

# Working Papers in Economic History

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June 2018

WP 18-06

## Economic inequality in Madrid, 1500-1840

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### Abstract

The study of economic inequality in preindustrial economies has received recent attention by economic historians, who have tried to unlock the mysteries of the left side of the Kuznets curve. This paper will try to shed some light on the debate providing new estimations of economic inequality in the province of Madrid using a sample of rural locations around the capital. Estimates of inequality are based on fiscal records that are demonstrated in this paper to be adequate source for measuring differentials in wealth and income across individuals. We will offer not just an overview of the changes in economic inequality in the long run, but will also provide enough periodicity in our calculations to observe short and middle term changes to capture better the connection between changes in inequality and the economic cycle. The initial results seem to indicate that economic inequality in the province of Madrid rose between 1500 and 1840, although the pattern was not a linear one and was closely connected with the economic cycle, with inequality rising together with economic growth and viceversa.

Keywords: Economic Inequality, Wealth, Spain, Madrid.

**JEL Classification:** N33, D31, N93

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### Publisher:

Carlos III University of Madrid. Figuerola Institute of Social Sciences History

[www.uc3m.es/if](http://www.uc3m.es/if)

*Series:*

Working Papers in Economic History

ISSN: 2341-2542

*Electronic version of these working paper series available on:*

<http://hdl.handle.net/10016/16>



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# ***Economic inequality in Madrid, 1500-1840<sup>1</sup>***

*(Preliminary version – Please do not quote without permission)*

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## **Introduction**

The study of economic inequality in preindustrial economies has received recent attention by economic historians, who have tried to unlock the mysteries of the left side of the Kuznets curve. The available literature on the evolution of modern inequality tends to highlight two main conclusions. The first one suggests that urban areas are in general more unequal than rural locations, where social structures consequence of a lower degree of economic diversification are more egalitarian (van Zanden, 1995; Soltow and van Zanden 1998; Ramos Palencia and Nicolini, 2011). The second conclusion highlights the relationship between economic growth and rising inequality, suggesting that during the first stages of development both variables move together (Van Zanden, 1995; Van Zanden, 1995; Alfani, 2010a and 2010b). We count on studies of economic inequality in modern Europe, although in the case of Spain the literature is still very scarce. This paper will try to shed some light on the debate providing new estimations of economic inequality in the province of Madrid using a sample of rural locations around the capital. Estimates of inequality are based on fiscal records that are demonstrated in this paper to be adequate source for measuring differentials in wealth and income across individuals. We will offer not just an overview of the changes in economic inequality in the long run, but will also provide enough periodicity in our calculations to observe short and middle term changes to capture better the connection between changes in inequality and the economic cycle. The initial results seem to indicate that economic inequality in the province of Madrid rose between 1500 and 1840, although the pattern was not a linear one and was closely connected with the economic cycle, with inequality rising together with economic growth and viceversa.

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1 “The research leading to these results has received funding from the European Research Council under the European Union's Seventh Framework Programme (FP7/2007-2013) / ERC Grant agreement n° 283802, EINITE-Economic Inequality across Italy and Europe, 1300-1800”

The first part of the paper will present a survey of the existing literature on modern economic inequality, as well as the sources and methodologies used and the main results obtain in the studies. After the literature review we will describe in detail the sources that we use to estimate economic inequality and the reasons and evidences that we have supporting their reliability. In the same section we will also explain the inequality measurements that we will use to transform the raw data. The third part of the study will describe the sample of locations that we use from a brief description of their origin to the effect that different historical events had shaping their economic structure. In the following section we present the results, first individually in each one of the municipalities and later combining them to try to uncover a general pattern. Finally we will conclude the paper with a comparison of our results with other estimations of economic inequality in Spain in the long run, and studying if as in other cases in Europe there was a connection between economic growth and rising inequality.

### **Literature review**

The study of inequality in pre-modern times has received an increasing academic attention that has been translated into a growing literature that has exploited a wide variety of sources. Some of the studies like Milanovic, Lindert and Williamson (2007) have traced the evolution of income inequality back to ancient times, showing that although estimated through traditional inequality measures inequality levels in preindustrial economies today are not different to preindustrial economies in the past, the extraction ratios (or how extortionary the elites were) were considerably higher in the past.

Van Zanden (1995) carries out an analysis of income and wealth inequality for Holland, Germany, Italy and Britain during the preindustrial age. The combination of fiscal sources and income datasets reveals similar patterns that suggest that economic growth and prosperity were associated with increasing inequality during the first stages of development. The analysis of inequality in Dutch cities reveals that those locations of larger size were also those that presented higher inequality levels. On the other hand, rural areas enjoyed inequality levels (Gini 0.35) that were well behind their urban counterparts (Gini 0.52). In a later study Soltow and van Zanden (1998) reinforced the relationship between economic growth and increasing inequality in pre-modern times. Analysing the case of Holland, the authors argue that inequality increased sharply during Holland's Golden age (1561 and 1732). In the seventeenth century and according to the tax records almost all the wealth was controlled by 10 per cent of the households (Soltow and van Zanden, 1998: 41).

Lindert (2000) studied the evolution of economic inequality in England and the United States from since the late seventeenth century using a wide variety of sources from tax assessments to probate records. The analysis of traditional inequality measures reveals that inequality increased in England between the mid eighteenth century and

Napoleonic wars. In the case of the United States Lindert also observes an increase that took place from 1774 to somewhere nearby the 1900s.

Hoffman et al (2002) followed a different approach taking into account the differences in incomes between the top and the bottom social classes and introducing the concept of real inequality. The originality in their approach was based on the use of different consumption baskets whose prices followed different patterns, with a rapid increase of prices of bread and other “wage-goods” relatively to industrial and luxury goods consumed by the richest classes. Their conclusions show that once corrected by the correct price indexes, the ratio between the incomes of the richest and the poorest reveal an increase of inequality levels between the sixteenth century and the beginning of the nineteenth century in England, France and Holland. Similarly, measuring an augmented real inequality, Hanus (2012) documents an increase in real inequality in 's-Hertogenbosch, the Low Countries, during the first half of the sixteenth century and then a decline until 1636.

Alfani (2010a) used a highly detailed dataset on properties to estimate the changes in wealth inequality in the Italian town of Ivrea. The results show that as in many of the examples previously cited, economic growth and development was a force that increased economic inequality. The author points to the role of migration as a key factor to understand the rise in inequality, as immigrants tended to join the lower part of the income distribution. In a related study Alfani (2010b) explained not just the connection between inequality and growth, but also the high resilience of inequality over time. Dramatic changes like the arrival of the plague only had short term effects on the reduction of inequality that returned quickly to the pre-epidemic levels.

A recent study by Reis, Santos Pereira and Andrade Martins (2012) have used taxation records from several locations in Portugal from the capital itself and large urban areas to smaller rural municipalities. Their results show that unlike the trends showed in other parts of Europe, inequality levels fell in Portugal between 1600 and 1800. Another interesting conclusion reveals that inequality levels in Portugal were lower than those present in other European countries like Holland and France.

Although less abundant than in the rest of Europe, we also count on some studies that analyzes the changes in economic inequality in Spain. Ramos Palencia and Nicolini (2011) use probate inventories and wealth estimations from a contemporary survey to study wealth inequality in the province of Palencia. Their results suggest that those areas that were more urbanized with a stronger presence of the tertiary sector were also the ones that presented higher inequality levels. In this sense, their conclusions support the results from other areas like Holland (van Zanden, 1995 and Soltow and van Zanden 1998). Alvarez-Nogal and Prados de la Escosura (2012) use the land rent/wage ratio as a measure of income inequality, assuming that the incomes of the riches were represented by land rents and the income of the poorest by wages. They argue that income inequality in Spain was very low in the mid fifteenth century, but that increased rapidly until the late seventeenth century when it stagnated to later decline during the first half of the eighteenth century. After circa 1750 income inequality increased again until the first decades of the nineteenth century. Santiago-

Caballero (2011) followed a different approach and used the amount of grain paid as tithes to the church by each producer in the province of Guadalajara between 1690 and 1800 as an estimation of income. The difference between producers was used to measure income inequality showing a relative stagnation during the whole period with a small decrease in the last decades of the eighteenth century.

## Sources and method

The existence of fiscal records has been a constant source of information for the economic analysis of preindustrial societies all around the world. In this sense, Spain is not an exception and the study of tax records has been widely used by economic historians to estimate not just the fiscal charges supported by its population, but also for more ambitious tasks like the estimation of GDP (Carreras, Prados de la Escosura and Roses, 2006 and Yun, 1994). The *alcabalas* is an example of the taxes that existed in preindustrial Spain, and it was also the most important for centuries. The tax was created in 1342 by King Alfonso XI to finance the conquest of Tarifa, a city in the strait of Gibraltar that still remained under Muslim control (Andres Ucendo, 2004). In order to collect the resources required for its conquest, the King imposed a five per cent tax on all the goods that were sold on its kingdom. Although the tax was presumed to be temporary, the fall of Tarifa in 1344 did not suppose its elimination and in 1345 the King convinced the courts to maintain it permanently. The tax increased over time and in the fifteenth century reached the ten per cent representing an eighty per cent of the total revenues of the crown (Ossorio Crespo, 2005). During the reign of the Catholic Kings the way in which the *alcabalas* were collected changed significantly with the main cities of the kingdom being the responsible of paying directly the amounts estimated by the royal authorities. The system was named *encabezamientos* (headings) as it was the head city of each district the one that had to collect and pay the tax to the king and that in principle depended on their population and wealth. In some cases this distribution created an unequal distribution of the charges, because the population of some districts under control of the aristocracy was underestimated (Carretero Zamora, 2009).<sup>2</sup>

Once the amount to be paid had been estimated and sent to each district, their authorities had to distribute it among the locations under their control that at the same time had to decide the way in which their share had to be distributed among its economic agents. The distribution of the tax within each municipality changed considerably depending on its location and especially on the economic status and diversification. One of the most common ways of collecting the tax was through the rents that had to be paid by the sale of wine and meat. The increase of the *alcabalas* over time implied that in many cases the payment of the tax had to be extended to many other products. In the cases where the rents from the sales were not enough to

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<sup>2</sup> After the debate concerning the wrong estimation of the population in the Courts of Toledo in 1525, the King ordered a survey between 1528 and 1536 to estimate the exact amount of inhabitants in all the districts.

collect the required amount, the authorities used to tax the main economic activities in the municipality like artisans and traders. However, this was only an option when the size of the town was large enough to support these economic sectors and therefore not a realistic one in locations of smaller size. In those cases where the taxes of sales and on guilds was not enough to pay the *alcabala*, the local authorities had to rely on the *repartimiento* (sharing) of the amounts between all their inhabitants. In 1585 Philip II wrote an order where he demanded to know the amount of people in each location in order to pay the *alcabalas* where he wrote:

“ ... we should know the right amount of neighbours in each one of the towns, villages and places, rich or poor ... knights or hidalgos [low aristocracy], widows and young as all of them must pay the *alcabala*, and also indicate the clerics that were found as they also have to pay...”<sup>3</sup>

The distribution of the amounts to be paid among the population of each municipality had to be done respecting a principle of moral justice. Each family had to contribute depending on their capacity to do so, that was usually estimated based on the goods that they possessed or in other words depending on their wealth (Zabala Aguirre, 2000 and Irijoa Cortes 2011: 191) In some cases the rules that had to be followed for the distribution of the tax were extremely precise. For example the information that we have for the distribution of the taxes in the town of Segovia shows that the amounts to be paid by each family had to be decided by a royal official supported by a group of *good men*. Among the committee that had to evaluate the wealth of the population, there should be a representation of both richer and poorer families. We count on the written rules that were followed on the 14th of January 1490, where the authorities explain in high detail how the wealth of each family had to be estimated from their properties to the economic activities that they carried out (Asenjo Gonzalez, 1985:729). The *repartimientos* of *alcabalas* were less common in large urban centers, were the rents that were extracted from the sales of products like wine or meat and the revenues from commercial and industrial activities were enough to finance the payment. Therefore, it is usually in towns of middle size or in rural areas where we can find more abundant documents with *repartimientos* of *alcabalas*.

The same procedure followed to distribute the payment of the *alcabalas* among the population was also used in order to face other expenditures that were common at local administrative levels. The municipalities had to collect and pay other taxes like the *Servicio ordinario* and *extraordinario* (ordinary and extraordinary service). The *Servicio ordinario* was introduced by Charles V in 1525 while the extraordinary service was implemented by Philip II in 1577. Therefore we can also find records at local level of how these other taxes were distributed among the population following the same principles that were previously described for the *alcabalas*. In addition to the payment of taxes, the local authorities also had to confront other expenses like the improvement and reparation of infrastructures, cost of maintaining services like the

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<sup>3</sup> Averiguación de las alcabalas y vecindario de la villa de Yeste, caserías de Nerpio y dehesa de Taibilla durante el quinquenio 1579-1584, hecha por Gonzalo de la Peña, juez de comisión. Archivo General de Simancas. Expedientes de Hacienda, legajo 110.

local doctor, etc. In these cases the total cost was also distributed between the families of the municipality.

The records that include the distribution of the *alcabalas*, *servicio ordinario* and *extraordinario* or other local expenditures like the ones described previously, can be found in the historical archives of each municipality in manuscripts where the local accountants kept the details of all the amounts that had to be paid by each family. Given that in general the distribution of the taxes and the local expenditures was done depending on the wealth of each family, we decided to use them to estimate the levels of economic inequality.<sup>4</sup> In order to do so we need our sources to fulfill certain requirements. The first and most important of all is the existence of the source itself. Although the existence of tax records for Spain at a macro level is abundant, well organized and easily accessible, the availability of information at local and micro level is less generous. One of the main problems that we faced was the difficulty to find historical archives with enough information about any kind of *repartimientos*. The second requirement is the necessity of obtaining records with a time span large enough to capture the movements of economic inequality in the long run. Finally we need to be sure that the *repartimiento* is able to capture the real levels of economic inequality within each municipality and that includes a significant and representative sample of the entire population.

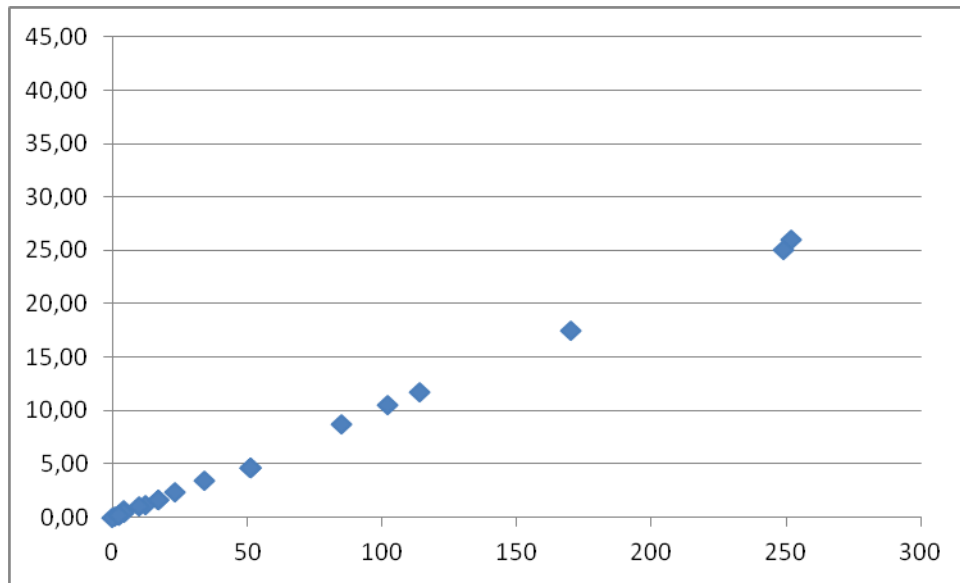
The data that are presented in this paper are concentrated in the municipalities of Getafe (south of Madrid) and El Escorial (north of the capital). In the case of Getafe we used *repartimientos* of *alcabalas* and *Servicio ordinario* and *extraordinario*, with records of the distribution of the taxes between 1497 and the first decades of the nineteenth century. The information from Getafe is rich not just in terms of temporal coverage, but also in its quality and high level of detail. There were clear explanations about how the distribution of the *alcabala* was done depending on the wealth of the families and we also count on detailed information about how it was estimated. We were even able to obtain a copy that showed in one of the years how the properties and economic activity of each family was valued and translated into cash. A cross analysis of this estimation of wealth and the amounts that had to be paid in the *repartimiento* that year shows that the tax was neither progressive nor regressive, but a proportional one as it can be observed in the sample of families presented in Figure 1. In the list of payments of the *repartimiento* we also include people who paid nothing and the names and contributions of families connected with the low aristocracy. Therefore we believe not just that the records are accurate representing the economic differences across the families included, but also that it included both the lowest and highest socio-economic classes of the town.

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<sup>4</sup> Other authors have also used local *repartimientos* to analyse wealth (Vitores Casado, 2009), socio-economic differences (Sanchez Benito, 2008) and even population (Valdeon Baroque, 1980).



**Figure 1: relationship between wealth and payment in the *repartimiento***



Source: *Libros de repartimientos*, Archivo histórico de Getafe.

To analyse the evolution of economic inequality in our samples we decided to use the most common statistical procedures. The first and most simple one is the analysis of the percentage of wealth in the hands of the top and lower deciles and the ratio between them. The study of the deciles will allow us to understand not just if inequality increased or decreased, but also to see if the changes were consequence of movements in the upper or lower part of the distribution. The other two measures of inequality that we will use are the Gini coefficient and the Theil index. The Gini Coefficient measures the dispersion of the observations in a sample and has been widely used to measure inequality. The coefficient takes values between 0 and 1 attributing a value of 0 to perfect equality and a value of 1 to perfect inequality. In other words and in the case that we are studying, the Gini Coefficient would be 0 if all the families pay exactly the same amount in the *repartimiento* and 1 if one family pays the whole amount. In mathematical terms the Gini Coefficient can be defined as:

$$G_1 = 1 - \sum_{k=1}^n (X_k - X_{k-1})(Y_k + Y_{k-1}) \quad (1)$$

Where G is the Gini coefficient, X is the cumulated proportion of the population variable and Y is the cumulated proportion of the payments. Using the information provided by the *repartimiento* books and following the methodology presented above, we generated decadal calculations of the Gini coefficient in our samples. We used bootstrap methods in order to estimate standard errors and to construct confidence

intervals that would reveal if the changes detected are statistically significant.<sup>5</sup> Although the Gini coefficient is a good way of measuring the changes in total inequality, it also has limitations. A different way of measuring inequality levels is the use of generalized entropy measures like the Theil Index, a measurement that has also been widely used in the literature of income inequality (Steckel and Moehling, 2001; Mora Sitja, 2006) and is defined by the formula (2) where  $n$  would be the number of producers,  $w_i$  the production of the individual  $i$  and  $\mu$  the arithmetical average of the sample. As in the case of the Gini coefficient we use bootstrapping methods to estimate confidence intervals.

$$T = \frac{1}{n} \sum_{i=1}^n \frac{w_i}{\mu} \ln \left( \frac{w_i}{\mu} \right) \quad (2)$$

Following this methodology we used the *repartimientos* to estimate the evolution of economic inequality every ten years, trying to locate the records for the first year of the decade (1500, 1510, etc.). In the cases where we did not have the records for that particular year, we used the closest *repartimiento* that was available. That is the case for example for the year 1500 in the town of Getafe, where we used the information from a *repartimiento* of 1497.

### **The sample: Getafe, El Escorial and Alcala de Henares in modern times**

This paper presents the results for Getafe, El Escorial and Alcalá de Henares, three towns located around Madrid that were chosen for both methodological and historical reasons. Figure 1 presents the exact location of the three towns and their relative position with respect the capital.

**Figure 2: Map of locations**

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<sup>5</sup> The method uses bootstrapping following Steckel and Moehling (2001).



The importance of Getafe as a case study relies on the fact that in preindustrial times, the town became the largest urban centre nearby Madrid. Located just 12 kilometres south of Madrid, Getafe took advantage of its strategic position in the middle of the Royal Way that connected the old imperial capital of Toledo and the new capital Madrid. The *Relaciones Topograficas* of Philip II written in the 1570s are probably the oldest source with recorded evidence concerning the origins of Getafe. In the manuscripts of Getafe we can read:

*“That this place is called Getafe and that we are not sure about why this name was chosen, although after gathering information the name in Arabic language is Jata and means long thing... and where it is now, was close to another village that was called Alarnes, and because this one [Getafe] was located in the royal way between Madrid and Toledo and Alarnes was a humid and sick place, many of its inhabitants came here to build their houses...”*<sup>6</sup>

The description of the origins of Getafe make clear the importance of its location in the royal way and even the name in Arabic (long thing) seems to be related with the fact that the town grew along the way adopting a linear shape. The proximity to Madrid and the excellent connections with the transport network of Castile meant that Getafe grew rapidly and soon became the largest town around the capital. In the early sixteenth century Getafe had a population of around 200 families, a number that had grown to around 1,000 at the end of the century. Although the terrains around the town were not bad for the cultivation of grain, they were scarce and according to written records they limited considerably the possibilities of maintaining a strong rural

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<sup>6</sup> Text extracted from Alvar Ezquerra, A. 1993. *Relaciones topográficas de Felipe II*, Madrid. Madrid, Consejería de Cooperación, pp. 389-391.

economy. The agrarian handicap was probably compensated by the rise of an urban and services economy around the activity that rose around the royal way and the visitors and travelers to the Madrid. We can therefore define Getafe as a town that took advantage of its location and that was able to prosper around the economic dynamism of the capital.

El Escorial is located at the feet of the mountains of Guadarrama, 49 kilometres northwest of Madrid with an altitude of more than 900 metres. The origins of El Escorial are less clear than the case of Getafe, although the name seems to indicate a relationship with Arabic origins that would bring its creation back to the High Middle ages. The sixteenth century is a period of constant and rapid growth for the town that became independent in administrative terms. In the mid sixteenth century its population reaches more than 100 families in an economy that was predominantly rural with practically all its inhabitants working their own lands. However, the most important event in the history of El Escorial was the victory of Philip II in the battle of San Quintin, where he defeated the French armies. To commemorate the victory, Philip II decided to build an immense palace-monastery in El Escorial that we called San Lorenzo, honoring the Saint whose feast was celebrated the day of his victory. The construction of the palace changed completely the town that doubled its population. The arrival of the monks to the monastery also supposed that the prior became the main authority until the second half of the eighteenth century.

Arganda del Rey is a city located 30 kilometres south east from the capital. Its origins seem to be connected with the Arabic conquest during the middle ages and during the modern age it remained a middle size municipality with around 500 families in the middle sixteenth century and experienced a sustained demographic growth during the following centuries. The *Relaciones topográficas*, a survey that in the case of Arganda took place in 1576, reveal an economy that was mainly rural, where most of the neighbours were farmers and that also sustained a large proportion of poor families.

Located 35 kilometres east of Madrid, the origins of Alcala de Henares lay in the town of Complutum that was built by the Romans in the first century. In the middle ages, the Muslim rulers that had conquered most of Spain built a fortress on the outskirts of the town that was then known as "Al-Ka'a-Nahar" or "Castle of Nahar" being Nahar the Arabic name of the river Henares nearby the city (de Salam, 1973). The importance of Alcala de Henares relies on its size and historical background. Although it was not as close to Madrid as Getafe, Alcala de Henares was the largest city of the province around Madrid with more than 2,300 families in 1591. In 1498 cardinal Cisneros built the University in Alcala that enjoyed its own golden age during the sixteenth century. The urban nature of Alcala is supported by the information from the *Catastro de la Ensenada*, a fiscal survey carried out in the mid eighteenth century that reflects the diversification of its economy, presenting a town a town full of professors, lawyers, artists, merchants and artisans.

The dynamism of an economy in preindustrial times can be estimated by analyzing the evolution of its population. Table 1 presents the changes in the population in Alcala de Henares, Arganda del Rey, El Escorial, Getafe, Madrid (city) the province of Madrid

and the province minus the population in the capital. We can observe that between the late sixteenth and the mid eighteenth century all the towns lost ground except Arganda, especially Getafe and Alcala de Henares that lost half of their populations. In the case of El Escorial the decrease was less deep but still substantial with a reduction of 29 per cent. Madrid on the other hand more than tripled its population while the rest of the province also lost around one third of its inhabitants. The role of Madrid as growth pole had serious consequences in the surrounding urban areas that suffered depopulation. Real wages in the capital increased between 1680 and the mid eighteenth century, especially for skilled workers whose salaries doubled (Llopis Agelan and Garcia Montero, 2011:303). However, economic conditions in the capital worsened in the second half of the eighteenth century and the demographic growth of Madrid slowed down until the first decades of the nineteenth century (Ringrose, 1983:26). Alcala de Henares was able to recover a significant part of its population and doubled it between 1750 and 1868 and El Escorial was also able to recover the population of 1591. Although population in Getafe increased by 54 per cent, it still remained below the maximum levels reached in the late sixteenth century.

**Table 1: Evolution of the population in the province of Madrid (families)**

	1591	1750	1.868		1591-1750	1750-1868	1591-1868
<b>Alcalá de Henares</b>	2,345	1,193	2,424		-49%	103%	3%
<b>Arganda del Rey</b>	532	652	898		23%	38%	69%
<b>Escorial, El</b>	180	128	174		-29%	36%	-3%
<b>Getafe</b>	1,165	580	892		-50%	54%	-23%
<b>Madrid</b>	10,642	33,135	76,448		211%	131%	618%
<b>Province</b>	53,939	62,872	123,240		17%	96%	128%
<b>Province - Madrid</b>	43,297	29,737	46,792		-31%	57%	8%

Source: For 1591 INE (1985) for 1750 INE (1994) and for 1868 Instituto de Estadística de la Comunidad de Madrid (1995).

We must take into account the fact that the numbers for the 1591 census are probably overvalued (Alvar Ezquerro, 1993) although this would also be the case for the rest of the sample that shows more demographic dynamism than Getafe. We believe that one of the reasons behind the erratic demographic performance of Getafe is the same that explained its rise as one of the largest urban centres of Madrid. The proximity of the town to the capital can explain why Getafe presented a more volatile population than Alcala de Henares or El Escorial. Being just within a 3 hours walk from Madrid and given its nature as place of passage, we would expect a more unstable demographic regime. There was also another handicap that Getafe had to pay for its proximity to Madrid. In times of political turmoil and war, armies that were directed to control the capital remained in the outskirts of Madrid, and Getafe was often occupied with devastating results. That was the case of the War of the Spanish Succession between 1701 and 1714 when the armies of both sides remained in the town halving its population. A similar event took place in the early nineteenth century with the

invasion of the Napoleonic armies. Our analysis of the fiscal sources supports the chronicles and the substantial changes in the population of Getafe.

### General trends in economic inequality 1500-1840

To estimate the evolution of inequality in the case of Getafe, we used information from the payment of *alcabalas* and also from the *Servicio ordinario* and *extraordinario* that were described previously. In both cases the distribution of the payment between all the families in the *repartimiento* was carried out taking into account their wealth and income. The long term analysis between 1500 and 1840 shows an increasing trend with the lowest Gini reached in 1500 (0.45) and the highest in the first decades of the eighteenth century (0.80) similar to the one that we find in 1840 (0.76). The sixteenth century is a period of increasing inequality in Getafe that grows until the last decades of the century. The first half of the seventeenth century on the other hand shows a decline in inequality levels that are particularly deep during the 1750s. However, inequality rises again during the last decades of the century to reach the maximum levels around 1710. The Gini coefficient then falls again until the middle of the century to later increase and remain high until 1800 when we observe a sharp decline. The evolution during the first decades of the nineteenth century seems to be an increase of inequality to return to levels similar to the maximum reached in the early eighteenth century.

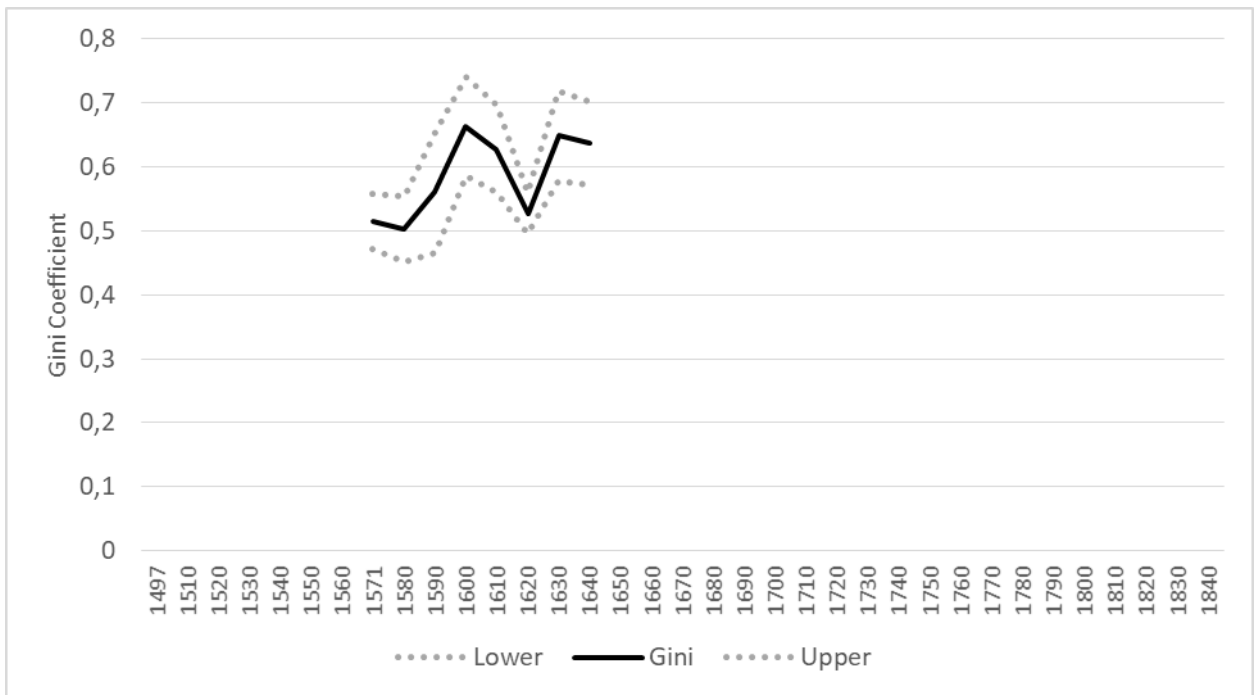
**Figure 3: Inequality in Getafe (Gini coefficient and 95% confidence interval)**



Source: Libros de repartimientos, archive histórico de Getafe.

In the case of El Escorial we used information from *repartimientos* of the *Servicio ordinario* and *extraordinario*. The sample for the town is more limited than the series that we were able to obtain from Getafe and range from 1570 to 1640. The trends are similar to the ones that we observe in the case of Getafe, with the Gini coefficient rising between 1570 and 1600 to later remain stable. The lowest values are found during the first decades of the period where the Gini coefficient reached 0.50 points and the maximum inequality levels were reached around 1600 when the Gini coefficient rose to 0.66.

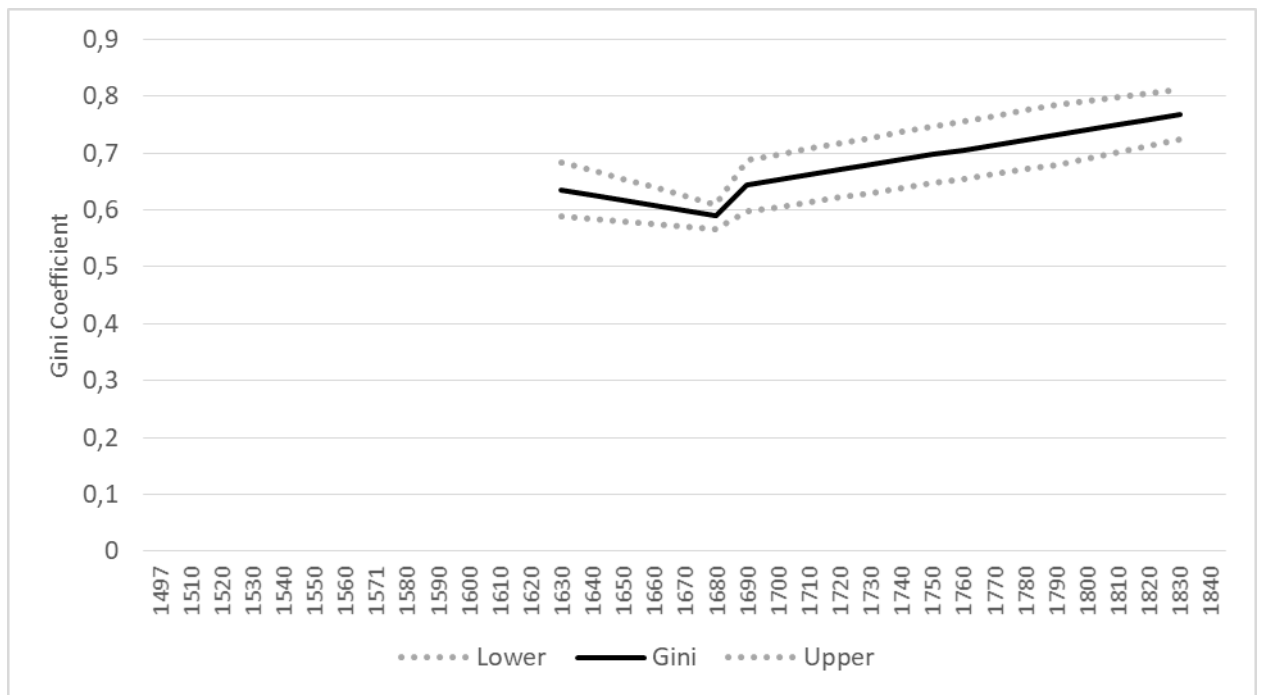
**Figure 4: Inequality in El Escorial (Gini coefficient and 95% confidence interval)**



Source: Repartimientos from El Escorial, Archivo Histórico de El Escorial. See appendix for a detailed description.

For Arganda, measures of inequality were calculated from *repartimiento de alcabala, cientos y médico* for the years 1632, 1677, 1678 and 1690 and *repartimiento de millones y tercios* for 1786 and *Repartimiento de la contribución real* for 1828. The Gini coefficient averaged more than .6 for 1632 and 1677 and had an increasing trend during the eighteenth century to reach more than 0.75 in the 1820s.

**Figure 5: Inequality in Arganda (Gini coefficient and 95% confidence interval)**

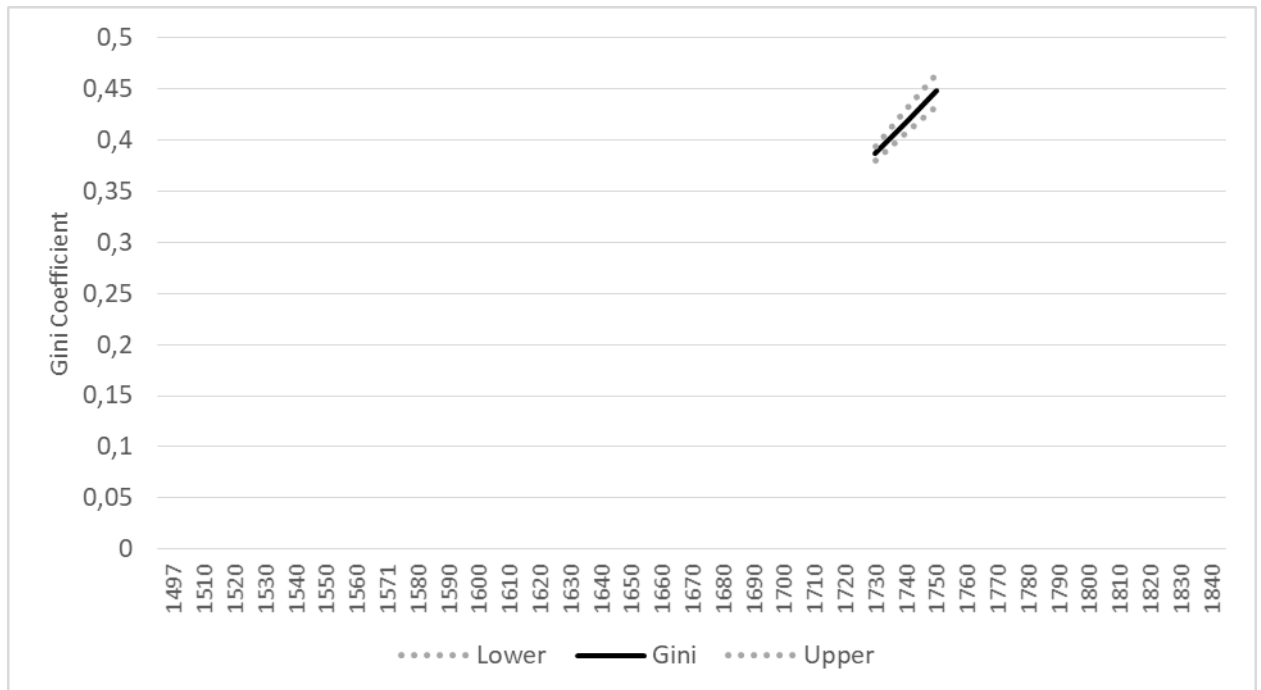


Source: Repartimientos from Arganda, Archivo de la ciudad de Arganda. See appendix for a detailed description.

Alcala de Henares was not just the largest city in our sample, but also the one where the amount of information that survived was scarcer. We were not able to find *repartimientos* of *alcabalas* or *servicio ordinario* and *extraordinario*, the taxes that as we explained before were the best candidates in order to estimate inequality levels. On the other hand, we were able to locate two *repartimientos* of *cuarteles* (barracks), where the families of Alcala had to face the payment of an amount of money dedicated to military expenditures of the Crown. However, when we analyzed the *repartimientos* of *cuarteles* in Alcala, we observed that although the amounts paid by each family were different, the same numbers were repeated very often, meaning that the distribution had been done using ranges of wealth and income. In other words, all the families whose incomes belonged to a certain range paid the same amount. As we explained before in Figure 1, this was not the case of Getafe where the payment of the *alcabala* was directly proportional to the wealth and incomes of each family. Therefore, although this sort of *repartimiento* can shed some light on the trend of inequality, the averaging of the payment will underestimate its real value obtaining Ginis that are lower in level than the real ones. In any case the *repartimientos* in Alcala also give us information about the profession of the person who paid the tax, information that supports our view that those families with a higher socio-economic status paid more. The fact that people in the same professions also paid different amounts supports the reliability of the source, as it indicates that the *repartimiento* was not done depending on the profession as an estimator of wealth and income, but on the economic potential of each family (see Figure 9 in appendix). The two *repartimientos* that we obtained indicate that inequality in Alcala de Henares increased between 1730 and 1750. The result is the same that we observe in the case of Getafe and the relative change is also similar.



**Figure 5: Inequality in Alcalá de Henares (Gini coefficient and 95% confidence interval)**

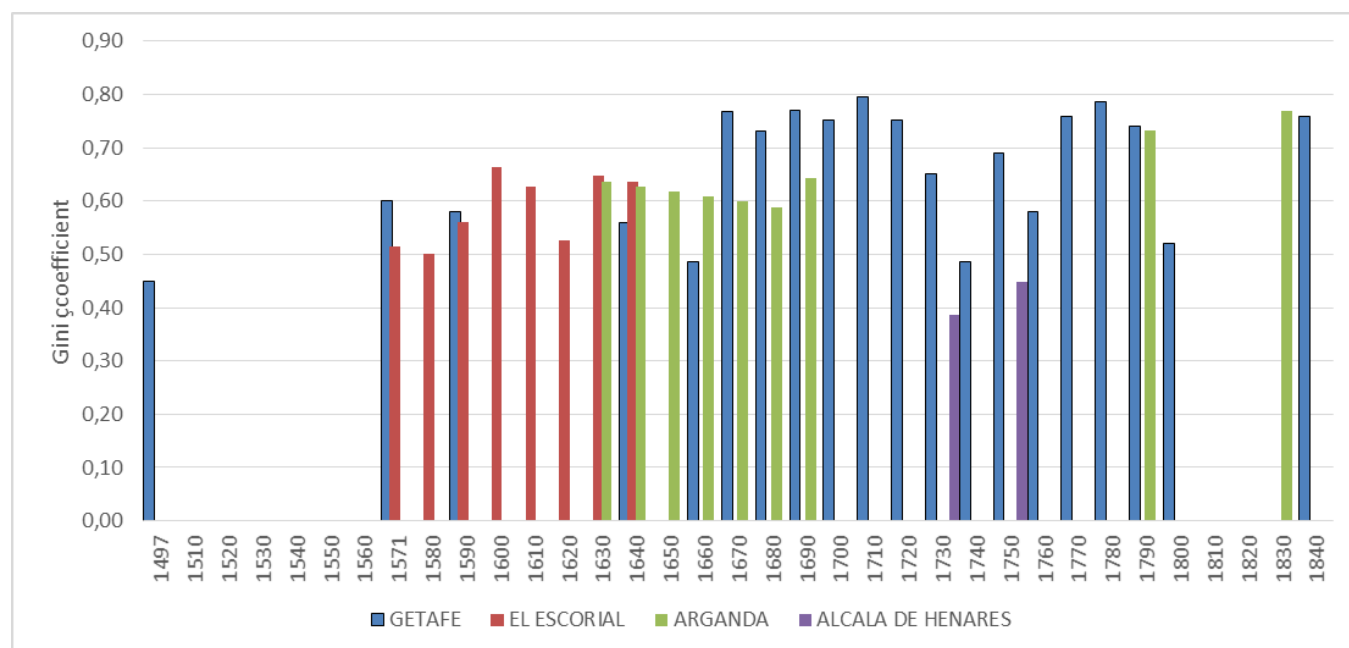


Source: Repartimientos from Alcalá de Henares, Archivo Histórico de Alcalá de Henares. See appendix for a detailed description.

The similar trends observed in the three locations means that the combination of the results for Getafe, El Escorial and Alcalá de Henares can help us to understand the long trends of economic inequality around Madrid. Figure X presents the three samples where we can observe better the low values of the Gini coefficient of Alcalá de Henares consequence of the way in which the repartimientos of cuarteles were carried out.

The combined results indicate that the lowest inequality levels were found around 1500 and that the differences between the rich and the poor increased substantially over the following 340 years. However, the increase that we observe in the very long run was not a steady one, and also shows important variations over time. The first period that we can identify lasts between 1500 and the early seventeenth century when we observed a strong increase in inequality levels. The following decades were a period of relative stagnation until the mid seventeenth century when we observe a significant reduction that is particularly strong until the 1660s. Inequality increased sharply again in the last decades of the century to remain high until the first decades of the eighteenth century when the maximum inequality levels were reached. After 1710 inequality decreased again until the middle of the century just to later increase and reach in 1780 levels similar to the maximum of 1710. The last decades of our analysis show a decrease between 1780 and 1800 and finally a new rise in inequality between 1800 and 1840.

**Figure 6: Inequality in Getafe, El Escorial and Alcala de Henares (Gini coefficient)**



Source: Same as Figures 4, 5 and 6.

### Inequality in Madrid in the Spanish framework

We do not count on many works that study long term trends of economic inequality in Spain. One of the most recent examples is the work by Alvarez Nogal and Prados de la Escosura (2012) where the authors present an estimation of the Williamson index for Spain between the thirteenth and the nineteenth centuries. The Williamson index is a rough measurement of inequality that is computed as the ratio of nominal output per head to nominal wage rates. While the numerator estimates the evolution of total income, the denominator estimates incomes of workers, the lowest part of the income distribution and therefore when the index increases, so does inequality and viceversa. Their results show that between 1500 and 1650 inequality increased steadily, a growth that ends with an abrupt fall until 1670, when the Williamson index grows again rapidly to remain stable until the last decade of the seventeenth century. Inequality decreases again during the 1690s and the first decades of the eighteenth century. The fall was so intense that the inequality levels of 1650 would not be reached again until the 1750s. The second half of the eighteenth century was a period of rapid increase of inequality that grew until 1805, when it decreased slightly to later remain stable.

We also count on another study of income inequality in the long term for the Spanish province of Guadalajara, an interesting case study for its geographical proximity to our sample (Santiago-Caballero, 2011). Guadalajara shares its western border with the province of Madrid, and in fact Alcala de Henares is closer to its capital (Guadalajara) than to Madrid. The article estimates income inequality using the payment of the tithe by the grain producers of Guadalajara between 1690 and 1800.<sup>7</sup> The results indicate

<sup>7</sup> The tithe was a 10 per cent tax on the grain harvest that every grain producer had to pay to the church.

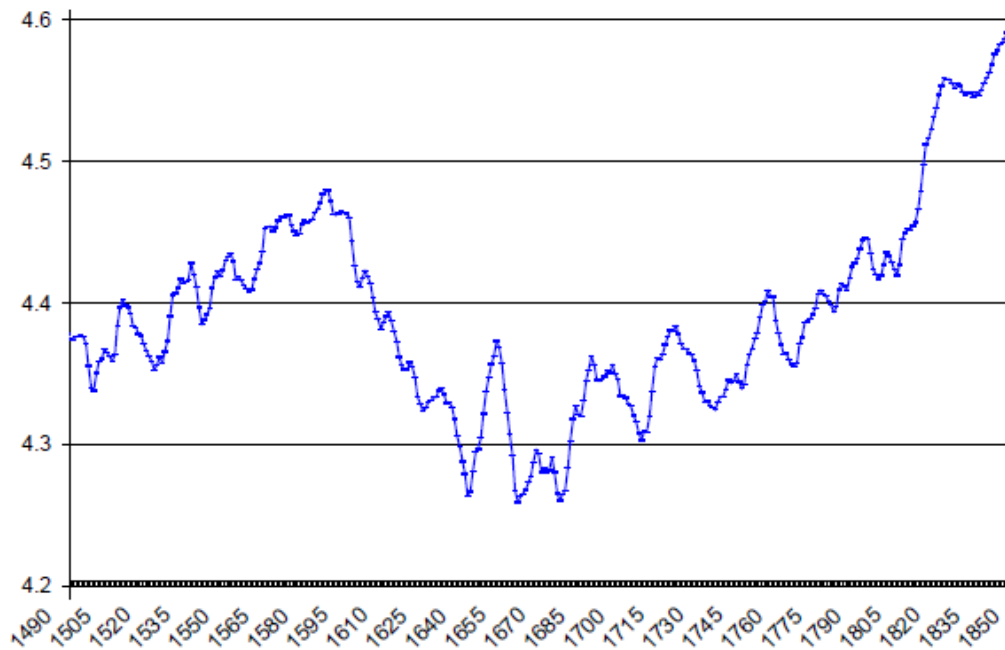
that income inequality in Guadalajara decreased between 1710 and 1740, increased between 1740 and 1770 and later declined between 1770 and 1800.

How well do these studies compare with our own estimations? Our estimations support the trend found by Alvarez Nogal and Prados de la Escosura for the period 1500-1600 when our results also indicate a substantial increase of economic inequality. However while the authors observe a continuous increase in inequality until 1650, our data suggest that inequality in Madrid during that period stagnated and even declined. Our results also support the intense decrease in inequality that Alvarez Nogal and Prados de la Escosura found between 1650 and the 1660s as well as the intense growth that followed. We also share the depression of economic inequality during the first decades of the eighteenth century and the period of recovery that followed, although while they date the beginning of the fall in the late seventeenth century, our estimations postpone the fall until the first decade of the eighteenth century. The other major difference is the decline that we observe in the last decades of the eighteenth century when they maintain a relatively constant increase of inequality levels, although in this case the authors suggest in their article that their estimation of inequality during this period could be over exaggerated (Alvarez Nogal and Prados de la Escosura, 2012).

The comparison between the evolution of income inequality in Guadalajara and the results that we obtain for the province of Madrid show a very similar trend. As in the case of Guadalajara, our data reveal a decrease in inequality between 1710 and 1740, an increase between 1740 and 1770 and finally a decrease between 1770 and 1800. The resemblance of the results is surprising given the difference in the sources that were used in both studies and also the sort of locations that were used in each one, mainly rural in the case of Guadalajara and with a strong urban character in the case of Madrid.

Another interesting aspect of the analysis of economic inequality in the long run is its possible connection with economic growth. As it was explained previously, the link between economic development and inequality has been one of most explored aspects in the literature. The results for the available bibliography seem to indicate that during the early periods of economic growth, inequality tended to increase, while stages societies in stages of lower development tended to be more equal. Was this the situation in the case of Madrid? As in the literature of economic inequality, it is hard to find reliable estimations of income per capita for preindustrial times in Spain. Several authors like Yun (1994) and Carreras (2006) have tried to obtain estimations of GDP in Castile and Spain from different sources like fiscal records. Alvarez Nogal and Prados de la Escosura (2012) provided not just estimations of economic inequality but also yearly estimations of GDP per capita in Spain between 1280 and 1850. Figure X shows the result.

**Figure 7: Real output per head in Spain 1280-1850 [11-year moving aver] (1850/59 = 100) (logs)**



Source: Alvarez Nogal and Prados de la Escosura (2012)

The period 1500-1600 of increasing inequality coincides with the rapid growth that took place in Spain during its economic golden age. Alvarez Nogal and Prados de la Escosura argue that by 1600 GDP per capita in Spain was above the levels achieved in other main European economies like France, England or the average for Western Europe (Alvarez Nogal and Prados de la Escosura, 2007:358). After 1600, income per capita in Spain shows a complete collapse reaching the lowest values around 1670. This period coincides with the stagnation and decline of economic inequality in Madrid that we observed until the 1660s. The period of recovery that follows in terms of GDP per capita is maintained until the first decades of the eighteenth century. Our estimations show that during this period of economic growth inequality increased again. Income per capita in Spain remained practically unchanged between 1710 and 1760 in the same period where our estimations present a decline in economic inequality. Finally the estimations of Alvarez Nogal and Prados de la Escosura suggest that the second half of the eighteenth century was a period of increasing income per capita that was maintained until 1850. Inequality in Madrid increased with the recovery, although while incomes kept growing after 1780, our estimations suggest that inequality decreased until 1800 to later increase.

Does this fact confirm that economic growth is the driving force pushing up economic inequality? The data available suggest that periods of economic growth show increasing inequality and periods of stagnation or economic decline present decreasing inequality. These results seem to confirm in the case of Madrid the evidence found in other regions of Europe where economic growth during the first stages of development was closely connected to increasing levels of inequality. However the connection between growth and inequality also depends heavily on the years that we choose in order to compare both variables. It is also clear that the same forces that drive up and later down inequality with economic growth during industrialization are not the same that can be applied to a preindustrial framework, where the literature

tends to suggest that Malthusian forces prevail. Our data suggest that this is also the case and that demographic pressure also played a significant role in the story.

## Conclusions

The analysis of economic inequality in the past has experienced a considerable expansion in the last decades. Although we count on several studies in countries like Italy, Holland, France, England, Germany or Portugal, few of them carry out a systematic study of inequality in the very long run with enough periodicity to understand not just long trends but also short and middle term changes. The main conclusions of the existing literature tend to indicate that inequality was higher in urban areas and that it rose with economic development. Given rich sources available in the case of Spain, the lack of research on economic inequality for preindustrial times is paradoxical.

We used information from fiscal sources at local level to estimate the evolution of economic inequality in the province of Madrid since from the late fifteenth to the mid eighteenth centuries. The *repartimientos*, or distribution of fiscal charges among the population of each municipality, are in our opinion a perfect source to estimate economic inequality within each location. The information concerning how the *repartimientos* were done and the quantitative evidence that we have found support their use for this purpose. In order to obtain a reliable and not biased estimation of economic inequality in the province of Madrid, we chose a sample of municipalities around the capital that include both urban and rural areas and locations close and far away from Madrid.

Our results indicate that economic inequality increased sharply between 1500 and 1840, although the trend was not continuous and steady. The sixteenth century was a period of increasing economic inequality that was followed by a pronounced fall during that continued until the last decades of the seventeenth century, when we observed a new rise. The increase of the late seventeenth century kept inequality levels very high during the first decade of the eighteenth century, although our results also show a new depression of economic disparities during the central decades of the century. Inequality increased again between the mid eighteenth century and 1780 to later decline until 1800. The information that we have for the first half of the nineteenth century seem to indicate that inequality increased again sharply between 1800 and 1840.

The comparison of our results with the other estimations of economic inequality in the long run in Spain allows us to identify very similar trends. The rise of inequality between 1500 and 1600, the reductions of the seventeenth and the mid eighteenth century and the final increase during the nineteenth century coincide with the estimations by Alvarez Nogal and Prados de la Escosura (2012). However we differ in the trends during the first half of the seventeenth century when our data suggest stagnation and even decline while the authors indicate a continuous rise. The comparison with the estimations of income inequality for Guadalajara is interesting given the geographical proximity of the province to Madrid. The results show that the

evolution of inequality in the provinces of Madrid and Guadalajara during the eighteenth century were practically identical, a fact that we believe adds robustness to our estimations. The common behavior of inequality in both estimations is especially interesting because both studies use completely different sources reaching the same conclusions.

Finally we decided to analyse if the case of Spain fit in the existing literature concerning the relationship between inequality and economic growth. Using the estimations of income per capita for Spain by Alvarez Nogal and Prados de la Escosura, we observe that the case of Madrid supports the conclusions reached by other authors in the rest of Europe. Income inequality increased in periods of economic growth and stagnated and declined in periods of economic depression. This was the case of the golden age of Spanish economic growth during the sixteenth century when inequality increased sharply and also the economic crisis of the seventeenth century when inequality decreased. We observe the same movements in the other increases and crises analyzed in the paper. However we should be cautious with these results, as the industrialization process associated with the appearance of the Kuznets curve is not present in preindustrial Spain, where Malthusian forces seem to play a significant role.

Therefore, we believe that the use of the *repartimientos* can help us to understand the evolution of economic inequality in Spain in the very long run. The existence of the source for different regions of the country offers a unique opportunity to economic historians to unlock one of the best kept secrets in our discipline, the left side of the Kuznets curve, where new research and surely new evidence will be required to present a more general and consistent picture.

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## Data appendix

Getafe: the *repartimientos* from Getafe were obtained from the Archivo Histórico de Getafe. The manuscripts that were used were the books of *repartimientos*.

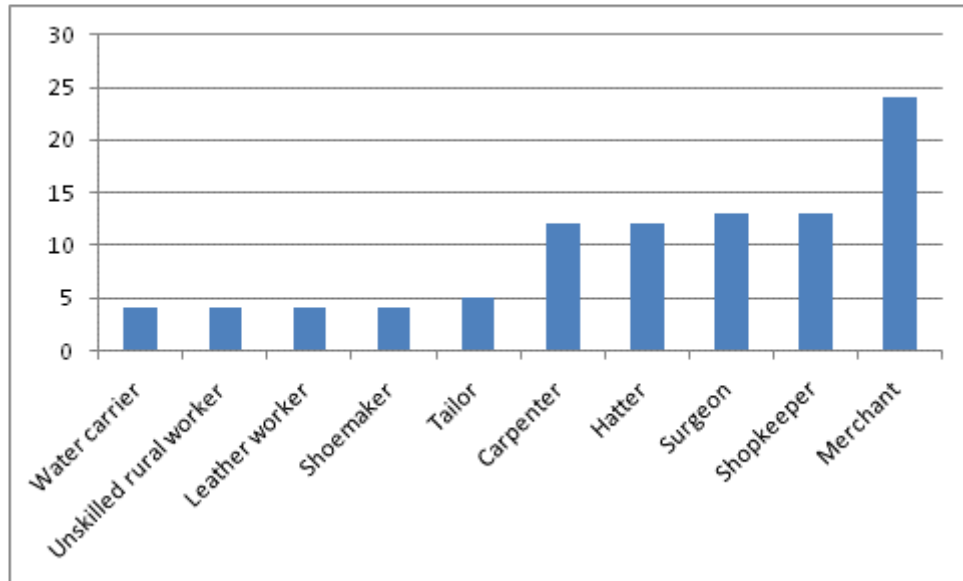
El Escorial: the information was found in the Archivo Histórico de El Escorial. The year of analysis and the manuscript of origin are: 1570: legajo 3367-2, 1580: legajo 3367-8, 1590: legajo 3367-11, 1600: legajo 3367-22, 1610: legajo 3367-29, 1620: legajo 3367-42, 1630: legajo 3368-23, 1640: legajo 3369-4.

Arganda: data was taken from the Archivo de la ciudad de Arganda for the years 1632 (Sig 149/1), 1678 (Sig 149/25), 1690 (Sig 151/2), 1786 (Sig 151/25) and 1828 (Sig 151/14).

Alcala de Henares: information from the Archivo Municipal de Alcala de Henares. The information from 1730 was extracted from the manuscript 660/001 and the data for 1750 from the manuscript 659/001.

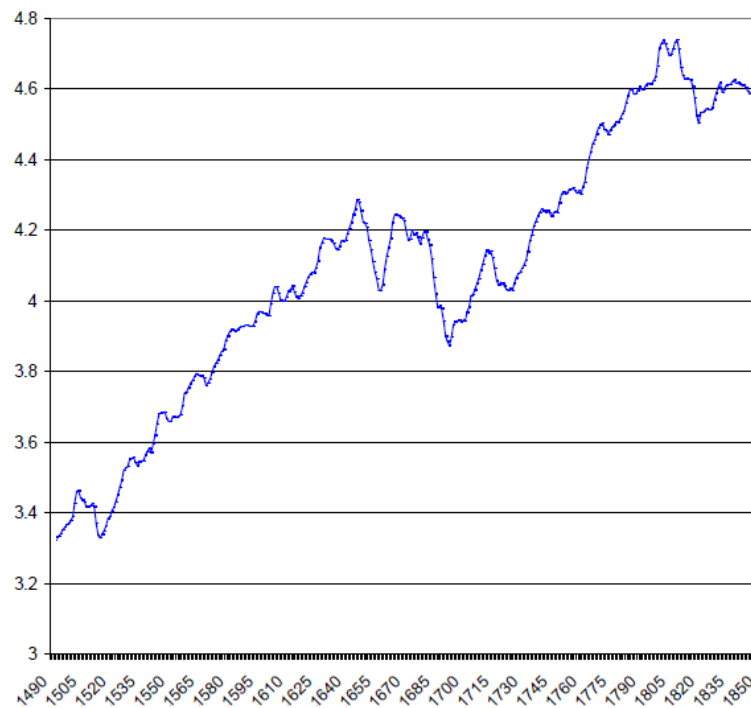
## Appendix

**Figure 8: Payment of the *repartimiento* by profession in Alcala (1750)**



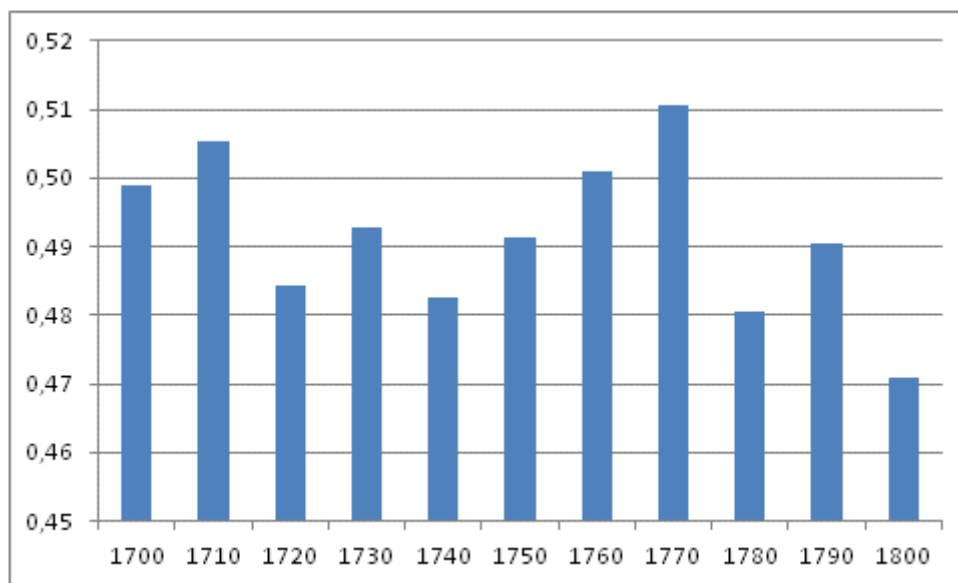
Source: Same as Figure 5.

**Figure 9: Williamson index in Spain (1500-1850)**



Source: Alvarez Nogal and Prados de la Escosura (2012)

**Figure 10: Inequality in the province of Guadalajara, 1700-1800 (Gini coefficient)**



Source: Santiago-Caballero (2011)