

preindustrial inequality

This article considers inequality in preindustrial societies, defined as those prior to the industrial revolution and subsequent non-industrial societies that are not systematically integrated into the advanced world's economy. Although data on individual incomes and wealth in these societies are limited, increasingly they are becoming available. On the basis of these data, inequality as measured by the Gini coefficient is often on a par with modern industrialized societies, but the income gradient tends to be different, with a mass of people at subsistence level or marginally above, few at the mean, and a small affluent class. More work remains to be done, particularly on the relationship between income inequality and economic progress.

Defining preindustrial

We need to circumscribe the scope of preindustrial. At one level, it is easy: preindustrial economies are characterized by low urbanization rates, high share of agriculture in GDP, low literacy rates, and of course low overall GDP per capita. However, many of today's poor countries share precisely these features. They are however 'non-industrial' or 'non-industrialized' rather than 'preindustrial' economies: this is because they are part of the modern world, systematically included in trade and voluntary movements of factors of production ('globalization') and have social structures which are very different from those of preindustrial societies. The life expectancy of their populations as well as the immunization and school enrolment rates exceed many times those of 'true' preindustrial societies. Not the least important is the fact that political compulsion of slave or serf labour, so ubiquitous in all preindustrial societies, is – except in a few pockets – largely absent.

Our definition of preindustrial includes all societies prior to the industrial revolution, and those that have not engaged with the industrial revolution, only up to a point when they began to be integrated systematically, rather than episodically, into the world economy. For many of them, integration coincides with colonization. Thus, broadly speaking – since we are painting with a very broad brush here – we can set limits around the end of the Napoleonic wars for Western Europe and the United States and Canada, and the end of the 19th century for everybody else. Twentieth-century societies, even when poor and hardly industrialized, belong to a different category.

A cut-off date around 1815–20 is convenient for at least three reasons. Politically, it coincides with a 'rearrangement' of Europe and, as later emerged, the world. It marks the beginning of the 'long 19th century'. Economically, it marks, according to the new English wage data series produced by Clark (2005), the beginning of a long-run rise in real wages which is continuing to this day. In terms of history of economic thought, Ricardo's *Principles* were published in 1817.

An obvious, but nevertheless important, clarification is that we are concerned here with income inequality: that is, inequality that includes all sources of income and reflects differences in households' and individuals' living standards. This, for example, rules out wage or rural–urban inequalities as such. (Wage inequality has meaning only if calculated across all wage-earners; income inequality includes the entire population.)

Implicit theory

We do have an implicit theory about income inequality in preindustrial economies. The Kuznets hypothesis (formulated in 1955), the bread and butter of inequality economics, posits that inequality charts an inverted U shape as economy transforms from predominantly agricultural to predominantly industrialized or modern. In Kuznets' own words:

One might thus assume a long swing in the inequality characterizing the secular income structure: widening in the early phases of economic growth when the transition from the preindustrial civilization was most rapid, becoming stabilized for a while; and then narrowing in the later phases.

(Kuznets, 1955, p. 276)

The same hypothesis, albeit without the mechanism that generates the inverted U-shaped curve, was formulated 120 years before Kuznets by Tocqueville:

If one looks closely at what has happened to the world since the beginning of society, it is easy to see that equality is prevalent only at the historical poles of civilization. Savages are equal because they are equally weak and ignorant. Very civilized men can all become equal because they all have at their disposal similar means of attaining comfort and happiness. Between these two extremes is found inequality of condition, wealth, knowledge-the power of the few, the poverty, ignorance, and weakness of all the rest.

(Tocqueville, 1835, pp. 42–3)

From both we should retain the sense that inequality is supposed to emerge only when societies are richer, and thus inequality in preindustrial societies may be expected to be low. But differently, we also have an image of preindustrial societies as combining abject poverty in the bottom with extravagant wealth on the top. For example, in ancient Rome, Goldsmith (1984, p. 287) notes the extraordinarily high income of the rulers relative to Great Britain in the early 19th century. Could both these images be right? As we shall argue below, yes – and this is one of the key features that distinguishes inequality in premodern times from inequality in modern times.

But in order to speak about inequality in preindustrial societies, we must also assume that preindustrial societies were 'modern' in the sense that they were (predominantly) market-oriented economies with non-negligible monetized sectors – and when they were non-monetized, goods and services given or received for political or power reasons could be valued at some meaningful 'market' prices. This is a position not universally accepted. In a famous debate about the later Roman Empire (and, by extension about all ancient economies) and 'modernity', there were two camps: that of 'primitivists' led by Polanyi (1944), Finley (1985) and Schiavone (1995), and that of 'modernists' (Rostovtzeff, 1926; Walbank, 1946). The first believed that Rome lacked most of the modern concepts that we associate with a market economy. Market relations, even when present, were of peripheral importance, and a market economy, itself a recent phenomenon, is perhaps, in a historical sense, only a brief episode (Polanyi, 1944). For the 'modernists', the links between a preindustrial society like Rome and modern capitalism were obvious. Both Rostovtzeff and Walbank write of Roman 'bourgeoisie'. Whatever our opinion about the respective merits of 'primitivists' and 'modernists', it is important to realize that once we

attempt to make some tentative estimates of economic inequality in preindustrial societies, we *ipso facto* accept that, while preindustrial societies might have been poorer and with a different social structure from modern societies, the differences are of magnitude, not of kind. For if such key concepts of market economy as prices, wage-labour and private property are vague, insufficiently understood by the population, not sanctioned by custom or law, then applying modern economic categories may be meaningless. Every attempt to study preindustrial societies empirically using today's economists' tools must assume that 'ancient' and 'modern' are fundamentally the same – so that that the 'ancient' can be described and understood using economic concepts developed from Adam Smith onwards.

Private property must enter the list above with a caveat. No one would deny that socialist societies, where private property was limited, were not modern. Moreover, they regarded themselves as the epitome of modernity. Similarly, societies with largely communal ownership of land (as in Africa) are modern too. Thus, private property of the means of production seems to be less of a requirement for a modern society than for example monetization. Rawls (1971), who can hardly be seen as a non-modernist, allows in his *Theory of Justice* for both private and non-private ownership of the means of production (see pp. 54, 240–1).

Data for preindustrial inequality

Where do data for preindustrial inequality come from? Since the Second World War, empirical studies of income distribution have been based on household surveys (nationally representative samples of households who are anonymously interviewed about their household characteristics, spending patterns and income). The earliest household surveys are from late 18th-century England. There were a few sporadic surveys in the 19th century (continental Europe, rural Russia) but they spread broadly only after the end of the Second World War, and as far as Africa and China are concerned, surveys became available only more recently, from the early 1980s. Obviously, such surveys were not conducted in any preindustrial society – even if censuses (driven by government tax needs) were. However, there are relatively abundant sources that economists can use to gauge income distribution in preindustrial societies, although the sources are often buried in hard-to-access archives and books, written in languages and alphabets that are not widely known, and requiring large amounts of both money and effort to be brought to light in a usable form. (For example, Ottoman censuses are written in Turkish but using Arabic script, rather than Latin as is used in today's Turkish. To process them requires knowledge of an often archaic Turkish and an alphabet into which this language is no longer written. See Cosgel, 2002, 2004.) And then lots of heroic assumptions are needed in order for them to be 'translated' into modern economic categories. This has severely limited the use of ancient sources, and this is probably why only a fraction of such sources has been used so far.

The most comprehensive contemporary sources are tax data and government censuses undertaken in order to supply governments with information about taxation and the war-waging capacity of the populace (number of men, houses, horses, grain). Early documentary evidence includes government edicts (such as Diocletian's edict on maximum prices and wages from 301, recently studied by Allen, 2007), as well as numerous Roman papyri preserved in the dry climate of Egypt. The English Domesday survey of 1086 is perhaps the best known of such sources.

From the Byzantine Empire, we have a few preserved *praktika* that provide descriptions of household characteristics, inventories of possessions and taxes paid, although they cover only limited areas (towns or ecclesiastical communities). (See the multi-volume *Economic History of Byzantium: From the Seventh through the Fifteenth Century* edited by Angeliki Laiou, 2002.) Ottoman censuses (*defterlar*) from approximately the 14th century onward, conducted to assess the wealth and military capacity of newly conquered territories, provide detailed information on settlements (hamlets, villages, small and larger towns) but then present it in average amounts for each settlement (not by individual household). If inequality within settlements is not huge, and the number of settlements included is large, censuses can be used to assess overall income distribution within a country or a region.

A much-used source is the Florentine *Catasto* from 1427. (The data were originally collated by Herlihy and Klapisch-Zuber, 1985. Currently, they are available on the Internet.) The Spanish *Ensenada Cadastre*, similar to modern-day household surveys, was carried out in the 1750s for the purposes of a never-implemented fiscal reform. It has recently been used by researchers, and will be no doubt analysed more once it is digitized. Inequalities for the cities of Paris, Amsterdam and London were studied from tax data for respectively 1292–1313 (Sussman, 2005), 1732–42 (McCants, 2007; Soltow, 1989) and 1797–1801 (Schwarz, 1979). However, they refer to wealth inequality (there is no attempted ‘conversion’ to income), cover very truncated data sets, focus either on the rich – those subject to taxation – or the poor (McCants, 2007), and of course include single cities only. Incidentally, all examples but one used by Pareto in the formulation of his famous ‘iron law’ of income distribution come from various European tax data from the end of the 19th century (see Pareto, 1896). The data on Latin America, produced by various Spanish *Visitas*, which collected detailed information on population, age, land ownership and agricultural output, have been published in numerous volumes but not used for estimates of income distribution. (For Peru, books with detailed notes from *Visitas* for the years 1562, 1567 and 1604-05 have been published.)

What is common to these sources is that they are in principle surveys of stocks (people and wealth) and require a huge effort of price imputation; first, to ‘transform’ a stock into a meaningful annual yield (income), then to convert produced quantities, expressed in local ‘natural’ units (such as Egyptian *modii* of wheat), into kilograms, and finally to convert all of these into monetary units. Then the researcher needs to resort to even more heroic assumptions to calculate other sources of income, from husbandry, vineyards, honeybee cultivation, fruits and plants, services provided by farmers, and not least, from manufacturing activities like pottery, glass or cloth-making, or provision of urban services from the shoe-maker to the teacher (for which, at least some wage data are generally available). Particularly vexing is the issue of measurement units, volumes or weights with often confusingly similar or identical names, which nevertheless imply different physical amounts from one region to another; or when money units are provided, the issue of silver or gold conversion between them. But such sources, however frustrating, can and do provide very useful evidence about ancient living standards and distribution of income.

The second contemporary evidence is provided by social tables. This is what William Petty termed ‘political arithmetick’. They aim to describe the structure of a society by listing all salient social classes (or professions) and estimating their average incomes (per household, or less often per person). For modern economists, these sources are much easier to use because the classification into presumably socially important groupings and estimates of

their money-equivalent incomes provide us with most of what we need to know for the derivation of income distribution. England was the pioneer in the production of social tables, beginning with the famous one of Gregory King for 1688 (which contains 33 social groups with their population sizes and average incomes), and continuing with Massie (1759) and Colquhoun (1801–3). (None of the social tables, or the results obtained from them, is without its critics: for a critique of King's social table, see Arkell, 2006; for Colquhoun, see Schwarz, 1979; for a critique of Lindert–Williamson's use of English social tables, see Feinstein, 1988.) Much more recent authors have produced similar social tables for a number of countries (see, for example, Morrisson and Snyder, 2000, for France in 1788, Bértola, Castelnovo, Reis and Willebald, 2006, for Brazil in 1872, van Zanden, 2003, for Java in 1880, Berry, 1990, for Peru in 1876). These new social tables are of course not contemporary sources but they were produced, using bits of dispersed primary or most often secondary sources, by economic historians who specialize in various eras and countries, and they represent our best guess at social structure at remote points in time. The work of Milanovic, Lindert and Williamson (2009; hereafter MLW), who made the first systematic attempt to measure and analyse preindustrial inequality, is largely based on such (contemporary and recent) social tables.

Empirical evidence

To translate preindustrial inequality into modern economics, we must not only hold that preindustrial societies were largely monetized (and whatever was not monetized could be ultimately expressed in money), but also hold that their inequality can be meaningfully handled by Gini, Theil or any other currently used inequality measure. Otherwise we lack a common yardstick with which to compare past and present.

Using mostly social tables from 30 preindustrial societies, MLW calculated Gini coefficients. They found that the preindustrial Ginis range from the mid-20s to around 65, with a mean of 45 and standard deviation of 11. (Gini is the most commonly used measure of inequality, and ranges from a theoretical zero (everybody has the same income) to a theoretical maximum of 100 (everybody but one person has a zero income, and the richest person takes the entire income of the community).) This is almost the same as the range of Ginis in modern societies. In fact, the modern equivalents of the preindustrial societies included in MLW sample (such as Turkey for Byzantium, Syria for the Levant, today's United Kingdom for the 1688 England and Wales) have an average inequality of 40 Gini points with a standard deviation of 10. However to make such a simple comparison and leave it at that would be erroneous. Preindustrial and modern societies were very different, even when compared in the language of modern economics.

First, it is very likely that the income gradient (how income increases as we move from poorer to richer income classes) was much flatter in preindustrial than in modern economies (see MLW, 2009). Using Jan Pen's (1971) metaphor of dwarfs and giants, where people are visualized as marching in a 60-minute parade, from the poorest to the richest, with everyone's height reflecting their income, preindustrial societies can be seen as societies of dwarfs who would take some 40 to 45 minutes to file past. They contained large groups of people (most of the time, the vast majority of the population) living at, or just above, the subsistence minimum. Percentage differences in income among this vast mass of people were small. The income gradient was flat up to a very high point in income distribution. But then, and quickly, as

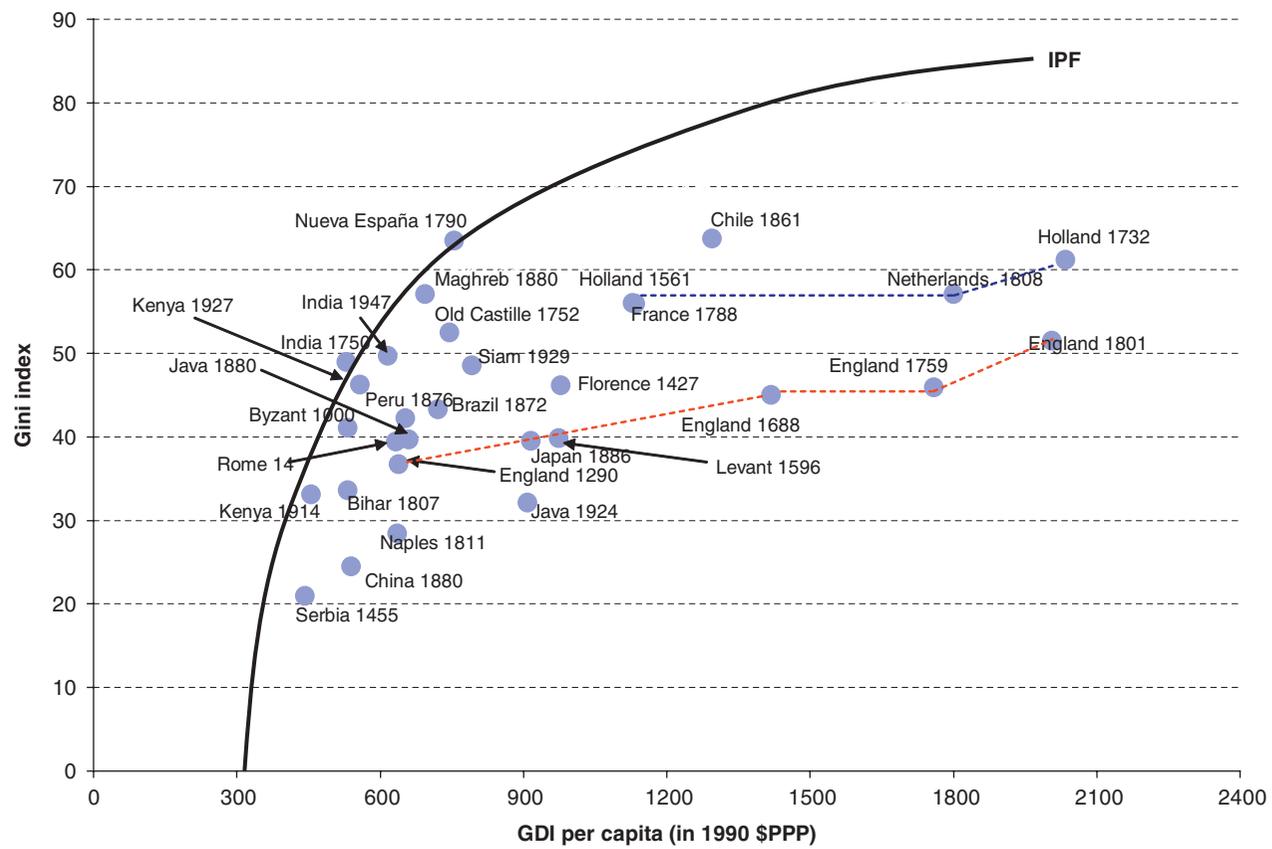
we approach the very end of the parade, the gradient would suddenly increase, much more so than in modern societies. Thus, unlike a modern parade which would be characterized by a steady increase of the gradient, in preindustrial societies the middle was not much different from the bottom. There was a dearth of people whom we would (using modern terminology) identify with the middle class. (It is worth pointing out that this ‘middle class’ is not defined in terms of absolute income, or what we would consider today to be middle-class requirements, but entirely in terms of the period average income.) We can thus see why both of our preconceived notions – of generalized equality and drastic income disparity among the ancient – are true: they just refer to different parts of income distribution.

This difference in structure implies that the same calculated measures of inequality have different meanings. Ginis, as we have already indicated, were broadly in the same range then and now. But a Gini of 40, estimated independently for the Roman Empire by MLW (2009) and Scheidel and Friesen (2009), had an altogether different meaning from the same Gini in the contemporary United States. (The MLW estimate refers to the year 14 (at the death of Octavian), Scheidel’s estimate to the mid-second century.) The Roman Empire’s mean income was about twice the physiological subsistence level (s). If we require that all members of a society have at least the subsistence minimum – for otherwise the society will tend to shrink and disappear – then a very low level of mean income, regardless of how tiny the upper class is, limits the extent of measured inequality. Simply put, the extent of inequality is limited by the size of average income. That ceiling is more binding when a society is poor. To realize this, assume that society’s mean income is just a fraction above s . If all but a tiny elite live merely on s , the elite cannot be extravagantly rich because total income is low, and Gini or Theil indexes, which take into account incomes differences between all individuals, cannot be very high either. This is the idea underlying the Inequality Possibility Frontier (IPF: see Figure 1), defined by MLW (2009) and Milanovic (2006).

The frontier gives a maximum Gini (or Theil) coefficient which is compatible with a given level of mean income and maintenance of society as a going concern. The maximum Gini is equal to $(a-1)/a$ where a = mean income divided by s , or the number of subsistence minima contained in the mean. As can be seen from the formula, the maximum feasible Gini rises with mean income (a), but at a decreasing rate. If average income is twice the subsistence ($a=2$), the maximum Gini will be 50. Thus, we see that the Roman inequality of 40 exhausted some 80 per cent of maximum feasible inequality. But for the modern-day United States, where the mean income stands at more than 100 s , the maximum Gini is 99. The actual inequality will have exhausted only 40 per cent of its maximum value. Hence, the social meaning of the same Gini is entirely different. To sustain high inequality, societies must be relatively rich.

We have left the issue of defining the subsistence minimum deliberately vague. Depending on whether we pitch this physiological (note: not social, not relative) minimum higher or lower, the IPF will move down or up, but the same logic will hold.

The difference in the income structure (income gradient) also shows why some other measures, like top-to-bottom ratio or top 1 per cent share, may not be very useful in the preindustrial context. They show the extent of the gap between the richest and the poorest, but they disregard the entire distribution in-between, which in the past has been much more equal than in today’s societies.



preindustrial inequality

Figure 1 The Inequality Possibility Frontier. Source: MLW(2009).

IPF imposes a consistency check on our inequality calculations, a fact which is particularly useful for preindustrial societies where the evidence is scant. As illustrated in the figure, once we know the mean income of a society, and estimate its Gini, we know that this estimate must be within, or at the maximum on, the frontier. If it is not, there is something wrong with either the income or the inequality estimate, or the society is doomed to experience a dwindling population and ultimately extinction. It is not surprising that MLW found that all six cases of ancient societies with inequalities close to the frontier were colonies: India in 1750 and 1947, Kenya in 1914 and 1927, Nueva España (Mexico) in 1790, and Maghreb in 1880. Colonizers were clearly much less concerned about the welfare of the populations they ruled than, or did not have to fear them as much as, native rulers.

Preindustrial inequality and modern debates

Empirical evidence on preindustrial inequality has a direct bearing on several contemporary debates. Evidence from the two most advanced economies at the time (England and Holland) paints a picture of increasing inequality from 16th century to the beginning of the Napoleonic wars. (The exception is Soltow, 1968, who found English inequality to have been flat throughout the 18th century.) Premodern growth seem to have exacerbated inequality even in the areas that were characterized by an already high inequality of wealth and income (such as the South Midlands in England, considered by Allen, 1992). Using social tables, Lindert (2000) and Lindert and Williamson (1982, 1983) document the increase of inequality in England between 1750 and 1801. All four observations available for England and Wales in the MLW database (1290 – from Campbell, 2007 – 1688, 1759 and 1801–3) show both mean income and inequality rising with time. Similarly, van Zanden (1995), and Soltow and van Zanden (1998) find that income inequality increased in Holland during its ‘Golden age’: between 1561 and 1732: the urban area Gini rose from 53 to 59, and the rural area Gini from 35 to 38. According to a pioneering study by Hoffman and colleagues (2002), ‘real’ European inequality between 1500 and the early 19th century increased even more because the prices of wage-goods, consumed by the poor, rose relative to the prices of ‘luxuries’.

The upswing of the Kuznets curve seems to be strongly in evidence in all these cases. But what drove it? Was it a ‘classical explanation’ (as van Zanden, 1995, terms it), namely a shift in the functional distribution of income toward property owners (and their rising concentration) and away from labour – a mechanism that Marx would easily have recognized? (For Spain, Prados de la Escosura, 2008, uses functional distribution of income, and also finds a clear Kuznets upswing from 1850 to around 1914.) Or was it, as argued by Lindert and Williamson (1985) and Williamson (1982, 1985), caused by the ‘wage-stretching’ which continued well into the 19th century and involved labour-saving technological progress and increased pay-ratios for skilled labour in the presence of demographic pressure from mostly unskilled population? Education responded only very slowly, and the process continued for a couple of centuries until massive European emigration reversed it. The latter is a very neoclassical mechanism familiar to every economist working on poor or rich countries today. The focus is on the functioning of factor markets, not on the division of society into capitalists and workers.

If countries where the industrial revolution originated went through a period of sustained increase in inequality prior to the industrial revolution, does it shed some light on the relationship between higher inequality and the industrial take-off? A number of recent writings (most famously, Pomerantz, 2000; Frank, 1998; and more recently Wen, 2009; Shiue and Keller, 2007) have contrasted China and Western Europe in the 17th and 18th centuries, trying to understand why these two large areas that seemed in many respects similar (for instance in market integration, level of income, technological innovations) charted such different paths in the following three centuries. Does income distribution have to do something with it? Unfortunately, we do not yet have even the intimation of an answer because the historical data for China are not available. However a recent upsurge in archival research on Chinese sources might help throw some new light on this issue.

The work of Engerman and Sokoloff (1997) has profoundly affected our conception of the role of inequality in explaining the economic success of North America and relative decline of Latin America. But while there is little doubt that Latin America was more unequal (particularly in land ownership) than the North, recent historical evidence contrasting Western Europe and Latin America finds no perceptible difference in inequality between the two. Williamson (2009) thus wonders why Western Europe and Latin America have followed different growth trajectories. If the inequality explanation works for one set of regions (the two 'New Worlds'), why does it seem not to work for another (Europe and Latin America)? Moreover, it is not evident that Latin America was 'always' unequal. Prados de la Escosura (2007) and Bértola et al. (2009) argue that strong expansion of inequality occurred during the previous round of globalization (1870–1920). Prados de la Escosura (2007, p. 298) sees the explanation as consistent with the factor-price equalization theorem: opening up Latin America to trade raised land rents, and since land was unequally distributed, increased the concentration of incomes. The data prior to around 1870 are not available (although some estimates for 1870 show inequality in the Southern Cone countries to be at the same level as in Spain: Prados de la Escosura, 2008, Figure 8, p. 307), but we could wonder whether our 'acquired idea' of an always high inequality in Latin America is not mistaken – or perhaps it was not inequality, but the inequality extraction ratio that was high. Recasting the issue in this way suggests that the Latin American problem was a low level of income rather than a high Gini.

Conclusion

Studying inequality in its historical context, an area which will doubtlessly loom larger in economics as the search to uncover our economic past progresses, is important not only because it helps us learn about history but because it helps us understand today's economic problems. Actually, as every historian and politician knows, studying the past is about the future.

Uncited References

Allen, 2003; Cosgel, 2006; Herlihy et al.; Malanima, 2006; Mayhew, 1995; Williamson, 1980.

Acknowledgements

I am grateful to Mihail Arandarenko, Peter Lindert, Leandro Prados de la Escosura and Jeffrey Williamson for excellent comments.

Branko Milanovic

See also

- < xref = E000016 > economic history;
- < xref = I000273 > inequality (international evidence);
- < xref = I000269 > inequality (measurement);
- < xref = S000533 > standards of living (historical trends);
- < xref = C000551 > wage inequality, changes in.

Bibliography

- Allen, R.C. 2007. How prosperous were the Romans? Evidence from Diocletian's Price Edict (AD 301). University of Oxford, Department of Economics, Discussion Paper Series 363, October.
- Allen, R.C. 1992. *Enclosures and the Yeoman: Agricultural Development of the South Midlands, 1450–1850*. Oxford: Oxford University Press.
- Allen, R.C. 2003. Progress and poverty in early modern Europe. *Economic History Review* 56, 403–43.
- Arkell, T. 2006. Illuminations and distortions: Gregory King's scheme calculated for the year 1688 and the social structure of later Stuart England. *Economic History Review* 59, 32–60.
- Berry, A. 1990. International trade, government and income distribution in Peru since 1870. *Latin American Research Review* 25(2), 31–59.
- Bértola, L., Castelnovo, C., Reis, E. and Willebald, H. 2006. Income distribution in Brazil, 1839–1939. Paper presented at Session 116 of “A Global History of Income Distribution in the Long 20th Century,” XIV *International Economic History Congress*, Helsinki-Finland 21–25 August.
- Bértola, L., Castelnovo, C., Rodriguez, J. and Willeband, H. 2009. Income distribution in Latin American Southern Cone countries during the first globalization boom, ca. 1870–1920. *International Journal of Comparative Sociology*, forthcoming.
- Campbell, B. 2007. Benchmarking medieval economic development: England, Wales, Scotland and Ireland c. 1209. *Economic History Review* 60, 1–50.
- Clark, G. 2005. The condition of the working class in England, 1209–2004. *Journal of Political Economy* 115, 1307–1340.
- Cosgel, M. 2004. Ottoman tax registers. *Historical Methods* 37(2), Spring, 87–100.
- Cosgel, M. 2006. Taxes, efficiency, and redistribution: discriminatory taxation of villages in Ottoman Palestine, Southern Syria, and Transjordan in the sixteenth century. *Explorations in Economic History* 43, 332–56.
- Engerman, S. and Sokoloff, K. 1997. Factor endowments, institutions and differential paths of growth among New World economies. In *How Latin America Fell Behind: Essays on the Economic Histories of Brazil and Mexico, 1800–1914*, ed. S. Hager. Stanford, Calif.: Stanford University Press, pp. 260–304.
- Feinstein, C. 1988. The rise and fall of the Williamson curve. *Journal of Economic History* 48, 699–729.
- Finley, M. 1985. *The Ancient Economy*, 2nd edn. London: Penguin.
- Frank, A.G. 1998. *Re-Orient: Global Economy in the Asian Age*. Berkeley: University of California Press.
- Goldsmith, R.W. 1984. An estimate of the size and structure of the national product of the early Roman Empire. *Review of Income and Wealth* 30, 263–88.

- Herlihy, D. and Klapisch-Zuber, C. 1985. *Tuscans and their Families*. New Haven, Conn.: Yale University Press.
- Herlihy, D., Klapisch-Zuber, C., Litchfield, R.B. and Molho, A. *The Online Catasto*, available at: <http://www.stg.brown.edu/projects/catasto/overview.html>, accessed January 2008. (a searchable online database of tax information for the city of Florence in 1427–29, based on D. Herlihy and C. Klapisch-Zuber, principal investigators, Census and property survey of Florentine dominions in the province of Tuscany, 1427–1480).
- Hoffman, P.T., Jacks, D., Levin, P.A. and Lindert, P.H. 2002. Real inequality in Europe since 1500. *Journal of Economic History* 62, 322–55.
- Kuznets, S. 1955. Economic growth and income inequality, presidential address to the 67th meeting of the American Economic Association, Michigan., December 1954; published in *American Economic Review* 45 (1955) and *Economic Growth and Structure: Selected Essays*, New Delhi: Oxford and IBH, 1965.
- Laiou, A. 2002. *The Economic History of Byzantium: from the Seventh through the Fifteenth Century*. Washington DC: Dumbarton Oaks.
- Lindert, P.H. 2000. Three centuries of inequality in Britain and the United States. In *Handbook of Income Distribution*, ed. A. Atkinson and F. Bourguignon. Amsterdam, North Holland: Elsevier.
- Lindert, P.H. and Williamson, J.G. 1982. Revising England's social tables, 1688–1812. *Explorations in Economic History* 19, 385–408.
- Lindert, P.H. and Williamson, J.G. 1983. Reinterpreting Britain's social tables, 1688–1913. *Explorations in Economic History* 20, 94–109.
- Lindert, P.H. and Williamson, J.G. 1985. Growth, equality and history. *Explorations in Economic History* 22, 341–77.
- Malanima, P. 2006. Pre-modern equality: income distribution in the Kingdom of Naples (1811), paper presented at 14th International Congress of Economic History, August 2006, Helsinki. Available at: <http://www.helsinki.fi/iehc2006/papers3/Malanima.pdf>.
- Mayhew, N.J. 1995. Modeling medieval monetization. In *A Commercialising Economy: England 1086 to c. 1300*, ed. R. N. Britnell and B.M.S. Campbell. Manchester: Manchester University Press, pp. 55–77.
- McCants, A. 2007. Inequality among the poor of eighteenth century Amsterdam. *Explorations in Economic History* 44, 1–21.
- Milanovic, B. 2006. An estimate of average income and inequality in Byzantium around year 1000. *Review of Income and Wealth* 52(3), 449–470.
- Milanovic, B., Lindert, P.H. and Williamson, J.G. 2009. Preindustrial inequality. Unpublished ms, available at: <http://econ.worldbank.org/projects/inequality>. Previous version published as Measuring ancient inequality, National Bureau of Economic Research Working Paper No. 13550.
- Morrisson, C. and Snyder, W. 2000. The income inequality of France in historical perspective. *European Review of Economic History* 4, 59–83.
- Pareto, V. 1896. La courbe de la repartition de la richesse. Université de Lausanne. Republished as On the distribution of wealth and income, *Rivista di Politica Economica*, 645–660, 1997. (The same issue of *Rivista di Politica Economica* contains English translations of five other articles by Pareto on the same topic.)
- Pen, J. 1971. *Income Distribution: Facts, Theories, Policies*. New York/Washington DC: Praeger.
- Polanyi, K. 1944. *The Great Transformation*. Boston, Mass.: Beacon Press.
- Pomerantz, K. 2000. *The Great Divergence: China, Europe, and the Making of the Modern World Economy*. Princeton, N.J.: Princeton University Press.
- Prados de la Escosura, L. 2007. Inequality and poverty in Latin America: a long-run exploration. In *The New Comparative Economic History: Essays in Honor of Jeffrey G. Williamson*, ed. T. J. Hutton, K.H. O'Rourke and A.M. Taylor. Boston, Mass.: MIT Press, pp. 291–315.
- Prados de la Escosura, L. 2008. Inequality, poverty, and the Kuznets curve in Spain, 1850–2000. *European Review of Economic History* 12, 287–324.
- Rawls, J. 1971. *A Theory of Justice*. Cambridge, Mass.: Harvard University Press.
- Rostovtzeff, M. 1926. *The Social and Economic History of the Roman Empire*. Oxford: Oxford University Press, 1957.
- Scheidel, W. and Friesen, S.J. 2009. The size of the economy and the distribution of income in the Roman Empire. Princeton/Stanford Working Papers in Classics, January.
- Schiavone, A. 1995. *The End of the Past: Ancient Rome and the Modern West*. Cambridge, Mass.: Harvard University Press, 2000.

- Schwarz, L.D. 1979. Income distribution and social structure in London in the late eighteenth century. *Economic History Review* 32, 250–9.
- Shiue, C. and Keller, W. 2007. Markets in China and Europe on the eve of the industrial revolution. *American Economic Review*, September.
- Soltow, L. 1968. Long-run changes in British income inequality. *Economic History Review* 21, 17–29.
- Soltow, L. 1989. Income and wealth inequality in Amsterdam, 1585–1805. *Economisch-en-Social Historisch* 58, 72–95.
- Soltow, L. and van Zanden, J.-L. 1998. *Income and Wealth Inequality in the Netherlands, 16th–20th Century*. Amsterdam: Het Spinhuis.
- Sussman, N. 2005. Income inequality in Paris at the heyday of the commercial revolution. Hebrew University, Jerusalem. Available at: http://economics.huji.ac.il/faculty/sussman/sussman_gobaleconomies.pdf.
- Tocqueville, A. de. 1835. *Memoir on Pauperism*. Chicago: Ivan R. Dee, 1997.
- Van Zanden, J.L. 1995. Tracing the beginning of the Kuznets curve: western Europe during the early modern period. *Economic History Review* 48, 643–64.
- Van Zanden, J.L. 2003. Rich and Poor before the Industrial Revolution: A Comparison between Java and the Netherlands at the Beginning of the 19th Century. *Explorations in Economic History* 40(1), 1–23.
- Walbank, F.W. 1946. *The Decline of the Roman Empire in the West*. London: Cobbett Press.
- Wen, J.G. 2009. Why was China trapped in an agrarian society – an economic-geographical approach to the Needham puzzle. *New History*, forthcoming.
- Williamson, J.G. 1980. Earnings inequality in nineteenth century England. *Journal of Economic History* 40, 457–76.
- Williamson, J.G. 1982. The Structure of pay in Britain, 1710–1911. *Research in Economic History* 7, 1–54.
- Williamson, J.G. 1985. *Did British Capitalism Breed Inequality?* Boston, Mass.: Allen and Unwin.
- Williamson, J.G. 2009. History without evidence: Latin American inequality since 1491. Mimeo.