indices for workers and elite groups have been extended from 1800 to 1913 by Arthur van Riel (http://www.iisg. nl/data.html), as updated to 29 May 2001.

Would a closer look at other countries and regions also show that relative price movements accentuated the widening of gaps between rich and poor before the early nineteenth century, as they seem to have done when incomes widened in England, France, and Holland?

SINCE THE EARLY NINETEENTH CENTURY

Has the cost of living of rich and poor diverged since the onset of industrialization? How did price trends for luxury goods compare with those for bread? Was the hiring of household labor still a big factor making any real-wage movement affect poor and rich consumers in opposite ways? Did the

upper and middle classes still own their homes much more than the poor? Were staple foods still a much greater share of low-income budgets than of high-income budgets? The evidence continues to be sparse for the nineteenth century, and even for the twentieth. Movements in the relative costs of living seem to have moved in favor of England's workers across the nineteenth century, but not in favor of French workers; and there were no clear trends in relative consumer prices in the twentieth.

The relative price trends of luxury goods and staple grains can be discerned in a few cases, thanks to the fact that staple grains are the best documented of commodities. For the English and Italians, food grains became cheaper relative to most other goods in two nineteenth-century periods. The first great cheapening of food came in the first quarter of the century, especially with the recovery of international grain markets in the decade after Waterloo.[30] This had an egalitarian effect, as suggested by the interclass movements in the cost of living in England (Figure 2A).

Western Europe's second period of an egalitarian movement in relative costs of living was the last third of the nineteenth century. Once again, improvements in grain markets get part of the credit. Cheaper grain from across the Atlantic and from Eastern Europe meant that grains and bread fell in price relative to labor, housing, meat, and dairy products; so say the data for food-importing England and the Netherlands and the food-importing regions of Germany and Russia.[31] The same was not true of food-exporting regions, however, as shown by grain-price movements in Russia, Germany, and the United States, and by relative-price movements in Lviv (Lemburg) in Austria–Hungary.[32] Thus the great grain globalization of the late nineteenth century favored workers' relative purchasing power in food-importing Western Europe, though not in food-exporting areas.

Workers were denied some of the benefits of cheaper grain in France, Germany, and Italy, which imposed new tariff barriers in the last quarter of the century. The difference between French and British relative cost-of-living trends between 1870 and 1900 seems to be explained well enough by France's new grain duties, which were on the order of 28 percent by the early twentieth century.[33]

The real-wage gains of the nineteenth century raised the cost of high-income lifestyles, in mirror image to the pattern of earlier centuries. In Britain, domestic service declined as a share of the labor force between 1841 and 1851, and again after 1911. The rise in wages relative to other factor

[30] Phelps Brown and Hopkins, *Perspective*; and De Maddalena, *Prezzi e mercedi*.

[31] Phelps Brown and Hopkins, *Perspective*; Smits and Horlings, "Private Consumer Expenditure"; Smits, Horlings, and Van Zanden, "Measurement"; and O'Rourke and Williamson, *Globalization and History*, chapter 3.

[32] O'Rourke and Williamson, *Globalization and History*, chapter 3; and Hoszowski, *Ceny* and *Prix*.

[33] O'Rourke and Williamson, *Globalization and History*, pp. 100–04.

incomes at least offset the decline in the share of servants in total employment, so as to prevent any drop in the share of Britain's national product spent on domestic service until the twentieth century.[34]

By the early twentieth century, the basis for earlier wide swings in relative living costs had disappeared, at least for Britain. No longer did top and bottom income strata differ so sharply in the shares they spent on staples versus luxuries. In accordance with Engel's Law, prosperity cut all staple-food shares, reducing the contrast between rich and poor expenditure patterns, for any given income ratio between the two groups. Meanwhile, income inequality itself shrank throughout Western Europe over the first half of the twentieth century,[35] due to fiscal redistribution and the logic of moving from a property-based to a skills-based market economy. This automatically reduced the contrast in budget shares.

For example, a pair of British household surveys in 1937–39 found the usual qualitative contrast between working-class and middle-class expenditures. Yet the contrasts were less pronounced. The share of food and drink was 39.6 percent for the working-class group and 26.9 for the (smaller) middle-class group, a difference of less than 13 percent of total expenditures. Contrast this with Table 1's wider gaps from earlier eras, such as that between the bottom 40 percent and the top 20 percent in England and Wales in 1688: the former spent 59.7 percent on food and drink, and the latter only 31.5 percent, a difference of over 28 percent. The shrinking and convergence of the expenditure shares meant that any movement in food prices versus other prices would mean less in the more prosperous and egalitarian twentieth century.

Finally, the real price of food did not fluctuate in the twentieth century as it did in the sixteenth through eighteenth centuries, partly because localized shocks were more easily offset by trade. The only major relative-price shocks were the oil crises of the 1970s and the headlong fall in the prices of computing and communications over the last quarter of the century. Yet these probably did not affect the poor and the rich as differently as did early modern price movements. Dependence on gasoline and home heating oil does not differ sharply along income-class lines. As for hi-tech innovations, it might seem that these were of greater benefit to more wired-in upper-income groups, but the benefits have diffused quickly to all income classes. In particular, the communications revolution greatly cheapened discount-store merchandising of staple goods. Overall, the cost-of-living indexes appropriate to poor and rich lifestyles shared much the same trends across the twentieth century.

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[34] See WP, appendix A.

[35] Kuznets, "Economic Growth"; Lindert and Williamson, "Growth, Equality, and History"; Lindert, "Three Centuries"; Morrisson "Case of Europe" ; and Morrisson and Snyder, "Income Inequality."

SUMMARY

Five centuries of relative-price movements suggest some striking contrasts in real-income trends—contrasts between eras, between income classes, and between nations.

The eras in which price trends favored the rich were eras in which nominal incomes also trended toward inequality. Thus those eras brought more widening of real purchasing power than of nominal income inequality, on which we have focused in the past.

The era with the clearest inegalitarian trends seems to have come at the very start of these five centuries, long before any Industrial Revolution or globalization. It was between 1500 and 1650 that the rich benefitted most from the relative cheapening of new and old luxuries, while soaring land rents probably enhanced their nominal incomes. In the same period the poor faced growing scarcities of food, housing, and land. As far as we can tell, this shift toward dear food and cheap luxuries was experienced throughout most of Europe before 1650.

Inegalitarian trends reappeared on occasion between 1650 and the turbulent era from 1790 to 1815. For England and France, at least, one might argue for a second inegalitarian phase across the second half of the eighteenth century. For England, this second inegalitarian age probably came between 1740 and 1795–1815. It might have had a similar dating for France, but data limitations allow us to see only a slightly inegalitarian trend change between 1750 and 1790. For Holland, the timing was quite different. The three centuries of rising nominal inequality traced by Van Zanden[36] were only slightly augmented by inegalitarian price movements.

The nineteenth century, which lacked a clear overall trend toward nominal income inequality, was also a period in which relative-price movements were broadly egalitarian, helping the advance of purchasing power for workers more than for the top income classes. In the twentieth century, by contrast, the net trend toward greater equality in Europe was hardly affected by relative price movements.

The divergence in early modern price trends also carries an implication for trends in international inequality, at least within Europe. To the extent that all countries shared a drift toward scarcer grain and cheaper luxuries between 1500 and 1800, the real purchasing power of the richest nations, especially England and Holland, must have risen above other nations' purchasing power even faster than the silver-price or constant-price comparisons could reveal. Real purchasing power must have risen faster, other things equal, in countries where consumption patterns favored the goods that were falling in relative price.

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[36] Van Zanden, "Tracing."

What caused these relative-price movements that so reshaped the history of inequality? The ultimate answer is likely to be multicausal, of course. Yet among the main forces governing prices and incomes and inequality, one in particular is likely to stand out for the preindustrial era. The rate of population growth seems to have driven the main trends in real prices and inequality, across periods and countries.[37] Faster population growth by itself could have lowered real wages, raised real land rents, raised the price of staple foods relative to luxuries, and raised real inequality even more than it raised nominal inequality. And for our three leading countries, population growth was indeed faster in the inegalitarian eras 1500–1640s and 1740s–1800 than in other eras.

In retrospect, the wartime era between the 1790s and 1815 was an historic high-water mark of expanded population, scarce food, cheap servants, and wide income gaps in Western Europe. It was the kind of period that could have inspired pessimistic theories of population and economics. If one were inclined to fear that population growth would cause food scarcity and a drop of wages back down to subsistence, the year 1798 would have been a good time to write an *Essay on Population* persuading a wider public to take these fears seriously. And if one thought that population growth tended to raise land rents for the rich at the expense of workers and capitalists, with workers' wages again sinking back to subsistence, 1817 would have been a good time to publicize this prediction in a book on the *Principles of Political Economy and Taxation*.

[37] Our emphasis on the role of population growth echoes the interpretation of Phelps Brown and Hopkins, "Wage-Rates," "Builders' Wage-Rates," and *Perspective*.

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