



# How rich were the rich? An empirically-based taxonomy of pre-industrial bases of wealth

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## ABSTRACT

The paper uses fifty-three social tables, ranging from Greece in 330 BCE to Mexico in 1940 to estimate the share and level of income of the top 1 % in pre-industrial societies. The share of the top 1 % covers a vast range from around 10 % to more than 40 % of society's income and does not always move together with the estimated Gini coefficient and the Inequality Extraction Ratio. I provide a taxonomy of pre-industrial societies based on the social class and type of assets (land, control of government, merchant capital, citizenship) that are associated with the top classes as well as lack of assets associated with poverty.

## 1. Introduction

In the recent years, the tops of national income distributions, and especially the top 1 %, have been studied extensively. The reasons for the increased interest lie in the rising economic and political influence and visibility of the very rich, and researchers' ability to access fiscal data that cover the very top of income distribution better than the more conventional surveys of income or consumption. The interest has carried over onto historical studies of the top 1 % that are no longer limited to the advanced countries (e.g., [Alvaredo et al., 2013](#); [Piketty and Saez, 2003](#)) but have included a number of developing countries in Latin America ([De Rosa et al., 2022](#)), China ([Piketty et al., 2019](#)), the Middle East ([Alvaredo et al., 2017](#)) etc. The historical spread of such studies however is limited by the existence of tax data, which in turn means by the existence of regular systems of annual taxation of personal revenues. For many currently rich countries such systems have become fully routinized since the first or second decade of the twentieth century. In other cases, the systems are more recent: in India, since 1962, in China since 1980 (but implemented only from 1993). In many countries they do not exist at all.

Therefore, the tops of income distributions have not been studied in a systematic fashion for the period predating the introduction of the modern systems of taxation. The data for such studies cannot obviously come from the fiscal sources which did not exist, but have to rely on social tables which are the only source of empirical, and relatively consistent, information on incomes for the pre-modern times. Social tables have been used only in limited number of cases for the study of inequality over time: examples include [Allen \(2019\)](#) for England/UK 1688–1867, [Lindert and Williamson \(1982 and 1983\)](#) for England and the United Kingdom 1688–1911, [Lindert and Williamson \(2016\)](#) for the United States 1774–1870, [Castañeda and Bengtsson \(2020\)](#) for Mexico 1895–1940, [Rodríguez Weber \(2017\)](#) for Chile 1860–1971, [Leon and de Jong \(2019\)](#) for Germany and the UK, 1900–1950. They have not been used for the study of the rich in history though.<sup>1</sup>

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<sup>1</sup> For an excellent survey of inequality studies in pre-modern societies, see [Alfani \(2021\)](#).

Social tables have well-known limitations discussed by Milanovic et al. (2011), Modalsli (2015), Milanovic (2018) and more recently by Fintel et al. (2023). However, for the purpose of the study of the rich in history their advantage is that the richest social groups are always included. They are simply too conspicuous to be overlooked. Furthermore, a number of recently created social tables (e.g. for Sweden 1613 by Anderson and Molinder, 2022; Moscow province for 1811 by Korchmina and Malinowski, 2022) combine the data from non-regular (ad hoc) personal income or wealth taxes with the data from the occupational surveys or censuses to create social tables that more explicitly than before include the top of income distribution.

There is one advantage of social tables even compared to the modern fiscal data. The social tables provide not only information about the estimated incomes of top groups, but provide information about the type of social classes that are at the top, namely, whether they are landlords, aristocrats, capitalists, or as is often the case in colonial settings, foreigners who reside in the country. The same holds for social classes along the entire income distribution. The social tables thus introduce a richer, sociological dimension that is absent in modern fiscal data.<sup>2</sup>

The main disadvantage of social tables is forced homogenization of the population into a relatively small number of social classes (sometimes fewer than ten). Even if we assume that the selection of social classes is well done, in the sense that the author of the social table has focused on the economically salient social groups, there is the problem of within-class inequality which is ignored by the very design of the social tables since they provide only mean class incomes. There is also the problem of overlapping incomes: some people from a mean-poorer social class may have higher incomes than some people from a mean-richer social class. This biases the estimated inequality measures downward.<sup>3</sup> There were several attempts to account for it (e.g. Modalsli, 2015; Milanovic et al. 2011) but the problem is, simply because of lack of information, not easily solvable, if at all. The bias though is less the greater the number of groups, the greater the income homogeneity within classes, and the less the overlap between the group incomes. The overlap can be expected to be small in societies where classes are legally defined, and such legal status implied a certain economic status as well. For example, for Roman senators there was a wealth census of 1 million sesterces (HS), and for the equestrian order 250,000 sesterces which consequently means that their annual income (assuming a standard rate of interest in the first century AD of 5 % to 6 %) could not have been less than 50–60,000 HS (for senators) or 12–15,000 HS (for knights). Despite that, our estimates must be regarded as the lower bounds of the top 1 % shares.

The objective of this paper is to provide the first across-country and across-time estimation of the historical income share of the top 1 %. For this purpose, I use the data from 53 social tables that range from the classical Athens (year 330 BCE) to 1940 Mexico. Since the focus is on the period before the introduction of modern taxation and modern household surveys, the end-dates that are applied are the beginning of the First World War (1914) for the advanced countries, and approximately the beginning of the Second World War (1939) for all other countries. Section 1 and Annex 2 discuss the data and the method used to estimate the top 1 % share. The method is based on the Pareto extrapolation applied across several top social classes, formally in the same way as it is applied across the top income groups in the standard studies of income inequality.

Section 2 provides calculations of the top 1 % share. The fact that for most countries/regions included in the study, we also have estimates of GDP per capita from the Maddison Project means that, once the top 1 % share is calculated, we can derive incomes of the top 1 % expressed in real international dollars. This is shown in Section 2, with the obvious caveat that given huge distances in time, differences in the availability of goods and services, and in relative prices such comparison, in both of their components: income shares and GDP per capita, should be regarded as best as indicative of rich groups' incomes.

Social tables show the classes spanning the entire income distribution. We use them to highlight the social bases of the richest and poorest classes in Section 3. Section 3 looks at the sociological characteristics of the top classes (are they landlords, aristocracy, colonial elite etc.?), and bottom classes (are they landless peasants, industrial proletariat, slaves, foreigners, beggars etc.?). It provides a taxonomy that can be usefully applied in further, more detailed, studies. The purely quantitative analysis conducted before thus becomes enriched by a more sociological or class-structured view of pre-industrial societies. Section 4 presents the conclusions and lays out some ideas for further research.

The contributions of the paper are the first ever estimation of income concentration (top 1 % share) for a number of pre-industrial societies, comparison of income levels of the historically rich, and an introduction to the class analysis of pre-industrial societies that goes beyond ethnographic and uses empirical data on incomes.

## 2. The data and methodology

The paper uses the data from 53 social tables that range, as mentioned, from the fourth century BC Athens to 1940 Mexico. A more detailed information about individual social tables and their sources is given in Annex 1. Table 1 shows various inequality and concentration measures. It is worth noting that the number of social groups included in tables varies widely. At one extreme, there are Florentine/Tuscan data of 1427 with almost 10,000 observations. This is not a social table, not even a household survey, nor a fiscal database but a detailed source whose objective was to record taxable wealth (or more exactly, estimated income from such wealth) of

<sup>2</sup> There is also an element of subjectivity in the creation of social tables, in the sense that the author not only passively interacts with the data, but imposes a certain reality (by “choosing” the salient social classes) which in turn is based on the prior historical knowledge of the society for which she creates a social table. The point is made by Jackson (2023, p. 284).

<sup>3</sup> When Gini coefficient is decomposed into its three parts: between-class inequality, within-class inequality and the overlap component, social tables provide only the information for the first component. If classes are relatively homogeneous and different from each other, the bias may not be strong since then both the within-class inequality and income overlap are small.

**Table 1**  
Income inequality and income concentration measures for pre-industrial economies.

|   | Year | Gini (in %) | Extraction Ratio (in%) | Top 1 % Share (in%) | Top 1 % cut-off point (in terms of mean income) | Colony (Yes = 1) | Number of Groups included |
|---|------|-------------|------------------------|---------------------|---|------------------|---------------------------|
| <b>Low income concentration (top share &lt;10 %)</b>      |      |             |                        |                     |   |                  |                           |
| England   | 1381 | 42.2        | 52.8                   | 6.1                 | 4.4   | 0                | 4                         |
| England   | 1290 | 26.8        | 38.3                   | 6.4                 | 3.7   | 0                | 7                         |
| Tonkin  | 1929 | 25.6        | 33.4                   | 6.7                 | 2.8   | 1                | 9                         |
| Siam  | 1929 | 48.5        | 63.7                   | 6.7                 | 5.1   | 0                | 21                        |
| Maghreb   | 1880 | 48.5        | 65.9                   | 8.6                 | 5.8   | 1                | 12                        |
| Cochinchina   | 1929 | 36.8        | 49.0                   | 8.7                 | 2.5   | 1                | 8                         |
| England   | 1688 | 45.0        | 51.7                   | 8.7                 | 8.1   | 0                | 31                        |
| Prussia   | 1863 | 34.1        | 38.2                   | 8.7                 | 7.9   | 0                | 66                        |
| England   | 1801 | 51.5        | 56.6                   | 8.9                 | 6.2   | 0                | 44                        |
| USA   | 1774 | 45.7        | 52.2                   | 9.2                 | 6.8   | 0                | 74                        |
| USA   | 1870 | 51.4        | 59.2                   | 9.9                 | 6.3   | 0                | 6                         |
| <b>Moderate income concentration (10 %–15 %)</b>          |      |             |                        |                     |   |                  |                           |
| USA   | 1860 | 51.1        | 54.9                   | 10.0                | 5.8   | 0                | 6                         |
| Cape Colony   | 1757 | 33.3        | 38.7                   | 10.3                | 4.8   | 1                | 10                        |
| Bavaria   | 1847 | 32.0        | 36.9                   | 10.3                | 5.5   | 0                | 18                        |
| USA   | 1850 | 48.7        | 53.1                   | 10.4                | 5.6   | 0                | 6                         |
| England   | 1759 | 45.9        | 51.4                   | 10.9                | 4.2   | 0                | 56                        |
| Brazil  | 1872 | 43.3        | 59.2                   | 11.2                | 5.7   | 0                | 813                       |
| Java  | 1924 | 32.1        | 40.2                   | 11.4                | 4.1   | 1                | 14                        |
| Java  | 1880 | 39.7        | 55.8                   | 11.4                | 3.9   | 1                | 32                        |
| Bihar   | 1807 | 33.5        | 49.3                   | 11.5                | 3.8   | 1                | 10                        |
| Uganda  | 1925 | 37.3        | 50.8                   | 11.8                | 4.2   | 1                | 11                        |
| K. of Naples  | 1811 | 28.4        | 44.0                   | 12.1                | 6.1   | 0                | 12                        |
| Warsaw  | 1810 | 34.6        | 61.3                   | 12.4                | 6.6   | 0                | 10                        |
| Sweden  | 1613 | 33.3        | 41.2                   | 12.7                | 4.5   | 0                | 36                        |
| Chile   | 1900 | 45.0        | 49.4                   | 12.8                | 6.3   | 0                | 49                        |
| Tuscany   | 1427 | 46.1        | 50.8                   | 13.0                | 7.2   | 0                | 9780                      |
| Holland   | 1732 | 61.1        | 66.8                   | 13.7                | 9.1   | 0                | 10                        |
| Mexico  | 1895 | 47.4        | 57.2                   | 13.8                | 4.1   | 0                | 19                        |
| India   | 1938 | 49.7        | 69.3                   | 14.0                | –   | 1                | 8                         |
| <b>High income concentration (15 %–20 %)</b>              |      |             |                        |                     |   |                  |                           |
| Mexico  | 1910 | 45.9        | 53.1                   | 15.0                | 6.1   | 0                | 19                        |
| India-Moghul  | 1750 | 38.5        | 53.6                   | 15.0                | –   | 1                | 4                         |
| Cracow  | 1578 | 53.0        | 69.1                   | 15.8                | 7.1   | 0                | 13                        |
| Roman Empire  | 14   | 39.4        | 50.1                   | 16.1                | 12.4  | 0                | 11                        |
| France  | 1831 | 47.2        | 56.0                   | 16.7                | 7.7   | 0                | 9                         |
| Athens  | –330 | 37.4        | 45.0                   | 16.7                | 7.5   | 0                | 34                        |
| France  | 1788 | 55.9        | 67.1                   | 16.8                | 3.9   | 0                | 8                         |
| Netherlands   | 1808 | 57.0        | 64.4                   | 17.1                | 9.8   | 0                | 20                        |
| France  | 1866 | 49.2        | 54.6                   | 18.9                | 8.4   | 0                | 9                         |
| <b>Excessive income concentration (20 %–25 %)</b>         |      |             |                        |                     |   |                  |                           |
| Mexico  | 1940 | 51.5        | 58.4                   | 20.4                | 8.0   | 0                | 100                       |
| European Russia   | 1904 | 37.5        | 43.5                   | 20.4                | 3.5   | 0                | 19                        |
| Peru  | 1876 | 42.2        | 50.7                   | 20.8                | 9.6   | 0                | 9                         |
| Nueva España  | 1790 | 63.5        | 82.7                   | 21.1                | 9.8   | 1                | 3                         |
| China   | 1880 | 24.5        | 35.9                   | 21.3                | 5.6   | 0                | 3                         |
| Mexico  | 1930 | 41.4        | 47.8                   | 21.4                | 5.4   | 0                | 101                       |
| Chile   | 1860 | 46.6        | 56.9                   | 21.9                | 7.2   | 0                | 49                        |
| Uganda  | 1935 | 45.6        | 62.8                   | 23.1                | 3.2   | 1                | 11                        |
| Kenya   | 1914 | 33.1        | 65.4                   | 23.2                | 20.5  | 1                | 13                        |
| <b>Extraordinary high income concentration (&gt;25 %)</b> |      |             |                        |                     |   |                  |                           |
| Byzantium   | 1000 | 41.1        | 67.5                   | 30.6                | 3.7   | 0                | 8                         |
| Kenya   | 1927 | 46.2        | 80.4                   | 31.7                | 20.9  | 1                | 13                        |
| England   | 1867 | 56.9        | 60.3                   | 32.0                | 8.9   | 0                | 14                        |
| Iraq  | 900  | 58.6        | 76.1                   | 41.1                | 2.9   | 0                | 17                        |
| Aztec Empire  | 1500 | 51.1        | 89.0                   | 41.5                | 7.1   | 0                | 10                        |
| Moscow region   | 1811 | 60.2        | 78.4                   | 45.5                | 11.3  | 0                | 10                        |

Note: Observations are ranked by the top 1 % share. Top 1 % cut-off point shows at what income level (expressed in terms of national mean income) the top 1 % begins. Value of (say) 5 implies that to be part of the top 1 %, one's income must be 5 times greater than the mean. Data for India 1750 and 1938 are too fragmentary to allow for the calculation of the cut-off point.

the population. There is no other source included here that is nearly as detailed. Next in the number of groups included come occupational surveys (created however only recently) from the late nineteenth century Brazil, or the late nineteenth century and the first half of the twentieth century Mexico. They contain 100 or more categories. Prototypical social tables are those created by the contemporary authors (the famous Gregory King's social table, followed by Joseph Massie's etc.) in the eighteenth and nineteenth century England and Wales, all used here in a somewhat revised forms: they contain between 14 and 56 social classes. More recently, social tables for thirteenth and fourteenth century England and Wales have been created with fewer than ten social classes. The three social tables used for France have 8 to 9 social classes. The median number of social classes for all tables is 13. Finally, at the other extreme, with the fewest number of classes, are the tables for India 1759 and England 1381 with four groups each, and China 1880 and Mexico (Nueva España) 1790, with three..

There are fourteen colonies in the sample. They are interesting for research because the class composition in colonies is quite different from what we ordinarily find in independent countries. In colonies, the top (richest) social group is invariably composed of foreigners, i.e. of colonizers. Such colonizers can, by their position and type of assets they have, be fairly different from one colony to another. They can be rich farmers, or officials of the colonizing power, or foreign merchants. The number of social groups available for colonies is, fortunately, satisfactory: the median number is 11 groups, so that both domestic populations and foreigners are relatively well included.

This wide heterogeneity of detail poses specific requirement in the way that the data from the tables are processed. There are two important issues. Generally, the tables with fewer classes would generate less precise estimates for the income share of the top group or inequality statistics. However, this is not always the case because the data could be very detailed at the top, while the rest of the population is treated as homogeneous, that is as having the same (low) income. The Chinese 1880 social table is such an example: it is derived from an entire book that was concerned with incomes of the Chinese gentry only, so the information for the top is very precise while more than 90 % of the population is presented as an undistinguishable mass.

The second problem is more serious. If we have too many social classes, the top class may consist of very few people (for example, the top group could be just one individual, the King) which is not satisfactory if we want to capture more broadly the most affluent classes not just individual persons. On the other hand, if there are few social classes (say, under 7 or 8), the grouping can be too broad. The classes are not sufficiently distinguished. I have tried to find a median ground between the two problems by, if the table is too detailed at the top, combining the top two groups into one (in some cases it meant simply adding the ruler to the top group); if the table is too coarse, it is desirable that the poorest class not be a group that is too large, say, in excess of 80 % of the population because we then lose the specificity of what makes for poverty in a given society. I was not able to avoid this problem in all cases. The average population share of the poorest class is 22 %, but in Kenya 1914 and 1927, it is more than 80 %, in Roman Empire, 85 %, and in China 1880, even 98 %. It is however not unreasonable to think that in poor societies, such as we deal with here, the bottom classes' incomes must be similar since in principle they cannot fall below subsistence, nor be much higher than it. Homogeneity at the bottom (i.e., many poor people belonging to the same social class) may not be an artifact of the data, but reflect reality.

The average population share of the top group is 1.3 %. This implies that the creators of social tables tend to present rich groups in greater detail (more finely grained) than the poor groups. This also means that we may be more confident that the key characteristics of the top groups are well captured.

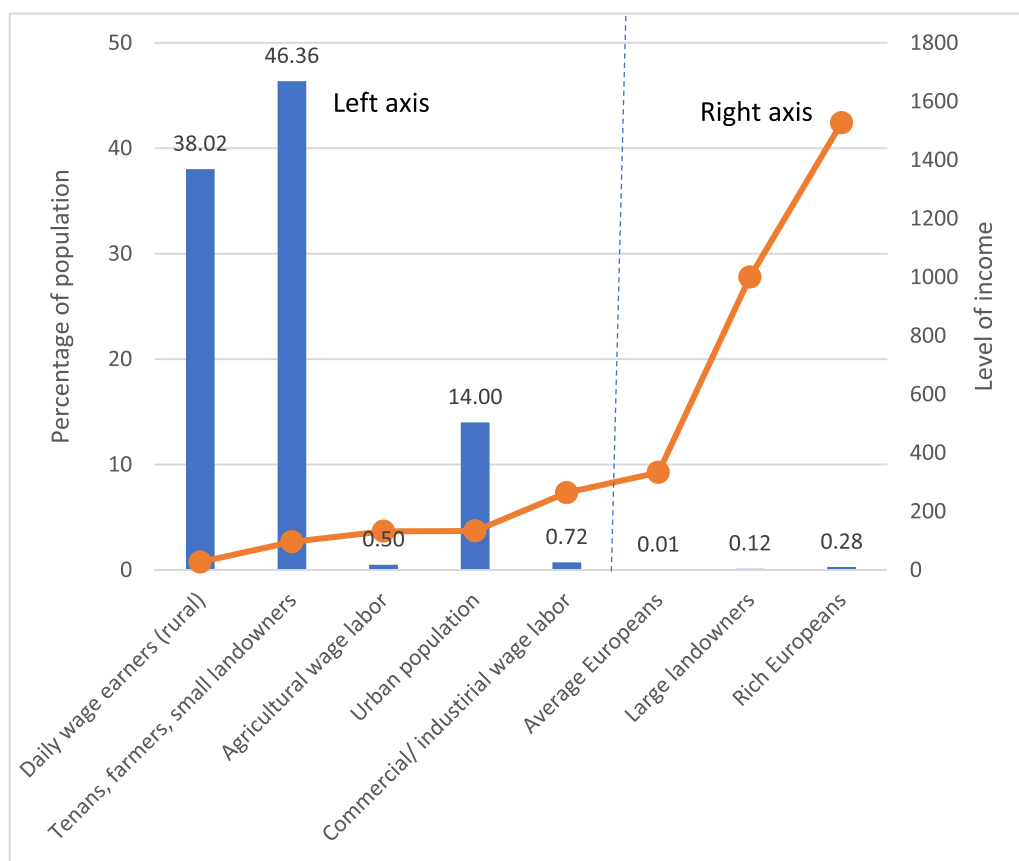
Typical data from a social table are shown in Fig. 1. The social groups (in percentage of total population) are given by the bars and read off the left vertical axis as well as from the top of the bars. The levels of income are shown by the line and read off the right vertical axis. The names of social classes are shown on the horizontal axis. Social classes are ranked by their income level, from the left to the right. The largest social class in this case (Cochinchina 1929) are tenants, farmers and small landowners (more than 46 % of the population). The richest class are the rich Europeans who account for 0.28 % of the population. As the graph shows, the top 1 % cut-off point will be located somewhere between commercial/industrial wage laborers and average-income Europeans (note the vertical dashed line at that approximate point). It would technically include the three richest classes plus some commercial/industrial wage laborers. Note that in this case, as well as in most colonies, the rich foreigners at the top of the social table represent less than 1 % of the population (see Annex 4), and thus the real income of the top 1 % is less than the average income of the foreigners.

To find where exactly the top 1 % cut-off point is, and thus to calculate the top 1 % share, I use the approximation suggested by Tony Atkinson in *Top incomes in the United Kingdom over the Twentieth Century* (December 2003 version). It is based on the idea that the top of income distribution follows Pareto distribution with the power coefficient that is estimated from the available data on cumulative distributions of people and cumulative distribution of income presented in a tabulated form. The estimated Pareto coefficient uniquely determines the income share of the top 1 %, and the cut-off point. The calculation, which needs to be explained in some detail because it is often subject to confusion, is given in Annex 2.

### 3. Incomes of the top 1 %

#### 3.1. Income share of the top 1 %

Table 1 compares the top 1 % share with key measures of inequality for fifty-three pre-industrial societies. The measures of inequality are Gini coefficient and the Inequality Extraction Ratio (IER). The latter is the ratio between the actual inequality and the maximum feasible inequality that could exist if everybody but an elite lived at the subsistence with the elite taking all income above subsistence (see Milanovic et al., 2011). The formula for the maximum Gini is  $G_{max} = \frac{\alpha-1}{\alpha}$  where  $\alpha$ =the ratio of mean income as calculated from social tables to the subsistence. For example, if a country's mean income is twice the subsistence, the maximum



**Fig. 1.** Cochinchina 1929: Size of social groups and their average income.

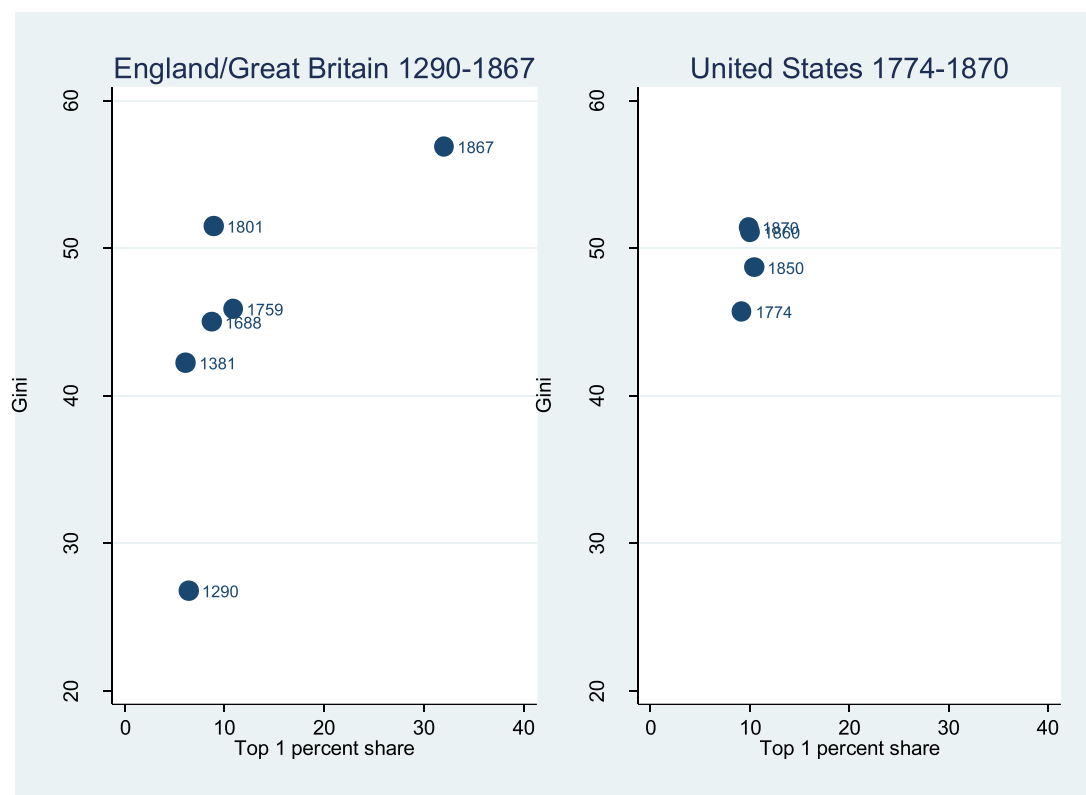
Source: Calculated from [Merette \(2013\)](#). Income is in piastres per capita per year. The figure ranks social classes by their per capita income (from left to right). The left vertical axis shows the share of each class in total population; the right vertical axis shows their mean income.

feasible Gini is 0.5. The ratio between the actual Gini and the maximum feasible Gini yields the Inequality Extraction Ratio that can be seen as an estimate of how far the powerful classes have pushed inequality. Loosely speaking, it is an index of “exploitation”. In the extreme case, the IER could be close to 1, meaning that the actual Gini is pushed to its highest value consistent with the maintenance of a society. For subsistence I use 300 international dollars at 1990 prices, thus making the currency units consistent with GDPs per capita, also expressed in 1990 international dollars in the latest (2020) version of the Maddison Project.

The measures of concentration are the top 1 % share, and the cut-off point at which the top 1 % begins (expressed in terms of mean income). I divide the observations into six groups using the share of the top 1 % as a criterion, from low to extraordinary high income concentration. 20 % income share of the top 1 % was considered by [Piketty \(2014\)](#) as the indicative of countries with excessively high concentrations of income. Here, however, there are six cases with the top 1 % share in excess of 25 % of total income.

Among the countries with an excessively high income concentration (above 20 % but less than 25 % of total income) are Latin American countries (Mexico, Chile, Peru) in the second half of the 19th century, China (1880), European Russia (1904) and colonial Kenya (1927). But, as [Table 1](#) shows, there are in our sample countries with a top 1 % share that is exceeding 30 %, and even 40 %. Among the countries with an extraordinarily high income concentration are medieval societies of Iraq-Mesopotamia (year 900), Byzantium (year 1000), and the Aztec Empire (year 1500), and more recently the Moscow principality just before the Napoleonic invasion (year 1811), colonial Kenya (year 1938), and the United Kingdom (year 1867), probably then at the peak of its historical inequality.<sup>4</sup> The latter case is interesting because the data regarding England/UK, for which we have more observations than for any other country, show much lower levels of income concentration for the earlier periods ([Fig. 2](#), left panel), and moreover the data from the 13th and 14th century show England to have had the lowest income concentration among all the countries included here (see [Table 1](#)). The top 1 % share was around 10 % (which is low or moderate income concentration according to the definitions used here)

<sup>4</sup> According to [Allen \(2016; Tables 11 and 12\)](#), the peak of English income inequality was in 1846 (Gini of 61); according to [Milanovic, Lindert and Williamson \(2011\)](#), the peak was in 1867 (Gini of 57). Both sources are working with the same underlying social tables but are organizing them differently. According to [Alvaredo et al \(2016\)](#), British wealth inequality kept on increasing throughout the nineteenth century and peaked on the eve of World War I.



**Fig. 2.** Top 1 % share and Gini in the pre-industrial England/Great Britain (1290–1867) and the United States (1774–1870).

Note: The graph displays the top 1 % share estimated from social tables (see Annex 1) and the Gini calculated from the same sources. It shows that Gini can increase substantially while the top 1 % remains relatively stable.

in all observations for England/UK except the last one for 1867. This fairly stable top 1 % share coincided with the steadily rising Gini from under 30 in 1290 to over 50 in 1801 (Fig. 2, left panel). The social tables thus imply the rising gaps in incomes among the 99 % of the population as England grew richer but not the rising concentration of income in the hands of the top 1 %. This changed in the second half of the 19th century as the share of the top 1 % drastically increased to more than 30 % of total income and drove overall income inequality up. (A part of the increase may be due to the coverage of the 1867 data that include all of the United Kingdom, whereas other social tables were done for England and Wales only.)<sup>5</sup>

A similar but less pronounced increase in inequality coinciding with the broadly constant share of the top 1 % is shown by the US data for a century after its independence (Fig. 2, right panel). Here too, the share of the top 1 % is consistently low (around 10 %) while inequality measured by the Gini is quite high (between 45 and more than 50 points). The data for the United States come from the same authors (Lindert and Williamson, 2016), are methodologically similar, and cover a shorter time period.<sup>6</sup> They are thus more reliable too. An obvious implication of the finding is that synthetic measures of inequality (like Gini) need not always move together with the measures of concentration (like the share of the top 1 %).<sup>7</sup>

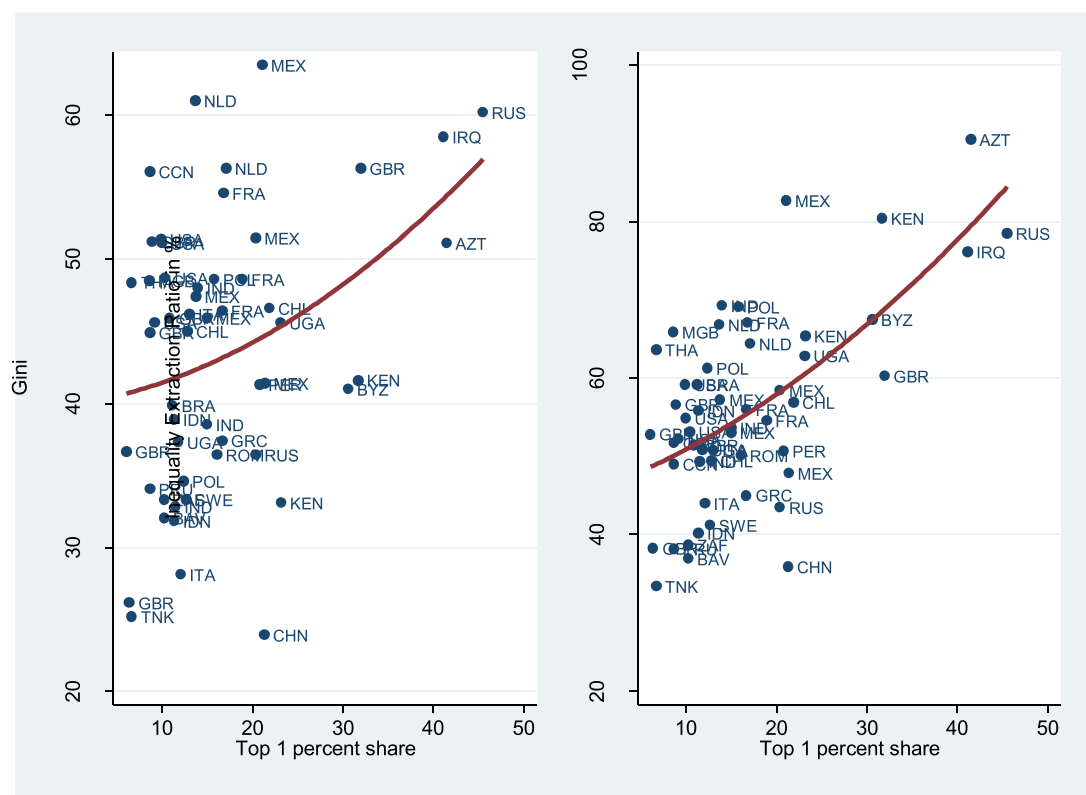
Fig. 3 illustrates the relationship between the top 1 % share and respectively Gini (left panel) and the Inequality Extraction Ratio (right panel) for all social tables included here. In both cases, the correlation is positive but not very strong: 0.40 between the top 1 % share and Gini, and 0.62 between the top 1 % share and the Inequality Extraction Ratio.<sup>8</sup> It is noticeable that if income concentration is less than 25 (i.e., the share of the top 1 % is less than 25 %), inequality, measured by Gini or the IER, can vary quite widely. Inequality in those cases seems to be determined largely by income gaps within the “bottom” 99 % of the population. However, at some point, the

<sup>5</sup> For the historical background to the social tables studied here see (among others since the literature on the British Industrial Revolution is immense) Broadberry, Campbell, Klein, Overton and van Leeuwen (2015), Soltow (1988) and Allen (2009).

<sup>6</sup> The 1774 data include only 13 colonies, prior to their declaration of independence; the 1850, 1860 and 1870 data include the United States as geographically defined at the time. For the latter two dates, Lindert and Williamson provide also regional income distribution estimates.

<sup>7</sup> This can be seen from the Gini formula as derived by Alvaredo (2011)  $G \approx G_{99}(1-s) + s$  where  $G_{99}$  is the Gini among the bottom 99 percent of the population and  $s$ =top 1 percent income share. If  $s$  is broadly constant, movements in the overall Gini will be determined by what happens to the inequality among the bottom 99 percent. Similarly, with a very high  $s$ , what happens to inequality within the bottom 99 percent becomes less important in influencing the overall Gini (because it is weighted by a decreasing  $(1-s)$ ).

<sup>8</sup> Gini and the IER are more strongly correlated: 0.76.



**Fig. 3.** The relationship between the top 1 % share and Gini (left panel) and the top 1 % share and Inequality Extraction Ratio (right panel). Source: Social tables cited in Annex 1. Gini and the Inequality Extraction Ratio (IER) are shown in percent. IER is calculated on the assumption that the subsistence minimum is \$PPP 300.

top 1 % share becomes so overwhelming, essentially squeezing out whatever remains for the 99 %, that it tends to dominate measures of inequality too, both Gini and the IER. This is why we observe that when the top 1 % share is in excess of about 25 %, it always goes together with high values of Gini and Inequality Extraction Ratio.

I do not discuss the extraction ratios here (for more discussion, see [Milanovic, 2018](#)), but one may note that the most extractive societies seem to have been (in order) Iraq 900, Aztec Empire just before the Spanish conquest, Nueva España 1790, Moscow region 1811 and the British-ruled Kenya in 1927. All displayed extraordinary high income concentration (top 1 % share above 30 %). It is also notable that the pre-conquest Aztec Empire and Nueva España almost three centuries later (with the data independently calculated) have the two highest inequality extraction ratios in the sample.

### 3.2. Real income of the top 1 %

[Table 2](#) shows the estimated real income of the top 1 % in international 1990 dollars. As explained before, once we have estimated the top 1 % share, it is easy to calculate real income of the people in the top 1 % by applying the GDP per capita estimates from the most recent (2020) round of the Maddison Project. The size of income received by the elites covers a very broad range, and there may be a varieties of explanations why this is so. Consider first the relatively poor top 1 % (under \$PPP 10,000 per person per year). It includes the medieval England that was very poor overall, and so was its elite; but it includes also the early 20th century colonies of Siam, Tonkin and Cochinchina where the real elite (the European colonists) was smaller than 1 % and where drawing the line at 1 % brings in, as seen in [Fig. 1](#), some local industrial and commercial workers. We are dealing here with very poor agricultural societies where, in part because of their very poverty, inequality is low amongst the majority of the population, and where a very tiny rich colonial group is “tacked on” at the top. The situation appear to have been the same among the slightly richer elites (under \$PPP 20,000 per capita) in Bihar 1807, Moghul India 1750, and British-ruled India 1938 as well as in Java at the end of the 19th and early 20th century, and Kenya in 1914. For example, in Java 1880, all European colonists (including those who were not super rich) represented only 0.23 % of the population; in Kenya 1914 and Uganda 1925, they were only 0.12 % of the population, in the British-ruled India in 1938, British officials and traders were just 0.06 % of the population.

When we look at the historically highest-income top 1 % groups, we also have several varieties there. First, the rich industrial or commercial societies with a huge concentration of income. This would be the case of the richest elite in our sample, the British top 1 % in 1867 with an estimated income of \$PPP 167,000 per capita, France in 1866 with the top 1 % income of \$PPP 58,000, and of the just

**Table 2**

Top 1 % estimated real per capita income (in 1990 \$PPP dollars).

| Income range                          | Country, year          |
|---------------------------------------|------------------------|
| Under \$PPP 10,000                    | England 1290           |
|                                       | Siam 1929              |
|                                       | Duchy of Warsaw 1810   |
|                                       | Tonkin 1929            |
|                                       | England 1381           |
| Between \$PPP 10,000 and \$PPP 20,000 | Maghreb 1880           |
|                                       | K of Naples 1811       |
|                                       | Cochinchina 1929       |
|                                       | Bihar 1807             |
|                                       | Java 1880              |
|                                       | Brazil 1872            |
|                                       | Kenya 1914             |
|                                       | India 1938             |
|                                       | India-Moghul 1759      |
|                                       | Java 1924              |
| Between \$PPP 20,000 and \$PPP 30,000 | Sweden 1613            |
|                                       | China 1880             |
|                                       | England/Wales 1688     |
|                                       | Cracow 1578            |
|                                       | USA 1774               |
|                                       | Cape Colony 1757       |
|                                       | Kenya 1927             |
|                                       | Rome 14                |
|                                       | USA 1870               |
|                                       | Bavaria 1847           |
|                                       | Byzantium 1000         |
|                                       | Mexico 1895            |
|                                       | Prussia 1863           |
|                                       | Nueva España 1790      |
|                                       | Aztec Empire 1500      |
|                                       | Athens –330            |
|                                       | England/Wales 1801     |
|                                       | France 1788            |
|                                       | England/Wales 1759     |
|                                       | France 1831            |
| Between \$PPP 30,000 and \$PPP 40,000 | Mexico 1910            |
|                                       | Chile 1860             |
|                                       | Peru 1876              |
|                                       | USA 1850               |
|                                       | Florence/Tuscany 1427  |
| Between \$PPP 40,000 and \$PPP 50,000 | Chile 1900             |
|                                       | USA 1860               |
|                                       | European Russia 1904   |
|                                       | Netherlands 1808       |
|                                       | Mexico 1930            |
|                                       | Netherlands 1732       |
| Over \$PPP 50,000                     | Mexico 1940            |
|                                       | Iraq (Mesopotamia) 900 |
|                                       | France 1866            |
|                                       | Moscow region 1811     |
|                                       | United Kingdom 1867    |

slightly less well-off Netherlands in 1732 and 1808 with around \$PPP 50,000. We can add there, as an example of a very rich early commercial society, Florence where the individual data from Catastro allow us to estimate the top income share very accurately: the income of the top 1 % is calculated at \$PPP 43,000. Second, there are very unequal pre-industrial societies: Moscow in 1811 and the European Russia with top 1 % average income of respectively \$PPP 59,000 and \$PPP 45,000, and Mexico in 1930 and 1940 (both around \$PPP 50,000). Third, traditional societies with an extremely high inequality like Iraq (Mesopotamia) in 900 with the top 1 % income estimated at \$PPP 54,000. Thus, the richest elites considered here come from very different societies, and, as we shall see next, they have different social basis for their economic power.

The data allow us to compare elite incomes in the 19th century Europe, among the then top 1 % that frequently interacted and intermarried. The British top 1 % stands out with an extremely high income, followed by the Russian and French (almost equal) and the Dutch, and only at a distance by the Bavarian and Prussian top 1 %. The latter were distinctly poorer. By 1860 also, the US elite was not dissimilar, in terms of income, from the French and Russian. The same is true for the Latin American elites in Chile and Peru.



#### 4. The social bases of the rich and the poor

Table 3 shows the richest social class (according to social tables) in each of the societies studied here. (For more detail, see Annex 3.) It is important to note that the richest social class discussed here is not necessarily the same as the top 1 % whose income and income share were estimated in Section 2. This is because the top class given in the social tables is often much smaller than 1 % of the population. Accordingly, if we were to focus by design only on the social composition of the top 1 %, it would include several different social classes, not just one. The taxonomy presented here thus does not account for the complexity or heterogeneity of class composition at the top.

I divide the top classes into four different types, in function of the predominant asset that allows them to be the richest group. These assets are (1) ownership of land, (2) control of government, (3) ownership of capital (including merchant capital), and (4) belonging to the conquering nation. There are no cases where human capital or superior entrepreneurship were listed as key characteristics of the richest group.<sup>9</sup>

As the Table makes clear, the asset classes are not always exclusive. Land ownership was throughout history combined with aristocratic titles. In some cases, being a part of aristocracy led to the assignment of a land domaine; in other cases, ownership of land led to being given an aristocratic title. However, the asset was always land, and its value came from the output it produced, whether it was rented out or directly used to employ workers. It is the ownership of land that ensured wealth in England/Wales throughout the period of more than five centuries for which we have the data here (from 1290 to 1801), with the landowning class being consistently on the top (see columns 1 and 3). In Mexico, Chile and Peru, it was also large landownership that distinguished the top class, even if in Chile and Peru the top class also consisted of what may be considered a more capitalistic element implicit in mining activity (column 2).

Nobility combined with landownership was a feature of the top class in Byzantium 1000, England 1688–1801, Moghul India in 1750, Russia 1811, Russia 1904, and China 1880 (see column 3). In those cases, it could be argued that the title of nobility as such too becomes an asset.

The fusion of nobility, government power, and landholding is clear in our next grouping (column 4) that includes Roman and Aztec Empires and pre-revolutionary France. In Rome, the senatorial class and the equestrian order had privileged access to top government jobs and owned land. It was also the case in France before 1789. Thus, all three assets (land, government control, and nobility as an asset) were combined.

The following grouping (column 5), is more clearly distinguished by the importance of control of government. The control might bring various titles of nobility over one's lifespan but the key asset is power. Iraq 900, Sweden 1617, Bavaria 1847 and Prussia 1863, are the examples. A more "modern" top class structure combines government control (whether in the form of high officials as in Brazil 1872 or King and his entourage as in Poland 1578) with merchant and industrial capitalists (column 6).

Countries in column 7 are more capitalistic: post-Revolutionary France and 20th century Mexico. The notable feature here is legal equality of social classes which dispensed with de jure advantage of access to top government positions held by aristocracy. The importance of land as asset also declined with development. The top landholders thus lost the right to the most lucrative government positions, while their principal asset (land) might have declined in relative value. The capitalist class was dominant.

The final group (column 8) is composed of heterogeneous social classes. However they are on the top because they share one important asset: citizenship of a country that rules another country.<sup>10</sup> In Cape Colony 1757, they were *pachters*, the large farming monopolists of Dutch origin; in Maghreb 1880, they were the urban European population (especially in Tunisia; richer than Morocco and Algeria); in India 1938, they were British officials and traders; in Java, European traders and Dutch officials.<sup>11</sup>

Was there a relationship between the type of asset that ensured the top position, and the lack of ownership of that same asset that "ensured" poverty? In other words, we ask whether the wealth at one end of the spectrum, acquired through a particular asset-type, was associated with that same specific type of asset-poverty on the other side of the spectrum. Table 4 is the analog of Table 3 but now with the focus on social characteristics of the poorest social classes.

Not surprisingly, the poorest social classes are those without full legal rights (slaves or serfs in Cape Colony 1759 and Moscow 1811), and landless or day laborers in agricultures in many other countries. Their lack of ownership of land is reflective of what is, on the other end of the income spectrum, wealth associated with large ownership of land. In the case of England/United Kingdom in all social tables up to 1867, the poorest class were landless peasants, rural cottagers and paupers. As development proceeded, the bottom class changed to becoming manual workers in manufacturing (in 1867). We see the same evolution in other modernizing societies:

<sup>9</sup> Fochesato and Bowles (2022) propose a taxonomy of societies based on institutions. It ranges from non-state and archaic proto-state to modern democratic and non-democratic state. Their classification covers a much greater variety of historical cases, but is not based on the asset-ownership but the type of social organization..

<sup>10</sup> Citizenship is understood here essentially in a negative sense, as not belonging to the indigenous group that is colonized. Members of different nationalities even if they were not citizens of the ruling colonial power enjoyed broadly the same advantages that distinguished them from the local population.

<sup>11</sup> An interesting issue which cannot be answered with the data we have here is to what extent high inequality in colonies, driven by extremely high incomes of the colonized, added to inequality in metropolises. The logic of the possible effect is that colonial fortunes were eventually transferred to the metropole as the colonists or their children returned there. (Note that this is a separate issue from the more common problem of "colonial surplus": the latter could have been transferred, and was transferred, out of colonies through transfer pricing, monopoly, direct plunder of art artifacts, high taxes and other means without the intermediary of metropole's population residing in colony.

**Table 3**

Richest social class in various societies according to the dominant type of asset owned.

| Land  |   |  | Government control   |   |   | Non-agricultural capital                    | Citizenship  |
|---|---|--|--|---|---|---|--|
| 1   | 2                                       | 3  | 4  | 5   | 6   | 7   | 8  |
| Landowners                                      | Landlord-capitalists                    | Nobility combined with landownership   | Nobility combined with government functions  | Government notables                                     | Merchants, capitalists combined with government | Bourgeoisie (incl. merchants)               | Colonizers   |
| England 1290<br>1381<br>Mexico 1895, 1910, 1930 | Chile 1861 (mining owners)<br>Peru 1876 | Byzantium 1000<br>England 1688, 1759, 1801 (temporal lords)<br>India 1750 (nobility & zamindars)<br>Moscow 1811<br>China 1880<br>Russia 1904 | Rome 14 (senatorial order)<br>Aztec 1500<br>France 1788<br>US 1774 (officials, titled) | Iraq 900<br>Sweden 1613<br>Bavaria 1847<br>Prussia 1863 | Poland 1578<br>Brazil 1872                      | France 1831, 1866<br>Mexico 1940<br>UK 1867 | Cape Colony (landowners) 1757<br>Nueva España 1790<br>Maghreb (urban Europeans) 1880<br>Java 1880, 1924<br>Kenya 1914, 1927<br>Uganda 1925, 1935<br>Tonkin 1929<br>Cochinchina 1929<br>India 1938 (officials, traders) |

Note: The exact definitions of top social classes for some countries are shown between brackets. The detailed list of top social classes is in Annex 3.

**Table 4**

Poorest social class in various societies according to the lack of ownership of crucial asset.

| No legal rights  | No land  | No capital  |   | No citizenship                                    |
|--|--|---|---|---|
| Slaves and serfs   | Peasants/rural servants  | Workers or soldiers   | Jobless (the reserve army of labor)   | Foreigners  |
| 1  | 2  | 3   | 4   | 5   |
| Cape Colony 1757 (boy & girl slaves)<br>Moscow 1811 (serfs in manufacturing) | Rome 14 (free or slave)<br>England 1290, 1381<br>Poland 1578 (rural servants)<br>Sweden 1613 (women rural servants)<br>England 1688, 1759, 1801 (landless, paupers)<br>France 1788 (landless)<br>France 1831, 1866 (agricultural workers)<br>Nueva España 1790 (indigenous peasants)<br>Maghreb 1880<br>Kenya 1914, 1927<br>Uganda 1925, 1935<br>Cochinchina 1929<br>Tonkin 1929<br>India 1938 | Bavaria (soldiers) 1847<br>Chile 1861<br>England 1867<br>Brazil 1872<br>Peru 1876<br>Russia 1904 (private servants) | Iraq 900<br>Byzantium 1000<br>Prussia 1863<br>Mexico 1895, 1910, 1930, 1940 | Athens 330 BCE (meteques)<br>India 1750 (tribals) |

Note: The exact definitions of bottom social classes for some countries are shown between brackets. The detailed list of poorest social classes is in Annex 3.

Chile 1861, Brazil 1872 and Peru 1876. In France, however, the bottom class remained marked by landlessness.

The distinctions however are fluid: servants in the poorest class could be women with no land ownership living in the poorest region of Sweden, or rural servants (without gender distinction) as in Poland in 1578, or private servants as in Russia 1904. These are indeed “pre-modern” poor where several characteristics are united to deepen poverty: landlessness, female gender, and residence in the poor part of the country. Such poor were more likely to be servants than agricultural laborers.

In colonized societies (Nueva España 1790, Kenya 1914 and 1927, Uganda 1925 and 1935; Cochinchina and Tonkin 1929, India 1938), the poorest groups were indigenous landless peasants or small landholders.

In the more urbanized ancient societies of Iraq 900 and Byzantium 1000, it is the urbanized proletariat that was the poorest. The same was true in Bavaria 1867 and in Mexico 1890–1940. In BC Athens and Moghul India the poorest groups were “foreigners”: the

official foreigners (meteques) in Athens, and de facto foreigners (the tribal populations in India).

## 5. Conclusions and future research

Social tables are often the only source of information about social classes and inequality in pre-industrial societies. They typically list the most important social classes and provide estimates of their mean incomes and population shares. In the past they have been created by contemporary authors; more recently, economic historians have used historical sources to create them. The paper uses 53 such social tables ranging from ancient Greece (Athens, 330 BCE) to Mexico in 1940 to estimate the share of the top 1 %, overall inequality (Gini), and the Inequality Extraction Ratio (IER).

Several conclusions can be made. The top 1 % share varies from around 10 % of total income (which may be considered a very low value) to more than 40 %. Despite positive correlation between the top 1 % share, Gini, and the IER, the results show that the top 1 % share can be fairly stable while inequality measured by Gini varies substantially. This is most evident on the examples of England/Great Britain where social tables done for a period of over 500 years register a substantial increase of inequality but little change in the top 1 % share until the second half of the 19th century. The same is true for the United States in the period 1774–1870. This second example is even more striking because of the methodological consistency and the same authorship of the social tables. The implication is that both in the UK and the US, incomes among the bottom 99 % diverged while the top share remained constant or changed but little. However, once the top 1 % share exceeds 20–22 %, the bottom 99 % get “squeezed” and it seems that the movements in inequality and the top share become more tightly correlated.

Using Maddison Project data on GDPs given in international dollars, we can easily convert the estimated top income shares into absolute incomes of the rich. There too, we find a huge variety. Poor societies, like England in the 13th and 14th century, 19th century Poland, and 20th century Siam had relatively poor top 1 %, earning less than \$10,000 international dollars per capita annually. In most pre-industrial societies considered here, the top 1 % earned between \$20,000 and \$40,000 international dollars per person. But in some, the top 1 % achieved income levels not too dissimilar from today's, exceeding \$PPP 50,000. They include relatively poor but extremely unequal societies of Iraq in year 900, pre-Napoleonic War Moscow, and the 1940s Mexico. But they also include the advanced and unequal societies of the 19th century France and the United Kingdom. Even the medieval Tuscany and the ante-bellum United States come close to it.

The possible advantage of social tables even over the modern, more detailed data from household surveys and tax authorities is that they explicitly list and rank social classes. We are especially interested in top and bottom social classes. The paper provides a taxonomy of societies according to the type of asset (land, control of government, merchant capital, or citizenship) that was crucial for belonging to the richest class. Several valuable asset types were often fused to keep the rich safely on the top. This is particularly evident in the combination of land ownership and government control (often going through the acquisition of titles of nobility). In colonies, the top classes were mutually different, but they all possessed one asset in common: citizenship of the conquering nation.

The lack of desirable assets, most frequently the land, was associated with being poor. And there too, the lack of one asset was often combined with the lack of another. People without full legal rights and foreigners akin to today's migrant workers (in sharp distinction from foreigners in colonies) were more likely to be on the bottom. Citizenship thus played a crucial but ambivalent role; it was either a guarantee of wealth or...poverty.

To what kind of future research could the work done in this paper lead? There are indeed several areas only vaguely mentioned or superficially treated in this paper but that could be extended and improved in future work. They need to exploit the greatest advantage possessed by social tables compared to other income sources, namely that social tables do not only provide income estimates, but they identify social classes and their location in the income pyramid. As Jackson (2023, p. 282) writes: “Without specifically meaning to... social tables and fiscal records ha[ve] gathered together a vast amount of information from unusual perspectives about how early modern states perceived and reproduced social hierarchy.” If information on the political and economic systems is added to this, one can find not only whether some systems are associated with greater inequality and greater top income shares, but also what specific classes tend to be the richest and the poorest. Political, economic and sociological aspects are naturally brought together. This in turn calls for further study of political characteristics of historical societies, their classification, and then an attempt to establish empirical links between politics, inequality and class-dominance. This is indeed the core part of individual historical case studies, but what the extension of the work done here would aim at is the establishment of broad regularities that go beyond individual case studies. As the number of available social tables increases it should become possible to make such broad generalizations. Section 3 which tried to suggest one possible taxonomy of asset-types associated with wealth and poverty in different societies is just a beginning. That taxonomy can be extended, refined and improved, and then linked to the political systems.

## CRedit authorship contribution statement

**Branko Milanovic:** Writing – review & editing, Writing – original draft, Methodology, Investigation, Formal analysis, Data curation, Conceptualization.

## Data availability

Data will be made available on request.

## Annex 1. Social tables used in the text (in chronological order)

| County/region     | Year | Number of social classes | Colony (1) or not (0) | Source/authors  |
|-------------------|------|--------------------------|-----------------------|---|
| Athens            | –330 | 34                       | 0                     | Ober, 2015, data kindly provided by Joshua Ober   |
| Roman Empire      | 14   | 11                       | 0                     | Scheidel and Friesen, 2009; Milanovic, unpublished notes  |
| Iraq              | 900  | 17                       | 0                     | van Bavel, 2016, p.73.  |
| Byzantium         | 1000 | 8                        | 0                     | Milanovic, 2006, Table 5, p. 465.   |
| England           | 1290 | 7                        | 0                     | Broadberry et al., 2015, Table 8.02, p. 317   |
| England           | 1381 | 4                        | 0                     | Broadberry et al., 2015; Table 8.03   |
| Tuscany           | 1427 | 9780                     | 0                     | Catastro micro data from Herlihy, 1978  |
| Aztec Empire      | 1500 | 10                       | 0                     | Alfani and Carballo, 2023, Table 1  |
| Cracow            | 1578 | 13                       | 0                     | Malinowski and van Zanden, 2015, Table 6, p.17.   |
| Sweden            | 1613 | 36                       | 0                     | Anderson and Molinder, 2022   |
| England & Wales   | 1688 | 31                       | 0                     | King (reworked by Lindert and Williamson, 1983, final version available from Lindert's website <a href="http://www.econ.ucdavis.edu/faculty/fzlinder/">http://www.econ.ucdavis.edu/faculty/fzlinder/</a> )      |
| Holland           | 1732 | 10                       | 0                     | Data kindly provided by Jan Luiten van Zanden   |
| India (Moghul)    | 1750 | 4                        | 1                     | Maddison, 2001, pp. 110–11  |
| Cape Colony       | 1757 | 10                       | 1                     | Fourie and Frentel, 2010  |
| England & Wales   | 1759 | 56                       | 0                     | Massie (reworked by Lindert and Williamson, 1983, final version available from Lindert's website <a href="http://www.econ.ucdavis.edu/faculty/fzlinder/">http://www.econ.ucdavis.edu/faculty/fzlinder/</a> )    |
| USA (13 colonies) | 1774 | 74                       | 0                     | Lindert and Williamson, 2016; data kindly provided by Peter Lindert   |
| France            | 1788 | 8                        | 0                     | Morrisson and Snyder, 2000, Table 3, p. 66.   |
| Nueva España      | 1790 | 3                        | 1                     | Milanovic et al., 2011, Appendix. Based on 1813, Manuel Abad y Queipo, Bishop of Michoacán, census published in his <i>Colección</i> .  |
| England & Wales   | 1801 | 44                       | 0                     | Colquhoun (reworked by Lindert and Williamson, 1983, final version available from Lindert's website <a href="http://www.econ.ucdavis.edu/faculty/fzlinder/">http://www.econ.ucdavis.edu/faculty/fzlinder/</a> ) |
| Bihar             | 1807 | 10                       | 1                     | Martin, 1838  |
| Netherlands       | 1808 | 20                       | 0                     | Soltow and van Zanden, 1998; data kindly provided by J.-L. van Zanden   |
| Duchy of Warsaw   | 1810 | 10                       | 0                     | Wronski, 2021; data kindly provided by Marcin Wronski.  |
| Kingdom of Naples | 1811 | 12                       | 0                     | Malanima, 2006, Appendix p. 31  |
| Moscovy           | 1811 | 10                       | 0                     | Korchmina and Malinowski, 2022  |
| France            | 1831 | 9                        | 0                     | Morrisson and Snyder, 2000, Table 7, p. 73.   |
| Bavaria           | 1847 | 18                       | 0                     | Erfurth, 2022; data kindly provided by Philipp Erfurth.   |
| USA               | 1850 | 6                        | 0                     | Lindert and Williamson, 2016; data kindly provided by Peter Lindert.  |
| Chile             | 1860 | 49                       | 0                     | Rodriguez Weber 2014; data kindly provided by Rodriguez Weber.  |
| USA               | 1860 | 6                        | 0                     | Lindert and Williamson, 2016; data kindly provided by Peter Lindert.  |
| Prussia           | 1863 | 66                       | 0                     | Erfurth, 2022; data kindly provided by Philipp Erfurth.   |
| France            | 1866 | 9                        | 0                     | Morrisson and Snyder, 2000; Table 7, p. 73  |
| Great Britain     | 1867 | 14                       | 0                     | Baxter (reworked by Lindert & Williamson; data kindly provided by Peter Lindert.  |
| USA               | 1870 | 6                        | 0                     | Lindert and Williamson, 2016; data kindly provided by Peter Lindert.  |
| Brazil            | 1872 | 813                      | 0                     | Bertola et al., 2008; data kindly provided by Luis Bertola.   |
| Peru              | 1876 | 9                        | 0                     | Berry, 1990; Table 4, p. 47. (Original estimates by Shene Hunt.)  |
| Maghreb           | 1880 | 12                       | 1                     | Amir, 1966  |
| China             | 1880 | 3                        | 0                     | Chang, 1962, pp. 326–33.  |
| Java              | 1880 | 32                       | 1                     | van Zanden, 2003; data kindly provided by J.-L. van Zanden  |
| Mexico            | 1895 | 19                       | 0                     | Castañeda and Bergtsson, 2020; data kindly provided by Diego Castañeda.   |
| Chile             | 1900 | 49                       | 0                     | Rodriguez Weber 2014; data kindly provided by Rodriguez Weber.  |
| Russia            | 1904 | 19                       | 0                     | Lindert and Nafziger, 2014, data kindly provided by Peter Lindert.  |
| Mexico            | 1910 | 19                       | 0                     | Castañeda and Bergtsson, 2020; available at <a href="https://swopec.hhs.se/luekhi/abs/luekhi0212.htm">https://swopec.hhs.se/luekhi/abs/luekhi0212.htm</a>   |
| Kenya             | 1914 | 13                       | 1                     | Bigston, 1986; 1987; Tables VI.2 and VI.4; data kindly provided by Arne Bigston and Jeffrey Williamson.   |
| Java              | 1924 | 14                       | 1                     | Booth, 1988   |
| Uganda            | 1925 | 11                       | 1                     | de Haas (2022); additional data kindly provided by the author.  |
| Kenya             | 1927 | 13                       | 1                     | Bigston, 1986; 1987; Tables VI.2 and VI.4; data kindly provided by Arne Bigston and Jeffrey Williamson  |
| Cochinchina       | 1929 | 8                        | 1                     | Merette, 2013, Table 4.   |
| Siam              | 1929 | 21                       | 0                     | Zimmerman, data kindly provided by Jeff Williamson.   |
| Tonkin            | 1929 | 9                        | 1                     | Merette, 2013, Table 3  |
| Mexico            | 1930 | 101                      | 0                     | Castañeda and Bergtsson, 2020; available at <a href="https://swopec.hhs.se/luekhi/abs/luekhi0212.htm">https://swopec.hhs.se/luekhi/abs/luekhi0212.htm</a>   |
| Uganda            | 1935 | 11                       | 1                     | de Haas (2022); additional data kindly provided by the author.  |
| India             | 1938 | 8                        | 1                     | Maddison 2013, pp. 110–11.  |
| Mexico            | 1940 | 100                      | 0                     | Castañeda and Bergtsson, 2020; available at <a href="https://swopec.hhs.se/luekhi/abs/luekhi0212.htm">https://swopec.hhs.se/luekhi/abs/luekhi0212.htm</a>   |

## Annex 2. The derivation of the top 1 % share and the cut-off point from a tabulated distribution (when the underlying distribution is assumed to be of a Pareto type)

We know that with a Pareto distribution, the inverse cumulative distribution is

$$H(y) = Ay^{-a} \quad (1)$$

where  $H(y)$ =cumulative percentage of people with incomes higher than  $y$ ,  $A$  = constant, and  $\alpha$  = the Pareto coefficient.

We also know that the mean income of people with income greater than  $y$ , denoted by  $y_h$ , is:

$$yh = \frac{a}{a-1}y \quad (2)$$

Define now  $G(y)$  = total income of those with incomes above  $y$  divided by total population.

$$G(y) = \frac{\text{total income received by people with income} > y}{N \text{ (total population)}} = \frac{yhH(y)N}{N}$$

It then follows

$$G(y) = \frac{a}{a-1}y Ay^{-a} = \frac{a}{a-1}Ay^{-(a-1)} \quad (3)$$

And analogously, the share of income received by people with income  $> y$  is

$$s(y) = \frac{G(y)N}{\mu N} = \frac{G(y)}{\mu} \quad (4)$$

or

$$\ln s(y) = \ln G(y) - \ln \mu \quad (5)$$

It remains to find the distribution specific  $\alpha$ . If we put the Eq. (3) to the exponent  $a$ :

$$\begin{aligned} (G(y))^a &= \left(\frac{a}{a-1}\right)^a H^a y^a = \left(\frac{a}{a-1}\right)^a H^a y^a = \left(\frac{a}{a-1}\right)^a H^a \frac{A}{H} \\ &= \left(\frac{a}{a-1}\right)^a A H^{a-1} = Ko H^{a-1} \end{aligned}$$

where  $Ko$  = constant, we can further write.

$$a \ln G = \ln Ko + (a-1) \ln H = K_1 + (a-1) \ln H$$

or

$$\ln H = \frac{\alpha}{\alpha-1} \ln G - \frac{K_1}{\alpha-1} \quad (6)$$

When we have the data for the inverse cumulative distributions of people and income, respectively points  $(H_1, s_1)$  and  $(H_2, s_2)$ , we can, using relations (6) and (5), retrieve the implicit  $\alpha$

$$\frac{\ln H_1 - \ln H_2}{\ln s_1 - \ln s_2} = \frac{\frac{a}{a-1} \ln G_1 - \left(\frac{a}{a-1}\right) \ln G_2}{\ln G_1 - \mu - \ln G_2 + \mu} = \frac{\left(\frac{a}{a-1}\right) (\ln G_1 - \ln G_2)}{\ln G_1 - \ln G_2} = \frac{a}{a-1}$$

Finding  $\alpha$  determines the income share. From the data for Cochinchina in 1929 given in Fig. 1, the relevant range that encompasses the 99th percentile is  $H_1 = 1.1223$ ,  $s_1 = 8.965$ ,  $H_2 = 0.3985$  and  $s_2 = 6.6156$  meaning that the top 1.1223 % of people receive 8.965 % of total income, and the top 0.3985 % of people receive 6.6156 % of total income. Inserting these values in the last relationship,

$$\frac{a}{a-1} = \frac{\ln H_1 - \ln H_2}{\ln s_1 - \ln s_2} = \frac{\ln 1.1223 - \ln 0.3985}{\ln 8.965 - \ln 6.6156} = \frac{1.0354}{0.339} = 3.407$$

from which  $\alpha = 1.415$ .

To obtain the share of the top 1 %, we substitute 1 instead of  $H_2$ . This yields

$$\frac{\ln H_1 - \ln 1}{\ln s_1 - \ln s_2} = \frac{\ln 1.1223 - \ln 1}{\ln 8.97 - \ln s_2} = \frac{0.1154}{2.193 - \ln s_2} = 3.407$$

from which the top 1 % share is 8.67 %.<sup>12</sup>

The implicit cut-off point where the top 1 % begins can be obtained from (5). Since we know  $s(y)$  and  $\alpha$ , and  $H(y)=1$

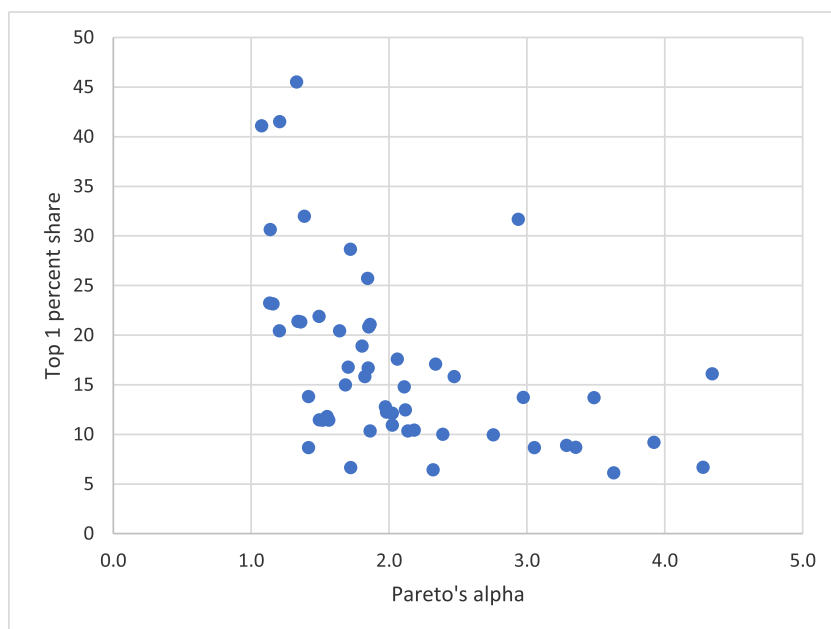
$$s(y) = \frac{G(y)}{\mu} = \frac{\frac{a}{a-1}H(y)y}{\mu} = \frac{\frac{a}{a-1}y}{\mu}$$

From which

$$\frac{y}{\mu} = \frac{s(y)}{\alpha/(\alpha-1)}$$

In the Cochinchina case given here,  $y/\mu$  will be  $8.67/3.407 = 2.54$ . This means that the people whose income is at least 2.54 times greater than the mean income belong to the top 1 %. We thus obtain two key values for each distribution that we shall use in the paper: top 1 % share, and income level (expressed in terms of mean income) where the top 1 % begins.

Fig. A1 shows the empirical relationship between Pareto's  $\alpha$  estimated, as explained, at the very top of income distribution and the top 1 % share. The relationship is broadly negative. This means that the distribution with long end-tails (low absolute-value  $\alpha$ ) are also associated with high top income shares.



**Fig. A1.** Empirical relationship between Pareto's  $\alpha$  and top income share in social tables.

Note: the graph shows the empirical relationship between  $\alpha$  (expressed in absolute amounts) calculated at the very top of each social tables' income distribution and the estimated top 1 % share.

### Annex 3. Richest and poorest social classes

| Country/region  | Year | Richest class               | Poorest class                       |
|-----------------|------|-----------------------------|-------------------------------------|
| Athens          | –330 | Top citizens (category 15)  | Lowest metèques                     |
| Roman Empire    | 14   | Senatorial order            | Workers (free or slave)             |
| Iraq            | 900  | Caliph, viziers & governors | Semi-unemployed                     |
| Byzantium       | 1000 | Civil & military nobility   | Marginals                           |
| England & Wales | 1290 | Landowners                  | Agricultural laborers               |
| England & Wales | 1381 | Landowners                  | Laborers                            |
| Florence        | 1427 |                             | .                                   |
| Aztec Empire    | 1500 | Imperial ruling class       | Slaves                              |
| Poland (Cracow) | 1578 | King, merchant elite        | Servants (rural)                    |
| Sweden          | 1613 | King and top nobility       | Female servants, poor (in Uplandia) |
| England         | 1688 | Temporal lords              | Cottagers and paupers               |

(continued on next page)

<sup>12</sup> The same result is obtained if we do the calculation “backwards”, namely substitute the top share for  $s_1$  and keep  $s_2$  as in the original equation.

(continued)

| Country/region    | Year | Richest class                       | Poorest class              |
|-------------------|------|-------------------------------------|----------------------------|
| Netherlands       | 1732 |                                     | .                          |
| India (Moghul)    | 1750 | Nobility & zamindars                | Tribal economy             |
| Cape Colony       | 1757 | Farming monopolists                 | Boy and girls slaves       |
| England           | 1759 | High titled classes 1               | Cottagers & paupers        |
| USA               | 1774 | Officials, titled, professions      | Zero-wealth free HHs       |
| France            | 1788 | Nobles and clergy                   | Agricultural day laborers  |
| Mexico            | 1790 | Spanish upper class                 | Indigenous peasants        |
| England           | 1801 | Temporal peers                      | Paupers                    |
| Bihar             | 1807 | Top 10 %                            | .                          |
| Netherlands       | 1808 |                                     | .                          |
| Duchy of Warsaw   | 1810 | Highest tax class                   | Indigent (not paying tax)  |
| Moscovy           | 1811 | Aristocrats                         | Serfs in manufacturing     |
| Kingdom of Naples | 1811 | Top 1 %                             | Indigent (not paying tax)  |
| France            | 1831 | Employers                           | Agricultural workers       |
| Bavaria           | 1847 | Commanding generals, bishops        | Soldiers                   |
| USA               | 1850 | Top 1 %                             | .Bottom 40 %               |
| USA               | 1860 | Top 1 %                             | .Bottom 40 %               |
| Chile             | 1860 | Top decile                          | .Bottom decile             |
| Prussia           | 1863 | Generals, government ministers      | Unemployed                 |
| France            | 1866 | Employers                           | Agricultural workers       |
| United Kingdom    | 1867 | Large income (in England)           | Unskilled manual workers   |
| USA               | 1870 | Top 1 %                             | Bottom 40 %                |
| Brazil            | 1872 | Top public officials/industrialists | Unskilled workers          |
| Peru              | 1876 | Potentates                          | Female spinners            |
| Java              | 1880 | Rich Europeans                      |                            |
| Maghreb           | 1880 | European urban (Tunisia)            | Muslim rural (Algeria)     |
| China             | 1880 | Upper gentry                        | Commoners                  |
| Mexico            | 1895 | Hacendados (large landowners)       | Without occupation         |
| Chile             | 1900 | Top decile                          | .Bottom decile             |
| European Russia   | 1904 | Nobility                            | Private servants           |
| Mexico            | 1910 | Hacendados (large land owners)      | Without occupation         |
| Kenya             | 1914 | Self employed Europeans             | African small holders      |
| Java              | 1924 | Europeans                           | Sharecroppers              |
| Uganda            | 1925 | European male-headed households     | African landless peasants  |
| Kenya             | 1927 | Self employed Europeans             | African small holders      |
| Cochinchina       | 1929 | Rich Europeans                      | Daily wage earners (rural) |
| Tonkin            | 1929 | Rich Europeans                      | Daily wage earners (rural) |
| Siam              | 1929 |                                     |                            |
| Mexico            | 1930 | Large landowners                    | People without occupation  |
| Uganda            | 1935 | European male-headed households     | African landless peasants  |
| India             | 1938 | British officials, traders          | Landless peasants          |
| Mexico            | 1940 | Businessmen                         | People without occupation  |

Note: In some cases, top or bottom groups are not defined in sociological terms, but are simply called top or bottom.

#### Annex 4. The size of European population in colonized countries (in percent of overall population)

| Country/region   | Europeans (in% of total population) |
|------------------|-------------------------------------|
| Cape Colony 1757 | 10.5                                |
| Mexico 1790      | 10                                  |
| Maghreb 1880     | 7.2                                 |
| Kenya 1924       | 0.35                                |
| Cochinchina 1929 | 0.29                                |
| Java 1880        | 0.23                                |
| Java 1924        | 0.18                                |
| Tonkin 1929      | 0.19                                |
| Uganda 1935      | 0.14                                |
| Kenya 1914       | 0.12                                |
| Uganda 1925      | 0.12                                |
| India 1938       | 0.06                                |

Note: Ranked by the share of the European population.

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