



Wealth inequality in pre-industrial England: A long-term view (late thirteenth to sixteenth centuries)

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Abstract

This article provides an overview of wealth inequality in England from the late thirteenth to the sixteenth century, based on a novel database of distributions of taxable household wealth across 17 counties plus London. To account for high thresholds of fiscal exemption, a new method is introduced to reconstruct complete distributions from left-censored observations. First, we analyse inequality at the county level, finding an impressive stability across time in the relative position of the English counties, perturbed only by the tendency of the South and South-East to become relatively more inegalitarian. Then, we produce an aggregate distribution representative of England as a whole, and we detect an overall tendency for inequality to grow from medieval to early modern times due largely to North–South divergence in average household wealth. We discuss our results in the light of the recent literature on historical inequality.

KEYWORDS

Black Death, early modern period, economic inequality, England, Middle Ages, plague, wealth concentration

Over the last few years, particularly from the outbreak of the Great Recession, economic inequality has become a burning issue, breaking through the academic frontiers of social sciences to

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solicit the interest of civil society. Economic history played a key role, as long-term dynamics have become increasingly central to debates on current inequality levels and trends. Although for decades mostly confined to certain periods and countries,¹ the study of economic inequality trends, particularly for the pre-industrial world, is now increasingly present in the academic arena. Recent systematic studies of pre-industrial inequality based on new data have involved Finland, Germany, Italy, the Low Countries, Poland, Portugal, Spain, and Sweden.² We know less about non-European areas, but some research has covered parts of the Ottoman Empire, Tokugawa Japan, and the pre-revolutionary United States.³

England has been relatively neglected by this renewed interest in inequality in medieval and early modern times, in sharp contrast to the considerable amount of research conducted on distributive dynamics during the industrial revolution and the period immediately preceding it, usually taking as a starting point Gregory King's social table of 1688.⁴ Some pioneering attempts were made by Soltow, who, based on Gray's elaborations from the 1436 income tax for the upper-income groups and the social tables by King for 1688, conjectured a slight decrease in income inequality between the two dates.⁵ More recently, Broadberry et al. have offered a new perspective on long-run trends in income inequality, on the basis of new social tables reconstructed for 1290 and 1381 and the re-elaboration of pre-existing ones for later periods.⁶ According to these authors, '[income] inequality grew substantially over the five centuries from 1290 to 1801–3 in tandem with the threefold rise in GDP per head' since 'prior to 1870 ... increasing inequality ... can be treated ... as a characteristic and unavoidable manifestation of economic growth'.⁷

Although economic growth might well be the main factor leading to inequality growth (of *both* income and wealth) in pre-industrial England, recent literature shows that inequality growth is a much more general feature of late medieval and early modern Europe and, indeed, it can have causes entirely different from economic growth – as it is found also in areas and periods characterised by economic decline, for example in many Italian pre-unification states during the so-called Little Divergence or in different parts of Spain during the same

¹ See for example the seminal studies of the Netherlands by [van Zanden](#), 'Tracing the beginning', and [Soltow and van Zanden](#), *Income and wealth*.

² See for Finland, [Bengtsson](#) et al., 'Unequal poverty'; for Germany, [Wegge](#), 'Inheritance institutions', and [Alfani](#), [Gierok](#), and [Schaff](#), 'Economic inequality'; for Italy, [Alfani](#), 'Economic inequality in northwestern Italy', [idem](#), 'The rich', [Alfani](#) and [Ammannati](#), 'Long-term trends', and [Alfani](#) and [Di Tullio](#), *The lion's share*; for the Low Countries, [Hanus](#), 'Real inequality', [Ryckbosch](#), 'Economic inequality', and [Alfani and Ryckbosch](#), 'Growing apart'; for Poland, [Malinowski and van Zanden](#), 'Income and its distribution'; for Portugal, [Reis](#), 'Deviant behaviour?'; for Spain, [Santiago-Caballero](#), 'Income inequality', [Fernández and Santiago-Caballero](#), 'Income inequality in Madrid, 1500–1850', [García-Montero](#), 'Long-term trends', and [Nicolini and Ramos-Palencia](#), 'Decomposing income' and [idem](#), 'Comparing income and wealth'; for Sweden, [Bengtsson](#), et al., 'Wealth inequality'.

³ See for the Ottoman Empire, [Coşgel](#), 'Estimating rural incomes', [Coşgel and Boğaç](#), 'Inequality of wealth', and [Canbakal](#), [Filiztekin](#), and [Pamuk](#), 'Inequality of income'; for Tokugawa Japan, [Saito](#), 'Growth and inequality', [Drixler](#), 'Inequality in Eastern Japan, 1650–1870', and [Kumon](#), 'The deep roots of inequality'; and for pre-revolutionary United States, [Lindert and Williamson](#), *Unequal gains*.

⁴ [Lindert and Williamson](#), 'Revising England's social tables'; [idem](#), 'Reinterpreting Britain's social tables'; [Lindert](#), 'Unequal English wealth', [idem](#), 'Who owned Victorian England?', [idem](#), 'When did inequality rise', and [Allen](#), 'Class structure'.

⁵ [Soltow](#), 'Long-run changes'; [Gray](#), 'Incomes from land'.

⁶ [Broadberry](#) et al., *British economic growth*.

⁷ *Ibid.*, pp. 307–8.



period.⁸ More generally, as we argue, the case of England can be better understood if analysed in comparison with other European areas, where often sources exist that allow for a much more systematic reconstruction of pre-industrial inequality levels. Almost invariably, these sources are fiscal in nature; indeed, at the root of the difficulty in studying English inequality lies its fiscal system, which suffered much more radical changes in time than elsewhere. Also because of these changes, the English fiscal system did not produce a continuity in documentation comparable to some other European regions.

We focus on wealth inequality measured at the county, regional, and national level at different dates, from the 1290s until 1525. As earlier research concentrated on income inequality at the level of the entire country and could not look at differences in inequality between sub-national territorial aggregates, our county- and regional-level analyses contribute significantly to improving our knowledge of distributive dynamics in pre-industrial England. This is also in line with research conducted on other European areas in the same period, given that information about wealth tends to be more abundant,⁹ as well as with the recent tendency in studies of inequality during the modern age.¹⁰

We begin by discussing the evolution of the English fiscal system, focusing on the challenges that it presents to a study of inequality (Section I). We detail the methods of historical analysis and statistical reconstruction that we have employed to produce, based on fiscal data, wealth distributions as reliable as possible (Section II). We then provide an analysis of inequality at the county level (Section III), before proceeding to propose a reconstruction at the regional and national level, which we discuss in comparison with other recent reconstructions for continental European areas (Section IV).

I

The only available sources to produce comparable measures of wealth inequality in pre-industrial times are usually fiscal, and they are also among those used most frequently to study wealth distribution in modern societies.¹¹ Although English fiscal sources do not provide us with data either as continuous or as consistent over time as those available in some other parts of Europe, they do present two comparative advantages. First, the English Crown created, as early as the Middle Ages, one of the first 'national' fiscal systems in Europe, so that English fiscal sources are homogeneous across the country. Secondly, the early achievement of a centralised fiscal system and the collection of documents in the Exchequer have made possible the successful preservation of a large quantity of documents from the thirteenth century. Indeed, since 1207 (and with increasing frequency since 1290), the lay subsidies supplied the English Crown with revenues extracted according to principles and procedures that were stable over time.¹²

⁸ Alfani, 'Wealth inequalities'; idem, 'Economic inequality in northwestern Italy'; Alfani and Ammannati, 'Long-term trends'; Alfani and Di Tullio, *The lion's share*; Fernández and Santiago-Caballero, 'Income inequality'; García-Montero, 'Long-term trends'; Alfani, 'The rich'.

⁹ For a synthesis, see Alfani, 'Economic inequality in pre-industrial times'.

¹⁰ Piketty, *Capital in the twenty-first*; Roine and Waldenström, 'Long run trends'.

¹¹ Alfani, 'Economic inequality in pre-industrial times', pp. 9–10; Roine and Waldenström, 'Long-run trends', pp. 517–19.

¹² In spite of their increasing importance to the finances of the English Crown during the thirteenth and first third of the fourteenth centuries, the lay subsidies were considered an extraordinary source of revenue, subject to Parliament's endorsement. This explains their time discontinuity and their coincidence with times of war or imminent war.



The main features of the medieval lay subsidies can be summarised as follows:

- a. they were taxes levied on movable goods (including coin and circulating capital, household furnishings, livestock, etc.), and the payments were proportional to the evaluated wealth. Very frequently, from 1294, the boroughs and the ancient demesnes were taxed at higher rates than the rural areas.¹³ As these rates are known, we could easily reconstruct the value of the goods evaluated, so as to properly compare city and country;
- b. a priori, with some exceptions, all the English territories were subjected to taxation,¹⁴
- c. the tax was charged at a household level, and each time the subsidy was approved every household was assessed, irrespective of its social status and including foreigners,¹⁵
- d. households with wealth under fixed minimum thresholds were exempt from payment and assessed, but their wealth was not recorded;
- e. the documents generated in the process included detailed local rolls (few of which survived) and county rolls subdivided into hundreds and communities. All these provide us with lists of the contributors and their payments.

This basic framework characterises the lay subsidies from their origins in the thirteenth century until 1334. In that year, the system underwent a critical change: the tax became a quota tax, and the Exchequer no longer supervised the rules and the assessment practices. These were now freely determined and monitored at a local level.¹⁶ In other words, the aim of the Exchequer was simply to obtain from each community a sum no lower than that collected in 1332. As a consequence, the evaluations were never centralised and the evidence preserved in the local archives is scant and scattered. In addition, from 1334 to 1623, when the last ‘fifteenth and tenth’ was granted, the tax was frozen for long periods at a fixed sum. Therefore, this information can no longer be considered, not even at a county level, an acceptable proxy for the movable wealth, and the lay subsidies levied from 1334 are not useful for a study of wealth distribution. For this reason, and also to take into account the relative abundance of surviving documentation, we have restricted our use of the lay subsidies to those produced in two periods: around 1290, at the summit of medieval

¹³ Some of the most usual fractions were a fifteenth (for the rural areas) and a tenth (for the boroughs and the ancient demesnes). In fact, in the literature the term ‘fifteenths and tenths’ is frequently used as a synonym for lay subsidies.

¹⁴ The main exemptions were the Cinque Ports located in the counties of Kent and Sussex and the counties of Chester and Durham, as well as the hundreds of Oswestry and Clun in Shropshire. The northern counties of Northumberland, Cumberland, and Westmorland were also exempted in some periods (e.g. during 1313–1327) because of the devastation caused by the invasion of the Scots and the expenses incurred in the fight against them. Occasionally (e.g. in 1319 and 1322), the raids also affected some districts in Lancashire and Yorkshire (North and West Ridings); hence, parts of these counties were also temporarily exempted from the lay subsidies.

¹⁵ This is clear with respect to the peerage and the landless; see for instance Willard, *Parliamentary taxes*, pp. 162–4; and Schofield, *Taxation*, pp. 60–3. Minor exceptions included the moneymen of London and Canterbury, the stannary men from Cornwall and Devon, and the lepers under the rule of a master leper. Regarding the clergy, in practice, only those goods obtained before 1291 and not subjected to clerical taxes (temporalities not annexed to spiritualities) were taxed; Willard, *Parliamentary taxes*, pp. 92–5, 117–22.

¹⁶ That is to say, the new rules could be different from those used in the past and they are generally unknown. In addition, from 1334, most of the surviving lay subsidy rolls were preserved because they were disputed and appealed in the Courts at Westminster (Schofield, *Taxation*, p. 35) and, thus, were potentially biased to begin with. Some documentation for a few urban and rural communities, preserved in local archives and in theory not biased, has been analysed in Dyer, ‘Taxation and communities’. On this topic, see also Hoyle, *Tudor taxation*, pp. 6–7.



growth,¹⁷ and in the years 1327 or 1332, immediately before the Black Death.¹⁸ Only for Kent do we use the subsidy roll for 1334, which seemingly was a postponement of that which elsewhere was collected in 1332 and followed the same criteria.

After 1332, no comparable fiscal sources with a national coverage and providing reliable household-level assessments can be found until the introduction of the ‘Tudor subsidies’ between 1512 and 1515. The new system can be considered ‘a revival of the medieval practice of making individual assessments’,¹⁹ and indeed, it has much in common with the lay subsidies. From the early sixteenth century, again irregularly owing to the extraordinary nature of this kind of taxation,²⁰ the Tudor subsidies provide us with the basic information needed to estimate wealth inequality. They differ in some respects from the pre-1334 ‘fifteenths and tenths’. Each time they were granted by Parliament, an assessment was made (at current values) of two or three different aggregates: the capital value of movable goods, the net incomes received yearly (which usually meant incomes from lands),²¹ and (until the subsidy levied in 1524 and 1525) wages. However, after the evaluation of the tax which would have been due on each different aggregate, only the highest figure was recorded and paid to the Exchequer. That being said, there are strong similarities with the lay subsidies. The Tudor subsidies had a national coverage, and a set of exemptions not unlike those found in the pre-1334 lay subsidies.²² They were also charged at a household level irrespective of social status, with only minor exemptions.²³ Similarly to the ‘fifteenths and tenths’, they had minimum thresholds below which no tax payment was due and the corresponding assessment was not recorded. Consequently, also in the case of these sources, there was a variable percentage of households that were not listed.

The Tudor subsidies were the main instrument of direct taxation well into the seventeenth century.²⁴ Yet, after the first decades of the sixteenth century, their usefulness for our purposes is, at best, very limited as the minimum taxable level increased so much that the vast majority of the population was left out of the records. What is more, the assessments for wealthy people who continued paying the tax became increasingly unreliable.²⁵ We therefore focused on the assessments

¹⁷ Campbell, ‘Benchmarking’.

¹⁸ For 1327/1332, a good number of rolls survive because copies had to be sent to the Exchequer; Hadwin, ‘Medieval lay subsidies’, p. 205.

¹⁹ Hoyle, *Tudor taxation*, p. 3.

²⁰ As in the case of the ‘fifteenth and tenths’, the Tudor subsidies were granted by Parliament to the Crown as an extraordinary source of revenues in the face of ‘unusual’ circumstances, which meant, in practice, when the Crown was engaged – or was going to be engaged – in war.

²¹ Less frequently this meant incomes from annuities, pensions, or fees; Hoyle, *Tudor taxation*, p. 13.

²² The main exemptions were the northern counties of Cumberland, Northumberland, and Westmorland (except for the aliens living in these counties) until 1603 owing to the recurrent incursions by the Scots, and the Bishopric of Durham because of its palatinate status. Cheshire was exempt in the first subsidies but not from 1535–8 onwards. Other less important exceptions were the inhabitants of the Cinque Ports and occasionally the cities of Brighton, Ludlow, and Westborne; Schofield, *Taxation*, p. 109. Parts of Hereford and Shropshire, which before 1541 were part of Wales, did not pay subsidies until 1543; Hoyle, *Tudor taxation*, p. 10.

²³ However, some exemptions were granted to colleges and religious houses until 1523 (Schofield, *Taxation*, p. 109). Certain clerical properties were also released (e.g. church furniture) and, as before, those subjected to clerical taxes. For the 1524–5 subsidies, temporalities were assessed both for the lay and clerical subsidies but finally taxed only on that providing more revenues to the Crown; Schofield, *Taxation*, p. 109.

²⁴ Schofield, ‘Geographical distribution’ (1965), pp. 490–1.

²⁵ Hoyle, *Tudor taxation*, pp. 29–31; Schofield, *Taxation*, pp. 203–6.



of 1524 and 1525, resulting from the subsidy granted in 1523.²⁶ This, as all early Tudor subsidies, is highly comparable with the pre-1334 medieval lay subsidies. Indeed, these sources have already been used in comparative works by historical geographers and economic historians interested in the evolution of the geographical distribution of wealth in England.²⁷ Admittedly, other scholars have debated the reliability of the figures contained in both the lay subsidies and the Tudor subsidies, and the constraints to potential comparisons.²⁸ In brief, the main objections to the use of these sources are:

- a. they cannot be considered to perfectly reflect reality, due to the suspicion of massive fraud, the frequently stereotyped and 'formalised' data, and the existence of social, regional, and production bias (this kind of criticism refers mostly to the medieval lay subsidies: see discussion below);
- b. there are differences in the sort of wealth taxed in the two sources;
- c. people exempt from payment were probably a different percentage of the population in the two sources;
- d. the wealth owned by the Church was an important and diverse percentage of the total wealth in both dates, and it could be not uniformly distributed.

Regarding the suspicion of widespread fraud, there is a clear trend towards a drop in revenues from the lay subsidies from the last years of the thirteenth century to 1334. Much less clear, however, are the reasons behind it. According to Willard and Hadwin, the main cause was the increase in the exemptions applied to the valuations.²⁹ Ormrod pointed out that taxpayers had become increasingly skilful at tax avoidance and by the end of the thirteenth century it was a common occurrence.³⁰ Another potential explanation could be the under-assessment of boroughs relative to the countryside.³¹ Dyer, on the other hand, argued that the heavy tax burden from indirect levies and the introduction of new duties were important factors behind the fall in the revenues.³² In this debate, there are also those who believe that the lay subsidies are a reliable source showing a real fall in the English economy.³³ However, most of the critics agree that a significant part of the decline in the revenues was necessarily due to the economic and demographic crisis that affected England in the decades immediately preceding the Black

²⁶ The evaluations for these years have two key advantages compared with other Tudor subsidies. First, the minimum taxable level was lower and, consequently, a good percentage of the total population was evaluated. Secondly, unlike in the early subsidies, the commissioners had to send an *estreat* with the assessments to the Exchequer; thus (at least in theory), a copy for each county was preserved (Hoyle, *Tudor taxation*, p. 22).

²⁷ For example, Buckatzsch, 'Geographical distribution'; Schofield, 'Geographical distribution' (1965); idem., *Taxation*; Darby et al., 'Changing geographical distribution'.

²⁸ See, among others, Willard, *Parliamentary taxes*; Buckatzsch, 'Geographical distribution'; Schofield, 'Geographical distribution' (1965); Glasscock, *Lay subsidy*; Darby et al., 'Changing geographical distribution'; Dyer, 'Taxation and communities'; Nightingale, 'Lay subsidies'; Sheail, 'Distribution'; Sheail and Hoyle, *Regional distribution*; Hadwin, 'Medieval lay subsidies'; Ormrod, 'Crown and the English economy'; Jenks, 'Lay subsidies'.

²⁹ Willard, *Parliamentary taxes*, pp. 73–86; Hadwin, 'Medieval lay subsidies', p. 207.

³⁰ Ormrod, 'Crown and the English economy', pp. 152–5.

³¹ Ibid., pp. 157–8; Hadwin, 'Medieval lay subsidies', pp. 210–13; Nightingale, 'Lay subsidies', pp. 8–9.

³² Dyer, 'Taxation and communities', p. 172.

³³ Jenks, 'Lay subsidies'.



Death.³⁴ The possible frauds can also be looked at from another perspective: under-assessment of the wealthy, or at least of the political elite. Had all the taxpayers been under-assessed according to the same ratio, this would have no impact on our inequality measures – so the question here is whether the elite were able to elude taxation better than all other groups. Franklin argued that this was the case for Gloucestershire in the 1327 lay subsidy.³⁵ This circumstance is not surprising (relative under-assessment of the wealth or income of the economic elite is presumably a feature of *all* fiscal systems, past and present) and can be expected to lead to some under-estimation of inequality. The early Tudor subsidies, including that of 1524–5, are generally considered by the literature to be much less subject to fraud than the lay subsidies.³⁶

Regarding the stereotyped and ‘formalised’ data, it seems clear that often the valuations suffer from a certain degree of approximation.³⁷ But, at the same time, prices used for the assessments recorded in the few surviving local rolls were basically consistent with the range of prices collected by Thorold Rogers for the corresponding years.³⁸ In addition, while surely there was some rounding in part of the assessments,³⁹ this could not be expected to lead to a significant bias in inequality measures, particularly if rounding was symmetric and close to the actual figures. In a more speculative way, some authors have underlined a potential increase in the ‘conventionalisation’ of the evaluations as a consequence of the growing frequency of the subsidies in the late thirteenth century and in the first third of the fourteenth century.⁴⁰ Also from this point of view, the Tudor subsidies are generally considered more reliable than the lay subsidies.

Regarding the potential bias in the assessments, three points can be considered. First, it seems quite clear that wool was exempt from 1275 onwards owing to the introduction of a specific tax on wool exports.⁴¹ Clearly this introduces a bias which is not only productive but, above all, regional, the northern counties being the most affected by undervaluation in their movable wealth.⁴² In addition, Briggs has underlined the lower quality and manipulation of the lay medieval subsidies for the northern counties of Cumberland, Westmorland, and Northumberland because of the Crown’s lack of authority in those territories.⁴³ According to Hoyle, in parts of Yorkshire and Lancashire in 1524–5 the evaluations were highly hypothetical and, in general, the records for the North of England are considered less reliable compared with the rest of the country.⁴⁴ Finally, there might have been some urban relative under-assessment, leading to an additional bias in the most-urbanised territories. Sheail, however, argued that the Tudor rolls treated towns and countryside similarly.⁴⁵ A social bias – in favour of the rich – in tax fraud has also been suggested by some authors.⁴⁶

³⁴ Hadwin, ‘Medieval lay subsidies’, p. 213; Dyer, ‘Taxation and communities’, p. 172; Nightingale, ‘Lay subsidies’, p. 28; Campbell, *Great transition*, pp. 172–81.

³⁵ Franklin, *The taxpayers*.

³⁶ Hoyle, ‘Resistance and manipulation’, p. 158.

³⁷ Hadwin, ‘Medieval lay subsidies’, pp. 203–4; Briggs, ‘Taxation’, pp. 656–61; Dyer, ‘Taxation and communities’, p. 171.

³⁸ Hadwin, ‘Medieval lay subsidies’, p. 203.

³⁹ Briggs, ‘Taxation’, pp. 656–61.

⁴⁰ E.g. Nightingale, ‘Lay subsidies’, p. 5.

⁴¹ *Ibid.*, ‘Lay subsidies’, p. 7.

⁴² *Ibid.*, pp. 28–9.

⁴³ Briggs, ‘Taxation’.

⁴⁴ Hoyle, ‘Resistance and manipulation’.

⁴⁵ Sheail, ‘The distribution’, p. 124.

⁴⁶ Dyer, ‘Taxation and communities’, p. 182; Schofield, *Taxation*.

**TABLE 1** Distribution of households according to the kind of wealth taxed in 1524–5

	Goods (movable wealth)	Wages	Incomes	Unknown	Total
Bedfordshire	1194 (59.8%)	759 (38%)	40 (2%)	2 (0.1%)	1995
Buckinghamshire	5573 (76.4%)	1568 (21.5%)	143 (1.9%)	6 (0.08%)	7290
Devon	18 878 (71.6%)	6701 (25.4%)	642 (2.4%)	124 (0.4%)	26 345
Dorset	6057 (75.9%)	1762 (22.1%)	65 (0.8%)	97 (1.2%)	7912
Essex	10 158 (62.2%)	4615 (28.2%)	894 (5.5%)	668 (4.1%)	16 335
Kent	6972 (53.3%)	5052 (38.6%)	919 (7%)	130 (0.9%)	13 073
Lancashire	1297 (69.5%)	10 (0.5%)	560 (30%)	–	1867
London (1541)	2876 (97.1%)	0 (0%)	71 (2.4%)	16 (0.5%)	2963
Rutland	933 (65.4%)	467 (32.7%)	27 (1.9%)	–	1427
Shropshire	3147 (63.3%)	452 (9.1%)	173 (3.5%)	1199 (24.1%)	4971
Staffordshire	3910 (70.4%)	1076 (19.4%)	398 (7.2%)	171 (3.1%)	5555
Suffolk	8651 (52%)	4049 (24.3%)	754 (4.5%)	3190 (19.2%)	16 644
Surrey	4212 (65.6%)	1999 (31.1%)	190 (2.9%)	28 (0.4%)	6429
Sussex	7471 (64.1%)	3318 (28.5%)	773 (6.6%)	91 (0.7%)	11 653
Warwickshire	5618 (88%)	526 (8.2%)	213 (3.3%)	21 (0.3%)	6378
Worcestershire	4290 (81.3%)	848 (16.1%)	129 (2.4%)	10 (0.2%)	5277

Another important point is related to the different concept of wealth taxed in the lay and in the Tudor subsidies. Firstly, how could the different sources of wealth (movable goods, incomes, and wages) taxed in the Tudor subsidies actually affect comparisons with the late medieval lay subsidies, which assessed only movable goods? And secondly, were ‘movable goods’ conceptualised in the same way during the two periods? Schofield argued that, in practice, the kind of information provided by the lay and Tudor subsidies was very similar.⁴⁷ We checked this hypothesis and calculated, county per county, the percentage of taxpayers contributing according to each of the three criteria in the 1524–5 subsidy. As can be seen in table 1, in 13 out of 15 counties between 62 and 88 per cent of taxpayers paid according to their goods, that is, according to movable wealth. For London, we use the lay subsidy of 1541, which reports almost exclusively (97 per cent) evaluations based on goods. A more variable percentage (between 8 and 38 per cent, except for Lancashire where it was close to zero) paid according to their wages. Finally, a small percentage of less than 8 per cent (exception made, again, for Lancashire) paid according to their incomes, which as discussed above were usually land incomes.⁴⁸

These measures confirm that, in our sample of counties, the 1524–5 Tudor subsidies basically continued to be a tax on movable wealth (albeit with some regional differences). Furthermore, most of the people paying according to the second-most frequent criterion, wages, were evaluated with annual wages of just £1 or £2.⁴⁹ This means that they were very probably labourers depending on their wage to survive, with few (if any) movable goods. It also means that the vast majority of the people taxed by ‘wages’ in 1524/1525 were workers that very probably would have been exempt in

⁴⁷ Schofield, ‘Geographical distribution’ (1965), pp. 492–3.

⁴⁸ In addition, the vast majority of them were evaluated with very small quantities of ‘incomes’.

⁴⁹ The percentage of people taxed in wages with a wealth above £2 is almost non-existent, less than 1% for every county.



the lay subsidies levied until 1332.⁵⁰ For these reasons, and to make the data from the two sources directly comparable, in our elaborations for 1524–5 we consider only those households taxed on movable goods.

Even when the Tudor subsidies taxed households based on their goods, we may wonder whether the information provided is truly comparable to the lay subsidies. The latter originally assessed all kinds of movable goods owned at Michaelmas at their current values. However, from 1283 onwards, a subsistence minimum was introduced which provided exemption. This included food, poultry and small domestic animals, clothes, tools, and equipment – like ploughs – necessary for the survival of the household.⁵¹ From 1290, exemption was explicitly guaranteed also for ‘characterising’ goods of some social groups: for example, the armour, riding horses, jewels, vessels made of precious metals, and clothing owned by knights, gentlemen, and their wives. Basic clothing, furniture, and personal ornamentation were also exempt from the assessments of the commoners.⁵² Furthermore, customary exemptions not included in the grants seem to have been progressively accepted from 1275 (in the case of wool) and especially from the 1290s.⁵³ Therefore, in the late thirteenth century and the first part of the fourteenth, lay subsidies were taxing the productive surplus, that is, the part available for trade.⁵⁴ This is confirmed by the rare surviving local rolls listing the items valued for each household or individual.⁵⁵

In the first Tudor subsidies, all movable property was liable to be evaluated. But from 1524 onwards, personal apparel, except certain kinds of jewellery, was exempt.⁵⁶ Loans and debts were also included in net terms. Thus, at least in theory, the concept of ‘movable goods’ was wider in the early sixteenth century than previously.⁵⁷ Since local detailed rolls have not survived, the real content of the evaluations remains unclear. However, it seems reasonable to assume that, in practice, the old evaluation customs were followed, at least to a significant degree. On balance, we agree with the earlier literature that, even if the concept of movable wealth had in theory a wider scope in the Tudor subsidies than in the lay, the actual differences can be presumed to be relatively limited, especially if the sources are used to build distributions for the study of regional and time changes in economic inequality.⁵⁸ In fact, in both periods, the lion’s share of movable wealth necessarily consisted of the agrarian surplus, at least for the vast majority of taxpayers. Also note that throughout the paper, and following the consolidated practice in the literature about the regional distribution of English wealth, we will assume that assessments of movable goods reflect overall wealth reasonably well.⁵⁹ Indeed, the technicalities of the tax assessment, especially in

⁵⁰ Sheail, ‘Distribution’, p. 112; Hoyle, ‘Resistance and manipulation’.

⁵¹ Willard, *Parliamentary taxes*, pp. 75–86.

⁵² Schofield, ‘Geographical distribution’ (1965), p. 494.

⁵³ Willard, *Parliamentary taxes*, pp. 73–86; Nightingale, ‘Lay subsidies’, pp. 5–8.

⁵⁴ Jenks, ‘Lay subsidies’, p. 7; Willard, *Parliamentary taxes*, p. 85; Glasscock, *Lay subsidy*, pp. 25–6; Nightingale, ‘Lay subsidies’, p. 28.

⁵⁵ See, for instance, Blackbourne hundred in Suffolk in 1283 or Buckinghamshire in 1332.

⁵⁶ Schofield, *Taxation*, p. 104.

⁵⁷ Hoyle, ‘Taxation’, pp. 653–8.

⁵⁸ As rightly argued by Schofield, ‘for the purposes of a statistical comparison of the wealth of the counties, no more accuracy was required of the tax assessments than that they should be able to rank the counties in the same order of wealth, and [...] in the same sort of proportions, as would have resulted from a complete and accurate survey of all forms of wealth.’ Schofield, ‘Geographical distribution’ (1965), p. 484.

⁵⁹ Schofield, ‘Geographical distribution’ (1965); idem, ‘Geographical distribution’ (2008); Darby et al., ‘Changing geographical distribution’.



1524–5, ensure that this assumption could not be far from the mark, at least concerning the vast majority of the population. In online [Appendix H](#), we provide some empirical evidence supporting this view, using exceptional data for Buckinghamshire, and we discuss in greater depth possible distortions in our inequality measures coming from focusing on movable goods only.

Regarding possible differences in the part of the population covered by our sources, the problem arises because both the lay and Tudor subsidies established a minimum level of wealth to be taxed. People with wealth below the threshold were not recorded. Therefore, the sources do not tell us what proportion of the population was exempt and how much was owned by those below the threshold for taxation. This is a challenge both for attempts at properly measuring economic inequality, and for making any sort of time comparisons. To solve this problem, first we made use of population figures recently provided by Broadberry et al.⁶⁰ for different dates to evaluate the percent of households missing from our sources at the county level (online [Appendix A](#)). The second step was to estimate the wealth distribution of the missing households by assuming a specific statistical distribution, as discussed in Section II.

The final concern regards the wealth of the church. Here it will suffice to underline that we are interested in the distribution of lay household wealth, not of institutional wealth. Despite its potential importance for the appraisal of the regional evolution of wealth across England,⁶¹ church wealth does not affect household inequality. Indeed, church property has usually been excluded from other works on wealth inequality in pre-industrial Europe.⁶²

Overall, we collected data from a sample of counties which roughly correspond to 30–40 per cent of the entire English population (less for the late thirteenth century, due to relative scarcity of sources) and which are spread across the different regions of England. Indeed, despite limitations in the surviving sources, our database is representative of all English regions and it includes all the counties for which we could make inter-temporal comparisons between 1327–32 and 1524–5 based on complete or almost-complete county-level information.⁶³ [Table 2](#) and [figure 1](#) provide an overview of the database, while online [Appendix B](#) details the sources used for each county. Most of the database has been produced by digitising the printed transcriptions of the original documents made by generations of genealogists and historians from the nineteenth century.

II

To produce standard indicators of economic inequality based on the surviving fiscal documentation, we need to overcome some obstacles. In particular, we need to find a way to account for the absence of a significant part of society from the wealth distributions observable from both the lay subsidies and the Tudor subsidies. This is the consequence of the existence of

⁶⁰ Broadberry et al., *British economic growth*.

⁶¹ Compare Schofield, 'Geographical distribution' (1965).

⁶² See, for example, Alfani, 'Economic inequality in northwestern Italy'; Nicolini and Ramos-Palencia, 'Decomposing income'; Alfani and Ammannati, 'Long-term trends'; Alfani, Gierok and Schaff, 'Economic inequality'. Also note that, in the rare case when it has been possible to compare wealth inequality including and excluding clergy and religious institutions, the estimated levels have been found to be similar, as not all members of the church were affluent. See Alfani and Di Tullio, *The lion's share*, pp. 121–6.

⁶³ Our sample, which includes counties in all English regions (as defined in Section IV), can also be taken to be broadly representative of each specific region, in the sense that for each of them the sample proxies decently well some general characteristics of the region (see online [Appendix G](#)).

**TABLE 2** Number of households taxed, by county, region, and period (actual year in parentheses)

County and region	1280–1319	1327–32	1524–5
Bedfordshire	5426 (1309)	4392 (1332)	1995*
Buckinghamshire	–	2248* (1332)	7290
Rutland	1645 (1296)	–	1427
<i>East Midlands (total)</i>	7071	6640	10 712
Essex	–	8258 (1327)	16 335
Suffolk	1339 (1283)*	11 713 (1327)	16 644
<i>Eastern England (total)</i>	1339	19 971	32 979
Kent	–	10 764 (1334)	13 073*
Surrey	–	3649 (1332)	6429
Sussex	7098 (1296)	6828 (1332)	11 653
<i>South-east England (total)</i>	7098	21 241	31 155
Dorset	–	7622 (1332)	7981
<i>Southern England (total)</i>	–	7622	7981
Shropshire	–	4872 (1327)	4971*
Staffordshire	–	3957 (1332)	5555
Warwickshire	–	5766 (1332)	6378
Worcestershire	7357 (c. 1280)	4769 (1327)	5277
<i>West Midlands (total)</i>	7357	19 364	22 181
Devon	–	10 517 (1332)	26 345
<i>South-west England (total)</i>	–	10 517	26 345
Lancashire	–	2567 (1332)	1867*
Cumberland	–	3538 (1332)	–
Northumberland	4359 (1296)	–	–
<i>Northern England (total)</i>	4359	6105	1867
London	1854 (1319) *	1631 (1332)	3641 (1541)
<i>All regions (total)</i>	29 078	93 091	136 862

Notes: *Incomplete information, covering only part of the county.

minimum thresholds for taxation (see Section I), and of the practice of not including in the fiscal records the households below the threshold. As a result, what can be measured directly is only the wealth distribution among the households above the threshold. While inequality among taxpayers is still a relevant and interesting distributive measure, it is obviously important to produce some estimates, albeit imperfect, of overall inequality – the more so, given that the part of society which can be observed differs across counties and time, which complicates comparisons.

To deal with this challenge, we follow a strategy consisting of:

1. estimating for each county and date the percentage of households recorded (taxed) and not recorded (not taxed);
2. studying the distributions to confirm that they fit the expected functional form;

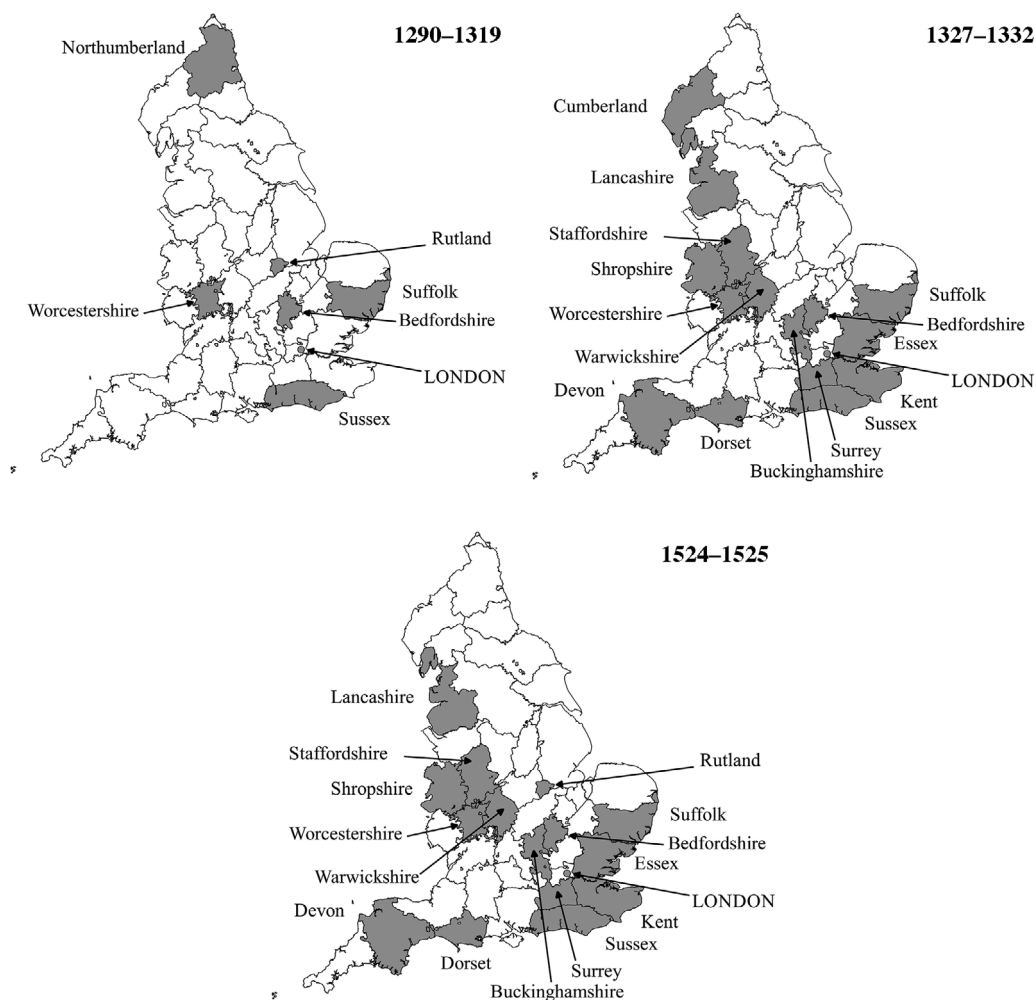


FIGURE 1 Counties included in the database for each date. *Notes:* The geographic information system (GIS) layers of historical county boundaries have been kindly provided by the Cambridge Group for the History of Population and Social Structure, through the project ‘The occupational structure of Britain 1379–1911’ funded by the Economic and Social Research Council, the Leverhulme Trust, and the British Academy

- calculating the main indicators of inequality for a lognormal censored distribution through a maximum likelihood probability function estimation.⁶⁴

To estimate the percentage of households recorded, we use the updated population figures provided by Broadberry et al., which trace the evolution of the population in England from the Domesday Book of 1086 to the first modern census, dated 1801.⁶⁵ On this basis, we can estimate the population at the county level, and subsequently the number of households per county, following the procedure reported in online [Appendix A](#) (see [table A1](#) for estimates of the share of

⁶⁴ Our distributions are ‘censored’ because we have no information about the wealth of the households below the threshold for taxation, but we can calculate how many they are (compare [Hong, Alfani, Bonetti and Gagliarano](#), ‘giniinc’, pp. 694–5).

⁶⁵ [Broadberry, Campbell, Klein, Overton and van Leeuwen](#), *British economic growth*.



population covered by our fiscal sources in each year and county). The coverage of our sources can be considered excellent for 1524–5 when we can usually observe 45–60 per cent of the entire distribution (with a peak of over 67 per cent for Buckinghamshire), less so for the earlier periods when on average we can observe one-third of the overall distribution. Also in this case, however, the part of the distribution that we can observe is larger than what is normally to be found in similar instances, both for historical and for modern populations. For example, a recent study of mid-nineteenth-century Finland estimated income distributions based on the top quarter only.⁶⁶ Additionally, the general literature on inequality measurement suggests that, given the nature of wealth and income distributions, with many individuals or households clustering around very low levels, the absence of observational data for the bottom part of the distribution (left-censored: see below) does not seriously compromise our ability to produce reasonably good estimates of overall inequality.⁶⁷

The second step is to identify the probability distribution that best fits the data. This is a necessary step to estimate inequality indicators for the whole society in a parametric way. From the pioneering contributions of Pareto or Kapteyn at the turn of the twentieth century to more recent and sophisticated proposals,⁶⁸ several functional forms have been suggested to model income and income-related variables such as wealth, rents, dividends, profits, or inheritances.⁶⁹ The lognormal distribution – a random positive variable whose logarithm is normally distributed – is the most obvious candidate for income and wealth distributions and is usually taken as reference both by economic historians and by applied economists.⁷⁰ There are good reasons for this, since: (a) the lognormal model provides a theoretical explanation for the genesis of the data based on the idea that ‘under certain kinds of “random processes” the distribution of incomes eventually turns out to be approximately lognormal’;⁷¹ (b) a good number of datasets on income or wealth have been proved to fit a lognormal distribution, at least for the main body of the society;⁷² (c) the lognormal distribution has useful properties such as the simple relationship to the normal, symmetrical, and non-intersecting Lorenz curves, inequality (e.g. the Gini coefficient) depending on a single parameter σ which uniquely determines the shape of the Lorenz curves, an easy interpretation of the parameters, and preservation under log-linear transformations;⁷³ and (d) it is an easy and relatively simple choice, based on the parsimony principle, compared with alternative models, and this is also why it has been used continuously over the years.⁷⁴

Beyond the theoretical debate, looking at the graphical representation of our data is informative about their real distribution. As can be seen by plotting the available data in histograms (figure 2), the distribution of wealth appears to be unimodal, positively skewed, and with a heavy right tail (which is typical of wealth distributions compared with income distributions). If we look at the

⁶⁶ Voutilainen, ‘Income inequality’. For modern examples of good estimates obtained from even smaller percentages of the observed population see Greene, *Econometric Analysis*, pp. 921–2.

⁶⁷ See for example Greene, *Econometric analysis*, pp. 921–2.

⁶⁸ See a synthesis in Cowell, *Measuring inequality*, pp. 158–62.

⁶⁹ Aitchison and Brown, *Lognormal distribution*, pp. 101–2; Lawrence, ‘Applications’, pp. 233–7.

⁷⁰ See, for example, Soltow and van Zanden, *Income and wealth*; Van Zanden, Baten, Foldvari and van Leeuwen ‘The changing shape of global inequality’.

⁷¹ Cowell, *Measuring inequality*, p. 82.

⁷² Cowell, *Measuring inequality*, p. 82; Lawrence, ‘Applications’, pp. 231, 234–7.

⁷³ Cowell, *Measuring inequality*, pp. 158–62.

⁷⁴ Lawrence, ‘Applications’, p. 230.

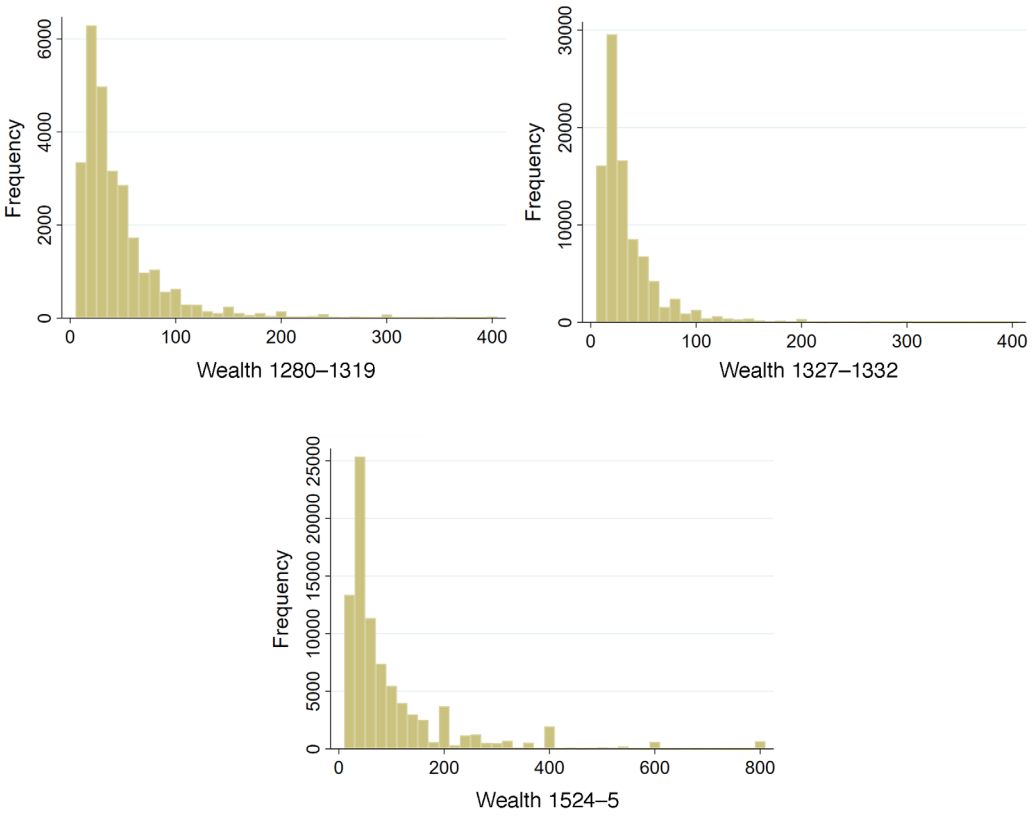


FIGURE 2 Histograms of wealth distributions (all counties) [Colour figure can be viewed at wileyonlinelibrary.com]

logarithm of the distribution in figure 3, it is quite clear that the data fit a lognormal distribution with left censoring, that is, a distribution in which we can observe the variable X only for $X \geq \xi$, with X being the taxable wealth and ξ the minimum threshold for being subjected to taxation.

The third step is to estimate the parameters of the hypothetical distribution that best fits the data, by means of maximum likelihood estimation (MLE) procedures.

The probability density function (pdf) of a random variable ($Y = \ln(X)$) lognormally distributed is:

$$f_X(x; \mu, \sigma) = \begin{cases} \frac{1}{x\sigma\sqrt{2\pi}} e^{-\frac{(\ln x - \mu)^2}{2\sigma^2}} & \sigma > 0 \quad x > 0 \\ 0 & x \leq 0 \end{cases} \quad (1)$$

And its cumulative distribution function (cdf) is:

$$F_x(x; \mu, \sigma) = \frac{1}{2} \operatorname{erfc} \left[-\frac{\ln x - \mu}{\sigma\sqrt{2}} \right] = \Phi \left(\frac{\ln x - \mu}{\sigma} \right), \quad (2)$$

where erfc is the complementary error function, and Φ is the standard normal cdf.

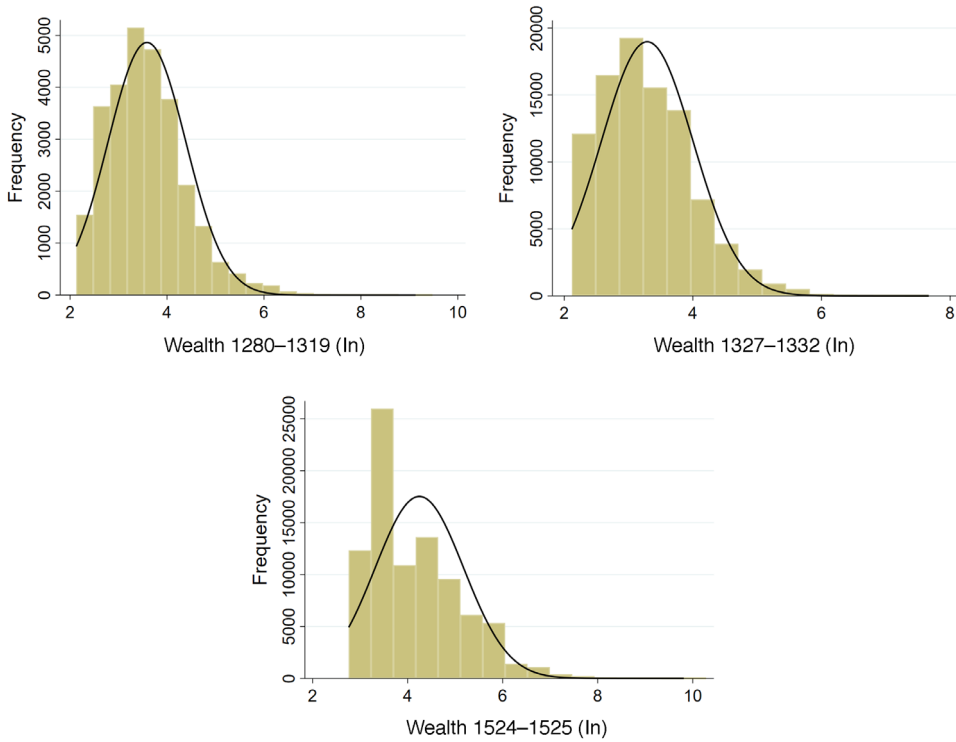


FIGURE 3 Histograms of logarithmic transformation of wealth distributions (all counties, fitted normal distribution superposed). *Notes:* Graph obtained with the Stata command *histogram* and the option *normal* to superpose the normal distribution that fits observed data (without any consideration of censoring) [Colour figure can be viewed at wileyonlinelibrary.com]

Then we consider a censored lognormal distribution (censored at ξ , the minimum quantity of wealth evaluated for taxation at each date) that for each geographical unit of analysis and benchmark year consists of a population of size n with n_1 observations not greater than ξ whose exact values are unknown, and n_2 observations x_1, \dots, x_{n_2} (all $x_i > \xi$) which correspond to the observed households wealth values.

Following Aitchison and Brown and Cohen,⁷⁵ to estimate the inequality indicators with MLE, the log likelihood function for a left-censored lognormal distribution can be written as:

$$\ln L = n_1 \ln \Phi \left(\frac{(\ln \xi - \mu)}{\sigma} \right) - \frac{n}{2} \ln \sigma^2 - \frac{1}{2\sigma^2} \sum_{i=1}^n (y_i - \mu)^2 \tag{3}$$

where $y_i = \ln x_i$. Then, to obtain the ML estimations of μ and σ^2 , we proceed by equating to zero the first partial derivatives of the former expression with respect to the parameters μ and σ^2 :

$$\frac{\partial L}{\partial \mu} = -\frac{n_1}{\sigma} \frac{\phi \left(\frac{(\ln \xi - \mu)}{\sigma} \right)}{\Phi \left(\frac{(\ln \xi - \mu)}{\sigma} \right)} + \frac{1}{\sigma^2} \sum_{i=1}^n (y_i - \mu) = 0 \tag{4}$$

⁷⁵ Aitchison and Brown, *Lognormal distribution*, p. 90; Cohen, ‘Censored’, pp. 139–42; idem, *Truncated*, p. 98.



$$\frac{\partial L}{\partial \sigma^2} = -\frac{n_1}{2\sigma^2} \frac{(\log \xi - \mu)}{\sigma} \frac{\phi\left(\frac{(\log \xi - \mu)}{\sigma}\right)}{\Phi\left(\frac{(\log \xi - \mu)}{\sigma}\right)} - \frac{n_2}{2\sigma^2} + \frac{1}{2\sigma^4} \sum_{i=1}^n (y_i - \mu)^2 = 0 \quad (5)$$

where ϕ is the standard normal pdf and Φ is the standard normal cdf.

Once the parameters are estimated, we can easily proceed to calculate any inequality measure. For instance, the Gini concentration coefficient for a lognormal distribution is:

$$G = 2 \Phi\left(\frac{\sigma}{\sqrt{2}}\right) - 1 \quad (6)$$

The practical task of producing our estimates was greatly eased by a recently introduced Stata package, *giniinc*,⁷⁶ which has been developed as part of the research project leading to our article; this is the first study to apply it systematically. To use the package, we need only two things: an observed (partial) wealth distribution, and an estimate of the percentage of unobserved households. Based on this information, *giniinc* allowed us to calculate the Gini coefficients and other basic inequality measures (quartiles, deciles, top percentiles, etc.) easily for each geographical unit relevant to our study (county, region, or country) and for each date. The results are discussed in the following section, where the estimates from parametric estimation are systematically compared with those produced based on the original (censored) distributions. Note that, although the idea of using the lognormal hypothesis for reconstructing distributions from incomplete data is certainly not new (although, to the best of our knowledge, the procedure has never been applied to English pre-industrial wealth data), our application is superior to others that make use of ‘short-cut’ procedures⁷⁷ because *giniinc* uses all the available individual observations for estimating the parameters.

III

The information collected from fiscal records can be used to study wealth inequality across much of England. Indeed, patterns in the regional distribution of wealth during medieval and early modern times have already been explored based on this kind of information and have been the object of intense debate among historical geographers and economic historians. These earlier studies have focused on changes in relative wealth levels across English counties, highlighting different paths of development across the country. In a pioneering article, Buckatzsch suggested that England had been characterised by a substantial stability in the geographical distribution of wealth from the middle ages to the end of the seventeenth century, with change in the internal hierarchy happening only from the eighteenth century.⁷⁸ Later studies, beginning with a classic contribution by Schofield, have overturned this view, showing instead that the geography of wealth changed significantly in pre-industrial times.⁷⁹ In the early fourteenth century, the richest counties ‘lie grouped along a fairly narrow band, starting in Gloucestershire and Wiltshire in the south-west

⁷⁶ Hong et al., ‘*giniinc*’.

⁷⁷ For example, that described by Greene, *Econometric analysis*, p. 921 ff.

⁷⁸ Buckatzsch, ‘Geographical distribution’.

⁷⁹ Schofield, ‘Geographical distribution’ (1965).



and moving north-east across the south Midlands to northern East Anglia, and then extending along the east coast to the East Riding,⁸⁰ but by the early sixteenth century wealth had moved south, especially to the South-east. North-western and northern counties remained the poorest throughout the period.⁸¹ This pattern is also clearly visible in the territorially disaggregated maps developed by Sheail for 1524–5.⁸²

These earlier studies provide crucial background information; however, none of them has explored within-county inequality, nor were they able to provide an estimate of overall inequality levels across the country, due to the lack of the kind of household-level information introduced in this article. As a consequence, we have the opportunity to further significantly the understanding of the geography and the time dynamics of wealth distribution across pre-industrial England. As discussed in earlier sections, this task is complicated by the limitations of the surviving sources, particularly in two respects: the incomplete coverage of the population (all the observed wealth distributions miss the poorest households) and changes in the fiscal systems. To take into account the first problem, we compare inequality measures calculated on the incomplete observed distribution with those related to ‘reconstructed’ complete distributions, produced with the method described in Section II. Note that we will focus mostly on the measures from the reconstructed distributions because, given the large percentage of households below the threshold for taxation, they can be expected to proxy better the real level of wealth inequality. Regarding the second problem, information coming from the late-thirteenth- and early-fourteenth-century lay subsidies and from the early-sixteenth-century Tudor subsidies can be considered broadly comparable.⁸³ Table 3 provides Gini indexes calculated at the county level (plus London) on both the observed and the reconstructed distributions for three periods: 1280–1319 (usually for 1296, see table 2), 1327–32, and 1524–5. Table 4 provides an ordinal analysis of the relative wealth inequality of English counties (the position of counties in the table follows the ordering of 1327–32, with value ‘1’ referring to the most unequal). Note that, to ease the interpretation of the table, table 4 ranks only the 14 counties (plus London) for which information was available for both 1327–32 and 1524–5.⁸⁴

Looking at wealth inequality from the ‘reconstructed’ distributions, we find considerable variation across counties. In 1327–32, the Gini index ranges from 0.455 in Devon to 0.798 in Kent, a value exceeded only by the city of London (0.953). Note that increases in the value of the Gini indexes when moving from the observed to the reconstructed distributions are to be expected, given that the reconstruction is meant to add to the calculations the (unobserved) poorest part of the population and that the assumption has been made that the overall distribution is lognormal. The range of variation of reconstructed inequality levels in 1524–5 is more limited than in the earlier period and appears to be displaced towards a somewhat higher level (from 0.597 in Buckinghamshire to 0.833 in Kent). Again, London’s inequality beats even Kent’s (although not by much with a Gini of 0.839).

The levels of wealth inequality estimated from the lay and Tudor subsidies, which can be expected to provide an acceptably reliable picture of actual inequality, assume values that are broadly comparable to the few other regional-level estimates of wealth inequality available for

⁸⁰ *Ibid.*, p. 505.

⁸¹ *Ibid.*; *idem*, ‘Geographical distribution’ (2008); Darby et al., ‘Changing geographical distribution’; Campbell and Bartley, *England on the eve of the Black Death*.

⁸² Sheail, ‘The distribution’, p. 120.

⁸³ See Section I as well as Schofield, ‘Geographical distribution’ (1965); *idem*, ‘Geographical distribution’ (2008).

⁸⁴ The complete database of inequality measures which have been produced for English counties and regions can be downloaded from http://didattica.unibocconi.eu/Alfani_database.

**TABLE 3** Wealth inequality in English counties, 1280–1525: observed and reconstructed distributions compared (95% confidence intervals between parentheses)

	1280–1319*		1327–32*		1524–5 (goods only)*	
	Observed	Reconstructed	Observed	Reconstructed	Observed	Reconstructed
Bedfordshire	0.449	0.807 (0.797–0.817)	0.405	0.736 (0.724–0.747)	0.479	0.671 (0.648–0.695)
Buckinghamshire			0.361	0.646 (0.629–0.663)	0.575	0.597 (0.588–0.606)
Cumberland			0.447	0.746 (0.733–0.760)		
Devon			0.336	0.455 (0.449–0.461)	0.560	0.694 (0.689–0.699)
Dorset			0.418	0.593 (0.585–0.602)	0.576	0.747 (0.738–0.757)
Essex			0.460	0.780 (0.772–0.788)	0.622	0.746 (0.739–0.753)
Kent			0.470	0.798 (0.791–0.805)	0.605	0.833 (0.825–0.841)
Lancashire			0.323	0.769 (0.754–0.785)	0.311	0.743 (0.721–0.766)
London	0.761	0.961 (0.954–0.969)	0.664	0.953 (0.943–0.963)	0.707	0.839 (0.826–0.851)
Northumberland	0.462	0.871 (0.861–0.881)				
Rutland	0.416	0.785 (0.766–0.803)			0.526	0.741 (0.716–0.765)
Shropshire			0.325	0.687 (0.675–0.698)	0.436	0.615 (0.602–0.629)
Staffordshire			0.325	0.706 (0.694–0.719)	0.409	0.627 (0.615–0.639)
Suffolk	0.533**	0.715** (0.687–0.742)	0.414	0.740 (0.733–0.748)	0.569	0.736 (0.728–0.744)
Surrey			0.411	0.646 (0.633–0.659)	0.594	0.769 (0.757–0.780)
Sussex	0.515	0.792 (0.783–0.801)	0.464	0.750 (0.741–0.760)	0.578	0.717 (0.708–0.725)
Warwickshire			0.358	0.731 (0.721–0.742)	0.574	0.634 (0.624–0.644)
Worcestershire	0.485	0.649 (0.641–0.658)	0.332	0.599 (0.589–0.610)	0.469	0.647 (0.635–0.658)

Notes: *Gini indexes calculated on ‘observed’ distributions refer to the incomplete distributions coming directly from the fiscal assessments; Gini indexes calculated on ‘reconstructed’ distributions refer to the complete lognormal distributions derived from the observed distributions using the method detailed in Section II and the giniinc Stata package. 95% confidence intervals for the Gini calculated on the ‘reconstructed’ distributions have been obtained with the giniinc Stata package as part of the parametric estimate (Delta method). Note that these are large-sample confidence intervals from likelihood maximisation; hence, they take into account possible measurement errors in the observed distribution (under the assumption that the distribution is lognormal). For clarifications, see Hong et al., ‘giniinc’, pp. 706–9. **For Suffolk in 1283, the estimates refer to the Blackbourne hundred only.

European areas. The vast majority of these estimates refer to Italian regions. Around 1500, the Gini index of wealth inequality amounted to 0.61 in the region of Piedmont (Sabaudian State, north-western Italy), 0.687 in Veneto and eastern Lombardy (Republic of Venice, north-eastern Italy), and 0.654 in Tuscany (Florentine State, central Italy).⁸⁵ An estimate of wealth inequality, obtained using sources and methods similar to those employed for Italy, exists also for Germany where around 1550 the Gini index of wealth inequality was 0.637.⁸⁶ While differences in the wealth components assessed by fiscal records in England, Germany, and Italy suggest caution when comparing directly inequality estimates, it is still true that the similarity in the inequality levels provides some additional support to our analyses. Also, the fact that the city of London experienced higher wealth inequality than the counties, with their mostly rural populations, is consistent with research on other European areas, given that empirically pre-industrial cities are usually found to

⁸⁵ Alfani, ‘Economic inequality in northwestern Italy’; Alfani and Ryckbosch, ‘Growing apart’; Alfani and Di Tullio, *The lion’s share*, p. 128.

⁸⁶ Alfani, Gierok and Schaff, ‘Economic inequality’, p. 108.

**TABLE 4** Wealth inequality in English counties, 1280–1525: ordinal analysis

	1280–1319		1327–32		1524–5 (goods only)	
	Observed	Reconstructed	Observed	Reconstructed	Observed	Reconstructed
London	1	1	1	1	1	1
Kent			2	2	3	2
Sussex	2	3	3	5	6	8
Essex			4	3	2	5
Dorset			5	14	5	4
Suffolk	3	4	6	6	9	7
Surrey			7	11	4	3
Bedfordshire	5	2	8	7	11	10
Buckinghamshire			9	12	7	15
Warwickshire			10	8	8	12
Devon			11	15	10	9
Worcestershire	4	5	12	13	12	11
Shropshire			13	10	13	14
Staffordshire			14	9	14	13
Lancashire			15	4	15	6
<i>Number of counties</i>	5	5	15	15	15	15

be more unequal than the surrounding rural areas and that larger cities tend to be more unequal than smaller ones.⁸⁷

As inequality measures from reconstructed distributions based on lay and Tudor subsidies are directly comparable, they can be used to detect broad trends of distributional change. However, regarding inequality within counties, no clear trends can be discerned, as both when moving from 1280–1319 to 1327–32 and from 1327–32 to 1524–5 we find that the sample of counties is quite evenly split between those growing more unequal and those going in the opposite direction. Additionally, some of the changes are relatively limited in size, with five counties (Essex, Kent, Lancashire, Suffolk, and Sussex) showing variations of less than 0.035 Gini points between 1327–32 and 1524–5, which might be taken as indicative of relatively similar inequality levels at the two dates across much of England.

For the above reasons, it is more interesting to focus on changes in the relative position of counties, shown in table 4. Focusing on the periods for which more cases are available and excluding London (as it was not a county), the list ordered by decreasing inequality among taxpayers (the ‘observed’ distributions) shows an impressive stickiness both at the top and at the bottom. Of the five more unequal counties in 1327–32, four make it to the top in 1524–5, the exception being Suffolk, which moves from the sixth to the ninth position. Also, four of the five least unequal counties of 1327–32 continue to occupy the bottom of the distribution two centuries later, and the only exception (Devon) is due to a movement upwards of just one position. Similar conclusions can be reached comparing the ordering of the reconstructed distributions. Indeed, this additional ranking matches quite closely that of the observed distributions, with two mirroring exceptions: Dorset in 1327–32, which falls from the fifth to the fourteenth position, and Lancashire, which,

⁸⁷ For a synthesis, see Alfani and Ammannati, ‘Long-term trends’, pp. 1084–5.



placed at the very last position both in 1327–32 and 1524–5, moves decidedly upward, reaching fourth and sixth position, respectively. The reason for this seems clear for Lancashire, which in both periods was the county with the lowest population coverage in the tax records (see [table A1](#) in online [Appendix A](#)), thus providing greater space for increases in the unequal character of the distribution as a consequence of the reconstruction process. In its turn, low population coverage is the consequence of widespread poverty, as it basically means that more households than usual were below the minimum threshold for taxation. Indeed, what our analysis suggests is that Lancashire had the unfortunate characteristic of being at the same time the poorest county of England and one where wealth was distributed in a particularly uneven way.⁸⁸ The case of Dorset in 1327–32 is less clear cut, but it is also explained, at least partially, by population coverage, which, contrary to Lancashire, was particularly good. Also note that the reported ordering for each year is fairly robust to possible distortions in the county-level estimates of the percentage of missing population (below the threshold for taxation), as can be seen by comparing our reconstructed Gini indexes with those obtained with a homogeneous censoring (online [Appendix C](#), [table C3](#)).

It seems important to underline that differences in the Gini values across time and between counties are statistically significant as revealed by the 95 per cent confidence intervals provided for the indexes coming from reconstructed distributions ([table 3](#)). The reported confidence intervals are overall quite short, which is reassuring: in 1524–5 they range from 0.01 Gini points for Devon (interval of 0.689–0.699 around the point estimate of 0.694) to 0.049 for Rutland.⁸⁹ The reliability of our analysis is further confirmed by the fact that the relative position of the Gini indexes is almost identical to that of the share of the richest 10 per cent, an alternative inequality measure that – as it refers to an observed part of the distribution – is less subject to possible faults in the reconstruction process (see online [Appendix C](#) for data and further discussion). As an additional robustness check, in online [Appendix D](#) we analyse the impact on the estimates of possible imprecisions in the assessment of the percentage of missing households, and we show that our estimates are robust to reasonable changes in this parameter.

A high degree of stickiness in the ranking of counties according to wealth inequality was probably to be expected, given that inequality levels tend to be persistent. Also because of this, what changes we do observe in the relative position of counties from the early fourteenth to the early sixteenth century are interesting. They seem to suggest a tendency for the south of England, and especially the south-east, to grow more inegalitarian compared with other parts of the country ([figure 4](#)). Of course, the incomplete territorial coverage of our database imposes limitations on how much can be glimpsed concerning changes in the geography of inequality; nevertheless, what we have does suggest a development that matches quite closely the changes in the geography of wealth identified by Schofield.⁹⁰

Parallel developments in the geography of wealth and in that of inequality are the result of an interesting empirical finding: inequality levels are strongly and positively correlated with the average taxpayers' wealth of each county. In other words, the richest parts of England also tended to be more unequal. This is an entirely reasonable finding for a pre-industrial society in which a large part of the population was close to subsistence; however, it is not something which could have been established *a priori* as, for wealth, a condition of extreme poverty is technically compatible with one of extreme inequality (imagine a society of landless peasant households, all working

⁸⁸ Schofield, 'Geographical distribution' (1965).

⁸⁹ Note that, while our confidence intervals account for measurement errors (see notes to [table 3](#)), they do not account for imprecision in the estimate of the censoring point; on this, see online [Appendix C](#).

⁹⁰ Schofield, 'Geographical distribution' (1965); *idem*, 'Geographical distribution' (2008).

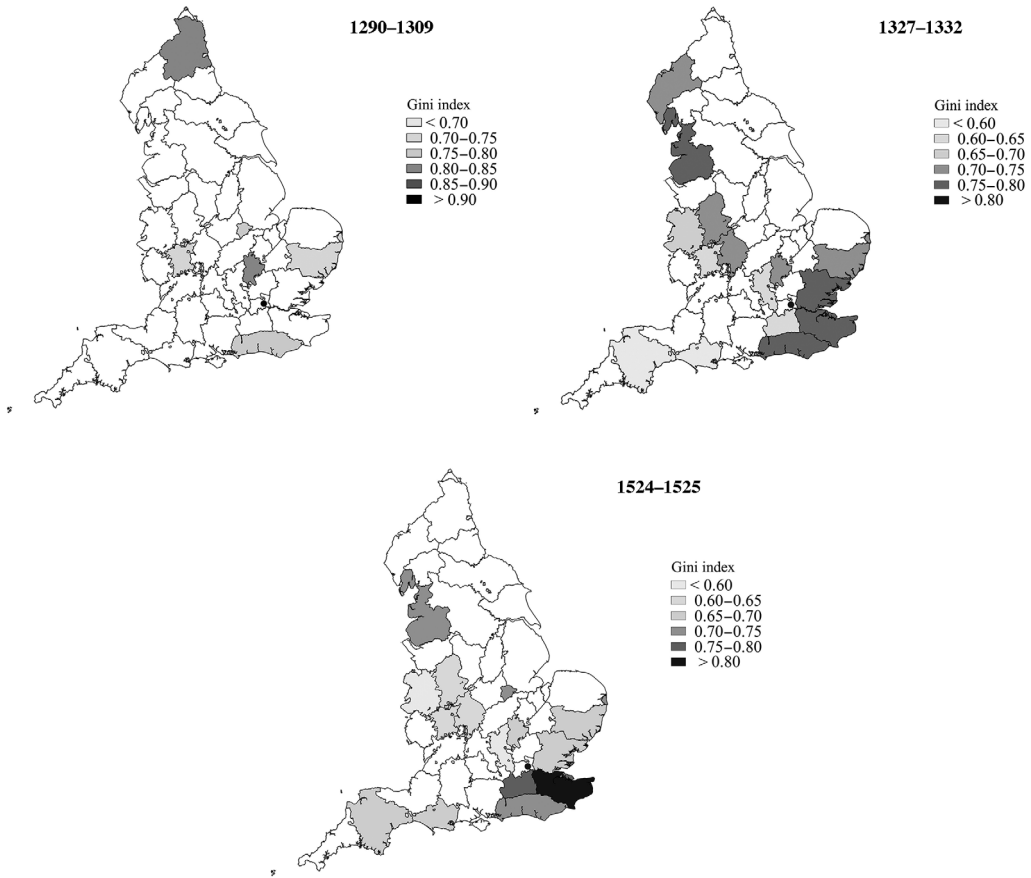


FIGURE 4 The geography of wealth inequality in English counties, 1290–1525 (reconstructed distributions)

the land formally owned by a single super-rich household). This point is also proven by the case of poor and unequal Lancashire discussed above. This being said, focusing on the two periods for which we have the best territorial coverage, we computed a high correlation of 0.87 and 0.86 in 1327–32 when using the observed or the reconstructed distributions, respectively, and of 0.8 and 0.75 in 1524–5. The correlation is shown graphically in figure 5, while complete information about the average wealth at the county level is provided in online [Appendix E](#). These findings might also help to interpret the above-reported changes in relative inequality levels in the north and the south of England: as argued by Nightingale based on lay subsidies and Statute Merchant certificates, already in the period 1290–1334 there are signs of a progressive impoverishment of the counties north of the Severn-Wash line.⁹¹

IV

Having analysed the inequality trends and tendencies at the county level, we now focus on England as a whole, providing a reconstruction and an analysis of wealth inequality for the two peri-

⁹¹ Nightingale, 'Lay subsidies', p. 26.

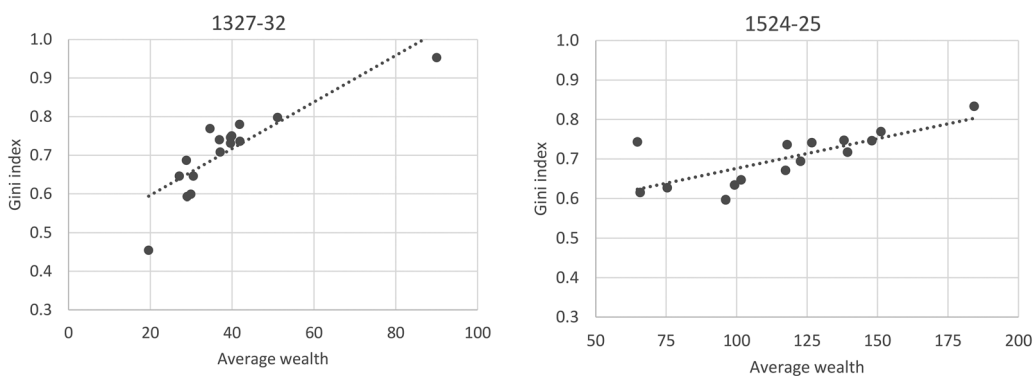


FIGURE 5 Correlation between average household wealth and inequality, 1327–32 and 1524–5 (reconstructed distributions). *Notes:* The figures for 1524–5 do not include London (whose observation refers to 1541) because of comparability problems in the average household wealth (see online [Appendix C](#))

ods for which we have the best and most comparable information (1327–32 and 1524–5) and focusing on the ‘reconstructed’ distributions. To obtain a distribution representative of the whole of England, it is not enough to simply merge all the county-level distributions together, as better territorial coverage in specific regions might significantly distort the results. So as a first step we aggregate the counties in regions, using the same classification as Broadberry et al.⁹² As inequality at this intermediate, regional level is itself interesting, in table 5 we provide the Gini index and the share of the richest 10 per cent for all regions in both periods, calculated both on the observed and on the reconstructed distribution (the notes to the table clarify which counties are included in each region). As we can see, the relative levels of regional inequality follow the geographic pattern already described in Section III. In particular, south-east England is found to be the most unequal region in both periods, with a Gini (calculated on the reconstructed distributions) of 0.777 in 1327–32 and of 0.775 in 1524–5, while the share of the richest 10 per cent would be 66.8 per cent and 67 per cent at the two dates, respectively. Again, inequality levels seem to correlate with the relative wealth levels of the different regions, except for the north, fairly unequal in spite of its relative poverty (the richest 10 per cent had 64.9 per cent of the overall wealth in 1327–32 and 62 per cent in 1524–5, about on par with eastern England and way above south-west England or the Midlands). Interestingly, inequality levels also show a strong correlation (0.66) with the available estimates of regional average land rents, suggesting that were we able to add land to our estimates, the relative positioning of regions on the inequality ladder would not change much.⁹³

From the regional distributions (plus London), obtaining a distribution representative of the whole of England is a simple matter of weighing the local components reflecting the population share of each region. On principle, this method is analogous to that discussed by Milanovic to

⁹² Broadberry et al., *British economic growth*, p. 11. In principle, different aggregation criteria would have been possible, for example by *pays* (on this concept see Overton, *Agricultural revolution*, pp. 50–3). While these alternative criteria might offer additional insights, they would be difficult to apply to our data because they require a sub-county reclassification of households.

⁹³ Correlation calculated based on the data provided by Clark, ‘Land rental’, p. 297, for the period 1480–1549 (not including our region Eastern England, which is difficult to match with Clark’s definition of regions). It is reasonable to presume that were estimates of land rents available specifically for the years 1524–5, the correlation would be stronger, as 1480–1549 was a period of intense change in agrarian structures (also see online [Appendix H](#)).



TABLE 5 Wealth inequality in English regions, 1327–32 and 1524–5

Region	Gini index		1524–5 (goods only)		Share of richest 10%		1524–5 (goods only)	
	1327–32		Observed	Reconstructed*	Observed	Reconstructed	Observed	Reconstructed
	Observed	Reconstructed*	Observed	Reconstructed*	Observed	Reconstructed	Observed	Reconstructed
East Midlands	0.399	0.713 (0.704–0.723)	0.559	0.647 (0.638–0.655)	32.8	59.6	46.1	51.3
Eastern England	0.436	0.759 (0.753–0.764)	0.602	0.743 (0.738–0.749)	35.4	64.3	49.9	62.7
Northern England	0.401	0.760 (0.750–0.770)	0.311	0.743 (0.721–0.766)	31.6	64.9	31.0	62.0
South-east England	0.472	0.777 (0.772–0.782)	0.595	0.775 (0.770–0.780)	37.1	66.8	48.3	67.0
Southern England	0.417	0.594 (0.585–0.602)	0.576	0.747 (0.738–0.757)	32.8	46.1	46.9	63.0
South-west England	0.331	0.455 (0.449–0.461)	0.56	0.694 (0.689–0.699)	28.8	33.4	45.8	56.5
West Midlands	0.348	0.687 (0.681–0.693)	0.496	0.643 (0.637–0.649)	27.6	55.4	42.3	50.7

Notes: Eastern England is represented by Suffolk and Essex; south-east England by Surrey, Sussex, and Kent; East Midlands by Bedfordshire and Buckinghamshire (plus Rutland but for 1524–5 only); south England by Dorset; West Midlands by Shropshire, Staffordshire, Warwickshire, and Worcestershire; south-west England by Devon; northern England by Lancashire (plus Cumberland for 1327–32 only). *95% confidence intervals between parentheses; see notes to table 3 for additional details.

**TABLE 6** Wealth inequality in England, 1327–32 and 1524–5 (Gini indexes and relevant percentiles)

Year	Gini	D1	D2	D3	D4	D5	D6	D7	D8	D9	D10	Top 5%	Top 1%
1327–32 (observed)	0.423	2.8	3.7	4.3	5.5	6.1	7.9	9.0	11.5	15.4	34.1	22.8	8.3
1524–5 (observed)	0.657	1.3	1.9	2.6	2.6	3.2	4.2	5.6	7.8	12.8	58.0	49.7	29.8
1327–32 (reconstructed)*	0.725 (0.723–0.726)	0.2	0.6	1.1	1.7	2.5	3.7	5.6	8.7	15.6	60.3	45.8	21.5
1327–32 (reconstructed, alternative estimate)*	0.753 (0.752–0.755)	0.2	0.5	0.9	1.4	2.1	3.2	5.0	8.0	14.8	63.9	49.6	24.4
1524–5 (reconstructed)*	0.756 (0.754–0.758)	0.2	0.5	0.9	1.4	2.1	3.2	4.9	8.0	14.8	64.1	49.8	24.5

Notes: *95% confidence intervals between parentheses; see notes to table 3 for additional details.

calculate ‘weighted international inequality’.⁹⁴ For example, in the case of London, for which we have complete coverage, we simply pasted all the household-level entries in the overall distribution. But in the case of the East Midlands in 1327–32, as the counties we had available (Bedfordshire and Buckinghamshire) together corresponded to just one-quarter of the entire population of the region, we copied each household-level entry four times in the overall distribution. The underlying assumption is that the distribution obtained by merging Bedfordshire and Buckinghamshire is a good proxy of the distribution of the entire region; hence, weighing it in the aforementioned way is sufficient to ensure that the East Midlands has an impact on the overall distribution proportional to its population. Also note that this procedure is similar to that used in other recent regional reconstructions involving a variety of Italian states, the southern Low Countries, and Germany.⁹⁵ In contrast to all these, our own reconstruction for England has one important advantage in the possibility of comparing directly the household-level estimates for each county or region (thanks to a relatively unified system of fiscal levy of the central state, which was quite exceptional for late medieval Europe). However, the absence from the observed distribution of a large part of the population does present unique challenges, and to meet them, we employ the method discussed in earlier sections. The resulting hypothetical distribution can be used to produce the measures presented in table 6, which beyond the Gini index provides a full set of deciles and the wealth share of the richest 5 and top 1 per cent.

As seen from the table, the Gini index is found to be moderately increasing between 1327–32 and 1524–5, from 0.725 to 0.756 (this change is statistically significant as revealed by the 95 per cent confidence intervals). Inequality growth seems to be driven by an increase in the wealth share of the richest, which is a common finding valid for both modern-day and pre-industrial societies.⁹⁶ So, between the two periods, the share of the richest 10 per cent grew from 60.3 per cent to 64.1 per cent, an increase of 3.8 percentage points that is mostly due to an increase of 3 percentage points in the share of the top 1 per cent (from 21.5 per cent to 24.5 per cent). In the same span of time, the wealth share of the poorest 10 per cent remained stable and basically negligible (0.2 per cent), while that of all deciles from the second to the ninth declined – implying that the overall process of wealth concentration took place in a way which favoured extremely few hands: indeed, only

⁹⁴ Milanovic, *Worlds apart*.

⁹⁵ Alfani, ‘Economic inequality in northwestern Italy’; Alfani and Ryckbosch, ‘Growing apart’; Alfani and Di Tullio, *The lion’s share*; Alfani, Gierok, and Schaff, ‘Economic inequality’.

⁹⁶ Atkinson, Piketty and Saez, ‘Top incomes’, p. 10; Alvaredo et al., ‘Top 1 percent’, p. 4; Alfani, ‘Economic inequality in preindustrial times’, p. 10.



the top 5 per cent.⁹⁷ Although differences in the definition of wealth suggest great care in making comparisons with other European areas, it seems interesting that these inequality levels are not far from those found for central-northern Italy. In particular, in the Italian part of the Sabaudian State (roughly corresponding to the current region Piedmont), around 1300 urban wealth inequality was 0.715 and the share of the richest 10 per cent was 61.3 per cent. By the mid-sixteenth century, however, England was more unequal than Piedmont/Sabaudian State where the Gini around 1550 was 0.663 in cities but just 0.613 for the overall population.⁹⁸ But early modern Piedmont was a relatively egalitarian part of the Italian peninsula, as in the Republic of Venice around 1550 wealth inequality was again very close to that found for England, with a Gini of 0.734 and a share of the richest 10 per cent of 63.1 per cent.⁹⁹

Our findings about higher wealth inequality in the 1520s compared with the 1320s–1330s are coherent with what has recently been argued by Broadberry et al. for income inequality.¹⁰⁰ They estimate the income Gini to be 0.33 around 1290, and 0.37 in 1381. No estimate is provided for the fifteenth and sixteenth centuries, while for 1688 the Gini would be 0.49. For 1688, however, two alternative estimates exist. Peter Lindert, based on Gregory King's social table, calculated a Gini of 0.556, which would rise (after some fluctuations) to 0.593 by 1801–3.¹⁰¹ More recently, Bob Allen proposed revising the estimates to 0.54 in 1688 and 0.60 in 1798.¹⁰² Taken together, all these estimates suggest an overall tendency towards income inequality growth in England from the end of the middle ages to the beginning of the nineteenth century.¹⁰³ This is also confirmed by other indicators, like the evolution of land rents that Clark found to be almost continuously growing from at least 1500. Interestingly, this would imply a growth of both income inequality (as increases in land rents tend to bolster the income of the richest) and wealth inequality (as land, an important component of total wealth, tends to be highly concentrated: see online [Appendix H](#)); for income inequality this would be further demonstrated by the evolution of the land rent/wage ratio and of labour's share.¹⁰⁴ Our own contribution supports this view for wealth inequality, at least until the mid-sixteenth century. Our comparison with income inequality levels, though, requires a caveat: if we took at face value the most recent estimates of the labour's share and of real wages, then we could infer a level of income inequality at the turn of the sixteenth century about equal, or maybe a little lower, to that at the turn of the fourteenth, because of the long-term effects of the Black Death (see below).¹⁰⁵ We must consider, though, that these indicators are much less direct measures of inequality compared with ours, or even with those produced with social tables; that they are subject to a significant imprecision in the point estimate for any given year or short period; and finally, that although in agrarian societies income and wealth inequality will unavoidably tend to be strongly correlated in the long run, they are not the same thing and could also show partly different tendencies (which in the end is a major reason why it

⁹⁷ As the share of the richest 5% grew by four percentage points while that of the top 10% grew by only 3.8 points, it is easy to calculate that the wealth share of percentiles 91–95 declined by 0.2 percentage points between 1327–32 and 1524–5.

⁹⁸ Alfani, 'Economic inequality in northwestern Italy'.

⁹⁹ Alfani and Di Tullio, *The lion's share*, p. 128.

¹⁰⁰ Broadberry et al., *British economic growth*, p. 329.

¹⁰¹ Lindert, 'Three Centuries', p. 175.

¹⁰² Allen, 'Class structure', pp. 109–11.

¹⁰³ See Alfani, 'Economic inequality in preindustrial times', pp. 12–3, for further discussion.

¹⁰⁴ Clark, 'Land rental', pp. 292, 304. For labour's share, see Humphreys and Weisdorf, 'Unreal wages?', pp. 2878–9.

¹⁰⁵ For example, Humphreys and Weisdorf, 'Unreal wages?'



is important to try to measure wealth inequality independently from income, and as directly as possible).¹⁰⁶

It is also possible that our estimate for 1327–32 is distorted towards greater-than-real equality because of an excessively low assumed population. The figure of 4.12 million in 1325 proposed by Broadberry et al. is debated, as it seems low compared with other estimates. In particular, Smith argued that around 1300 the population of England was in the range of 5.5–6.0 million.¹⁰⁷ Population, however, was surely curtailed by the Great Famine of 1315–7,¹⁰⁸ the worst food crisis of the late middle ages, which is considered to have caused an overall mortality of 10–15 per cent across England (recently a higher estimate of 15–20 per cent has been proposed).¹⁰⁹ Taking into account the extremes of the estimates (10–20 per cent) and accepting an initial range of 5.5–6.0 million, we are left with a post-famine estimated population of 4.4–5.4 million. For simplicity, and to account for some demographic recovery after the famine, we assume 5 million to produce the alternative estimate presented in table 6. The alternative Gini is higher than our earlier estimate (0.753 vs. 0.725), and would imply almost exactly the same wealth inequality level in 1327–32 and 1524–5; indeed, the 95 per cent confidence intervals around the two estimates overlap. Also note that the very limited differences in the territorial coverage of the sample used for the two periods (see the notes to table 5) do not influence significantly the overall results, as demonstrated by replicating the estimates with constant territorial coverage (online Appendix F). While imperfect population estimates might lead us to over-estimate differences between 1327–32 and 1524–5, it might be that the opposite result comes from the absence of land from the wealth estimates. This point, which would be compatible with Allen's views about the crisis of small-scale agriculture during 1450–1525 and the ensuing greater concentration of land, is further discussed in online Appendix H.¹¹⁰

An additional problem in the interpretation of our findings is that, in the absence of intermediary observations, we remain in the dark about the distributive consequences of the Black Death. In every other European area for which we have information about wealth or income inequality immediately before and after this terrible plague, which ravaged Europe during 1347–52 killing about half its population,¹¹¹ we find a sudden inequality decline after the plague with a tendency towards further levelling which continued for a period of a few decades to about a century thereafter.¹¹² So far, this finding refers to different Italian regions, like Piedmont in the north-west or Tuscany in the centre of the peninsula, southern France, Germany, and the southern Low Countries.¹¹³ These data also led Scheidel to argue for the levelling power of large-scale catastrophes,

¹⁰⁶ See Alfani, 'Economic inequality in preindustrial times', about the connection between wealth and income inequality in pre-industrial societies.

¹⁰⁷ Smith, 'Demographic developments'; idem, 'Plagues and peoples', p. 180.

¹⁰⁸ This is in fact how Broadberry et al., *British economic growth*, p. 21, justify population drop between 1315 and 1325, which they estimate to have been around 12%.

¹⁰⁹ Alfani and Ó Gráda, 'Timing and causes', p. 284; Slavin, *Experiencing famine*, p. 8.

¹¹⁰ Allen, *Enclosure*, p. 14.

¹¹¹ Mortality might have been up to 45% in England; Campbell, *The great transition*, p. 310.

¹¹² Spain might have been an exception to this general pattern. Although we lack complete pre- and post-Black Death income and wealth distributions, other evidence does offer substantial support to the idea that in Spain income inequality might have increased after the pandemic, as argued by Álvarez-Nogal, Prados de la Escosura, and Santiago-Caballero, 'Economic effects'. This, however, would be the result of conditions (low pre-pandemic population density) which made Spain differ from most other European areas, including England.

¹¹³ For a synthesis, see Alfani, 'Economic inequality in preindustrial times', pp. 15–18.



and Milanovic to propose the notion of a sequence of ‘Kuznets waves’ in inequality characterising European history.¹¹⁴ Also note that a reduction in both income and wealth inequality after the Black Death is exactly what should be expected, as we know that across Europe this huge shock led to higher real wages following the contraction in the labour offer¹¹⁵ (as recently confirmed for England by Clark)¹¹⁶ for both urban and rural male workers. Although female unskilled workers do not seem to have experienced the same improvement¹¹⁷ and some medievalists argue that speaking of a golden age of labour is an exaggeration, still ‘improved living conditions for the lower ranks of wage earners was a memorable characteristic of the late medieval economy’,¹¹⁸ as has also been confirmed by a recent study of labour share.¹¹⁹ Lower income inequality would also lead to lower wealth inequality, through the structure of savings as well as due to the relative abundance of property being offered on an inflated market which has been observed for a few European areas.¹²⁰ The Black Death might also have reduced wealth inequality directly, through the mechanism of inheritance. In the context of the unmitigated partible-inheritance systems characterising much of Europe on the eve of the pandemic, partible inheritance led to wealth being divided more evenly among the survivors and also helped to inflate the markets for real estate and other key wealth components, simply because some individuals inherited more property than they desired or could manage.¹²¹

And yet, in the absence of usable fiscal records between the 1330s and the 1520s, we are left to wonder about the trend followed by wealth inequality in the aftermath of the Black Death. To give an idea of what might have happened, figure 6 provides a hypothetical trend in wealth inequality in England from ca. 1320 to ca. 1540, assuming a Gini of 0.725 from 1320 to the eve of the Black Death, of 0.756 around 1540, and a movement in-between modelled upon the trend identified by Alfani for the cities of Piedmont in north-western Italy.¹²² Had England followed the ‘Piedmontese path’, its wealth inequality would have continued to decline until ca. 1440, reaching a bottom level of about 0.62; then it would have resumed growing quickly, necessarily departing from the tendency of Piedmont where wealth inequality did not exceed the pre-Black Death high point before the mid-seventeenth century. A quicker wealth inequality growth in late-medieval England compared with Piedmont seems compatible with the findings about income inequality discussed above. It is also entirely possible that inequality reduction in England was more limited and short-lived than in Piedmont, as suggested by the currently available estimates of income inequality. Therefore, the English ‘Piedmont-like path’ presented in figure 6 is to be understood as a lower boundary for inequality in the period comprised between our two estimates. However, it should be pointed out that the estimates provided by Broadberry and colleagues for 1290 and 1381 have been produced based on highly aggregated and hypothetical social tables (especially

¹¹⁴ Scheidel, *Great leveler*; Milanovic, *Global inequality*.

¹¹⁵ Pamuk, ‘Black death’.

¹¹⁶ Clark, ‘Condition’; idem, ‘Long march’.

¹¹⁷ Humphreys and Weisdorf, ‘Wages of women’.

¹¹⁸ Dyer, ‘Golden age rediscovered’, p. 195.

¹¹⁹ Federico, Nuvolari and Vasta, ‘Inequality’.

¹²⁰ See for example the case of Tuscany: Alfani and Ammannati, ‘Long-term trends’, pp. 1088–92. For a general discussion, see Alfani, ‘Epidemics, inequality and poverty’.

¹²¹ Alfani, ‘Effects of plague’; Alfani and Murphy, ‘Plague’, pp. 333–4; Alfani, ‘Economic inequality in preindustrial times’, pp. 24–5.

¹²² Alfani, ‘Economic inequality in northwestern Italy’, p. 1084.

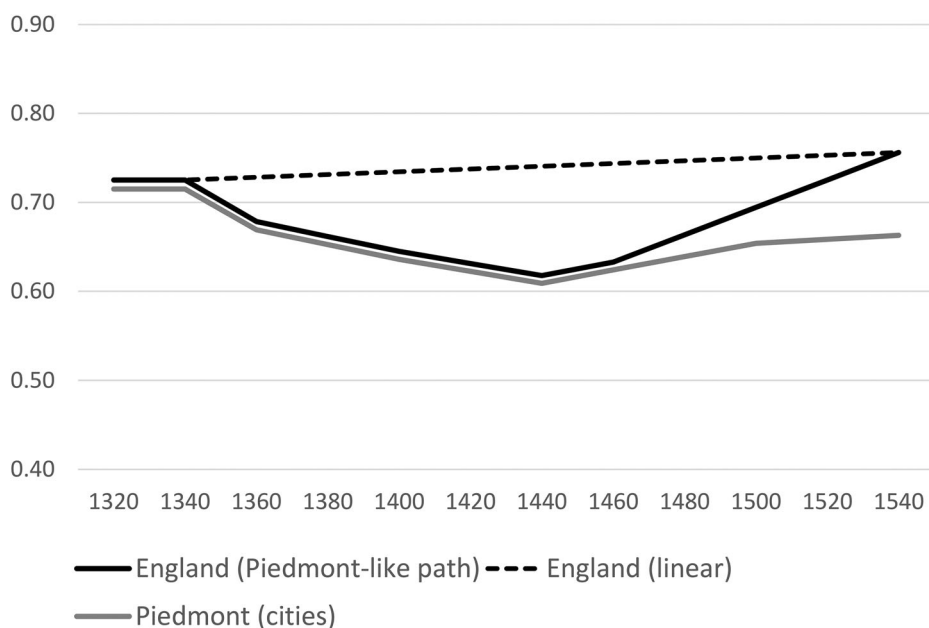


FIGURE 6 Wealth inequality trends in late-medieval England and Piedmont (north-western Italy). Gini indexes. *Sources:* Elaboration made on data from Alfani, ‘Economic inequality in northwestern Italy’, for Piedmont; see main text for England

that for 1381, which is explicitly described as ‘provisional’),¹²³ so they should be interpreted conservatively. Additionally, this might be one of those cases when the Gini index hides important changes in distribution. For example, Campbell has observed that ‘In England [after the Black Death] households living below the poverty line and unable to afford a respectability basket of consumption goods shrank from over 40 per cent of the total in 1290 to fewer than 20 per cent by 1381 ... Poverty became more manageable as a problem as its scale diminished ...’¹²⁴

A final point of interest is that the increase in wealth inequality that occurred between 1327–32 and 1524–5 across England is much more clear cut than that observed at the regional level in table 5 (and also at the county level in table 3), as in some regions the reconstructed inequality is found to be declining, not growing (in the north, this is also the case for inequality measured only on the observed part of the distribution). This could be the outcome of diverging tendencies between regions in terms of average wealth. Technically, these tendencies could lead to inequality growth at the national level, even in the presence of inequality decline at the level of each and every region. To shed some light on these dynamics, a Theil index can be used to decompose the overall inequality in two components: ‘between regions’ (BGI, between-group inequality) and ‘within regions’ (WGI, within-group inequality).¹²⁵ The decomposition has been conducted on the observed distributions (in their aggregated, weighted version) because the giniinc package does not allow us to extract discrete distributions from the reconstructed log-normal distributions.

¹²³ Broadberry et al., *British economic growth*, p. 321.

¹²⁴ Campbell, *Great transition*, p. 373.

¹²⁵ See Shorrocks, ‘Inequality decomposition’, for further discussion.

**TABLE 7** Wealth inequality in England, 1327–32 and 1524–5: Theil decomposition

	1327–32		1524–5	
Within-group inequality (WGI)	0.333	95.5%	0.821	62.3%
Between-group inequality (BGI)	0.016	4.5%	0.497	37.7%
Theil (England)	0.349	100%	1.317	100%

As seen in table 7, measured with the Theil index, inequality in England was 0.349 in 1327–32 and 1.317 in 1524–5. The fact that inequality grows between the two dates is reassuring as it confirms our findings using a more traditional measure like the Gini index; however, the size of the growth is not informative, as Theil is not a standardised index (meaning that it does not vary within specific boundaries, like 0 and 1 in the case of Gini). What is informative is the change in time of the relative importance of BGI and WGI. In 1327–32, regional differences were relatively small and between-region inequality (BGI) accounted for just 4.5 per cent of the total. This situation, however, had changed entirely by 1524–5, as by then BGI was found to account for almost two-fifths of the overall inequality. Such a finding is very relevant as it allows us to connect directly our work to earlier research on the regional distribution of wealth in England. In Section III we mentioned how, according to the literature, from the end of the middle ages and throughout the early modern period certain parts of England tended to become much wealthier than others. According to Schofield:

There were ... marked differences in the rate of increase of lay wealth between different counties over the period 1334 to 1515, and equally marked differences between the rate of increase of wealth between different regions. In general, the south was pulling further ahead of the north, while of the southern counties those in the south-west and the south-east were increasing much more rapidly in wealth than the Midlands and the more northerly East Anglian counties.¹²⁶

A very uneven regional rate of growth in average household wealth is bound to have an impact on inequality at the national level, explaining why inequality was found to be more clearly on the rise in England as a whole than in its single regions. This finding leads to two further considerations. First, it reminds us that, when considering very broad territories over long periods of time, it is not sufficient to think about individual-level mechanisms to explain inequality trends (e.g. mechanisms of the kind discussed to explain the probable inequality-reducing consequences of the Black Death), but we have to factor in regional dynamics as well. Secondly, it suggests that the very high regional inequality which is a scourge of England today has strong and ancient roots – hence it will not be easily reduced.

V

This article has provided an overview of wealth inequality in England from the late thirteenth to the sixteenth century. To do this, we compiled a database of distributions of taxable household wealth across 19 counties, plus the city of London. To account for the high thresholds for fiscal exemption applied in pre-industrial England, leading to the omission from the records of a large part of the poorest population, we introduced a new method for reconstructing complete distributions from left-censored observations. This method, which could be fruitfully applied to

¹²⁶ Schofield, 'Geographical distribution' (1965), p. 509.



other historical cases when a large part of the wealth or income distribution could not be observed directly, allowed us to produce estimates of wealth inequality that are both more reliable and more comparable across time.

Our sources and methods allowed us to reach a number of relevant conclusions about long-term distributive dynamics in England. First, looking at county-level inequality, we detected an impressive stability across time in the relative position of the English counties: those that were the most unequal in the middle ages tended to be characterised by high inequality in early modern times as well. However, some changes occurred, with south and south-east England being found to become more inegalitarian over time than the rest of the country. This seems to fit the earlier literature on the regional distribution of wealth in England, which reported a tendency for the southern counties to become relatively richer from the late middle ages to the eve of the industrial revolution,¹²⁷ as across our database, we found a high positive correlation between inequality and average household wealth. This connection between our findings and the literature on regional inequality is further confirmed by the analysis of an aggregate distribution representative of the whole of the country. By means of a Theil decomposition, we found that inequality between English regions accounted for 4.5 per cent of the overall inequality in 1327–32, but for almost 38 per cent in 1524–5: a stark reminder that the current imbalances in average wealth (and income) affecting England and increasingly impactful upon its society and politics have very ancient origins.

Overall, our analyses confirm the view that in late medieval and early modern England the baseline trend for inequality was orientated towards growth, as documented by a series of important works that tried to estimate income inequality from social tables.¹²⁸ Our aggregate reconstructions extend this result to wealth inequality until the sixteenth century. Additionally, as we worked on overall (reconstructed) distributions and not on social tables, we provide stronger support for this picture of inequality growth in the long run compared with what could be achieved from highly aggregated and sometimes quite hypothetical social tables. This being said, estimating a wealth Gini index of 0.725 in 1327–32 and of 0.756 in 1524–5 does not rule out a sharp decline in wealth inequality caused by the Black Death epidemic affecting England in 1348–9. Indeed, based on similarities in the historical trends followed by some key variables like real wages,¹²⁹ we make use of the historical experience of other European countries to provide a discussion (and lower boundaries) of the trend that wealth inequality might have followed between our benchmark years. However, further research on the distributive consequences of the Black Death in England would surely be needed to confirm locally the general assumptions made by recent literature.¹³⁰

Overall, our work on England sheds further light on the general tendencies of economic inequality across European history, helping to both expand and usefully nuance the picture. It provides support for the view that high inequality is not a characterising feature of industrial (and post-industrial) societies, but could emerge also in mostly agrarian contexts. It lends further credit to recent criticism of Kuznets' hypothesis that the tendency for inequality growth was triggered by the Industrial Revolution.¹³¹ Finally, it provides an exemplary case of the interrelation

¹²⁷ Schofield, 'Geographical distribution' (1965); idem, 'Geographical distribution' (2008); Darby et al., 'Changing geographical'.

¹²⁸ Lindert, 'When did inequality rise'; Broadberry et al., *British economic growth*; Allen, 'Class structure'.

¹²⁹ Clark, 'Condition'; idem, 'Long march'; Pamuk, 'Black death'.

¹³⁰ Alfani and Murphy, 'Plague'; Scheidel, *Great leveler*; Alfani, 'Economic inequality in preindustrial times'.

¹³¹ Lindert, 'Three Centuries'; Alfani, 'Economic inequality in preindustrial times', pp. 5, 36–7.



between regional and national inequality, showing how some regional divides which create the most unease in today societies, and from which originates much of their overall inequality, can be traced back to remote times. As a consequence of this, such divides should be expected to be extremely difficult to erase – a problem with which not only England but much of the West will surely struggle in the upcoming years.

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