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Kuznets at -7000: Is there a really long-term relationship between growth and inequality?

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Kuznets at -7000

Is there a really long-term relationship
between growth and inequality?

Timothy A. Kohler,¹ Adam Green,² and Scott G. Ortman³

April 2025

Abstract: We use archaeological data on house sizes to generate estimates for economic inequality and economic growth from near the beginning of the Holocene to about the first millennium AD. At worldwide scales these variables are positively related, but patterns are more divergent at regional levels. Cross-sectional regression shows that the formation of central-place hierarchies and development of landesque capital are important in generating both wealth and wealth inequality; development of farming is also important to the generation of wealth. Iron smelting detracts from wealth inequality whereas copper smelting detracts from the generation of wealth. Examination of three well-known interaction zones (Bronze Age West Asia, the Classic Maya world, and first-millennium-AD Britain) shows surprisingly regular transformations of the relationship between economic growth and inequality on millennial time scales.

Key words: economic inequality, economic growth, prehistory, Eastern Hemisphere, Western Hemisphere

JEL classification: B00, B52, C11, C31, D63

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1 Introduction

Understanding factors affecting economic growth and economic inequality, and the relationship between them, has long been a core concern in economics. The paper we commemorate in the studies collected here, published by Simon Kuznets in 1955, seems particularly interested in framing this task through comparisons over long periods: decades if not centuries. The famous and highly tentative conclusion reached by Kuznets in that paper was that the ‘early developing’ countries of western and northern Europe and their economic and cultural descendants in the USA, Canada, Australia and New Zealand, as they underwent industrialization and urbanization, experienced a long-term trend of first increasing, and later decreasing, income inequality in conjunction with their economic growth. Kuznets himself was uncertain how generalizable this pattern was, even whether this sequence applied to ‘late-developing’ countries in the contemporary world. And of course, we know now that the pattern of increasing income equality he identified in the mid-20th century in developed countries would begin to reverse within three decades. With the resurgence of inequality studies following the 2008 recession, many researchers have re-engaged with the assumptions that drove Kuznets’ hypothesis, including Thomas Piketty (2014) and Branko Milanovic (2016).

By contrast the long-term relationship between economic growth or performance and economic inequality has not been central to archaeological research. We see at least two reasons for this. First of course is the conspicuous (and automatic) lack—for all of *prehistory*—of documents detailing the levels and trends in income and wealth that can be found, or assembled, for many societies over the past few centuries. These gaps are almost as severe for the literate societies of the ancient world, though they are slowly being filled (Morris 2010; Scheidel 2017). Most research in archaeology dealing with economic growth, economic inequality, and their relationship has focused on states (Moreno Garcia 2016; Smith 2008; van de Mieroop 1999) or their immediate precursors (Hoffman 1979). Although interest in these topics also extends to Celtic societies (Cunliffe 2008), Bronze Age Europe (Kristiansen and Larsson 2005) and even the Neolithic (Hayden 2014; Hodder 2006) the results usually do not lend themselves to a quantitative comparative framework. Green et al. (2024) engage with Piketty in offering a global-scale narrative of inequality and economic growth extending back to the Neolithic, but this initial statement also relies on critical, qualitative comparison of highly heterogeneous data.

A more fundamental issue is a deep uncertainty as to whether, in non-capitalist societies, it is appropriate or useful to isolate an ‘economic sector’ and analyze it using tools of economics such as optimization theory, cost-benefit analysis or supply and demand. For that matter, are notions of wealth or income even relevant in such settings? These doubts were most notably articulated by Karl Polanyi (1944) who set forth what has come to be called the ‘substantivist’ approach, arguing that it is only fruitful to interpret economic activity in non-capitalist societies within the frameworks of their specific cultural and historical contexts. Despite competing (and contrary) views by ‘formalists’ such as Harold Schneider (1988), Polanyi’s views have been influential in anthropology and within certain strands of archaeology, especially post-processualism (Shanks and Tilley 1987). Within anthropology more generally (at least in the USA, archaeology is a subdiscipline of anthropology) it is primarily development studies that have sustained an interest in economic performance, inequality, and their relationship (see for example Topuz 2022).

Our approach to reconstructing economic inequality is formalist in its willingness to quantify and comparative goals but responds in some ways to the substantivist critique. This paper aligns most closely with a theoretical framework called ‘critical paleoeconomics’ marked by a willingness to explore big patterns in ancient economies while recognizing that systems of production and

consumption were subsumed in institutions that were variable in form (Green et al. 2024). The proxy for economic inequality we use is Gini coefficients calculated from residential building areas in archaeological sites. Our assumption is that larger houses index greater household resources, whether these were embodied in people, stored as goods, or maintained through social interchanges, and whether they are imagined as flows per unit time (income) or accumulated stocks (wealth). We substantiate this assumption elsewhere (Kohler et al. 2025a, 2017; Kohler and Smith 2018) and accept arguments by Ortman and colleagues (2025) that this proxy produces a minimal estimate of wealth differentiation.

Because we want to apply the same approach to sites that may date early in the Holocene, or as late as the Anglo-Saxon period in Britain, and that may have been occupied by hunter-gatherers, horticulturalists, farmers, or city-dwellers, we need a measure that responds appropriately to wealth differences that arise for many different reasons. Following Borgerhoff Mulder and colleagues (2009; Bowles et al. 2010) wealth differences among hunter-gatherers and horticulturalists are instantiated as somatic and relational differences among households. They emerge due to differences in the number of offspring, number of allies in conflicts, and importance of ritual obligations. Number of offspring in particular leads to larger residences, but ceremonial centrality may also require space to store paraphernalia or temporarily house participants. These factors continue to be relevant considerations among agriculturalists, but in such societies material goods become increasingly important to measuring wealth. More stuff to store (grain, livestock, tools and so forth) inevitably leads to larger residences. The important thing to note is that although different cultural contexts generate larger houses for somewhat different reasons, all of these differences in residential building area reflect wealth differences to some extent. A particular advantage of calculating Gini coefficients using house measurements from specific sites (or small regions) is that this method automatically holds constant a great deal of inter-household variability due to cultural differences (including variability in construction materials and techniques) and climate.

2 Returning to our Childe-ish roots

No early archaeologist expressed an interest in economic growth, economic inequality, and their relationship as clearly as V. Gordon Childe (1936). There is also reason to believe that he would have appreciated our quantitative approach (Childe 1951) which we describe in more detail elsewhere (Kohler et al. 2025a 2025b). The GINI project, on whose data this paper is based, assembled a team of regional experts, and with their help constructed a database containing measurements of residence sizes that currently includes >3000 sites with >52,000 residential units spanning >10,000 years in all major world regions except Australia. We ourselves are not very impressed by these large numbers because important areas in Africa, South America, central Asia, and northern Europe for example remain under-represented; but we believe we have made a good-enough start on a comprehensive database to permit informed estimates about large-scale trends in growth and inequality for a substantial portion of the Holocene. Since we calculate proxies of economic inequality from variability in house-size distributions, it follows that we can use estimates of the changing central tendency for residence size through time as a measure of economic function (performance, or growth when positive).

2.1 Economic inequality and economic growth at large scales

Figure 1 presents these estimates separately, for individual archaeological sites, across the entire world sample. Two conventions used in this figure need to be explained, each of which arose from our preliminary findings as we began to explore these data. First, we found that concurrent regional variability in house sizes was greatly reduced if we controlled for the time elapsed since the development of agriculture in each region. Consequently, in Figure 1 we present site dates relative to the time of the local arrival or development of agriculture (Δ years). Thus, a date -1000 indicates that the measured structures were constructed about a millennium before the local appearance of agriculture. (The same data are graphed by calendar year in Kohler et al. (2025b, fig. S4)). Second, we also noticed that much variability in structure size was related to the position of the site containing the structures in its local hierarchy of central places (if any; see (Berry and Garrison 1958) on settlement hierarchies generally and (Adams 1966; Childe 1950; Wright and Johnson 1975) on early use of these concepts in archaeology). Consequently in Figure 1 we control for this effect using a variable called SA (Social Advantage). SA is merely the sum of two more basic variables: NOfLevels (the number of levels in the central place hierarchy, ranging from 1-6 where 6 represents a system such as found in Imperial Rome), and WhichLevel, the level occupied by the focal site (ranging in these data from 1-5). Thus a small hamlet in a chiefdom might have an SA value of 3 or 4 (WhichLevel = 1 and NOfLevels = 2 or 3). We also characterize the location of sites within a settlement system in a way that provides a consistent descriptor even as the number of levels in the system (and thus the value for SA) changes. This is done by differentiating between 'Basal' and 'Apex' sites. Basal sites are those where WhichLevel = 1, regardless of the number of levels in the relevant settlement system. Such sites are thus always at the bottom of any hierarchy. Apex sites are those at the top of the hierarchy, whatever the size of the hierarchy. For more details see Kohler et al. (2025b).

Figure 1 shows that at these very large scales, measures of economic inequality (Ginis) and economic growth (mean of the log of total house size) both show an increasing trend over the 9 millennia represented. Comparing the top and bottom panels reveals that the mean log of the total house area (bottom panel) considered as a measure of economic function tends to increase prior to housing inequality (top panel), though this possibility needs to be more carefully examined on a by-region basis. The cumulative growth in both measures, though admittedly slow, is at odds with the assumption by some economists that, prior to the Industrial Revolution, 'increases in available resources will, in the long run, be offset by increases in the size of the population. Countries with superior technology will have denser populations, but the standard of living will not be related to the level of technology, either over time or across countries. The Malthusian model's predictions are consistent with the evolution of technology, population, and output per capita for most of human history. For thousands of years, the standard of living was roughly constant and did not differ greatly across countries' (Galor and Weill 2000). An obvious objection to Figure 1 though is that the world was not an effective interacting unit during the times depicted here, so growth and inequality cannot have plausible functional relationships at the scales plotted.

Explaining growth and inequality at large scale

Before examining the inequality-growth relationship at less-global scales it's interesting to explore the factors that contribute to (or detract from) economic growth and economic inequality at these scales, since these will represent what all the regional sequences assembled here have in common. Figure 2 reports regression analyses considering the World sample in a cross-sectional approach, taking the

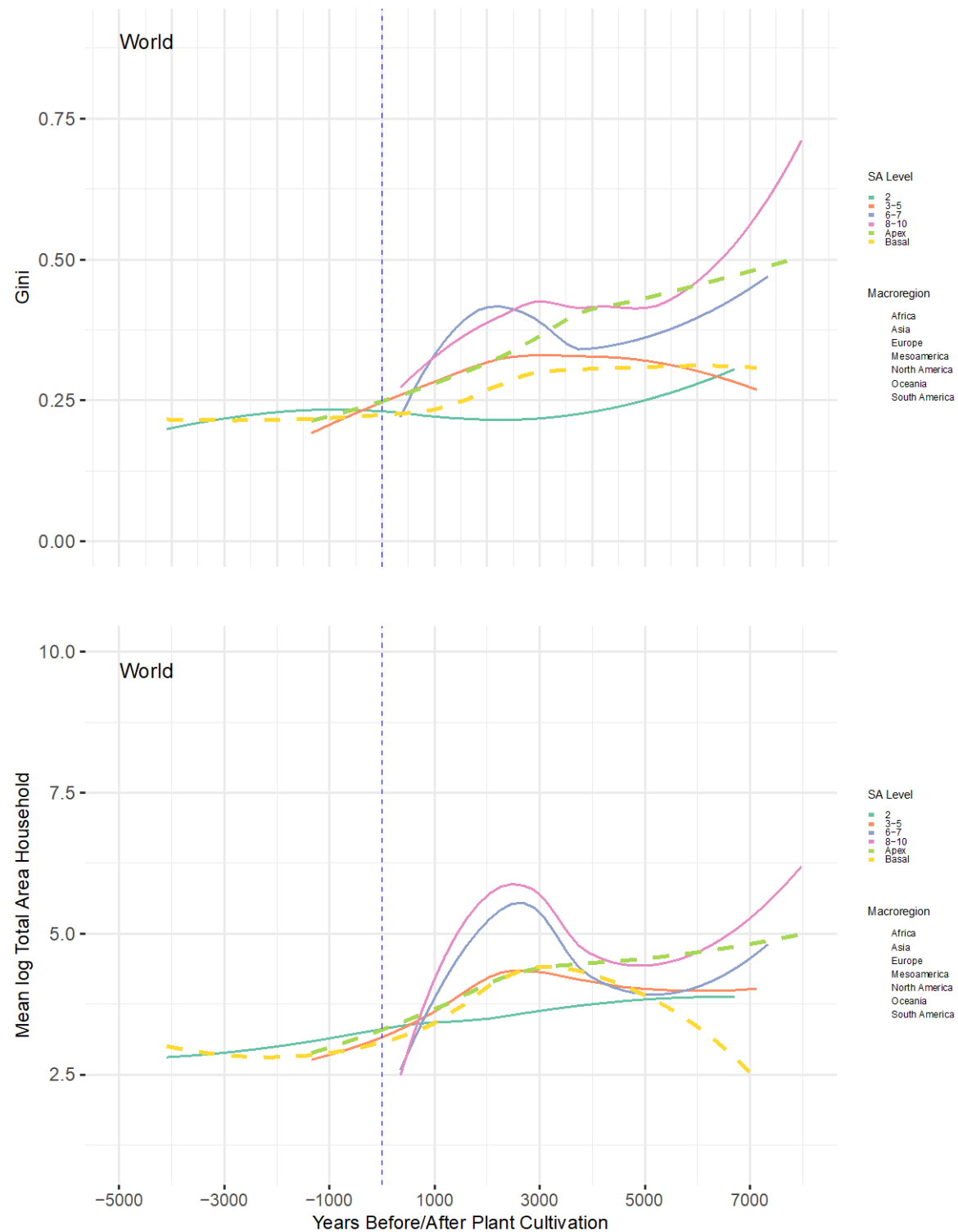
measures of inequality and wealth from the top and bottom panels of Figure 1 as the dependent variables. The top panel shows that high values for SA (Social Advantage) and for Fourscale (measuring extent of landesque capital development) increase inequality at high confidence. At lower confidence, presence of animals for riding, portage, and use of cultivated plants all increase Gini values. Iron smelting reduces Gini values (high confidence) as does bronze and copper smelting (both with low confidence). Kohler et al. (2025b) report and discuss these results in more detail, though the database used here is slightly larger, and the dependents were standardized, leading to slightly different results.

For this paper we add an analysis of the influences on economic growth, taking the wealth estimates in the lower panel of Fig. 1 as the dependents. The results bear some similarity to the results for wealth inequality, with interesting differences. Three variables in the analysis most connected to increasing wealth at these scales are Fourscale, DeltaCult (farming)—marked as present for sites in agricultural societies, and absent elsewhere—and SA. Horseback riding, animal management more generally, use of animals for ploughing (traction), and bronze smelting increase wealth at lower probability. Copper smelting decreases wealth at high probability, whereas iron smelting decreases wealth at low probability. The Bayes r^2 for wealth (0.64) is considerably higher than that for wealth inequality (0.33), suggesting that variables other than those considered need to be brought into the analysis.

The advent of metal working had consequences for wealth and wealth inequality that we did not anticipate. Copper and bronze smelting likely detract from wealth inequality according to our proxy, and iron smelting certainly decreases it. Copper smelting, and likely iron smelting, also decrease our measure of wealth (average house size). Two possible explanations for these effects come to mind, which need not be mutually exclusive. First, the appearance of these metals may be having narrow effects on our proxies themselves. Reasons for large residences in farming societies include space for storing grain or housing animals. These results strongly suggest that making or storing metals is an alternative path to wealth (and wealth inequality), and one that relaxes the need for a large residence. Alternatively (or additionally) the results for iron and for wealth inequality specifically are anticipated by the theory that iron, being cheaper than bronze, makes it possible for the first time to arm large numbers of men in warfare. Since such large numbers cannot be drawn from a noble class, this gives (bargaining) power to lower social strata, eventually increasing their social standing and decreasing wealth inequality. This argument was advanced by Axel Kristinsson (2010) specifically for Europe, but in light of our results may apply somewhat more broadly.

The strong connection between variability in levels of SA with variability in both wealth and wealth inequality—documented in Figure 2—reminds us that the urbanization and structural changes in employment invoked by Kuznets to explain the growth and increasing inequality in industrial societies were not in fact new processes, though they resembled processes experienced in antiquity about as much as a fire resembles the slow oxidation of an iron blade. Still, we must keep in mind that the curves graphed in Figure 1 are highly smoothed and it is possible that some of the trends they pick out were much more rapid, even step-like, in the event.

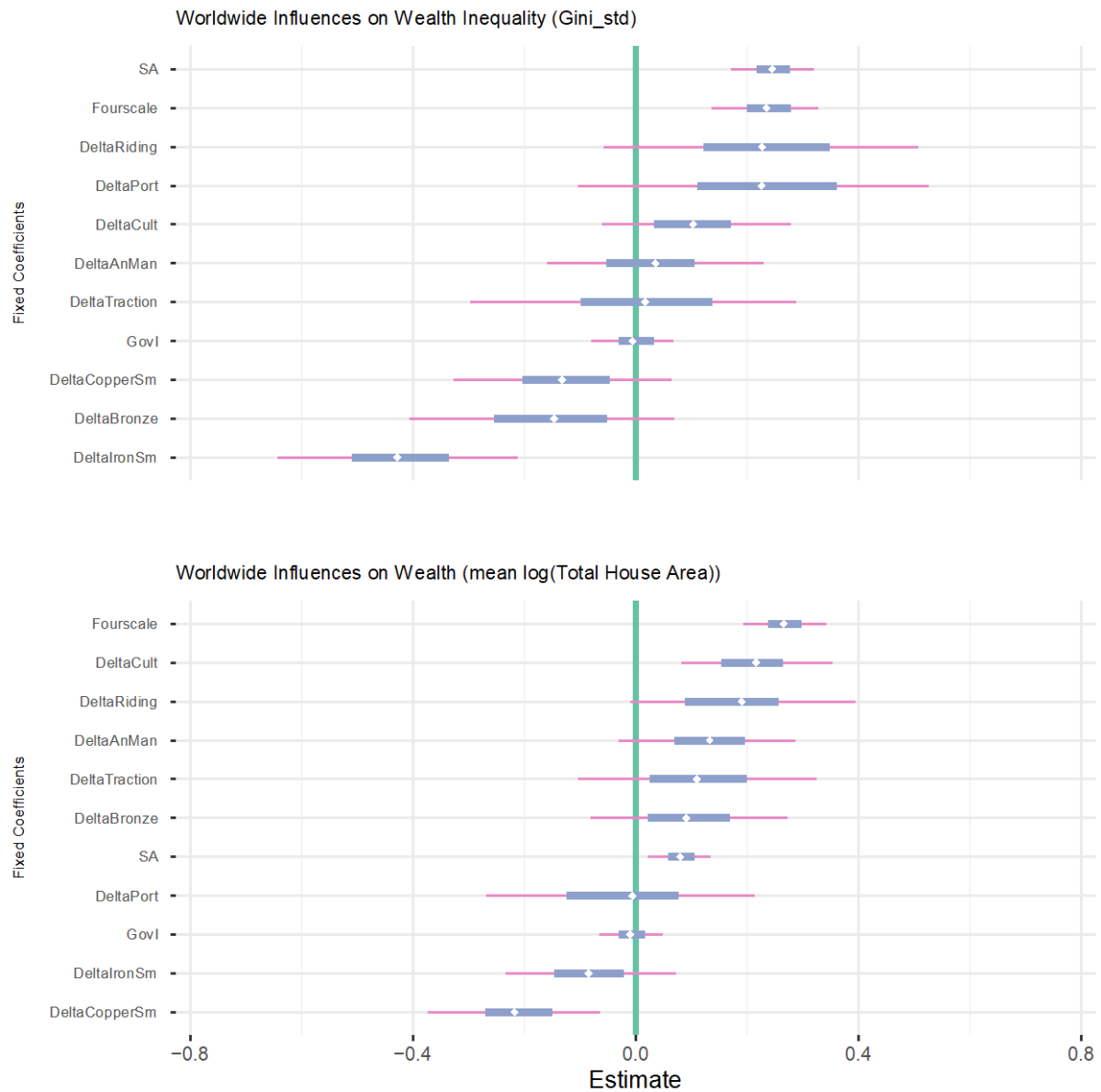
Figure 1: Distributional statistics computed by site through Δ years, controlling for SA level and designation as Basal or Apex



Note: years before/after Plant Cultivation (Δ years) are structure dates relative to the date when agriculture became locally common. Vertical line marks onset of common plant cultivation locally. Seven sites from Asia pre-dating Δ -5000 are not plotted. Smoothing is by loess (span=0.9). Top: Gini coefficients measuring housing inequality (interpreted as wealth inequality). Bottom: mean logs of house size, interpreted as representing typical living standards or wealth.

Source: authors' illustration based on data as described in Kohler et al. (2025a).

Figure 2: Fixed effects from Bayesian multilevel regression models for the entire sample (World) with 24 regions and 1164 sites (treated as cross-sectional data)



Note: credible intervals (CIs) for fixed coefficients are displayed as blue (50%) or red (90%); fixed coefficients ordered by median estimates displayed as white diamonds. Both models use random intercepts for regions. Top: Influences on Gini coefficients computed on household residence sizes by site; Bayes $R^2 = 0.33$. Bottom: Influences on typical wealth (mean of log of total residence size) by site; Bayes $R^2 = 0.61$.

Source: authors' illustration based on data as described in Kohler et al. (2025a).

2.2 Economic inequality and economic growth at regional scales

To further evaluate the Kuznets relationship (how growth and inequality are related over time) we need to reduce the scale of observation to regions whose size makes internal interactions plausible. We remind our readers that although this relationship is typically evaluated in contemporary societies using some measure of income versus a measure of economic performance such as GDP per capita (e.g., Milanovic 2016, fig. 2.18), the proxies available to us in archaeology are not precise analogues, and in some ways map better onto ideas of wealth, which are ironically more difficult to measure in a contemporary context.

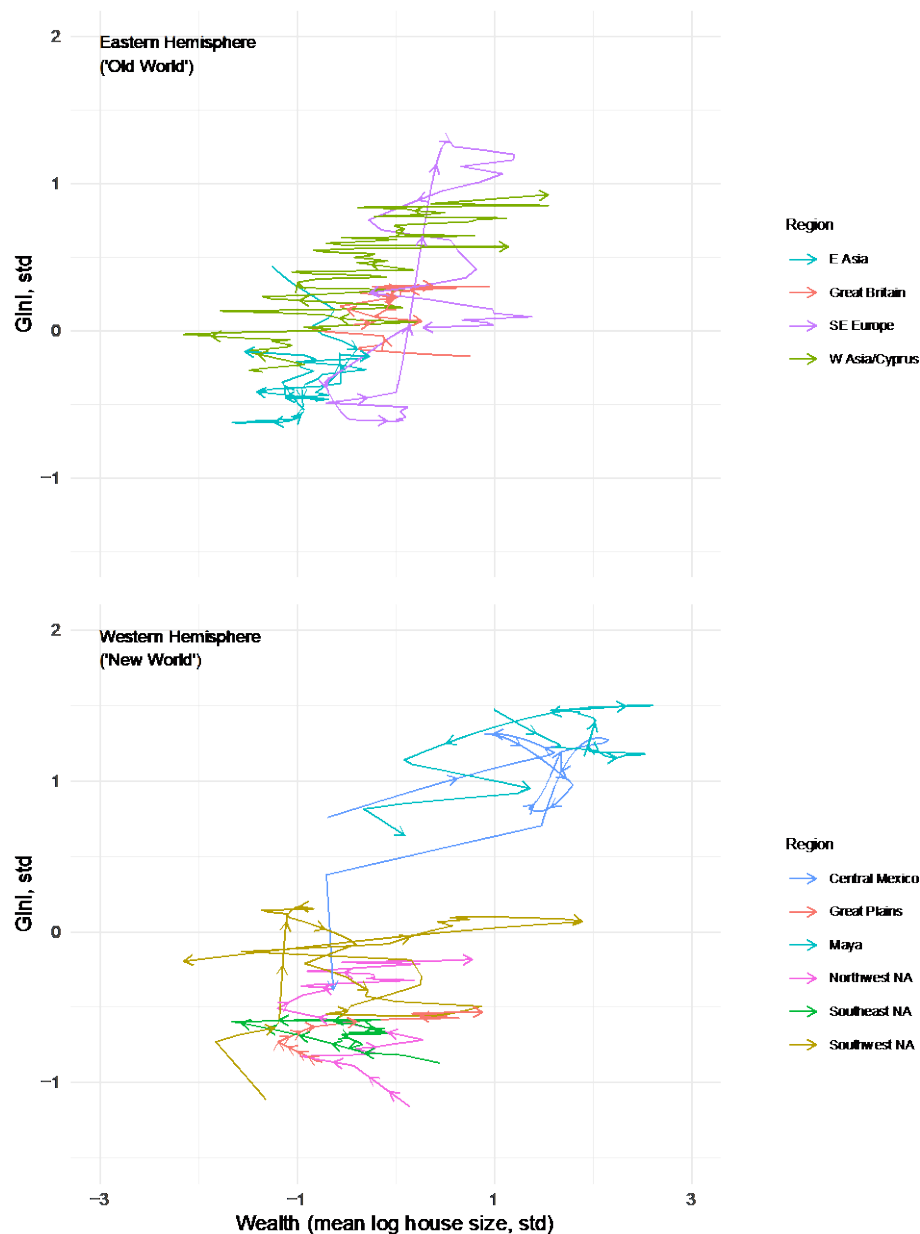
What sort of relationship between growth and inequality might we expect in such societies? Branko Milanovic has found that in historical societies with a steadily rising income—such as the developed world has enjoyed since the early/mid 19th century—inequality will first increase, and then later decrease, as growth proceeds. The mechanisms for increase suggested by Milanovic follow closely those originally suggested by Kuznets: movement from lower-income, lower inequality rural areas to urban areas offering the possibility of higher income produced by jobs in the industrial sector. But since such employment is not universal in urban areas these destinations also experienced higher inequality. Eventually however (in the USA beginning around WWI) inequality begins to decrease under pressure from ‘processes like wars, social strife, and revolutions’ brought on by the unsustainability of high inequality (Milanovic 2016, p. 98). Inequality ceased to decrease in these countries around the mid-1980s, when ‘a second technological revolution’ (still following Milanovic) driven by great improvements in information, communications, and transport technologies led to high-skill-biased wage differentiation and globalization. Milanovic suggests (not too convincingly given the self-perpetuating tendencies of plutocracy) that political and economic forces will eventually cause this wave to peak, and more generally that countries with steadily rising incomes will experience repetitive secular waves of inequality increase and then decrease.

But what is the expected pattern of the Kuznets relationship in a society with no increases in income? (Though we prefer to view our house-size-based proxy as a minimal estimate of wealth differentiation, we assume that over long periods wealth and income will be highly correlated.) The tendency among economists has been to assume that such relationships will be random, or irregular, driven primarily by external events such as plagues or wars (see Milanovic 2016, fig. 2.4). Yet Figure 1 above suggests that in fact both economic inequality and average wealth were slowly rising throughout significant portions of the Holocene, although the pace of such increases when averaged over the time scale in Figure 1 may seem insignificant to observers whose vision is trained on the last two centuries.

In Figure 3 we present the wealth inequality/typical wealth relationship through time as phase plots for the 10 regions that are best sampled in the current GINI database. The direction of time (Δyears) in these plots is indicated by arrows along each trajectory and at their terminations. Space precludes the discussion that archaeologists would appreciate of each of these, but to illustrate the approach we briefly discuss the West Asia/Cyprus region which has a reasonably large sample (90 sites) and a greater time-depth than any other region, with Δyears ranging from -1485 (9485 BC) at proto-Neolithic Hallan Çemi in Northern Mesopotamia to 7978 (22 BC) at the Classical site of Dura Europos, also in Northern Mesopotamia. This sample therefore constitutes an intermittent time series over nine millennia in length. The phase plot for this region in the upper panel of Figure 3, which uses fitted rather than raw values, begins with standardized Gini values of -0.28 at Δ -1485 coupled with standardized wealth values of -1.35 and ends with standardized Gini values of 0.92 coupled with

standardized wealth values of 1.55 at $\Delta 7882$. Between those beginning and end points the relationship zigzags between higher and lower wealth measures, though with a general trend towards higher values. The sequence likewise trends towards higher Gini values. Quick inspection of the other regions shows that this relationship is variable, though the sequences for Great Britain, SE Europe, and Northwest North America are generically similar to that in the West Asia/Cyprus region. Central Mexico and the Maya regions seem to move in the opposite direction, at least in their terminal portions. E Asia is for the moment restricted to hunter-gatherer-fisher and Neolithic sites in Japan and Korea, so its eventual directions of development in these two dimensions remains unclear.

Figure 3: Phase plots of wealth inequality (Ginis, standardized, calculated over house-size distributions) versus estimates for central tendencies for wealth (logs of the mean house sizes by site, standardized), through Δ years



Note: only regions with 40 or more sites shown. Fit is by the GAM function using a linear spline with cubic regression basis and 5 knots ($k=5$). In each series the latest point, and every tenth point, is marked by an arrow showing the local direction of time in the phase space.

Source: authors' illustration based on data as described in Kohler et al. (2025a).

These phase plots summarize a great deal of information in compact form and could become useful tools in the comparison of archaeological societies and regions, much like the plots comparing regional trajectories suggested by Peterson and Drennan (2012, fig. 6.14). They also allow us to pose and preliminarily answer questions such as, ‘are increases in inequality more likely to spring from times of low or high wealth?’ For the West Asia/Cyprus region at least the answer seems to be periods of higher wealth, not surprising since such times presumably represent periods when the surplus available for social manipulation is greatest (Milanovic et al. 2010).

Many readers will be familiar with phase plots from their use in studying solutions to systems of differential equations or for characterizing simple dynamical systems such as predator-prey relations. They will note (by contrast) the absence of fixed points or limit cycles in Figure 3; instead the societies in these regions are usually exploring new portions of this phase space. These behaviours—the novel and contingent histories tracked by the growth/inequality relationship—are typical of open, self-organizing systems of adaptive behaviour. And yet these plots are not without some regularities. Accounting for these will require use of many local models that work for limited portions of the temporal or social spectra, and a plurality of paradigms (Krakauer 2024). Such plots should be regarded as providing well-posed departures for explanatory journeys, not their destinations.

2.3 Detecting Kuznets’ ‘Tides’ in the relationship between economic growth and economic inequality

The *purpose* of Kuznets’ 1955 paper was to provide a framework for ‘underdeveloped’ economies and outline the pathways they should follow toward prosperity. Economic growth was thought to provide a pathway through a succession of different economic phases that could be difficult, which is why many economists thought that increasing economic inequality in supposed early phases of development was justified. Kuznets’ proposition that economic inequality was merely a phase that an economy had to endure to achieve prosperity became enshrined in modernization theory, a cornerstone of international economic policy for most of the 20th century AD (Lancaster and Van de Walle 2015). And indeed, many of the world’s nations attempted to follow this roadmap. Unfortunately, the economic trajectories that many embarked upon actually confounded the predictions of Kuznets’ theory, resulting in prolonged phases of increasing economic inequality, and structural economic changes that made reductions in that inequality difficult to envision. The dependency critique arose from the experience of many developing economies, positing that there must actually be many pathways to development—and underdevelopment (Hout 2016). Dependency theorists countered Kuznets’ theory with Wallerstein’s (e.g. 1974) argument that the role an economy played in the broader *capitalist world system* better explained differentials in access to resources than did progress toward modernization. Ironically, both modernization and dependency theory saw economic growth as the key variable of analysis, and in-depth studies of wealth and income distribution underwent a hiatus for most of the latter half of the 20th century (Milanovic 2023). Still, the debate underscored that economic development was the product both of the *internal* relationship between economic growth and economic inequality, and of *external* interactions between different economies.

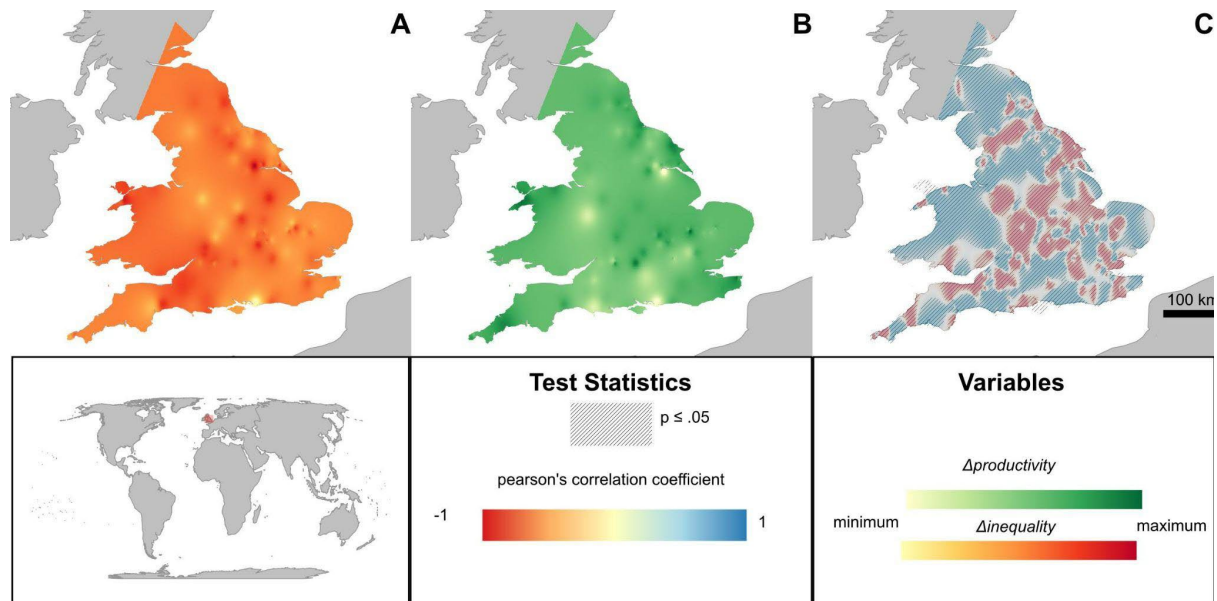
Our goal here is not to reprise this debate, nor to leverage the GINI database to contribute to it. Rather, the modernization/dependency debate highlights the need to investigate economic trajectories within larger world systems of interaction. After all, long before the resurgence of inequality studies within archaeology, many researchers had begun arguing that the interaction between different societies was equally or even more important to long-term trajectories of economic change (e.g. Adams et al. 1974; see review in Green et al. 2024, chaps. 1, 5). The distribution of

different categories of artefact (and especially the materials used to produce them) reveals that many world systems, or zones of interaction, have emerged, especially since humans began building cities (Blanton and Feinman 1984; e.g., Sherratt 1993; Wilkinson 2014).

In addition to allowing us to compare the general drivers of economic growth across a multitude of economies at continental scales, as above, the GINI dataset allows us to compare trajectories of change in economic growth and economic inequality within areas where the archaeological record attests to the emergence of zones of interaction within or between regions. Of course, doing so may reduce the sample of residence areas available for analysis, and so we must find ways to compensate for the data gaps that emerge. Figure 4 is based on Green et al. (2025), which uses inverse-distance-weighted interpolations of changes in economic inequality (A), again derived from the Gini coefficient of residence area, and change in economic growth (B), as calculated by changes in the mean-log of residence area in Roman Britain between AD 100 and 350. The resulting map reveals a decline in both economic growth and economic inequality in the period when imperial influence on the region waned. While this finding is interesting in itself, such interpolations can be used to extend the data available to the GINI database and compare the development trajectory of many different world systems (Green et al. 2024).

Figure 5, redrawn from Green and colleagues (Green et al. 2025), uses spatial interpolation to investigate the relationship between economic inequality and economic growth within three of the past world systems included in the GINI database, along with an additional assemblage of sites derived from the Spatial Analysis in Maya Studies dataset (Chase et al. 2023). Here, we find that the relationship between changes in inequality and changes in economic growth transform in surprisingly regular ways over millennial timescales. In the early phases of zonal interaction, economic growth rises while economic inequality drops, driven perhaps by an uptick in interaction among masses of everyday communities, such as when the earliest urban travelers forged networks of exchange in Bronze Age West Asia. However, as zonal interaction continues, and becomes increasingly geared toward extractive economic activities like imperial expansion, economic inequality rises and the relationship between economic growth and economic inequality reverses. After a phase of extraction, economic growth declines and economic inequality continues to rise, until eventually both decline together. Given the nature, scale and duration of these undulations in the relationship between economic growth and economic inequality, we called these 'Kuznets' Tides' (Green et al. 2025). As with the drivers of economic growth above, a wide range of variables likely shapes the relationship between these variables, and more data is needed to better reconstruct their shape, and new theories are needed to understand their drivers. However, just as economic growth often appears to be tied to Δ years across a range of different economic changes (Fig. 3), tides appear to begin with the introduction of weight metrology into different world systems (Fig. 5, B).

Figure 4: Spatial interpolations of changes in economic growth and changes in economic inequality between AD 100-350 in Roman Britain, as Roman imperialism reached its apogee then waned



Note: Map A depicts a spatial interpolation of changes in economic inequality, Map B depicts a spatial interpolation of changes in economic productivity (growth, or wealth). There is a weak positive correlation (0.132, p -value < 0.05) between these interpolations, as calculated in Map C. These interpolations use inverse-distance weighting from a sample of 85 sites.

Source: authors' illustration based on data as described in Green et al. (2025).

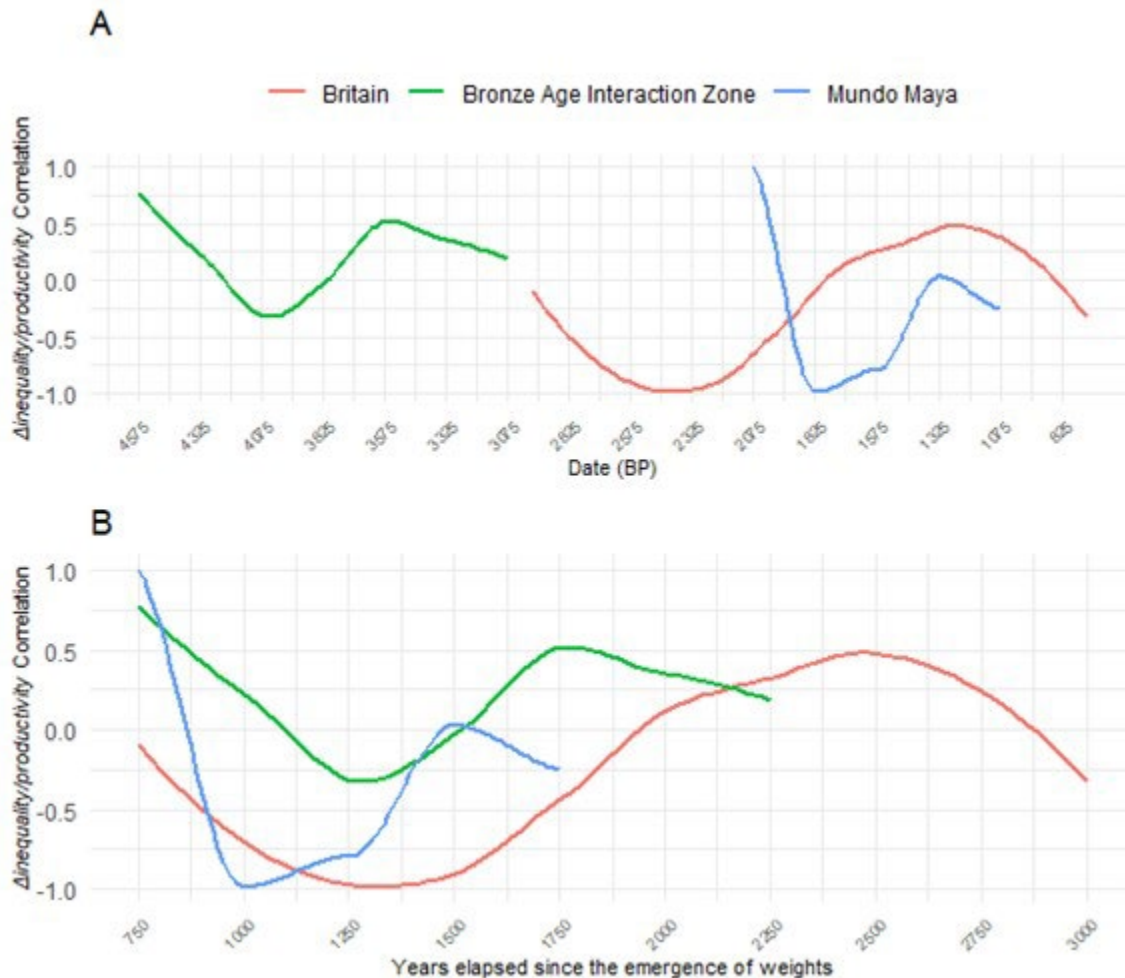
3 Discussion and conclusions

Our goal in this paper has been to show that the book of prehistory need not be so closed as economists (with important exceptions) have tended to believe. Treating it as one-dimensional, dismissed with a Malthusian epithet, places most of human history beyond the reach of economic analysis. Here we show that reasonable, if tentative, estimates of such basic economic constructs as economic inequality and economic growth through time are possible. This extends the purview of economic history for thousands of years and makes it possible to examine models, such as proposed by Kuznets (1955), over periods that not only pre-date the Industrial Revolution, but even the appearance of states and writing.

Any examination of the Kuznets model across the data presented here however is tentative and partial. We would be satisfied to have provided a proof of principle that will provoke our colleagues to extend the dataset and help sharpen the concepts employed. It's hard though not to note that several of the sequences in Fig. 3 generally trend up and to the right (implying a positive coupling between economic growth and economic inequality over these long periods) but that even these are subject to sharp reversals. If we had the ability to plot these precisely over the course of a couple centuries (as more data would allow) would these look like Kuznets 'waves' (Milanovic 2016)? The fact that archaeological data, in principle at least, can generate many more examples of these than the one-and-a-half cycles available to traditional economic historians suggests that archaeology may be able to contribute to a more general explanation for the Kuznets relationship than those currently on offer. Perhaps such contributions might even have benign contemporary applications in helping promote

growth without increasing economic inequality, extending both the relevance of archaeology in new directions (Ortman 2019), and the reach of economic history.

Figure 5: Kuznets' tides plotted by years before present and by years since the advent of weights and measures



Note: lines depict the correlation between Δ productivity and Δ inequality across space in different timeslices from each zone.

Source: authors' illustration based on data as described in Green et al. (2025).

Although plots such as Fig. 3 tersely speak volumes they present only the economic side of the social-evolutionary narrative. They reflect processes acted upon by, and in turn constraining or promoting, essentially all other aspects of human life. A broader and more satisfying view of life in these regions would need to consider physical health (Harper 2023), life expectancy and population growth rates (Kohler and Reese 2014), political organization, civil rights, and personal security; institutional arrangements facilitating or impeding economic growth and economic inequality (North 2010); technological progress and growth of usable knowledge (Mokyr 2005); and climates facilitating or impeding production and commerce (Fagan 2015). The research directions promoted here shed light on only a small part of the human story, but its centrality does not suit its neglect to date.

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