Technology, Institutions, and Wealth Inequality over Eleven Millennia

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TECHNOLOGY, INSTITUTIONS, AND WEALTH INEQUALITY OVER ELEVEN MILLENNIA

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Conjectures about trends in economic inequality are generally based on historical studies of past trends, along with models allowing predictions using expected movements in the influences on inequality such as the rise of democracy or new technologies such as those introduced during the industrial revolution. Here we broaden the range of variation of the determinants of inequality by studying inequalities in material wealth over the past 11 millennia in economies with vastly different technologies and institutions.

The technologies on which the economies we study range from hunting and gathering, horticulture (low technology land-abundant farming), agriculture, and manufacturing as well as modern service-and-information-based economies. The institutions governing these economies include common access to natural resources and sharing of most goods, ancient slavery, private property in early modern centralized authoritarian systems and urban economies, and capitalist economies governed by democratic states.

Technology, institutions and inequality. Stressing technology and environment as determinants of inequality, some economists and other social scientists derive hypotheses about inequality from the characteristics of a production function or the kinds of goods being produced (Solow 1956; Boserup 1965; Ferguson 1971; Goody 1976; Giuliano, Alesina et al. 2013; Mayshar, Moav et al. 2016). Similarly, the predictions concerning inequality among non-human animals by behavioral ecologists derive from the nature of the goods constituting the livelihood of a population, for example clumped or dispersed resources (Vehrencamp 1983; Mitchell, Boinski et al. 1991; Menard 2004). These social scientists and behavioral ecologists would anticipate changes in inequality to be associated with major developments in methods of production such as the increased capital intensity of production brought about by machine-based production during the

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industrial revolution or changes in the source of one's livelihood such as the prehistoric shift from wild to cultivated and tended plant and animal species.

By contrast, many historians (Brenner 1976; Wright 2013; Lindert and Williamson 2016), sociologists of the "conflict" school (Dahrendorf 1959; Wright 1979) and others (Acemoglu and Robinson 2009; Boix 2015; Scheidel 2017) focus on institutions and politics. For these scholars, the key to understanding the evolution of economic inequality are changes in the distribution of political power, such as that which occurred due to the increasing domain of private property during the early Neolithic and the emergence of states by the Bronze Age, or the demise of slavery and feudalism and the rise of liberal democracy as a form of rule.

The above sets of influences on economic disparity -- technology and institutions -- are not mutually exclusive. A circumscribed natural environment - the Nile Valley five thousand years ago, for example - favored the emergence and success of coercive state power, which in turn supported high levels of wealth inequality (Carneiro 1970; Allen 1997). Similarly, egalitarian institutions - the convention among some foragers that upon being acquired, food should be widely shared beyond the immediate family, for example - may influence the choice of technology, discouraging farming and storage even in environments where under different institutions both could contribute substantially to individuals' livelihoods (Woodburn 1982; Kaplan and Hill 1985; Bowles and Choi 2013).

Empirical investigations of the ways in which these two sets of influences affect the degree of economic inequality are hampered by the limited span of the available data. Even the best data sets from Kuznets in the 1950s to Atkinson, Piketty and their co-authors today cover at most a few centuries in a economies that, seen from the perspective of world history and prehistory, are quite similar in both institutions and technologies (Kuznets 1965; Atkinson, Piketty et al. 2011; Piketty 2013)

Comparing measures of wealth inequality. Much of the concern about inequality today relates to serious material and social deprivation or disparities in living standards broadly construed rather than wealth inequality. But while income measures based on individual or family level observations are typically not available except for recent centuries, estimates of household wealth are possible back to the beginning of the Neolithic and even earlier (our first estimate dates from 23,000 years ago).

Our data set complements that of Milanovic, Lindert, and Williamson on ancient income inequality (Milanovic, Lindert et al. 2011) in that we measure a different dimension of inequality – wealth (a stock of assets) rather than income (a flow of services making up a household's living standards). Our data are from observations on individual households, while Milanovic and his co authors construct inequality measures indirectly using estimates of the size and average incomes of population sub-groups. We measure between-family wealth disparities by the Gini coefficient, a measure based on the entire distribution of wealth rather than top wealth holders only, and that ranges from zero (all households have identical wealth) to 1 (all wealth is held by a single household).

Our measures of material wealth include the extent of land owned, taxable urban property, size of homes and extent of stored food, and wealth included in burials, as well as conventional modern measures of net worth. Estimates for these differing types of assets are not uniformly distributed over time. Grave goods and house size are the basis for most of the very early estimates, for example, while land and net worth occupy a larger role in more recent centuries. Similarly, the size of the population concerned differs over the course of our time period from small settlements in the earliest observations to entire nation states in the recent data.

To compare wealth inequality across our time period or among differing economic and political institutions we would ideally have estimates based on the same type of asset, unit of observation, and population size. Lacking a common measure of material wealth over our long temporal domain, we adjust our estimates to measure inequality in the same hypothetical benchmark with a common population size (1000 households), unit of observation (household) and asset type (household wealth). Statistical methods and sources are described in full in our online supplementary materials (Fochesato and Bowles 2017). Because the value of these estimates depends critically on the plausibility of these comparability adjustments, we describe them in some detail.

First, we need to convert individual level data to household equivalents when we have individual data but do not know which individuals were paired in households, as is often the case with burial wealth. To do this we simulate a large number of hypothetical couples by matching males and females under a range of assumptions concerning the degree of wealth assortment in marriage. Household wealth is the sum of the wealth of

the paired individuals. We are able to confirm the robustness of these estimates with a case on which we have individual wealth data, but also know which individuals constitute a couple. The data do not allow us to take account of household size in a consistent way across cases or to adjust wealth holdings to a common age.

Second, some measures of wealth – house size, for example – are more equally distributed than others – burial wealth for example. This is as one would expect if one considers the social signaling value of burial wealth. To develop comparable measures for the different asset types we exploit cases in which we have measures of multiple forms of wealth in a single population to convert measures based on different wealth types to a common form of wealth.

Third, because larger populations may include greater geographical and social heterogeneity and may exhibit greater wealth inequality as a result, we measure the population size effect empirically and adjust all observations to a hypothetical common benchmark population size. A naïve method to accomplish this end would be to simply use the observed statistical relationship between population size and the Gini coefficient to adjust each observation to the benchmark size. But this would confound true scale effects with unobserved other influences on inequality that are correlated with scale, such as the nature of the system of government.

We address this problem using a quasi-experimental technique, exploiting three nested data sets – for medieval Finland, 19th century U.S. and a group of hunter-gatherers in pre-European contact North America -- in which we can estimate wealth inequality at the level of both a larger entity (a district, e.g.) and the lower level entities (the villages that constitute the district).

The thought experiment motivating our method is to imagine that we had data on wealth inequality in just one of the villages constituting a district and that we wanted an estimate of inequality in the district or some other larger population unit. The difference between the observed village and district inequality measures and populations is then the basis for our estimate of the scale effect at that level of population. The estimated true scale effect is small for larger population units; but it is substantial for small populations; so, for example, we adjust upwards our estimates for the smallest populations by 0.022 Gini points.

Two remaining comparability concerns are statistical. Many of the reported Gini coefficients are based on wealth holders only, omitting those without wealth. We show that if their number is known, the missing observations can be incorporated in a very accurate revised estimate even if the underlying data are unavailable. Finally, some of the estimates of the Gini coefficient are based on a small sample of a larger population, such as routinely occurs with archaeological data, which represents the found and excavated observations from a larger population. Small sample estimates (we show in appendix) provide quite precise estimates, but are systematically somewhat downward biased; we incorporate empirically based upwards adjustment to take account of this bias.

Wealth inequality over 11 millennia. Our comparability-adjusted data appear in Figure 1. The earliest estimate – based on disparities in dwelling size among the sedentary hunter gatherers on the Sea of Galilee at Ohalo II – is clearly not sufficient to establish the pattern of wealth inequality prior to the Neolithic period beginning about 12 millennia ago. We focus therefore on the past 11 thousand years.

Two patterns in the data are clear. First is the modest bit strongly rising levels of inequality over the first ten thousand years of this period (which we discuss in more detail in the next section).

The second is the (with few exceptions) uniformly high levels of wealth inequality over the last two thousand years. The mean Gini coefficient for this period is 0.69. A Gini coefficient of this magnitude for land ownership, for example, would describe an economy of 10 individuals, one of whom owns a bit less than four fifths of the total land, with the remainder of the land owned equally by the other 9 owners.

Given the extraordinary differences in both technologies and economic and political institutions over this long period these almost uniformly high estimates are is something of a surprise. Analysis using crude categories to capture differences in political and economic institutions, as can be seen in Figure 2, yield small differences in the level of material wealth inequality.

As can be seen from both Figures 1 and 2, societies without states are the major exception to the lack of distinctiveness of the institutional categories that we have used. We have identified 29 societies in which on the basis of the historical and archaeological

evidence available it seems likely that the defining characteristics of a state were absent, that is, there was no specialized cadre of individuals with a monopoly on the legitimate use of violence within a given territory. Average wealth inequality in these non-state societies is less than two thirds the level of the state societies ($p = .0001$)
A second distinction among the political systems in Figure 2 is the significantly greater wealth disparity in the slave economies (including Roman Egypt, 18th century South Africa, 18th century Brazil, and the slave states of the U.S. prior to the Civil War.) The greater inequality in these economies, on average 0.105 Gini points more than the other state societies ($p < 0.001$), is close to the difference between wealth inequality in the U.S. slave and non-slave states in 1860.

These difference based estimates obviously do not measure the effect of the institution of slavery on the extent of wealth inequality, as the slave economies differed from the non slave economies in many other ways. Our difference in difference estimates of the effect of the abolition of slavery in the based on a comparison of slave and non-slave states before and after the Civil War suggests a smaller but nonetheless substantial difference in wealth inequality attributable to slavery as an institution. (Fochesato and Bowles 2017)

What we term "democratic and capitalist" societies are characterized by civil liberties, political competition and the absence of substantial restrictions of the right to vote along with a market economy based on the employment of labor by privately owned for profit firms. In our data set they are a bit more unequal (0.035 Gini points; $p=0.04$) than the other state (non slave) economies. The Gini coefficient for wealth in modern Sweden, for example, is substantially greater in recent years than was four centuries ago and also just prior to the advent of democratic rule early in the 20th century. The same is true of Finland in recent years compared to two centuries ago.

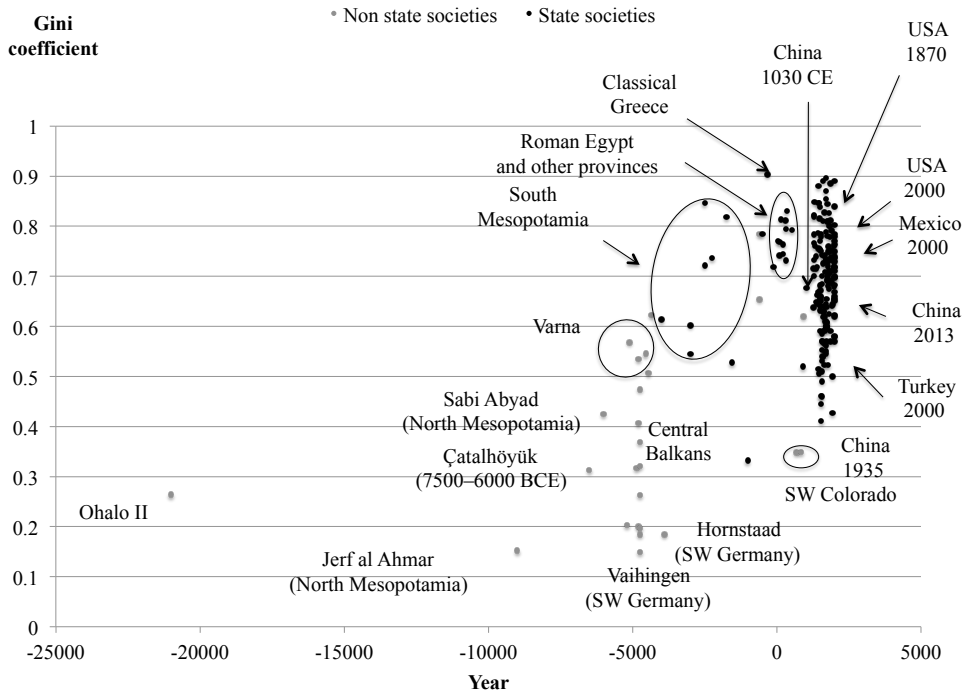

Figure 1 **Inequality in material wealth**. Corrected for comparability with respect to household composition, asset type, sample size and population size. Source: (Fochesato, Bogaard et al. 2017)

Given the paucity of the data the inferences that we can make about trends are quite limited. We can, however explore the trajectory of wealth inequality in two regions and time periods: western Eurasia during the ten millennia before a thousand years ago, and Europe over the past 7 centuries.

From "aggressive egalitarianism" to wealth inequality among Neolithic farmers. The emergence of sustained and substantial levels of inequality has commonly been associated with the advent of farming (Childe 1942), the primary wealth of which – dwellings, stores, animals and eventually land – were readily demarcated and defended as private heritable property(Bowles and Choi 2013). Ofer Bar Yosef, a leading archaeologist of this process writes: "The new social structures of sedentary groups that replaced the egalitarian mobile foragers [experienced] an increase in social inequality."(Bar-Yosef 2001)

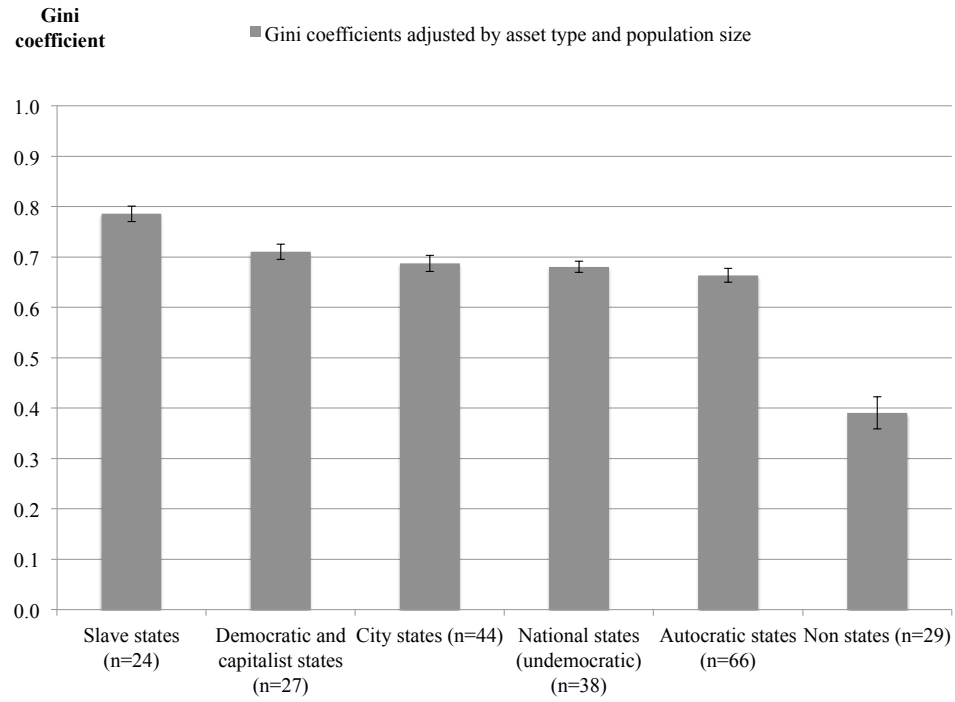

Figure 2 **Wealth inequality across different political institutions.** Error bars are the standard errors of the average Gini coefficients in each institutional category. Source: (Fochesato and Bowles 2017).

But as Figure 3 makes clear, wealth disparities in farming communities were quite limited well into the Neolithic: the early food producing economies in Northern Mesopotamia (Jerf al Ahmar), Anatolia (Çatalhöyük) and Germany (Vaihingen and Hornstaad), respectively 11, 9 and 7 to 6 and millennia ago, are among the least unequal economies in our entire data set. This observation is consistent with the limited wealth inequality and modest degree of intergenerational wealth transmission in some ethnographic horticultural economies. (Borgerhoff -Mulder, Bowles et al. 2009)

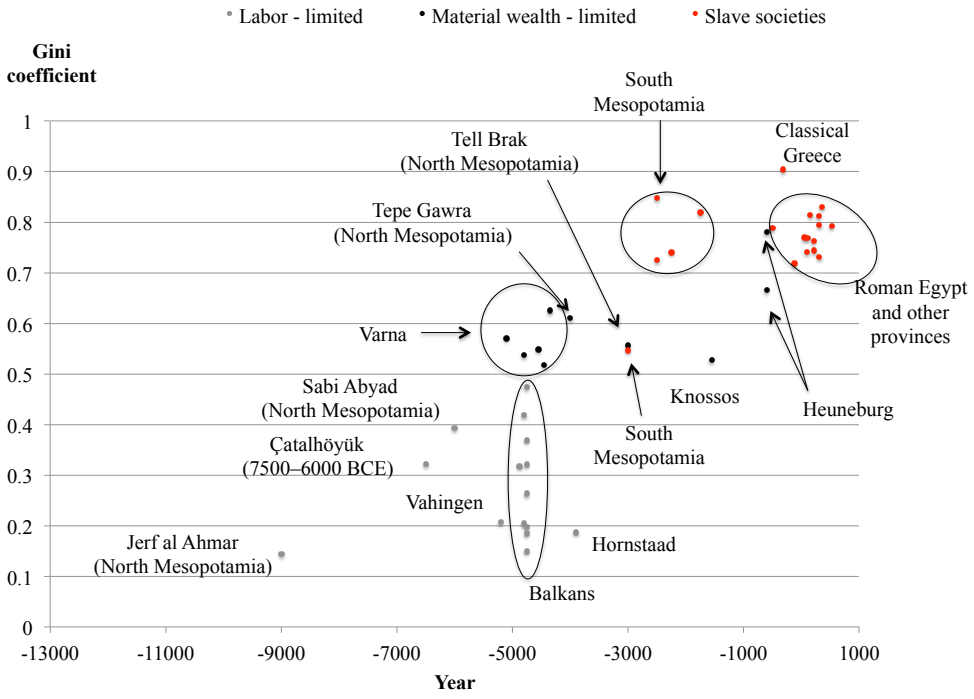

Figure 3. **Wealth inequality in western Eurasian farming economies, 11,000 BCE to 1000 CE.** Source: Gini coefficient from (Fochesato and Bowles 2017); labor limited designations from (Fochesato, Bogaard et al. 2017)

A clue to their egalitarianism may be that without exception these early egalitarian farmers were not governed by states (as can be seen in Figure 1). The limited political hierarchy and modest wealth inequalities of these societies may have been associated with the egalitarian "counter-dominance" social norms and political practices (Boehm 2000) that in mobile hunter gatherers limited the accumulation of wealth. One of them (Çatalhöyük) was described by one of its leading archaeologists as "aggressively egalitarian" (Hodder 2014). Ian Kuijt (1996):332 proposed that mortuary practices of the late Natufian semi sedentary hunter gatherers (3 millennia prior to our earliest observations on farmers) were part of "a system of social codes for limiting the development and centralization of power and authority.." and that later mortuary and archectual evidence (from c. 11,500 BP to c.9,500) "indictes that social codes were expanded and increasingly standardized within the Levantine region to reinforce a shared community ethos and limit the development of social inequality."

Also contributing to the modest inequalities among the first western Eurasian farmers may have been the fact that the more scarce factor of production in these economies was labor not land, which was abundant, or other forms of material wealth. In Figure 3 based on our joint work with Amy Bogaard and others, we use evidence on labor using (weeding, manuring) and labor saving (animal traction for plowing) farming methods to categorize early farming communities as either labor limited or land (or other material wealth) limited (Bogaard, Styring et al. 2017).[3] The third designation of economies in Figure 3 refers to slave economies in which, like material wealth, labor itself can be owned accumulated and inherited.

Figure 4 contrasts wealth inequality in these differing types of economy.

The labor-limited versus material wealth limited distinction is well illustrated by some of the earliest observations in our set: Çatalhöyük in Anatolia, and the Durunkulak - Hamangia site in what is now Bulgaria. Both engaged in land abundant farming (of similar crops), but the latter also produced salt ingots (which also served as currency) using highly capital intensive methods. The former was a labor-limited economy; the latter was material wealth limited. The Durunkulak – Hamangia economy is associated with the extraordinarily opulent burials at Varna, suggestive of extreme and inherited wealth differences (Nikolov, Petrova et al. 2009). Our estimate of wealth inequality at Çatalhöyük is less than two-thirds of that at Durunkulak – Hamangia.

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[3] A production function illustrating the labor-limited nature of the early Neolithic economis is the following, $Q = A(m+T)^{\beta}(x+L)^{1-\beta}$ where: Q = quantity of output produced; m=amount of manure applied to the land; T= amount of land cultivated; x= a measure of ox team services and L = hours of labor services applied to cultivation, while the "land services" exponent, $\beta < 1$, is a measure of the importance of land (possibly augmented by manure) in the production process . A measure of the scarcity of land relative to labor is then the ratio of the two marginal products

$$\frac{Q_T}{Q_L} = \left(\frac{\beta}{1-\beta}\right)\left(\frac{x+L}{m+T}\right)$$

It seems likely that the (labor) intensive farming that we describe was associated with high values of m, x = 0 and a lower vaue of β, which were (we hypothesize) sufficient ot offset the greater amount of labor applied to a given amount of land , resulting in labor being relatively more valuable than land. Of course there were marketes in none of these inputs in the early Neolithic, but the shadow price of labor was probably high, and of land low, setting the stage for the introduction of a labor saving land augmenting innovation – animal traction – that apparently altered the distribution of weatlh.

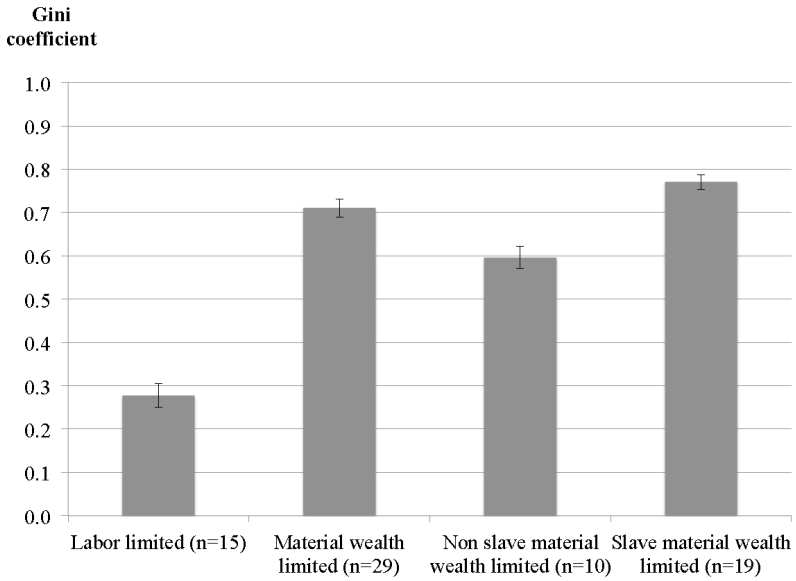

Figure 4. **Wealth inequality in labor-limited and material wealth-limited ancient economies.** Gini coefficients are fully adjusted for comparability. The differences among the economy types remain substantial and significant when conditioned on a (small but statistically significant) time trend.

Part of the explanation of the more equal early farming economies may also be the limits to the degree inequality that is biologically feasible given the modest energetic output of an hour of labor under conditions likely to have obtained in the early Holocene farming (Bowles 2011; Milanovic, Lindert et al. 2011).

Consistent with all of these interpretations of the data is the hypothesis that Neolithic inequality did not emerge because of the introduction of farming; it owes its origins to a subsequent transformation of farming and the social systems associated with farming. Key to this transformation in western Eurasia was the introduction of the ox drawn plough and its substantial reduction in the amount of labor required to cultivate a given body of land.

European wealth inequality over 7 centuries. Our data set allows us to explore long term trends in wealth inequality in a region – Europe – that has a rich tradition of historical analysis of institutions, technology and other influences on wealth disparities. The evidence (in Figure 5) is not sufficient to make inferences about trends within most localities or nations, but they suggest three distinct periods for the region as a whole,

consistent with a large body of research by economists and historians on factors that might have affected wealth inequalities.

Population declines in some cases predating the bubonic plague in 1348 and recurring with subsequent plagues in the next two a half centuries affected the entire region lowering the supply of labor relative to land and other forms of material wealth (Biraben 1975; Herlihy 1997). The effect broadly was to increase the bargaining power of labor – both employees and landless or land poor farmers -- vis a vis the owners of material wealth. Throughout the region, the prices of agricultural goods relative to the manufacturing goods fell and real wages rose (Allen 2001; Pamuk 2007) .

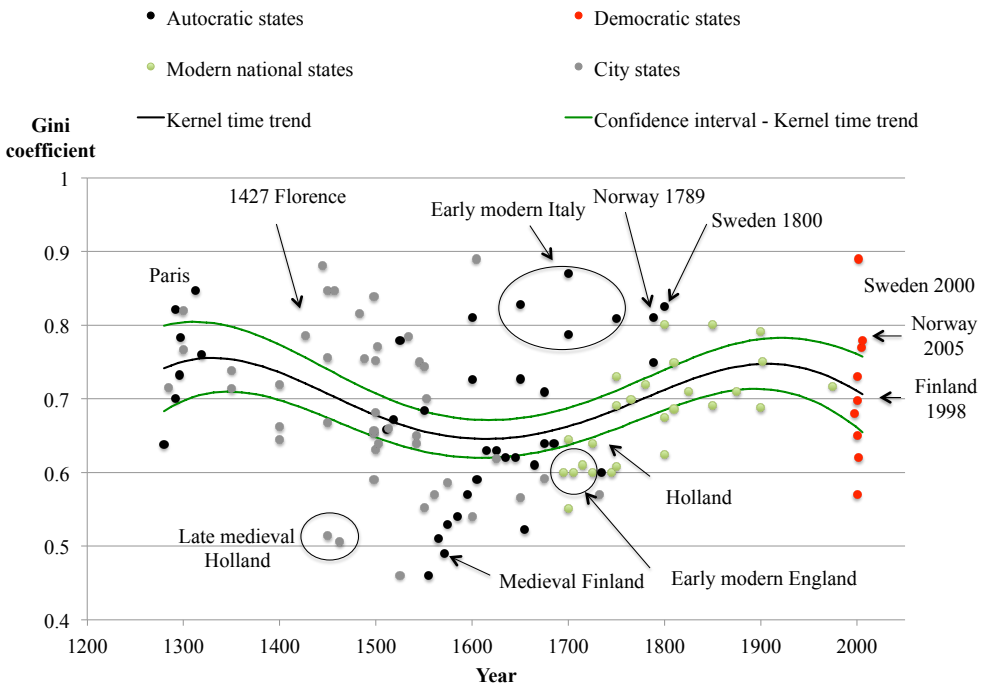

Figure 5. **Wealth inequality in Europe since 1250.** The data points are comparability adjusted Gini coefficients. The black line is a kernel trend estimate; the green lines are confidence intervals.

Labor scarcity persisted as a result of extensive mortality in warfare and increased trade and urbanization, which increased the reach and severity of epidemics. (Voigtländer and Voth 2013) The diffusion in northern Europe of norms of increased labor force participation by women and delayed marriage, termed the European Marriage Pattern,

(Hajnal 1965; Voigtländer and Voth 2013) also delayed the demographic recovery, keeping labor scarce and real wages high. In addition, where the bargaining power of those with less wealth was considerable, as in 1380s England, (Hilton 2003) increased wages and peasant incomes were stabilized, allowing for a prolonged phase of reduced wealth inequality in Europe. (Brenner 1976)

This trend reversed around the beginning of the 17th century, consistent with recent studies on early modern European regional inequality. (Van Zanden 1995; Piketty 2013; Alfani and Ryckbosch 2016) A key development was the recovery of population and labor supply (Bairoch, Batou et al. 1988; Livi Bacci 2007), but unlike the regionally uniform positive impact of labor shortages on wages following the plagues, the impact of greater labor supply was uneven.

In southern, central and eastern Europe, wages fell as population recovered. But in the northwestern areas wages had come to be substantially delinked from demographic movements. The fact that in London, Amsterdam and other parts of northwestern Europe wages responded little to the increase in labor supply may reflect the institutionalization of the gains in bargaining power that the less well off had achieved under the preceding period of labor shortage (Fochesato 2016).

While incomes of the non-wealthy were sustained in the northwestern regions, wealth disparities increased even in those areas, most likely in response to two developments stressed by historians of the period. The Atlantic trade in sugar and other commodities allowed the accumulation of extraordinary wealth in some countries. (Brenner 1993; Landes 1998) It also reduced the cost of calories, dampening upward pressures on the wage, as some of the economies in the northwest expanded rapidly under the joint effects of the commercial and then industrial revolutions. (Pomeranz 2000) Also contributing to the dis-equalizing trend, the accelerating introduction of labor-saving technologies raised output per worker while avoiding labor shortages that might have allowed workers to raise their real wages. (Allen 2005)

Central, eastern and southern European regions experienced an even more drastic drop of the wage share of the national income. The recovery of labor supply in an institutional setting characterized by substantial bargaining power by wealth owners resulted in a generalized redistribution of social and economic power in favor of the

historical elites. (Brenner 1976) Labor contracts returned to feudal- like relationships, as with the return of serfdom in eastern Europe, or to the reassertion of the economic and political interests of rural elites, as in Italy. (Conti 1965)

The twentieth-century reversal of rising wealth inequality may have been the result a set of difficult to reverse policies adopted during the world wars including greatly increased levels of taxation and the spread universal suffrage during and in the aftermath of World War I. However, our data indicate that even in the presence of effective policies of income redistribution though taxes, transfers and other policies, extraordinary levels of wealth inequality persisted even in the Nordic social democratic countries. (Fochesato and Bowles 2015)

Our European data suggest that changes in the broad categories of effects – technology (including the ratio of labor to land and other forms of material wealth) and institutions – thus may provide a contribution to the explanation of changes in wealth disparities over the long run.

Egalitarian labor limited economies: A conjecture. The substantial wealth inequality levels among the Columbia River sedentary hunter gatherers and the absence of pronounced inequalities among some food producing people are both consistent with the "clumped resources" explanation of inequality mentioned at the outset. We know that the wealth difference among the Columbia River fishers was based on the heritable use of highly productive fishing sites. (Hayden 1997) Where these and other defensible "clumped resources" were absent or unimportant to the livelihood of a people, we conjecture, wealth inequality may have been limited. By this reasoning the limited inequality of some food producing populations would be the result of the lack of such high value and defensible resources.

These examples suggest a generalization of the clumped resources explanation. On the basis of archaeological evidence it seems likely that the primary limiting factor of production in the more egalitarian populations' livelihoods was human capabilities – skills, strength, social networks -- rather than land, livestock or other capital goods, at least by comparison to the other economies in our data set. The labor-limited character of horticultural and mobile hunting and gathering economies may help to explain the

just- mentioned modest wealth inequality in these economies by comparison to the more material-wealth-limited pastoral and agricultural economies.

The extent to which an economy is labor-limited is affected by both institutions and technology. It depends on the nature of the goods and services constituting a people's livelihood and the production processes by which these are acquired, as well as the nature of the property rights governing access to the inputs into production.

Our conjecture is that where the production of goods and services is limited primarily by the amount of labor devoted to production, economic disparities, including inequalities in material wealth will be relatively modest. Reasons include the intrinsic biological and other limits to the degree of inequality in human capacities for labor and the fact that human capabilities are (excepting slave societies) not capable of being accumulated under a single owner. Consistent with this view, the significantly greater inequality in slave economies may be traceable to the fact that in these societies, the ownership of people converted labor itself into a type of wealth that could be accumulated and transmitted across generations.

We also know from previous work (Borgerhoff -Mulder, Bowles et al. 2009) that human capabilities are transmitted from parents to offspring to a considerably lesser extent than is the case for material wealth, thereby limiting the extent to which differences in income accumulate from one generation to the next. As a result, in labor-limited economies the income differences that support unequal wealth accumulation are likely to be relatively modest.

In Figure 6 we show the distribution of Gini coefficients across the entire data set for the labor limited and material wealth limited economies. We also show the mean of a set of estimates of disparities in human capacities – such things as hunting ability, grip strength, and farming skill. Consistent with the logic of the limiting factor hypothesis, the data suggest that human capacities are far less unequally distributed than is material wealth, and that material wealth is less unequally held in labor-limited economies).

Because all of the labor limited economies are also without states, we cannot explore the relative importance of these two apparent influences on the degree of wealth inequality. We do have 7 non-state material wealth limited economies (like Durunkulak –

Hamangia), their mean Gini coefficient is 0.558, which is significantly smaller than the 0.693 average Gini in the 202 material wealth limited state governed economies ($p<0.01$)

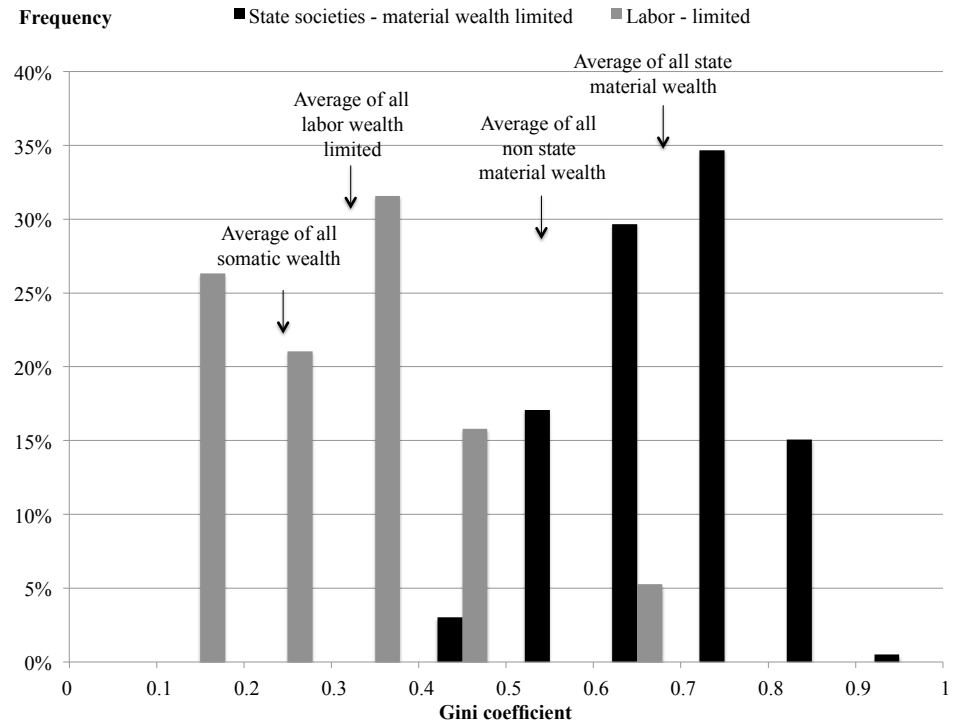

Figure 6. **Frequency distribution of Gini coefficients for material wealth by type of economy and political system.** Shown are the frequency distributions of Gini coefficient in state societies (black bars) and labor-limited societies (grey bar). The four arrows show the average inequality in those two groups, among the non state material wealth limited societies and the measures of somatic wealth as described in (Fochesato and Bowles 2017)**.** Source: See text and (Fochesato and Bowles 2017).

Discussion. Inequalities in material wealth contribute to inequalities in living standards as measured by what we now call disposable income (that is income net of transfers to (taxes, e.g.) and from (income support e.g.) the government. Inequalities in disposable income are typically substantially less than wealth disparities. The extraordinary wealth inequalities in Sweden and Finland mentioned above, for example are 3.75 and 2.58 times respectively greater than the inequality in living standards in those countries, measured by the Gini coefficient for disposable income.

While archaeological data sufficient to make quantitative comparisons of the extent of redistribution are lacking it seems likely that in early farming economies a significant amount of private between household consumption smoothing occurred (Bogaard, Charles et al. 2009; Hodder 2014) Ethnographic evidence also suggests a important role for decentralized consumption smoothing institutions among mobile hunter gatherers. In three Latin American and one African forager group a mean of almost two-thirds (by calories) of the food acquired by an individual is consumed by those beyond his or her immediate family. (Fochesato and Bowles 2015)

Our data motivate two questions about the future trajectory of inequality in living standards under the influence of rapidly changing technology in the production and distribution of information and the changes in social structure and institutions likely to accompany this technological revolution. The first is: will the knowledge and service based economy now emerging in the high income economies represent a shift towards a system of production that is limited more by scarce human capabilities than by capital goods and other forms of material wealth? And, second, will the politics of this new technological and institutional environment sustain a substantial degree of egalitarian redistribution as has been the case in many democratic and capitalist nations over the past half century? Positive answers to both questions would lend support to Kuznets conjecture of a possible future with reduced disparities in living standards (although on different grounds); while negative replies would support Piketty's contrary scenario.

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