

The Economics of Empire: Housing Size and Per-Capita Wealth in Asia Minor

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Abstract

For much of the 19th and 20th centuries, classical researchers have sought to understand the political and military history of imperial Rome in far greater depth than the situation of its populace. In particular, scholarly inquiry into the Roman economy has tended to focus on extensive, or aggregate, economic growth at the imperial level. While these studies indicate that the scale of the Roman economy peaked roughly during the 1st century CE, the effects of this growth on the average person remain uncertain. Recently, scholars have attempted to answer this question using housing data from the western empire, arguing that house size can be a reasonable proxy for wealth. However, similar studies in the eastern empire have yet to be undertaken. This paper addresses the economic impact of Rome on the eastern empire, specifically in the region of Asia Minor by amassing and analyzing archaeological housing data from Anatolia; specifically by observed trends in the distribution of house sizes. After compiling a corpus of housing data from Pre-Roman, Roman, and Post-Roman eras, I recorded the changing trends in median house size and the distribution of house sizes. The data reveal that though median house size decreases over time, the largest houses actually underwent significant growth. This suggests a corresponding rise in economic inequality. Essentially, while little changed for the majority of Romans, the richest segment of the population experienced disproportionate benefit. Understanding such trends in per-capita wealth is crucial in developing a more comprehensive view of the economic and material well-being of Roman citizens. As a result, it provides one contribution towards developing a more comprehensive understanding of the Roman Empire as a whole.

Keywords: per-capita income, Roman imperialism, Asia Minor

1. Introduction

This study analyzes the economic effect of the Roman Empire on the lives of its individual citizens, seeking to more accurately quantify that effect and determine both its extent and direction. It will attempt to assess the economic effect of empire by looking at trends in house size distribution. In doing so, it aims to provide a better understanding on Rome's effect on the region of Anatolia as well as gain one additional data point regarding the larger question of an empire's economic impact upon its constituent regions.

Anatolia sits at a cultural crossroads within the ecology of the ancient Mediterranean world. Throughout the second millennium BCE, it served as the core of the Hittite Empire until its late Bronze Age fragmentation. Half a millennium later, the Lydian kingdom emerged, eventually covering most of western Anatolian peninsula. In addition to their socio-political influence, the Lydians were also the first to mint currencies from silver, gold, and electrum. Lydia, and Anatolia as a whole, would later be subsumed by the Persian Empire, and then under Alexander after the latter's invasion of Persia. Upon Alexander's death, succession in the region was uncertain, and over the next two hundred years Anatolian rule shifted amongst the Hellenistic dynasties. Eventually, the last major powers in Anatolia, the Attalids, relinquished control of the region to Rome in 133 BCE.

The goal of this paper is to analyze the economic impact of the Roman Empire on its citizens during this period, specifically in this region of Asia Minor. In order to do so, a reasonably accurate proxy for per-capita wealth that does not rely on multiple, potentially inaccurate metrics must be used. Methods for determining per-capita wealth often involve measuring net economic activity and dividing by population, but those methods are generally more problematic because they require accurate values for both net economic value and population - both values with potentially huge variation. By relying instead on one, easily quantifiable value - house size - and observing trends over time, we can hope to develop a deeper and more accurate understanding of a perhaps often-overlooked facet of the Roman Empire; the day-to-day lives of its constituent populations.

2. Literature Review

Since the mid nineteenth century, scholars have debated the effects that Roman imperial incorporation had on the various regions of the empire. In his article “What Did the Attalids Ever Do for Us?”, Philip Kay approaches the issue of Roman impact from an economic perspective, focusing chiefly on the economic goals of the Roman Empire with regard to Asia Minor¹. He contends that during the mid to late 2nd century BCE Rome was concerned primarily with economic exploitation of the region, referencing the “stable system of taxation” effected under Tribune Caius Gracchus, which provided for a dependable and reliable income that would be less reliant on capricious sources of income in Asia Minor. This taxation was used to fund Gracchus’ own economic programs in Rome proper, including aqueducts, roads, and other infrastructure. But despite this heavy taxation, the Romans refrained from annexing the region outright for some time. The debate as to the degree of Roman involvement with its more far-flung provinces has been both long-lived and divisive; opinions have ranged from Theodor Mommsen’s argument that Rome generally abstained from complete, intensive annexation and “preferred to support client states” as a matter of general policy², to William Harris’ contention that instead Rome had attempted to annex as many territories as it was able³. Whatever the details, Asia Minor during this period, though heavily intertwined with Rome through both economic and political ties, was not wholly annexed and retained some measure of independence. A brief overview of the history of this scholarly trajectory helps situate this current project.

While Kay focuses in large part on the impact of imperial taxation, Saller shifts instead to the Roman labor force as a whole and its impact on Roman society⁴. In “Human Capital and Economic Growth,” he claims that the Roman Empire, compared with its contemporaries, placed a “high investment in human capital,” referring to the degree to which most of the Roman labor force was educated and trained. Despite that investment, however, as the population increased, according to Kehoe, competition for labor and wages increased, until the workers were living on “bare bones-subsistence.” It must also be mentioned that the labor market was heavily influenced by slavery; as Scheidel describes Rome as a slave society and economy, workers were forced to compete with the free labor from slaves, comparing the Roman situation with the New World slavery systems⁵.

The economy of Asia Minor, and its coinage in particular, has also been a focus of previous study. Both Facella and Ireland note the growing (but still lacking) archaeological records of monetization during the 1st century EE and the 1st century CE, and believe it to be in part related to Roman influence⁶. In his 2014 article “Rome’s Economic Revolution,” Kay builds on the discussion of coinage by assessing the impact of silver bullion and credit. In doing he focuses primarily on Roman economic growth and development during the Roman Republic, between the Second Punic War and the mid-1st century BCE⁷. He theorizes that the increasing silver bullion and expanding credit of this period were chiefly responsible for the development of the Roman economy. According to Kay, the more liquid monetary supply allowed for increasing market developments like investment farming, trade, construction, and manufacturing, and he focuses primarily on those developments with regards to the elite of the Roman citizenry.

To this point, we have seen scholars focus primarily on the Rome’s political influence in Asia Minor in particular or in the greater Empire as a whole. Rome’s impact on economic growth is also debated. Kehoe’s suggestion that workers were still living at subsistence level⁸ is at odds with Saller’s contention that there was significant growth in terms of Rome’s human capital⁹. While the debate over economic growth in Asia Minor has yet to be settled, it has also not yet been assessed in a quantitative manner. The remainder of this essay attempts to provide one quantitative assessment of economic growth in Asia Minor through the use of archaeological housing remains.

3. Methodology

The goal of this project is to assess and compare the level of intensive economic growth - or lack thereof - in Asia Minor during Pre-Roman and Roman time periods (demarcated here by 133 BCE, when the last Attalid king bequeathed Pergamum to Rome). Naturally these periods are extremely wide-ranging in scope, but these broad periods are helpful in gauging the total impact of the Roman Empire because they isolate imperial occupation as a potential causal variable; more specific periods might be more heavily affected by other economic factors not related to Roman occupation. Narrowing these periods further will provide a more nuanced patterns regarding change in prosperity over time. The aim is to focus specifically on per-capita economic growth, a function of both total economic growth and population growth.

Rather than attempting to rely on values for both total population growth and economic growth, with the potential for exponentially increasing error, this paper attempts to employ a proxy that can be measured at the level of the individual. Specifically, it focuses on measuring the distribution of house sizes. The underlying assumption is that house size positively correlates with individual or familial wealth. And because this study tracks changes in the distribution of house sizes, it obviates the need for knowledge of the changing total population.

This proxy has its flaws. In some cases or some cultures, housing may have mattered more or less relative to total wealth; there may be a certain bias in discovered houses, with archaeologists preferring to devote their efforts to larger, more visible houses, or simply the fact that those larger houses may have been made of better materials and so survived for longer; houses may have survived through several periods of time, with modifications - but it seems generally to be more accurate than any current estimates relying on uncertain data for economic growth and trade and even less reliable values for population in each region during these periods.

The focus of this case study is broadly over Anatolia, but more specifically on a select few cities. We attempted to choose cities that were better documented, with larger corpora of houses that extended over several periods. Optimally, a site with a larger number of houses, with examples of housing from multiple time periods, would be best in order to accurately chart the effect of the Roman Empire on a particular region. This would limit the impact of region-specific factors other than Roman imperial impact. Knowing simply that the citizens of a particular region had an average house size of two hundred square meters during the third century CE is far less helpful than knowing that the citizens of a particular region had house sizes that declined by forty square meters on average from the third to the fifth centuries CE. Of those houses, two statistics, housing size and date of construction, are used to analyze the economic progression of the region between the Pre-Roman and Roman periods, as these are the most easily quantifiable measurements.

4. Data

The data set consists of 119 houses over several cities. The primary cities contributing to the set were Blaundos, Gordion, and Priene, but there are also house plans from the Miletus, Ephesus, Sardis, Aphrodisias, and Men Askenos. Blaundos contained houses dated primarily to the Roman period, while Gordion and Priene, on the other hand, were both chiefly Pre-Roman sites, with the houses in Gordion being dated primarily to the Phrygian period (approximately 900 BCE to 540 BCE), and the houses in Priene being dated to the Middle to Late Hellenistic period (after Priene was rebuilt as a planned city in the middle of the 4th century BCE).

Priene, though not the largest site in terms of data quantity containing a slightly smaller number of houses when compared to Blaundos) was a very useful site for data collection. Priene has extremely comprehensive and preserved archaeological records, and is in general an extremely well-researched site. Unlike some other sites, the buildings in Priene generally are very clearly delineated, with visible districts and unambiguous buildings, thanks in great part to the nature of Priene as a planned city. Unlike other, organically expanding cities, like Gordion or Blaundos, Priene was built as a city in a relatively short period of time, as a result of the destruction of the original city, and so the site plan of the city shows many elements of such planning. Residential districts are organized into blocks, and each of those blocks were almost identical - eight sections, each with a house, storefronts, storage areas, and a courtyard, with the stores generally opening onto a main street, so as to better facilitate access. The houses in these districts were generally poorer houses, as archaeological records show them being both generally smaller and made of cheaper materials, and located nearer to the walls of the city. The houses closer to the center were richer, made with luxury materials like marble, and larger. This supports the use of house size as a proxy for house cost - the houses that were clearly wealthier, based both on location and on composition, were larger than those made of poorer materials and situated in less choice spots, near the outskirts of the city.

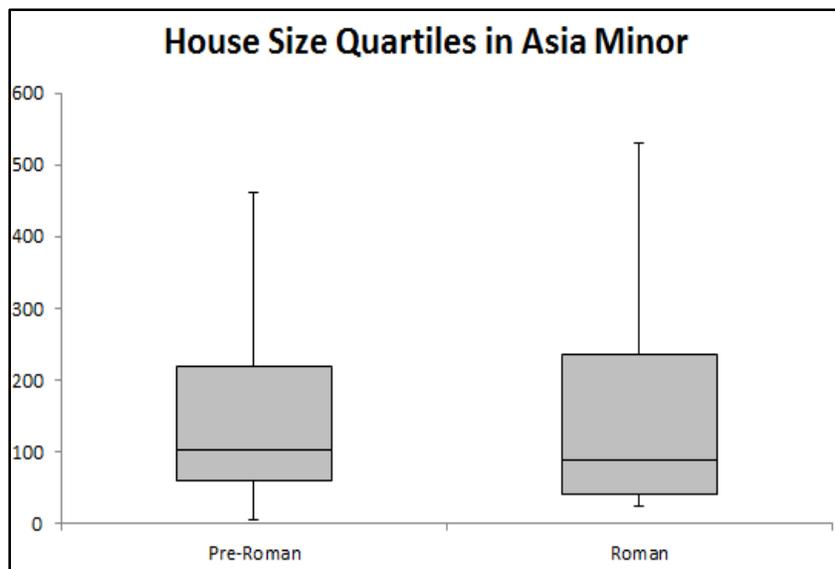
Ambiguity in the site plans of Gordium and Blaundos made house definition more difficult. The growth of these cities meant that a house built in the Pre-Roman era might have had wings and additions built onto it over time as it reached the Roman era. In some cases a large house would be split into two or more smaller houses as a result of the growing population and the need for more housing, and in others wealthy citizens would purchase multiple houses and either combine them or simply destroy them to construct an additional, larger house. Though this was by no means confined only to these sites, and in fact almost certainly occurred in any populous city that was occupied for more than a few centuries, in sites like Priene the original plans of the residential districts were generally still visible. This case study uses the size of the house when constructed, and the date at which the house was constructed; the investment involved in constructing a house most clearly correlates with the per-capita wealth and economic standing that this case study seeks to analyze, and it makes little sense to include each modified house plan in the dataset as an entirely separate house.

4.1. Data Analysis

The most important statistical metrics that this case study uses are the median and mean size of houses in a given region during a given period of time; also noted but less important are the first, third, and fourth quartile sizes and the inter-quartile range. Analyzing a combination of all of these metrics, and the trends of those metrics over the Pre-Roman and Roman time periods, allows us to get a sense for wealth distribution and income in multiple “classes” of each area. The datasets of both time periods were also represented by Lorenz curves and Gini coefficients. The Lorenz curve is a rough measure of inequality that plots the cumulative measure of wealth (in this case, house size) against the cumulative percentage of population, providing a relatively simple way to examine inequality; the steeper the curve, the greater inequality. The Gini coefficient is a number that roughly estimates that curvature, and by extension the inequality. Using both of those allows this paper to roughly gauge inequality in Anatolian wealth over the two periods.\

Between the Pre-Roman and Roman periods, median house size stays relatively similar; however, the difference between the mean house sizes is far more distinct. The median house size decreases modestly, from approximately 103 m² to 88 m². The mean house, on the other hand, increases dramatically, almost doubling from 169 m² to 309 m². In both cases, mean house size is larger than median house size, signifying that a small number of very large houses owned by the richest citizens are dragging the mean upwards. The fact that the difference between median and mean is larger in the Roman period suggests a correspondingly greater level of economic inequality, as the largest houses are significantly greater in size than the smallest houses.

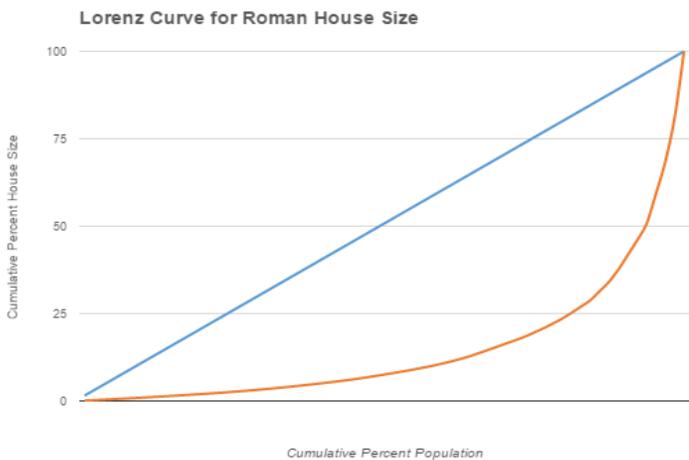
4.1.1. quartile graphs



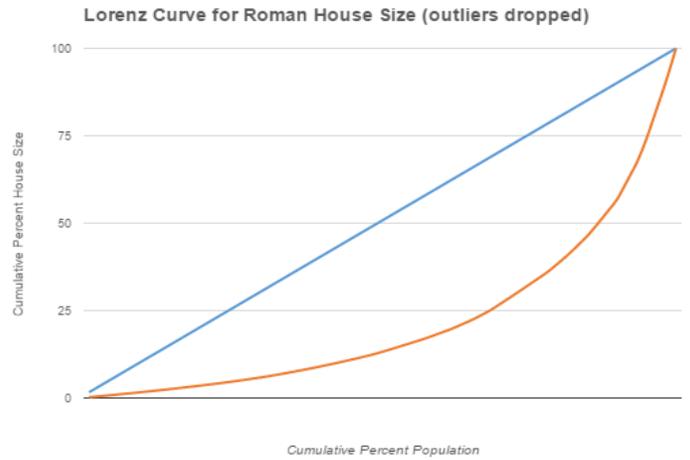
Graph 1. Quartile graph of house sizes in Asia Minor, split between the Pre-Roman period and the Roman period.

While mean and median house size are useful for providing a single measure of change in economic prosperity over time, they do so only at one point along the socioeconomic spectrum. By assessing quartile values, we are able to get similar point of comparison for other segments of the population. Even when this is done, the change in quartile values between those two periods also suggests similar results. For the majority of the populations, the bottom three quartiles, little changes in terms of economic well-being; housing size slightly decreases for the bottom two quartiles (19 m² and 15 m², respectively) and slightly increases for the third quartile (16 m²). However, there is a far more marked rise (68 m²) in the housing size around the upper limit, the richest quarter of the population, under Roman rule. This follows with the results from the mean and median data, where median house size (which would be more indicative of the actual economic well-being of the “average” citizen) would slightly decrease while the mean house size would increase by far more.

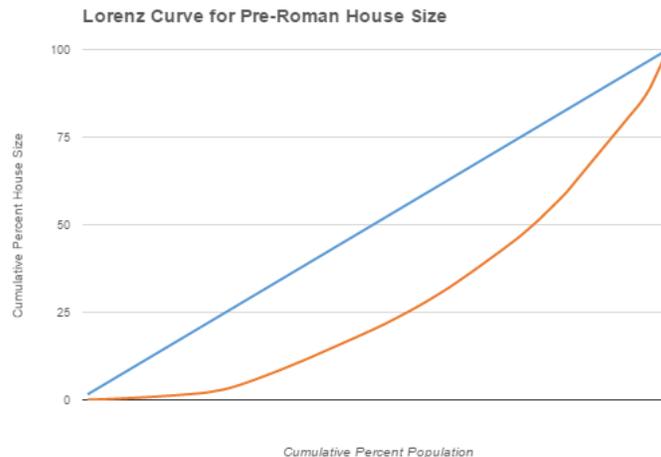
4.1.2. lorenz curves and gini coefficients



Graph 2. Lorenz curve for houses dated to the Roman period



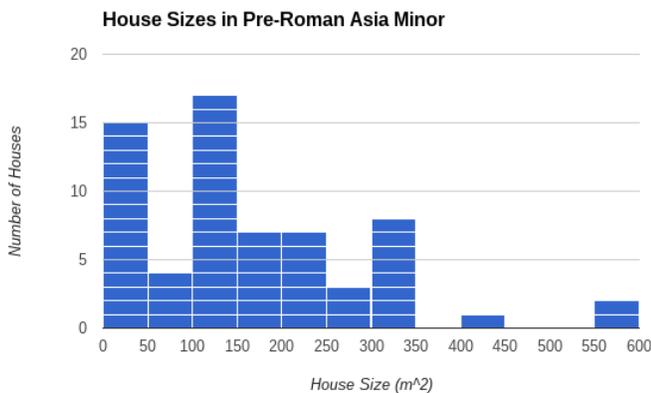
Graph 3. Lorenz curve for houses dated to the Roman period, discounting the four palaces that were significantly larger than the rest



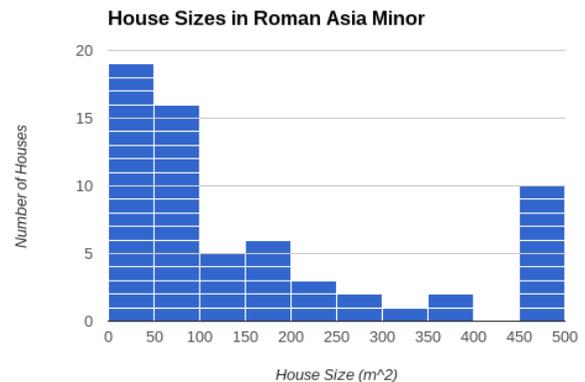
Graph 4. Lorenz curve for houses dated to the Pre-Roman period

Overall comparisons of the datasets between Pre-Roman and Roman Asia Minor housing indicate that inequality vastly increased. The Gini coefficient is almost doubled, rising from 0.4231 in the Pre-Roman period to 0.7171 in the Roman period, indicating a much greater inequality after the arrival of the Roman Empire. The Lorenz curve shown is also much steeper during Roman rule, visibly spiking at the highest percentiles of the population. The Gini coefficient and Lorenz curves in particular, more than other metrics like quartile values or median house size, were greatly affected by the largest four in the Roman period, which were several thousand square meters in size and may have heavily skewed the Gini coefficient. However, even when those outliers are removed, the Roman Lorenz curve is still significantly steeper than the Pre-Roman curve, as shown in the graphs above

4.1.3. histograms



Graph 5. Histogram for house dated to the Pre-Roman period, with a bucket size of 50 m²



Graph 6. Histogram for house dated to the Roman period, with a bucket size of 50 m²

The histogram, which would be less directly affected by a few distinct outliers, demonstrates similar results. In the Pre-Roman era histogram, the most common house sizes range between 100 and 150 square meters, but by the onset of Roman rule more houses are less than 50 square meters than any other “bin.” In addition, only two houses are larger than 450 square meters in the Pre-Roman era, an amount that increases to ten under Roman rule.

5. Limitations

While a large scale, quantitative approach is conducive to establishing broad patterns, both the methodological issues and the representativeness of the data set limit raise questions about the validity of the conclusion. The data set itself, or at least several of the metrics involved in the analysis of the data, were skewed by a number of outliers. In particular, the Lorenz curve, and the Gini coefficient derived from that curve, were disproportionately influenced by the existence of a few extremely large houses. However, those outliers did not create the trend towards increasing inequality that the dataset shows; they only compounded it, as the trends were still visible even without those outliers.

The necessity of strict categorization and definition of the houses of the dataset blurs the nuance and complexity of information regarding houses. Though each house was categorized as belonging to one of two broad periods - Roman and Pre-Roman - so as to compare the differing characteristics between houses before and after Roman influence, such broad classification does not take into account the fine-grained nature of change during this time frame. Concerns arise when houses are built in the pre-Roman period but expanded or divided in the centuries afterwards; should a house first built in the pre-Roman period but with wings built in the Roman era be considered a pre-Roman house with its original size, a Roman house with its new size, or two separate houses, each in its own era, as each is representative of the wealth of a different set of inhabitants? This paper seeks to deal with this issue by simply

recording the date of construction of each house, and the size when constructed; the initial investment involved with constructing a house is most clearly indicative of the wealth of each household, and thus can be better used to approximate that wealth.

One of the most important questions in assessing the validity of this study is that regarding the degree to which housing is indicative of wealth. If larger houses do not actually represent wealthier families, then the basic premise of this study would be fundamentally flawed - house size could not be used as a proxy for per capita wealth. There could be multiple possible reasons for a disconnect between housing size and wealth: trends in household size (people living in small households or on their own, as opposed to living with large extended families that would require larger houses), movement from generally more spacious rural homes to more crowded urban areas, rising or falling land prices in specific areas, different types of housing (as a modern corollary, consider the prices between penthouses and basement apartments of an identical size; in much the same way, perhaps specific types of design or architecture may have had significant impact on the price of a house, and by extension, the wealth of its inhabitants, without that impact carrying over in the observed house size), or homeless people growing to afford small homes that might bring down the average house size while simultaneously being representative of economic growth. But though these are certainly possibilities, and likely happened to some extent, far more factors seem to support the connection between housing size and per-capita wealth than to oppose it. No proxy is perfect, and cross-cultural anthropological studies^{10, 11} have confirmed the correlation between housing size and per capita wealth over many different cultures. There would likely be individual exceptions to the rule, with some smaller houses being made of more expensive materials or situated in choice regions of a city, but the relationship should generally hold.

The representativeness of the dataset might also pose an issue. By necessity, houses that were documented and had survived were chosen, which might have skewed the dataset towards richer houses that lasted longer by virtue of better materials, or towards larger or more lavish houses that might have been prioritized in the excavation process. But using site plans and reports from more exhaustively excavated sites with clearly delineated, contiguous residential areas like Priene should minimize such error, with a much lower chance of smaller buildings and domestic residences being overlooked. The potential for a bias towards larger houses is still noteworthy, but even accounting for it, the bias is not period-specific - such a bias would not be responsible for the rising inequality that the dataset shows in the Roman period when compared with the Pre-Roman period. Ultimately, this paper is reliant on finding and site documentation that has already been excavated and published; future fieldwork will undoubtedly add to and nuance its findings.

6. Conclusion

Despite the possibility of inaccuracies and distortions from the nature of both the dataset and the metrics used, the approximate agreement of all of the metrics with one conclusion seems to imply that a small segment of the population underwent far more economic growth and improvement than did the rest of Asia Minor. The dataset as a whole suggests that in Asia Minor, the rise of the Roman Empire generally increased economic inequality. Between the two periods, the small change in median housing size and the housing size of the three lower quartiles reveals that only a small subset of people benefited at all from the influence of empire.

This could be because only a few were greatly influenced at all economically; it is possible that only the previously wealthy were able to engage in large-scale, profitable trade with Rome, and therefore able to capitalize fully upon the benefits of contact with Rome. Some of the very rich houses that we found may also have been owned by a small number of actual Roman governors, plenipotentiaries, or other Roman surrogates, who would themselves have been capable of making large amounts of money (many Roman governors took their posts as excuses to reap an exorbitant income from their regions during the duration of their administrations). While the increased trade and wealth would have likely have also indirectly increased the economic well-being of most of the rest of Asia Minor (through a larger supply of money, increased trade with Rome, and a larger market for goods), this increase may have been offset by the substantial taxes that Rome is known to have drawn from its Anatolian subjects¹², thus resulting in little net change with regards to individual wealth.

This image seems to create a picture of Rome as generally hesitant to involve itself with its distant provinces to a significant degree, aside from taxation. Asia Minor as a region was very far from Rome proper, and certainly in the early years of the Empire considered to be more on the periphery of the Roman sphere of influence, accounting for the relatively small impact of the Empire on all but a very small selection of the population. In order to further investigate and corroborate this image the obvious continuation lies in measuring economic well-being in other regions of the Empire during the same period. Would regions closer to Rome, and therefore more closely tied - politically as well as economically - undergo economic growth, economic decline (if a conquered region was exhaustively taxed),

or increasing economic inequality to an even greater degree than in Anatolia? It would also be revealing to inspect regions conquered more violently than Asia Minor, such as Gaul or Britain, and how their economies developed under and as a result of imperial rule.

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