PRE-INDUSTRIAL INEQUALITY IN CATALONIA

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Abstract

This paper analyses economic inequality in Catalonia in the early 18th century using the information contained in cadastral tax records. The data set includes 2,617 male taxpayers distributed across 17 towns in inland Catalonia. Our findings show that income inequality in the 1720s was lower in Catalonia than in other Western European societies, but very close to other parts of Iberia. We take advantage of the wealth of information provided by the cadastre to study economic inequality in greater depth in a pre-industrial society by looking at the different sources of income, income groups and occupations. We find that the towns with a noteworthy presence of proto-industrial activities, measured by the number of textile artisans, were less unequal. Lastly, we explore the effect of proto-industrial wool specialization on levels of inequality and suggest channels that would explain the identified effect.

1. Introduction

This paper studies economic inequality in Catalonia in the early 18th century. Studying the Catalan case at that specific time in history seems particularly worthwhile since Catalonia became one of the early followers of British industrialization in the late 18th century and remained the only industrialized area of southern Europe until well into the 19th century (Nadal, 1975; Pollard, 1981). The roots of the industrialization process, however, are to be found in the profound changes that occurred in the Catalan economy and society during the Early Modern Period, mainly in the 17th and 18th centuries (Vilar, 1974). The Catalan economy underwent a gradual process of productive specialization in the period (Torras, 1984). On the one hand, the growth in wine led to increasing integration into the Atlantic international trade, thanks to the export of wine and spirits (Valls, 2004). On the other, proto-industrial manufacturing, mainly of wool, became consolidated in inland areas (Torras, 1998). From the 1730s, moreover, the city of Barcelona witnessed the arrival of calico printing and the production of *indianes* (Sánchez, 1989). Altogether these developments laid the groundwork for an industrialization in which, over the course of the 19th century, textiles came to play a leading role[1].

Against this backdrop, the literature has stressed that wool proto-industrialization in the Early Modern Period was key to subsequent industrialization (Marfany, 2012). The development of rural wool manufacturing contributed to the creation of business capacities, marketing structures, and an accumulation of capital and skilled labour, both in spinning and in weaving. These capacities were later used by the modern textile industry, whether in cotton or in wool (Torras, 1992, 2007)[2]. Later, when the first spinning jennies arrived in Catalonia in the 1780s, it spurred the beginning of industrialization (Thompson, 2005; Martinez-Galarraga and Prat, 2016). After the negative impact of the Napoleonic wars on the budding Catalan industry, the process became consolidated with the transition to a factory system in the mid-19th century (Nadal, 1975; Sánchez, 2000; Thompson, 1992, 2004; Rosés, 1998; Mora-Sitjà, 2007). The present paper, therefore, studies economic inequality at a historical moment that precedes the launch of industrialization in a context of profound economic and social transformations that would eventually lead to the creation of an industrial society.

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[1] Nadal (1985), Carreras (1990), Nadal et al. (2012).
[2] The new developments also seem to have favoured the accumulation of basic human capital as early as the 1720s (Gómez-i-Aznar, 2019).

By looking at pre-industrial inequality in Catalonia in the early 18th century, the present study seeks to contribute to a growing body of literature that has analysed economic inequality within the field of economic history[3]. Specifically, a series of works in recent years have studied the evolution of economic inequality in the pre-industrial period using a variety of methodologies, indicators and sources, although in most cases they rely on fiscal sources. The work of Van Zanden (1995) was followed by long-term analyses that looked into both income and wealth inequality in a host of European countries[4]. Among the studies, the cases of Italy (Alfani, 2015, 2017; Alfani and Ryckbosch, 2016; Alfani and Ammannati, 2017; Alfani and Di Tullio, 2019) and the Low Countries (Van Zanden, 1995; McCants, 2007; Hanus, 2013; Ryckbosch, 2016) have received particular attention. However, other countries have also been studied, including England (Alfani and García Montero, 2022), Finland (Bengtsson et al., 2019), Germany (Alfani et al., 2022), Poland (Malinowski and Van Zanden, 2017), Portugal (Reis, 2017), Spain (Santiago Caballero, 2011; Nicolini and Ramos Palencia, 2016, 2021) and Sweden (Bengtsson et al., 2018)[5].

With some nuances, these works have all found that, after the reduction in economic inequality that came with the Black Death, Europe witnessed a more or less continuous increase in inequality during the Early Modern Period[6]. Notably, one exception to the trend is the deviant behaviour of Portugal. In any event, within the set of studies seeking to analyse the long-term evolution of pre-industrial inequality, Catalonia has also received attention. Broadly speaking, the evidence has shown that the dynamics of inequality during the Early Modern Period were not constantly on the rise, although the different sources and indicators yield results that do not always point in the same direction (Álvarez Nogal and Prados de la Escosura, 2007; Badia-Miró and Tello, 2014; García Montero, 2015; Brea-Martínez and Pujadas-Mora, 2018, 2019).

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[3] In many cases, and often following Kuznets (1955), these are long-term studies that cover the past two centuries, when the industrialization processes that characterized modern economic growth were taking place (e.g. Morrison and Snyder, 2000; Rossi et al., 2001; Bértola, 2005; Prados de la Escosura, 2008). The British case has received special attention (Williamson, 1985; Lindert, 1986, 2000; Allen, 2009, 2019), as has the United States (Williamson and Lindert, 1980; Lindert, 2000; Lindert and Williamson, 2016).

[4] These works build on a traditional literature in the study of inequality linked to Italian cadastres (e.g. Herlihy, 1967) as well as other works about northern Europe (Soltow, 1979, 1981) and the Low Countries (Soltow and Van Zanden, 1998). See also Hoffman et al. (2002).

[5] Beyond Europe, there are studies for South Africa (Fourie and Von Fientel, 2010, 2011), Anatolia (Cosgel et al., 2012; Canbakal et al., 2018) and Japan (Saito, 2015).

[6] Van Zanden (1995, p. 622) identified a "super Kuznets curve spanning many centuries that was characterized by rising inequality until sometime in the nineteenth century and a decline in inequality during the twentieth century". This analytical framework has guided subsequent work on inequality in the Middle and Modern Ages, although the validity of the argument and the drivers behind it remain in dispute (Alfani, 2019, 2021).

The aim of our study is complementary to the aims of most of the previously noted studies since, owing to our statistical source, we focus on a single year. Our analysis rests on information provided by the cadastre established in Catalonia in the early 18th century (also known as the *Catastro de Patiño*). Although the present study does not enable us to contribute to the debate over the long-term trends in the evolution of inequality during the Early Modern Period, the wealth of information contained in the cadastre does afford an opportunity to carry out an in-depth analysis of the income distribution in Catalonia in the 1720s[7]. The availability of the source is linked to the political circumstances that Catalonia faced after defeat in the War of the Spanish Succession (1701-1714) and that gave rise, among other consequences, to the payment of a new cadastral tax in the territory.

The cadastre is a fiscal statistic that included individual information for all the towns in Catalonia, although the original documents have been preserved only for a limited number of localities. In our case, we focus on the year 1724 when, after some initial difficulties, the cadastre was finally implemented[8]. The cadastre was a proportional tax on income, which was calculated based on the estimated returns on assets (land, house, livestock, productive and financial assets, etc.), income from work, and business profits. Thus, the cadastre contains information on the taxes paid on each of these sources of income by male individuals in each locality, together with information on the name and profession of each taxpayer. Although the cadastre has certain shortcomings such as the possibility of concealment owing to its fiscal nature, the non-detection of pluriactivity and the absence of any registration of women, it has traditionally been used as a source largely to study agricultural land uses (e.g. Giralt, 1950; Garrabou, 1962; Tello, 1986; Valls, 1996).

We have collected information for 17 Catalan towns, which at the time contained a total of over 10,500 inhabitants, allowing us to compile a sample that includes 2,617 male taxpayers. Based on the information, our work aims to make a handful of contributions. First, we calculate the level of income inequality in Catalonia in the 1720s, which will allow us to place the Catalan case in an international comparative perspective. Second, we take advantage of the wealth of information provided by the cadastre to study the different sources of income (land, labour,

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[7] Owing to the similarity in the source used and the focus on a specific year, our work resembles another study carried out by Nicolini and Ramos Palencia (2016) for mid-18th century Castile, based on the Cadastre of Ensenada.
[8] While the cadastre was in force from that point throughout the 18th century, its use in analysing inequality in later years presents some limitations because the tax quotas remained frozen for much of the period.

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etc.). Third, we analyse the distribution of inequality by income group and for different occupations, distinguishing between agricultural and non-agricultural activities. Fourth, we explore the relationship between the levels of inequality and a few key aspects highlighted in the literature, such as population size, the average income of localities and the share of agrarian workers. And fifth and last, we examine the effect of proto-industrial wool specialization in inland Catalonia on the levels of inequality[9].

Following on from the last point, our analysis of any potential impact of proto-industrialization on levels of income inequality is a key (and to a certain degree, novel) aspect of our study. One of the main characteristics of pre-industrial Europe was the emergence of proto-industry, which was in many cases dedicated to the production of wool manufactures. During the Early Modern Period, wool manufacturing moved out of the large cities in search of lower labour costs and to take advantage of the shift in demand for lighter, lower-quality fabrics – the new draperies. This proto-industrial system was usually controlled by traders who, through artisan entrepreneurs, wool dressers (*paraires*) and weavers (*teixidors*), supplied raw wool to local producers and marketed the final product (Mendels, 1972; Coleman, 1983; Ogilvie, 1996, 2008).

This manufacturing system was widespread in Catalonia (Torras, 1981, 2019; Marfany, 2010, 2012). During the 17th and 18th centuries, several areas specialized in the production of woollen fabrics, and proto-industrial activities took root across inland Catalonia, where they flourished. Importantly, a good share of the towns included in our sample belong to this inland area, enabling us to take advantage of the circumstance to conduct a more in-depth study into the levels of inequality in these proto-industrial societies. In particular, we focus on the case of Moià, one of the most important proto-industrial wool centres in Catalonia, and then – as a robustness test – compare and contrast the obtained results with Olost, a town that was smaller but also deeply specialized in the production of woollen fabrics under a proto-industrial system. While previous studies have focused on the late 18th century, our data set enables us to lay out a view of the early 18th century, right at the dawn of the transformations that would eventually lead to the start of industrialization.

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[9] The spread of vineyard was another trait of Catalan economic expansion in the 17th and 18th centuries. However, analysing the impact on inequality of the growing wine specialization in accordance with previous works (Badia-Miró and Tello, 2014) becomes difficult given that the cadastre does not identify which individuals were dedicated (often not exclusively) to vineyard cultivation (i.e. *rabassaires*).

2. The cadastre: a new tax for early 18th-century Catalonia

Although the Kingdom of Castile and the Crown of Aragon shared the same kings throughout the 16th and 17th centuries, they preserved their own institutions and laws over the period. Accordingly, their fiscal systems were also different. It has been argued that while the Habsburg dynasty succeeded in increasing the tax burden in Castile over the course of the two centuries in question, the constitutional checks on taxation in the several territories under the Crown of Aragon (which actually required an agreement between the Crown and Parliament) made it impossible to do so in those territories (Artola, 1982)[10]. This state of affairs changed drastically after the War of the Spanish Succession (1701-1714). The House of Bourbon's military victory and its ascendance to the throne resulted in the abolishment of the legal and institutional system in effect under the Crown of Aragon when the *Decretos de Nueva Planta* were enacted in 1716. Likewise, any constitutional checks on taxation also disappeared.

In the aftermath of the war, fiscal needs led to an attempt to introduce Castilian taxes in the former territories of the Crown of Aragon. However, the Castilian indirect tax system (*alcabalas, cientos* and *millones*) was not adopted, to a large extent because of its disrepute and complexity. Instead, a new tax was established in order to level up the fiscal revenues from Aragon with those already obtained in Castile. The new tax, therefore, aimed to collect an amount equivalent to the amount paid in Castile or, in other words, as if Castilian taxes had been imposed upon the Crown of Aragon. The new tax had three main objectives: "a) avoid the need to submit tax collection in those territories to any decision of Parliament or similar body; b) ensure the financial means to maintain the troops quartered in the territory and guarantee their prompt payment; c) seek equality and contributory proportionality among all territories of the State" (Ferrer Alòs 2002, pp. 27-28). Ultimately, these changes gave rise to a significant reform of the overall organization of taxes in order to rationalize the fiscal system and improve the State's public finances.

In the case of Catalonia, the new tax was a direct contribution that received the name of *catastro*, or cadastre in English[11]. The new cadastre was established in October 1716 by Intendent José

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[10] The Crown of Aragon was a federation that included the kingdoms of Aragon, Majorca, Valencia and Catalonia (the latter nominally designated *Principat*, or "Principality").

[11] In contrast, in Aragon (*Única Contribución*), Majorca (*Talla General*) and Valencia (*Equivalente*) the new taxes were not direct but rather arbitrary personal excises (Mercader, 1968, p. 170; Segura and Canet, 1988).

Patiño, the face of royal authority in Catalonia[12]. Although in many cases the observable item was wealth, specifically a property, the target of the tax was income, i.e. how much income could be produced from the property in question. Hence, the novelty of the tax was that it was direct and proportional to income. Interestingly, to that end, it was necessary to prepare a wealth statistic according to a set of detailed instructions. First, the royal authority asked all towns for information to gain an overview of the Catalan economy (and its wealth). Then, the information was used to estimate how much could be collected in each town and in Catalonia as a whole (Ferrer Alòs, 2002, p. 30; Mercader, 1961, pp. 300-301). Once the amount or *cupo* was established for each town, the local authorities had to organize a system to collect information and produce detailed wealth statistics for each neighbour in order to tax them appropriately.

At first, the system was difficult to implement. A number of technical hitches arose and people tried to resist the increase in their tax burden[13]. In addition, monetary disorders, wars in Italy and the resistance of some local representatives hindered the rollout (Mercader, 1968, pp. 171-173). Together with the economic issues involved in the collection of the information and the application of the tax, it must be borne in mind "the nature of the tax, which was to pay for troops quartered in Catalonia, and the important role that the troops played in its collection in the first half of the century even further accentuated the tax's repressive aspect" (Escartín, 1981, p. 254). Indeed, the new tax was not a substitute for old taxes but an additional one, so it increased the tax burden and many contemporary accounts attest to the burden being so heavy that it initially generated strong resistance (Alcoberro, 2005). It has been estimated that the tax burden on the average Catalan taxpayer grew by a multiple of six when the new tax system was implemented (Mercader, 1968, p. 193).

Under these circumstances, the initial amount or *cupo* expected to be obtained with the tax (1.5 million *pesos*) could not be reached and it was substantially reduced: from 1717 onwards, the fixed amount was set at 900,000 *pesos* (Escartín, 1981). As a result, the tax initially had a top-down design based on the fixed *cupo*, but its implementation in fact took place at the local level so that the tax became bottom-up in nature. This would explain the gap between the amount that was expected to be collected and the amount that was actually collected, which essentially

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[12] He was appointed to be *intendente* of Catalonia in 1713, taking the government under his command, carrying out an administrative reorganization and promulgating the *Decreto de Nueva Planta* (16 January 1716).
[13] See the contemporary document "*Comentarios de Zavala y Auñón sobre el catastro de Cataluña*" which is reproduced in Camarero and Faci (2006, p. 106).

measured existing income at the local level. Importantly, the tax target remained virtually unchanged over the course of the 18th century. In spite of several initial problems, the statistics for each town were produced in 1723 and 1724 by local authorities under the supervision of civil servants[14].

As mentioned earlier, the new tax was direct, so its target was income. In particular, the cadastre covered three different sources of income that were called, in Spanish, *real, personal* and *gananciales*. The first two were reported in a single document called the *repartimiento personal y real*, which was produced for each administrative unit or town. The document contained a list of all male inhabitants who were liable to pay taxes[15].The *real* category taxed property, that is, all assets that were used or could be used to produce income, such as land, houses, livestock, mills, presses, stills, and so on, and also other sources of income that bore no relation to professional activities (financial assets or *rentas*) such as the tithe or the *censos* and *censals* – a very common, extended type of loan in Catalonia at the time[16]. For the purposes of implementation, it was first necessary to unify agrarian units of measure across the territory. Second, the land was categorized into 32 different types depending on the quality of the soil and the sort of crop cultivated, as stipulated in the cadastral rules known as the *Reglas para la realización del catastro*. It can thus be argued that the aim of the classification was to estimate land productivity. The most productive land paid 37 *rals*, while the poorest land paid only 0.5 *diners* (Ferrer Alòs, 2002, p. 30).

In any case, each town needed to have a detailed description of the plots within its boundaries, including their size, soil quality and the sorts of crops cultivated on them (in addition to the characteristics of the house and any livestock). This was no easy task to perform, as it required a good deal of precise information. Further, since the information was produced at the local level, it might also have sometimes led to concealment in order to benefit certain groups or individuals in a town. Major efforts to correct the situation, however, were made by the

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[14] In 1735, Intendent Sartine reformed some of the tax rules (Mercader, 1968, pp. 181-183).

[15] While we focus here on male taxpayers, the document also provides information (although much less so) about women who paid the tax – most were widows, although some single women were included on rare occasions – as well as other individuals who did not live in a particular town but owned property there (*forasteros*) and also an additional category of heirs (*herederos*). In our data set, there are 321 widows, who account for 3.9% of the total contribution, together with 666 *forasteros* or outside owners (10.2%) and 38 heirs (0.5%).

[16] Only the church and its institutions were exempt from paying the *catastro real*, although the exemption applied only to properties acquired before 1716 (Ferrer Alòs, 2002, p. 29).

administration to improve the collection of information on properties[17]. Finally, in the case of financial assets (*rentas*), a 10% tax rate was applied to estimated income (Mercader, 1961, pp. 298-299).

The *personal* category of the tax was aimed at income obtained by each individual through work. In theory, the *personal* tax charged 8.33% on the yearly earnings from the labour of every man who lived in the town, with the exception of the privileged (nobility, army officers and clergy) and men over 60 years of age (Mercader, 1961, p. 301). It was assumed that farmers worked 100 days a year while artisans worked 180 days a year. Assuming daily pay of 3 *rals*, the annual tax would have been 25 and 45 *rals*, respectively (Mercader, 1961, pp. 299-300; 1968, p. 70). However, in reality, the dividing line was not between agricultural and artisanal work but between two subcategories in each sector: farmers who owned the land, master artisans and liberal professionals paid 45 *rals* a year, while landless agricultural labourers and artisan labourers paid 25 *rals*[18]. Last, the document called *repartimiento de gananciales* reported the contribution of those involved in commercial, financial and manufacturing activities. The tax rate was 10% on estimated profits. The tax was only levied on members of guilds, so in towns with no guilds no *gananciales* were levied (Mercader, 1968, p. 171).

The cadastral tax as implemented in Catalonia is nevertheless not without certain shortcomings. Since it is a fiscal source, it is always subject to the potential problem of concealment. Hence, the cadastre shares with other fiscal sources commonly used in the literature the possibility of under-reporting in upper income segments. Historians have also raised a number of other critical issues with the cadastre. Vilar (1962), for instance, argued that it probably underestimates the value of buildings and trade profits while perhaps overestimating labourers' earnings[19]. Although concerns do exist about some misreporting in the source (i.e. omissions in the declaration of woods and barren lands, and undervaluation of the quality of some plots of land) that could be biased in favour of big owners, these limitations would become especially important as time

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[17] This can be seen in the requirement to prepare a document called the *recanación*, which updated information on land properties, including their size, crops cultivated, boundaries, location and name of owner (Ferrer Alòs, 2002, p. 30). These documents usually contained measurements and hand-made cartographies and maps of the plots (Burgueño, 2009).

[18] Widows, heirs and *forasteros* [outside owners] did not pay the tax on labour.

[19] Vilar (1962, vol. 2, p. 450). Other works that analyse the information of the cadastre in detail include Escartín (1981) and Alcázar et al. (1999). For classic works, see Giralt and Nadal (1963), and Nadal Farreras (1971).

passed because the initially compiled information was not properly updated over the course of the 18th century (Ferrer Alòs, 2002, pp. 32-33).

While such concerns are common in studies of inequality that rely on cadastres and other fiscal sources, it is our view that the way in which the cadastre was implemented in Catalonia does make it a reliable source for the examination of inequality. Ultimately, given the nature of the tax, local authorities had to find out the wealth of individuals[20]. First, a commission was created in each town. Each commission, which was made up of the local priest and two farmers (ch. 2, art. 5, *Reglas para la elaboración del catastro*), took charge of filling in a series of forms and creating a number of documents. The first form contained the general geographic characteristics of the town (such as latitude, boundaries, and the amount and quality of available land). The second form was actually a survey of 32 questions that the individuals must satisfy, item by item, in each town. Based on the survey information, a new document had to be generated to summarise the responses (*Respuestas Generales*). This enabled the royal authority in Catalonia to make an initial estimation of the total amount to be collected and then decide how to distribute it among the municipalities.

The next step was to assign the tax to be paid by each individual in each town. In order to do so, a new form had to be created with a list containing all households in the town, including the name, occupation, and commercial and industrial activities of the individuals in each household. Then a detailed inventory was taken of all the plots that existed within the town boundaries. The inventory described the characteristics of the plots "with their individual sizes and the crops that they produce each year in addition to […] the houses, buildings, factories, mills, *censos, censales*" (ch. 2, art. 7, *Reglas para la elaboración del catastro*). This information, which also included different land uses (cereals, vineyard, fruit trees, forest, vegetable garden, barren land, etc.), was written down in a notebook, where the quality assigned to each piece of land (according to the 32 categories established in the *catastro real*, as mentioned above) was noted in the margin of the page. This was a key piece of information to determine the tax base to be paid by each individual, and the same rules applied to every town.

At this point, the information had to be reviewed and certified in a process that involved close examination of the documentation by "two representatives in each *veguerío*". Next, they had to

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[20] Here we follow the documents with the legislation, instructions and surveys administered to undertake the cadastre that are compiled in Camarero and Faci (2006, 2007).

declare whether or not the information was in accordance with reality, and then prepare a new document (the *tavelas* or *extractos*), which had to be sent to a delegate (*subdelegado*) of the *veguerío*. This was followed by a mandatory meeting attended by a representative from every town in the *veguerío*. After making any necessary amendments to the information, the last step involved the publication of the cadastre in each town. At that point, everyone in each town gathered together in a public space, and the results of the cadastre were read aloud by a local authority (*escribano*). The residents could then express disapproval if they had any sort of grievance over the information that it contained, and after any amendments and final approval, the tax declaration was finally published (*Edicto General*).

Hence, given the characteristics of the tax, the preparation process and the amount of financial information generated at the individual level, it can be argued that the new cadastre was rather modern in the Spanish and European contexts. In fact, after its implementation in Catalonia, the monarchy believed that it was a success and in 1749 the Marques de la Ensenada tried to implement a similar tax in Castile. Although the new tax system was not ultimately adopted in Castile owing to the complexities of the undertaking, the huge amount of statistics that resulted makes it a very rich historical source for the 18th century and it has therefore been widely used (e.g. Nicolini and Ramos Palencia, 2016). The cadastre in Catalonia has also been a key source in widespread use because, as Segura (1983, p. 130) underlines, it is the only source available for analysing how the agrarian and urban distribution of land evolved during the 18th and first half of the 19th centuries[21].

3. Data, sample, and sources of income: a description

To conduct our study, we have compiled information from the cadastre undertaken in Catalonia in 1724. Altogether, the preparation of the cadastre laid out in the previous section produced a series of documents and cadastral information, including the archival information used here to study the levels of inequality in Catalonia. Of the two cadastral taxes in question, the first involves the "*personal*" and "*real*" tax, which essentially covered a sort of personal income tax and a tax on properties, while the second involves the *gananciales* tax, which was a tax levied on non-

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[21] Giralt (1950), Llobet (1955), Garrabou (1962), Tello (1986), Barbaza (1966), Segura and Suau (1982), Ferrer Alòs (1987), Vicedo (1991) and Valls (1996). A good survey can be found in Segura (1983) and Valls (1996).

agrarian activities mainly linked to manufacturing and commerce and would therefore be closer to a tax on economic activity. Given that the two taxes affect different occupations and sources of income, we add them together to calculate the overall taxpayer contribution[22]. The selection of localities relies on the availability of information preserved in the Archive of the Crown of Aragon in Barcelona, which houses the documentation and books of the cadastre that have enabled us to build the data set[23]. Our sample includes 17 towns that were part of the former counties (*corregiments*) of Manresa and Mataró, located in central Catalonia in a strip that runs roughly north of the capital city Barcelona along the coast up the foothills of the Pyrenees (see Figure 1). Interestingly, the towns in the sample belong to a geographical space characterised as being a rather dynamic area in Catalonia in the early 18th century.

[FIGURE 1]

Table 1 summarises some general information about our data set. First, taken together, the 17 towns amounted to a total population of 10,562 inhabitants in the early 18th century (column 1). Among the towns, there are bigger ones with a population above (or around) 1,000 inhabitants, like Moià (1,468), Caldes de Montbui (1,391), Granollers (1,324), and Santpedor (948). At the other extreme, we find smaller towns like Lliçà d'Amunt (200), Cerdanyola (175) and Matadepera (120). If we focus on taxpayers, our sample contains a total of 2,617 males (column 3), who paid an average contribution of 60.7 *rals* per taxpayer (column 7)[24]. It can also be observed that most of the towns have a mean contribution around the overall average, but there are three locations, the smallest ones, that clearly exceed the average contribution.

[TABLE 1]

The cadastre also provides detailed information on the professions of individuals. While the information on occupations will be the subject of more in-depth study later on, we can take a first glimpse now at the productive structure that emerges from the sample. Table 1 shows that 73.8% of taxpayers across all the towns were agricultural workers, while the remaining 26.2%

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[22] The tax paid was expressed sometimes in *lliures*, *sous* and *diners* (the traditional Catalan monetary structure, following the Carolingian system) and sometimes in *rals*. We convert and express all data in *rals*.

[23] There are nonetheless some towns in which the *ganancials* tax did not have to be paid, mainly because there were no guilds controlling non-agrarian activities (which is the condition that determined the obligation to pay). This is, for instance, the case of four towns in our sample: Cerdanyola, Lliçà d'Amunt, Matadepera and Montmany.

[24] Given that unskilled workers at the time received daily pay of 3 *rals* (Mercader, 1961, pp. 299-300; 1968, p. 70), the mean contribution would be equivalent to 20 days of work.

were engaged in non-agrarian activities (column 9)[25]. The overall percentage of the workforce employed in agriculture is thus not far from the share recorded in 1705 in France (70%), Prussia (80%) or Spain (71%), although it is clearly above that of England (35%) (Dennison and Simpson, 2010, p. 149). However, there are wide differences within the sample. On the one hand, towns such as Monistrol de Montserrat (56.4%), Olost (42.9%) and Granollers (39.2%) have a percentage of agrarian workers clearly below the average. The small share of agrarian workers observed for Granollers would be explained by its urban nature, while Olost was a relatively small town that was highly specialized in wool proto-industry and Monistrol was a rather special case[26]. By contrast, most towns in our sample are highly, or even exclusively, agrarian. Finally, the presence of textile manufacturing also varied substantially among the towns (column 10). The share of population engaged in these activities was sizeable in Olost (32.1%) and Moià (17.3%), and also noteworthy in Monistrol de Montserrat (11.0%) and Perafita (7.4%). In the remaining towns, the share was below 5%, while in five of them there is no presence at all of textile workers linked to proto-industry.

How the tax was conceived and designed and what information was provided by the cadastral books enable us to determine not only the contribution paid by each individual but also the different sources of income. Hence, it is possible to break down the structure of the cadastre by source of income. Specifically, the first tax covering *personal* and *real* is divided into six different categories: land, house, labour (*personal*), livestock, mills and financial assets (*rentas*). If we add the tax on business profits (*gananciales*), we end up with seven general categories within the cadastre. Table 2 shows that among the different sources of income included in the tax, the category of *personal*, which taxes labour income, accounts for almost half of the total contribution (48.2%). Likewise, the category for land also represents a sizeable share of the contribution (39.6%). Overall, these two categories contribute 87.8% of the total amount paid. Interestingly, the relative contribution of the two categories is rather similar in every town in our sample, ranging from 81% to 93% of the total contribution[27].

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[25] These values are very close to those obtained by Gómez-i-Aznar (2019) for rural Catalonia in the 1720s in his analysis of numeracy levels based on the *padrons* or rolls of inhabitants (70.3% and 29.7%, respectively).

[26] Monistrol de Montserrat was exceptional because the occupations in the town were very much influenced by the close presence of the monastery of Montserrat.

[27] The only two notable exceptions are Lliçà d'Amunt and Cerdanyola, two small agrarian towns. While the joint amount is also close to 90% in both cases, the distribution differs: the *personal* tax amounts to around 20% and the tax on land stands at around 70% (see Table A1 in the Appendix).

Columns (3) and (4) add information on the number of taxpayers by category and the share that they represented, respectively. The category of *personal* was the one paid by the highest number of individuals in our sample (88.7%), followed by house (61.2%) and land (55.8%). The number of individuals that paid tax on livestock was lower (21.8%), while the remaining categories included a relatively small share. Among these, a prominent case is that of *gananciales*, a category to which only 4.2% of all the individuals in our sample contributed. Finally, column (5) shows the mean contribution in each of the seven categories of the tax. The highest mean contribution was paid in the categories of land (43.1 *rals*), followed by *personal* (33.0 *rals*), *gananciales* (32.1 *rals*), financial assets (*rentas*) (27.2 *rals*) and mills (19.4 *rals*). The other categories, namely livestock (7.5 *rals*) and house (4.9 *rals*), showed a much lower mean contribution.

[TABLE 2]

At this point, it is worth raising a concern over the source data linked to the design and structure of the cadastral tax, which can influence the study of inequality. As noted earlier, the structure of the *personal* part of the tax stipulated that agrarian labourers, young artisans and apprentices had to pay a fixed amount of 25 *rals*, while landowners, liberal professionals and master artisans contributed 45 *rals*. This seems a priori a rather simple way to capture labour income, and it could explain why among the different categories within the tax, the *personal* portion yields the lowest Gini coefficient. Under these circumstances, labour income inequality might be inaccurately estimated and it could have an impact on our results because income may have been better captured for agrarian workers, who relied on land, than for non-agrarian workers, who depended more on labour earnings.

On the one hand, it can be argued that labour income inequality tends to be low in pre-industrial societies because labour earnings through work were limited. On the other, differences in land ownership, a dimension that is very well captured by the cadastre, were key in pre-industrial societies, establishing a clear social division between agrarian workers with and without land ownership. Put in relative terms, the value of the Gini obtained for labour income (0.146) is around 22% of that obtained for land (Table 2). This is not very different from the results obtained, for example, in Old Castile. In that case, labour income yielded a Gini of 0.252, which represented 30% of the Gini obtained for land (Nicolini and Ramos Palencia, 2016). Further, in the case of textile artisans linked to proto-industrial activities who became wealthier and could therefore differentiate themselves socially and economically from other artisans and non-

agrarian workers – in the Catalan case, they were basically *paraires* or wool dressers – they did so not because of their work as artisans, but because they were adopting the role of true capitalist entrepreneurs. Indeed, these cases can be plainly detected in our source because the individuals in question had also accumulated wealth in the shape of financial assets, land, houses, or livestock. In addition, the category of *gananciales* was especially designed for them, as it taxed the profits accruing from their businesses, and thus captured an additional source of income.

Given the concerns over any potential effect on the measurement of inequality arising from the structure of the *personal* tax, we recalculate inequality levels excluding the *personal* part of the tax as a robustness test for our aggregate results[28]. In so doing, we look at the income distribution by occupation, since labour income mattered to varying degrees depending on profession (non-agrarian or agrarian). Our alternative calculations thus enable us to examine whether inequality levels still tell the same story in terms of income dispersion among the main occupations once the effect – and thus any potential bias – of labour income (*personal* tax) has been subtracted. Table 3 shows some interesting results. First, when we exclude labour income, we obtain much higher Ginis (0.77 vs. 0.46). Interestingly for our purposes, we find that non-agrarian workers (0.73) still show lower inequality levels than agrarian workers (0.78). Also, the Gini coefficients for the textile manufacturing sector are even lower (0.70), and these results hold when we exclude the zero values, i.e. those corresponding to the individuals that paid only the *personal* tax. The results thus mitigate the concerns that emerge from the design of the *personal* part of the tax. Once we remove the potential source of bias, we observe that the main findings regarding inequality remain valid.

[TABLE 3]

4. The patterns of income inequality in pre-industrial Catalonia

We focus first on aggregate levels of inequality in order to explore income inequality in pre-industrial Catalonia in greater detail. If we take the individuals in our sample of 17 towns all together, the value obtained for the Gini coefficient is 0.47[29]. This value, however, may become more meaningful if it is compared with the evidence gathered in previous studies for other geographical areas in the early 1700s. However, when comparing inequality levels across

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[28] Note that when we exclude labour income, we are very close to measuring wealth inequality.
[29] The Theil index yields a value of 0.438. If we break it down, the between (towns) component is 0.037 (8.5% of total inequality), while the within (towns) component represents the lion's share of inequality: 0.401 (91.5%).

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different areas and countries based on aggregate values, it must be borne in mind that the sources, the sample size and methodology that are used in each case will differ and one must therefore be very cautious when making a comparison. Based on our results, a first conclusion that emerges is that, in the first half of the 18th century, income inequality was lower in our sample of towns in Catalonia than it was in the most advanced economies of Western Europe (Figure 2). In England and Wales, the Gini coefficient had reached values around 0.53 by 1759 (Lindert, 2000; Allen, 2019) and economic inequality grew over the rest of the century. Higher values are found for the southern Low Countries (0.57) in 1750 (Alfani and Ryckbosch, 2016) and for the northern Low Countries (0.63) in 1732 (Van Zanden, 1995)[30]. Even higher values are obtained for northern Italy. In Piedmont, the Gini varied between 0.82 and 0.85 in the period from 1700 to 1750, and although at a lower level, Tuscany also showed remarkably high levels of inequality (0.72 in 1700 and 0.76 in 1750) (Alfani and Ryckbosch, 2016).

[FIGURE 2]

South of the Pyrenees, in Iberia, things were somewhat different. Reis (2017), who studies economic inequality in Portugal, finds a Gini of 0.66 for the city of Porto around 1700, which then increased to 0.70 in 1776. In the interior of the country (Alentejo), the Gini ranged from 0.50 in Portalegre in 1725 to 0.63 in the more rural area of Galveias in 1753. However, if we focus on the first half of the 18th century, the most direct comparison can probably be made with Old Castile in a study conducted by Nicolini and Ramos Palencia (2016)[31]. They analyse economic inequality in different localities in the province of Palencia, in north-central Spain, based on the Cadastre of Ensenada in the year 1750. Taken together, their results for Old Castile yield values for the Gini coefficient (0.49) that are very close to what we find for Catalonia (0.47)[32]. However, there is a significant geographical variation within their sample. The city of Palencia, which had around 10,000 inhabitants at the time, showed higher levels of inequality (0.58), whereas inequality was substantially lower in the more rural surrounding counties (0.33).

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[30] For the United States, Lindert and Williamson (2016) find a Gini of 0.44 for the year 1774.

[31] Nonetheless, the productive and agrarian specialization in both areas differed substantially, with Catalonia enjoying a more dynamic economic context. From a methodological point of view, Nicolini and Ramos Palencia (2016) are able to include women in their sample.

[32] The north-central Iberian Peninsula, where Palencia is located, has traditionally been characterized by having a more egalitarian distribution of land, which has given rise to a social structure characterized by small-to-medium-sized agrarian holdings dedicated to the production of cereals (Carrión, 1933; Malefakis, 1970; Beltrán Tapia et al., 2021).

Various works have analysed other areas of Spain in the 18th century. Santiago-Caballero (2011) studied income inequality in the province of Guadalajara, in central Spain, between 1690 and 1800 using wheat production (obtained from the tithe) as a proxy for income. His results show a constant level of inequality during much of the 18th century which, in the first decades of the 1700s, yields values for the Gini coefficient that are slightly below 0.5, thus standing at a level comparable to the level obtained for Catalonia[33]. The magnitude of this value is also comparable to the one used by Milanovic et al. (2007, 2011) in their calculations of the extraction ratio used to measure pre-industrial inequality, where Old Castile was included with a Gini coefficient of 0.52 in 1752[34]. A similar result (with a Gini around 0.51) is obtained by Espín-Sánchez et al. (2019) in their analysis of the city of Murcia in south-eastern Spain in the 1750s, based on the Cadastre of Ensenada, although in this case the authors focus exclusively on labour income inequality.

Finally, our results can be framed within the more general dynamics of inequality in Catalonia in the Early Modern Period. Among recent contributions, there are a number of longitudinal studies that have estimated inequality levels in the pre-industrial period. Álvarez Nogal and Prados de la Escosura (2007), by examining the land rent to wage ratio, have claimed that inequality in Catalonia grew in the 16th and 18th centuries, but fell in the 17th century. By contrast, García-Montero (2015) analyses wealth inequality in seven localities of inland Catalonia based on the fiscal information provided by the *llibres d'estimes* between 1400 and 1800. The general picture given by his estimates is one of stability in the evolution of inequality at relatively high values (with the Gini between 0.5 and 0.65), although a declining trend is observed between 1550 and 1650 and there is a slight increase afterwards. These results lead him to question the existence of a super Kuznets curve in Catalonia (as there was in Portugal), while arguing that inequality was greater in urban areas. Finally, Brea-Martínez and Pujadas-Mora (2019) analyse the socioeconomic inequality in the area of Barcelona by looking at the occupations and taxes paid on the basis of the marriage license books of the Diocese of Barcelona. Their results show

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[33] Fernández and Santiago-Caballero (2018) study several localities surrounding Madrid from a fiscal source (*alcabalas*) and show that inequality in the first half of the 18th century – a period of decreasing inequality – presented great variability, fluctuating between 0.5 and 0.8 in Getafe, and standing at around 0.4 in Alcalá de Henares.

[34] This value corresponds to five localities in Palencia, the same ones used in the work of Álvarez-Nogal and Prados de la Escosura (2006), which were in turn taken from Yun (1987, p. 465) and Ramos Palencia (2001, p. 70). In this sense, Álvarez-Nogal and Prados de la Escosura (2007, p. 346) claim that: "Gini coefficients for income distribution at different Old Castile towns c. 1750 cast values ranging from 0.39 to 0.56, while similar estimates were obtained for Jerez (around 0.5)".

a rise in inequality between 1650 and 1750 and a drop in the second half of the 18th century. Further, according to their calculations, pre-industrial inequality in Catalonia would have reached a peak in the 1740s[35]. Despite the diversity of approaches, indicators and sources used, therefore, these studies indicate that over the broader time frame, the period of our study is a decade (the 1720s) of relatively high inequality in the context of the Early Modern Period.

To explore the levels in income inequality in pre-industrial Catalonia in greater detail, we next look at the distribution of the contribution paid by the 2,617 male taxpayers included in our study. Figure 3 sets out a histogram to illustrate the distribution, presenting the data normalized to the average, where each bar contains a 2% interval. The shape of the histogram shows that small taxpayers predominated in the sampled Catalan towns, as 75% of taxpayers had a contribution below the average. The frequency of observations above the average is much smaller and decreasing up to values that are five times greater than the average. Roughly from that threshold upwards, the frequency is substantially lower and any observations greater than five times the average are scarce (56 taxpayers), although the maximum contribution is more than ten times greater than the average.

[FIGURE 3]

To analyse the data set further, we next break down our sample by income group. Table 4 shows that the wealthiest 1% account for 8.1% of the whole contribution and, overall, pay a mean contribution that is eight times greater than the sample average. If we look at the occupations of the super-rich, we find that 20 of the 26 wealthiest individuals in the sample declare themselves to be agrarian landowners, four are members of the nobility, one is a wool dresser (*paraire*) and one is a shopkeeper (*botiguer*). While the super-rich are highly concentrated by occupation, they appear to be more dispersed over space, although Moià, the biggest town in the sample, is home to eight of the 26. If we focus instead on the wealthiest 10% (262 taxpayers), the contribution rises substantially. This income group represents almost 40% of the total contribution and their mean contribution is four times greater than the average. The next income group, which falls within the range of 10-50%, (1,047 taxpayers) has a similar contribution to that of the top 10% at around 40% (column 3). In this case, however, their mean contribution is similar to the sample

[35] Badia-Miró and Tello (2014) have pointed to 18th-century expansion of wine in the coastal areas of Catalonia as a factor that led to a reduction in inequality for much of the century (compared to what happened in the inland cereal-growing areas), although their study focuses mainly on the mid-nineteenth century.

average (column 5). The income group within the range of 50-90% (1,046 taxpayers), has a contribution that is lower than one-fifth of the total and their mean contribution is less than half of the sample average. Finally, the bottom 10% contribute less than 2% to the total and their mean contribution is only around one-tenth of the sample average.

[TABLE 4]

The compiled information also enables us to explore income distribution according to the professional occupation of the taxpayers. In this case, we split the information into two economic sectors: agrarian and non-agrarian activities. Next, we divide each of the two economic sectors into subcategories (Table 5)[36]. To begin with, if we focus on the number of taxpayers (columns 1 and 2), we can approach the economic structure of pre-industrial Catalonia. Based on the two main defined economic sectors, we see that 73.8% were agricultural workers and the remaining 26.2% were engaged in non-agrarian activities. Among the agrarian workers, landowners represented almost one-fifth of the active population (18.8%), but more than half (54.9%) were landless peasants[37]. In addition, most of the landless peasants were labourers (50.5%) and the presence of sharecropping *masovers* was more limited (4.4%)[38]. As regards the non-agrarian workers, those who worked as artisans or were involved in the liberal professions stood at almost one-fourth of the workforce (24.9%), and only a very small fraction of them were apprentices and/or artisan labourers (2.8%). All in all, this leaves the privileged subcategory with only a marginal share (1.4%). The subcategory of "privileged" covers a wide range of occupations that received the privilege of being exempt from the payment of the *personal* part of the tax. This is a rather heterogeneous group, given that it contains a wide range of professions including members of the nobility, priests and soldiers.

If we look at the contribution by occupation (columns 3 and 4), a few conclusions emerge. First, as regards the sector of activity, agrarian/non-agrarian, their respective share of the contribution largely reproduces the structure obtained for the workforce as a whole. Second, and more

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[36] "The poor and handicapped" and individuals whose employment is unknown (n.a.) are drop from the analysis as they cannot be regarded as active population. Also, their numbers are relatively small (178 and 50 individuals, respectively). As a result of their exclusion, however, the sample falls in size from 2,617 to 2,389 individuals.

[37] The category of labourers includes mainly agrarian labourers, but also servants (*criats*, *mossos*) and shepherds. Among the agrarian owners, we have included two fishermen from Alella.

[38] Access to land was the result of a complex variety of contracts and agreements. The cadastre identifies a subcategory of sharecroppers known as *masovers/parcers*.

importantly, things change within the agrarian sector. The agrarian owners accounted for 18.8% of the workforce, but paid 38.4% of the tax. By contrast, the contribution of labourers falls significantly: they accounted for 54.9% of the workforce, but paid only 34.0% of the tax[39]. Finally, the contribution of the privileged is higher than their share (1.4%) but it still remains at a rather low value (3.5%). As regards the mean contribution of each sector (columns 5 and 6), the non-agrarian sector accounts for a slightly higher value (68.0 *rals*) than agrarian activities do (63.6 *rals*). Differences, however, do appear in the various occupations within the two economic sectors. The privileged and agrarian owners clearly made above-average contributions. The privileged had an average contribution that was 2.5 times greater than the sample average. The mean contribution of agrarian owners is two times greater than the sample average, and the differences between agrarian owners (132.1 *rals*) and non-owners (40.1 *rals*) are stark.

A general perspective of the levels of inequality by occupation can be gleaned from the results for the Gini coefficient (column 11). The agrarian sector shows a Gini (0.48) that reaches values close to the overall Gini (0.46) and clearly surpasses that of the non-agrarian sector (0.38)[40]. The privileged are a small but heterogeneous group with higher Gini values (0.62). Then, at a second level, we find that the distribution of income is more unequal among agrarian owners and sharecropping *masovers* (0.48 and 0.43, respectively). Liberal professions and artisans (whether owners or not) hold an intermediate position with Ginis around 0.3. Finally, within the group of agrarian labourers, we find a lower dispersion of income (0.24), meaning that they were all largely and equally poor.

[TABLE 5]

Although the analysis so far has looked at our sample as a whole, Figure 4 provides a spatially disaggregated view of inequality patterns in Catalonia. The different towns in the sample are ranked on the basis of their Gini coefficient, which ranges from 0.39 to 0.52. There is, nonetheless, a town that clearly behaves as an outlier: Monistrol de Montserrat appears at the bottom end of the distribution (0.24)[41]. For a further examination of the main patterns of

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[39] Within the agrarian non-owners, *masovers* paid a share of the contribution (6.0%) higher than its size in number of taxpayers (4.4%). This result confirms that some *masovers* may have had a relatively high income.

[40] Here the exclusion of the poor and handicapped and those without a known profession causes the overall Gini to drop from 0.47 to 0.46.

[41] As we mentioned, this town is a special place in central Catalonia. It combines a rather adverse geography, a marked proto-industrial specialization and a workforce structure that is very much influenced by the nearby presence of the monastery of Montserrat, a key religious institution in Catalonia.

inequality in pre-industrial Catalonia, we conduct some exploratory and descriptive exercises. Figure 5 combines a series of graphs that explore whether there is a relationship between inequality levels and a number of economic and social dimensions of the 17 towns in the data set, namely population size, mean income, share of agrarian population and share of proto-industrial textile workers. First, if we focus on population size and inequality (upper-left panel), it can be argued that town size does not seem to be a determinant factor of inequality levels[42]. Whether population size matters has been the subject of much debate in the literature on pre-industrial inequality. In general, it is claimed that there is a positive association elsewhere in Europe between increases in urbanization and increases in inequality, although Alfani and Tullio (2019) find that the association might not be as strong as previously thought. In our case, the results obtained from our sample of Catalan towns falls in line with the latter view, although the absence of large cities in our sample must be borne in mind.

[FIGURE 4]

[FIGURE 5]

Second, we explore whether there is a relationship between town wealth, using the mean contribution from each town as an indicator, and the towns' respective levels of inequality (lower-left panel). In this case, we find that inequality was higher in wealthier towns[43]. Third, a larger share of agrarian population is also associated with higher Ginis (upper-right panel). This result is related to a previous finding, i.e. that land property proved to be a fundamental source of income and was therefore a key to understanding income distribution as it usually occurs in pre-industrial societies[44]. Conversely, this result implies that less agrarian towns were more equal. A potential explanation for the finding could be a larger presence of proto-industrial activities. Thus, we look at the relationship between the share of their workforce employed in proto-industrial wool manufacturing and inequality. Figure 5 (lower-right panel) shows a slightly declining trend: a higher share of proto-industry (textile artisans) is associated with lower Ginis. To explore this issue further, we now study the distributional effects of proto-industrial activities in greater detail. In a nutshell, we aim to determine whether proto-industrial wool manufacturing

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[42] If we use the number of taxpayers instead of population, the result is virtually the same.

[43] Additionally, Figure A1 in the Appendix shows that a negative relationship appears between town size (measured by the number of contributors in each town) and mean contribution.

[44] This result holds even if we remove the outlier in the sample (Monistrol de Montserrat), although the positive correlation becomes weaker.

fostered inequality or whether, conversely, it led to the formation of more egalitarian societies in inland Catalonia. To do so, we focus on the main Catalan proto-industrial area.

5. Proto-industry and inequality: a case study

The development of a proto-industrial system of production, mainly specializing in wool manufacturing, was a pan-European phenomenon during the Early Modern Period (Mendels, 1972; Coleman, 1983; Ogilvie, 1996, 2008). This manufacturing system was also widespread in Catalonia (Torras, 1981, 2019; Marfany, 2010, 2012). During the 17th and 18th centuries, several areas specialized in the production of woollen fabrics in a process that was complementary to the specialization in viticulture that occurred in other (more coastal) areas. While the production of woollen fabrics maintained precarious structures and was in recession in southern Catalonia (Camp de Tarragona) and in the mountains (Western Catalan Pyrenees and Pre-Pyrenees), proto-industrial activities thrived in a large swath of inland Catalonia. A number of proto-industrial towns became specialized in medium-quality fabrics, for which not only Catalan wool, but also wool from Aragon and Castile, was used as raw material. Accordingly, the produced draperies were sold not only in the Catalan market but also in the rest of Spain[45].

In Catalonia, this proto-industry system was often managed by wool dressers (*paraires*), i.e. artisans dedicated to the preparation of wool and the finishing of fabrics. Being at the beginning and the end of the production process put them in a strategic position to dominate the whole process. Some *paraires* became true capitalist entrepreneurs in the proto-industrial system and enriched themselves above the rest of their peers, coordinating the production process from the outside, and controlling the supply of raw materials, the marketing of the final product and the financing of everything[46]. The specialized artisans who managed the manufacturing process would often organize themselves into guilds in some of these proto-industrial towns. While the literature has presented breaking free of the control of medieval guilds as one of the advantages for traders fleeing the cities, the Catalan case is marked by merchants/artisans who were

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[45] Some Catalan towns like Olot, Terrassa and Igualada became in turn specialised in higher quality woollens, which were sold both in the Spanish and colonial markets (Torras 1984, pp. 67-73).
[46] As we shall see, however, as the process developed, some differences appeared across Catalonia in the structure and organization of proto-industrial activities.

interested in creating new guilds to guarantee quality standards and reduce the inherent uncertainties in their activity (Torras, 1999).

The location of the production of woollen fabrics in the territory was conditioned by the great need for workers to spin wool. This was usually a task performed by farmers, especially women, in times of low field work. An area that became particularly specialized in woollen manufacture included the Moianès and Lluçanès plateaus in central Catalonia. The two areas, which contain five of the towns in our sample, shared a number of features in common[47]. Their agrarian production was characterized by almost complete specialization in cereals with low yields, while the harsh conditions made it very difficult to cultivate vineyards, a crop then in expansion in other parts of Catalonia[48]. Agrarian families also relied on other economic activities such as extensive livestock farming or logging. It was under these circumstances that the area increasingly developed wool manufacturing as a way to bolster household incomes.

Within this general setting, the town of Moià was undoubtedly one of the major proto-industrial enclaves in 18th-century Catalonia. With a population of 1,468 inhabitants in 1717 (Iglésies, 1974), Moià is located at an altitude of 717 metres on the plateau of Moianès. Torras (1984) characterizes it as one of the typical mid-sized towns in the central Catalonia, an area that wove close to two-thirds of the wool woven in Catalonia. According to the *Junta Particular de Comerç*, the two contiguous towns of Castellterçol and Moià had accumulated the largest number of wool looms in Catalonia by 1760. This proto-industrial specialization was the result of a long tradition in wool manufacturing that had its roots in earlier centuries. Drapery became consolidated during the 16th century, and the wool dressers (*paraires*) and weavers (*teixidors*) in the village of Moià established a guild (*confraria*) as early as 1523. The village's wool specialization carried on through the 17th century and intensified over the course of the 18th century.

In Moià, a mid-quality drapery prospered. Raw wool arrived from different areas of Catalonia but also, to a large extent, from the neighbouring region of Aragon. At first, the final product was aimed at the Catalan market, but increasingly it was also aimed at different regions of Spain. Vilar (1962) describes Moià as a paradigmatic example "of the Catalonia of the plateaus", where

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[47] The five towns are Moià, Santa Maria d'Oló, Olost, Perafita and Sant Feliu Sasserra.
[48] The only exceptions were Sant Feliu Sasserra, Oristà and Calders. Things were somehow different in the other parts of central Catalonia included in our sample (i.e. those located in the Pla del Bages). There, a growing number of woollen looms and increased manufacturing specialization during the 18th century were compatible with a specialization in viticulture (Ferrer Alòs, 1987).

people typically combined agriculture and spinning. As regards agrarian production, this was a land of cereals and despite the growing relevance of textile manufacturing, "the Moianès had a dual economy at the end of the 17th century: on the one hand, the large rural estates (*masos*) that had formed after the crisis of the Early Modern Period and possessed a vast amount of natural resources but were still unable to exploit them; and on the other hand, the village economy organized around textile activity" (Ferrer Alòs, 2000, p. 70). The specialization in wool manufacturing under a proto-industrial regime implied that a phase of the production process, specifically spinning, was carried out chiefly by women within the domestic sphere, and in the case of Moià they would spin thin worsted yarns[49]. Overall, it appears that while men worked both in wool manufacturing and in agriculture, whether cultivating their own holdings or the large estates known as *masos*, women focused on spinning wool[50].

The complementarity between agriculture and manufacturing within a proto-industrial setting has a few key implications for our analysis. First, given that household heads had to declare only one profession, their main one, we cannot properly capture the magnitude of pluriactivity. Second, and more importantly, the fact that women (and children) were excluded from paying the cadastral tax may result in an underestimation of household incomes, which would inevitably affect our calculations of inequality. Finally, it is notable that proto-industrial wool manufacturing networks were not confined to a single town, but instead often included peasant families from other towns. In the case of Moià, by 1787, the guild of wool dressers (*paraires*) and weavers (*teixidors*) had 23 larger producers (*fabricants majors*) and 30 smaller producers (*fabricants menors*), who owned 156 looms and gave employment to around 300 families "in more than seven adjacent places, some within and others beyond the Moyanés" (Ferrer Alòs, 2000, p. 83; Torras, 1981).

In this context, the 1724 cadastre includes a total of 434 male taxpayers in Moià. Our results yield an aggregate value of 0.477 for the Gini coefficient. This value is of a similar magnitude to the value previously obtained for the whole sample of 17 Catalan towns[51]. Income distribution

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[49] According to contemporary accounts, by 1765 there were 48 wool producers (*fabricants llaners*) with 111 looms, and each mill (*fàbrica*) or workshop (*taller*) employed 3 men, 22 women and 2 children, thus employing around 1,300 workers (Ferrer Alòs, 2000, p. 83).

[50] "How many spinning wheels there are, it is impossible to say except that they nearly equal the number of women, who hardly do any other work and each has her own" (Ferrer Alòs, 2000, pp. 83-84).

[51] Figure A2 in the Appendix shows a histogram with the contribution paid by all resident male taxpayers in Moià relative to the average. The distribution is clearly skewed to the left, so that small taxpayers predominate.

can be further examined using the information that appears in Table 6 on the distribution of tax payments by income group. The richest taxpayers in the top 1% accounted for 9.7% of the total contribution in Moià, whereas the top 10% reached 45.1%. At the other end, the bottom 10% represented only 3.1% of the total contribution. Among the 4 individuals that belong to the top 1%, the richest taxpayer in the town is an honoured burgher who paid a contribution of 625.8 *rals*, which is 11.3 times greater than the average contribution (55.4 *rals*). The other three were rich landowners[52]. Conversely, the bottom 10% is mainly composed of landless agrarian workers. The list of taxpayers in descending order from highest to lowest contribution highlights the clear relationship between the individuals' profession, their income, and the contribution they had to pay in the cadastral tax. Thus, to gain a deeper insight into the income distribution in the proto-industrial town of Moià, we turn now to occupations.

[TABLE 6]

First, Table 7 illustrates that in spite of being an important manufacturing centre, the active population in Moià was mainly agrarian (69.4%)[53]. The town's agrarian workforce was divided in turn into 30 landowners and 258 non-owners, most of them agrarian labourers (247 individuals), although we also find sharecropping *masovers* (11 individuals). On the other hand, there are 127 non-agrarian taxpayers, i.e. 30.6% of the workforce. The main professional category within the latter group were artisans and liberal professions (123 individuals), while the privileged were a minority (4 individuals). Of particular interest for our study are the 72 textile artisans, since we can assume that they were working on the production of wool manufactures under a proto-industrial system. These textile artisans (lower panel in Table 7) notably represented 17.3% of the total workforce in Moià and accounted for 19.1% of the total contribution paid in the town, with a mean contribution that exceeded the average by 10%. Interestingly, with a Gini coefficient of 0.324, textile artisans show a lower dispersion of income not only than the level observed for Moià as a whole (0.480) but also than other professional groups such as non-agrarian (0.405) and agrarian (0.478) workers. Thus, textile artisans appear to be a relatively homogeneous group within the occupational structure of a proto-industrial town like Moià.

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[52] Within the top 10% income group, the occupations that predominate are: agrarian landowners (15), textile artisans (13), liberal professions (6), privileged (4) and sharecropping *masovers* (4).
[53] Given that we exclude the poor and handicapped (4 individuals) and those of unknown profession (15 individuals) from the analysis, the number of observations falls from 434 to 415.

[TABLE 7]

We can examine the category of textile artisans in greater depth by looking at two of the main occupations within the category: wool dressers (*paraires*) and weavers (*teixidors*). Table 7 shows that, within the group of textile artisans, there were 39 wool dressers (5 of them apprentices or *aprenents*) and 30 weavers (1 of them an apprentice or *aprenent*). Additionally, we find 2 *perxers* and 1 dyer (*tintorer*), giving a total of 72 textile artisans in Moià. If we look at the two professional groups of wool dressers and weavers, however, some differences do emerge. On average, the wool dressers have a higher mean contribution than we observed both for Moià as a whole (30% higher) and for the weavers (almost 40% higher). Yet, the higher incomes of the wool dressers compared to the weavers also imply a larger dispersion of income as evidenced by the Gini coefficients (0.364 and 0.221)[54]. Finally, the higher income observed for the wool dressers is also reflected in the fact that we find 11 of them among the top 10% of richest individuals. The first wool dresser holds 15th place in the ranking with a contribution of 290.8 *rals* (i.e. more than five times the average contribution in Moià). The wool dresser with the lowest contribution stands in 41st place with 89.9 *rals.*, still clearly above the average contribution (56.7 *rals*). These figures illustrate that some wool dressers were among the town's wealthiest individuals, but that there was also a high degree of differentiation within the group and a greater dispersion in income[55].

Overall, the analysis of the data seems to indicate that proto-industrialization favoured the expansion of a social group, the proto-industrial textile artisans, which apparently formed a reasonably egalitarian group from the viewpoint of income. The case of Moià at least shows that the proto-industrial textile artisans had less internal inequality (with a Gini of 0.324) than the set of agricultural workers (with a Gini of 0.478), probably owing to the large differences observed between agrarian owners and labourers, which are ultimately responsible for the higher levels of inequality recorded[56]. In other words, the presence of a social group engaged in proto-industrial textile activities favoured the creation of an intermediate group that broke down the polarization between landowners and landless peasants typical of pre-industrial agrarian societies. Two simple counterfactual exercises may serve to bolster these conclusions. On the one hand, we have found

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[54] These differences remain, although at different levels, if we focus on master artisans and exclude apprentice labourers (*aprenents*) (0.347 and 0.215, respectively).

[55] Among the top 10%, we also find two weavers holding more modest places (29th and 33rd) and making more modest contributions (140 and 120 *rals*, respectively).

[56] The potential shortcoming in the design of the *personal* part of the cadastral tax, which was examined for the whole sample in an earlier section, does not seem to affect the results in the case of Moià (see Table A2 in the Appendix).

that inequality is strongly linked to the ownership of land and, in particular, to its distribution, as evidenced by the existence of large landowners who are among the richest individuals in the village, and by the fact that there was a low number of agrarian landowners (30) compared to agrarian labourers (258). Thus, if we remove the landowners from our calculations, the result is that the Gini goes from 0.480 to 0.368, confirming that agrarian landowners play a crucial role in inequality. On the other hand, to see whether the presence of artisans was an egalitarian force, we calculate the Gini coefficient removing the textile artisans. In this case, it increases slightly from 0.480 to 0.500.

These results can be framed in the context of a more general discussion. The relationship between proto-industry and economic inequality is an important element in the debates on proto-industrialization and its effects. To sum up, the relationship has been linked primarily to two elements: demographic factors and aspects related to the business structure that proto-industrialization adopts. First, the role of demography as a determining factor in the relationship between proto-industry and inequality is part of a traditional debate that, in its distributive aspects, has pointed to the importance of proletarianization as the main mechanism to link the two concepts (Levine, 1977; Tilly, 1984)[57]. On the one hand, it is argued that proto-industrial work allowed many rural workers to live on little land, enabling them to marry earlier and have more children. On this line of reasoning, the existence of an alternative source of income shattered the traditional control mechanisms that adjusted demographics to the ability of agriculture to produce food (the famous Malthusian preventive checks). According to Levine (1977), proto-industrialization helped in the development of capitalism and industrialization by creating a significant mass of landless, or very low-land, workers who had to offer their labour to the market. From this viewpoint, therefore, proto-industrialization increased pre-industrial inequality through the proletarianization of a particular part of society.

The demographic effects predicted by the traditional theory of proto-industrialization, however, have been among the most studied and have quite often been empirically refuted[58]. Several authors have shown that the increase in rural manufactures did not necessarily imply a fall in the age of marriage, or higher fertility, or an increase in population. According to Vardi (1993), flax

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[57] The role of proletarianization has also been very much present in recent studies on inequality in the Early Modern Period. See Alfani (2019, 2021).

[58] Among the abundant literature, see Hendrickx (1993) and (1997), Spagnoli (1983), Lehning (1980) and Schlumbohm (1996).

weavers in Cambresis took advantage of weaving to earn extra income but it did not change their reproductive behaviour. Rather, it raised their standard of living. In fact, he argues, it also reduced mortality, which in turn resulted in increased population. Even in Flanders, which Mendels studied and built the theory of proto-industrialization on, Vandenbroeke (1996) shows that increased population was the result of falling mortality, not rising birth rates. These cases suggest that rural manufactures led to an improvement in the living standards of peasants, who did not "waste" their extra income on more children as Malthus had feared. Such household behaviour would therefore have contributed to a reduction in economic inequality.

Taken together, if proto-industry enables families to earn more income, the difference in the arguments put forward in the two interpretations lies in how families respond to higher income: marrying sooner and having more children; or not altering reproductive patterns and enjoying a higher standard of living (accompanied by a reduction in mortality rates). According to the available evidence, therefore, the phenomenon of proto-industrialization is compatible with different regimes of nuptiality and fertility. In fact, it has been argued that the response of families is mediated by the land tenure regime, and access to it, in each geographical and temporal context. According to Hudson and King (2000) and Marfany (2010), the demographic predictions of proto-industrialization theory will not be borne out as well in those societies that, despite the development of rural manufactures, continue to maintain an important link with land tenure. To the extent that the logic of traditional peasant society was dominant, proletarianization would not occur despite the significant income provided by rural manufactures. Rather, we would be in the presence of an egalitarian proto-industrialization.

However, demographic factors are not the only ones that conditioned the relationship between proto-industry and inequality; how rural manufacturing was organized and structured also has implications on how it impacted the levels of inequality in a society. Kriedte et al. (1981) argued that proto-industry transformed rural manufacturing by shifting it from the *Kaufsystem*, in which the artisan retained autonomy over production and sales, to the *Verlagsystem* or putting-out system, in which the trader controlled the supply of raw materials and the marketing of the finished product, while the rural producer worked for a monetary payment. While Hudson (1986) relates the two systems to the maintenance of land tenure, Thomson (1983) links them to the type of market and product in which producers specialized: the *Verlagsystem* would be better suited to selling into more distant markets or selling quality products, and it would

generate a structure able to respond quickly to changes in demand. The *Verlagsystem* would therefore lead to more hierarchical structures that resulted in greater inequality among manufacturing producers. By contrast, the *Kaufsystem* would generate less differentiation between producers and lead to a more egalitarian structure.

As regards Catalonia, Marfany (2010, 2012) has studied the case of Igualada, one of the localities that witnessed a greater development of proto-industrial manufacturing. Her findings show that in the last third of the 18th and first two decades of the 19th centuries, among the families engaged in textiles there was a fall in the age of marriage, an increase in fertility, and a reduction in the period between children's births, probably owing to the shorter duration of lactation, which in turn contributed to an increase in infant mortality. The case of Igualada would thus corroborate the demographic predictions of proto-industrialization theory. Marfany (2010) argues that the inheritance system greatly conditioned the establishment of new family units engaged in agriculture by younger brothers and, consequently, the expansion of rural manufacturing shattered this constraint. Ferrer Alòs et al. (1992) found similar patterns for a sample of localities in central Catalonia in the early 19th century: a lower age of marriage and a lower incidence of celibacy among textile workers than among peasants. However, we must remember that our data set, which is focused on the 1720s, gives a picture that predates the development of these processes.

All in all, it can be argued that proto-industry leads to a more unequal social structure insofar as it contributes to a two-way proletarianization: creating landless workers and turning artisans into dependent workers. At the same time, however, these aspects varied substantially among different areas and periods. If we focus on the two modalities of rural manufacturing (the *Kaufsystem* and the *Verlagsystem*), we observe in Catalonia that both co-existed, depending on the locality. Marfany (2010) finds that, although commercial capital did not play a decisive role in rural wool manufacturing in the Catalan case, those localities where higher quality cloths were produced and sold further afield (Igualada, Terrassa) did have a strong hierarchy among the wool dressers or *paraires*, who were the real *verlagers*. By contrast, places like Olesa and Esparreguera had a more egalitarian structure of *paraires*, that is, the *Kaufsystem* was predominant[59]. Thus, based on the previous classification, Moià had reached an intermediate point by 1765. That is, it was

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[59] The success of one or the other model would ultimately depend on the resilience of the guild structures: as Torras (2006) and Benaul (1992) have shown, some *paraires* managed to unify the guild regulations in Igualada and Terrassa from the 1720s onward.

marked by a low level of importance of commercial capital but a relative autonomy of textile artisans. Therefore, in the case of Moià, we are looking at a locality that, first, showed a rather unequal land distribution that could be pointing to a certain proletarianization, although this hypothesis is difficult to assess owing to the static nature of our analysis[60]. And second, it was a town with a wool manufacturing business structure closer to the *Kaufsystem*, that is, with little differentiation among participants. These two aspects could be acting in opposite directions in relation to the effect of local proto-industry on the levels of inequality, and thus our results must be analysed keeping in mind the characteristics of this specific historical context.

With the aim of further checking the robustness of the results for Moià, we look next at an alternative town in our sample, where the presence of strong proto-industrial wool production is also well known: Olost. Olost, which is a town located north of Moià on the Lluçanès plateau (669 m), had a lower population (451 inhabitants). Agriculture was almost exclusively specialized in the production of cereals (mainly wheat) and the cultivation of vineyards was not possible, so that the population relied on livestock and forestry exploitation as well as a traditional specialization in manufacturing draperies to complement their income and guarantee subsistence. In general, the manufacturing specialization in the Lluçanès was focused on simple, cheap and medium-quality woollen fabrics, which was common at the time in central Catalonia. In this context, textile activities occupied most families during the second half of the 18th century (Planes, 1997)[61].

First, the proto-industrial nature of the town is plainly visible in Table 8[62]. The occupational structure shows that 57.1% of taxpayers worked in non-agrarian activities (48 of 84 workers), a noteworthy figure for a pre-industrial society in the early 18th century. Further, from the 48 individuals registered as artisans and liberal professionals, up to 27 had a direct relationship with the production of draperies (both wool dressers and weavers). This means that one-third of the workers worked as textile artisans (32.3%). In terms of inequality, Olost largely reproduces the

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[60] In Moià, 48.6% of taxpayers did not pay taxes for land, that is, they were landless. In addition, the Gini on land taxpayers gives a value of 0.80, pointing to a high inequality in the distribution of land, well above the average (0.67).
[61] In the long run, this woollen manufacture in central Catalonia, which produced cheap clothing made of thin worsted yarn (*roba d'estam estreta*) for the working classes, would be the most vulnerable to the introduction of cotton. Once cotton production was introduced and the industry underwent mechanization in the 19th century, the production of wool yarn eventually languished in the region and disappeared (Planes, 1997, p. 116).
[62] Together with the 84 taxpayers in Table 8, there are two additional individuals of unknown profession. As before, we exclude them from the analysis by occupation.

results obtained for Moià albeit at a lower level. We find differences, however, in the aggregate inequality values with a lower Gini coefficient in Olost (0.418) than in Moià (0.477).

These results seem to be linked to the lower relative presence of agrarian activities in the town. On the one hand, the level of inequality within the group of agrarian workers is markedly higher (0.560) as a consequence of the apparent polarization in income between landowners and labourers. On the other, we find that the category that includes artisans and liberal professions is a more egalitarian group (0.134). Dispersion within textile artisans (0.143) occurs at similar levels. Thus, if we remove textile artisans from the sample the Gini increases from 0.418 to 0.493. Finally, within the proto-industrial textile artisans, differences appear between wool dressers and weavers as they do in the case of Moià. Actually, the wool dressers have a mean contribution that is slightly greater than that of the weavers, showing that the wool dressers had higher incomes but also, in this case, a higher income dispersion than the weavers (0.135 and 0.110, respectively). The gap between textile artisans and agrarian workers is even more acute in Olost than it was in Moià. In any case, however, it shows a comparable behaviour in terms of income dispersion among different occupational groups, especially among textile workers. All in all, these results seem to point that the lower relative presence of agrarian activities in the town and the higher presence of proto-industrial activities favoured the formation of a more egalitarian society[63].

[TABLE 8]

7. Conclusions

In this paper we analyse economic inequality in Catalonia in the early 18th century. In so doing, we exploit the information for the year 1724 contained in the cadastral tax, a source that has not been previously used for this purpose. We have compiled a data set that contains 2,617 male taxpayers distributed across 17 towns, obtaining a Gini coefficient of 0.47 for the whole sample. Although the sources and methodologies used in previous studies on pre-industrial economic inequality differ, when put in comparative terms, our results show that inequality in the 1720s in

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[63] By providing an additional income to families, the widespread work of women as spinners (which cannot be considered here because they are excluded from the source) would probably strengthen this argument.

our sample of Catalan towns was lower than in other Western European societies, but very close to other areas of Spain.

Taking advantage of the wealth of information provided by the cadastre, we observe that land property was a crucial determinant of inequality among the different sources of income, a fact well established in the previous literature. In close connection with this fact, we find that, when looking at occupations, income inequality was higher among agrarian workers (with a Gini of 0.48) than among non-agrarian workers (with a Gini of 0.38). The large gap that existed between landowners and landless peasants would account for this result. Moreover, we find that the towns in our sample that had a larger share of agrarian population were more unequal, while the towns with a greater presence of proto-industrial activities, namely towns with a higher share of textile artisans, systematically yielded lower Ginis. In view of these results, we explore the relationship between proto-industry and inequality in the last part of the paper.

More specifically, we focus on one of the main Catalan proto-industrial towns of the 18th century, Moià, and on another, smaller proto-industrial town, Olost. By exploring the effect of proto-industrial activities on income inequality, we suggest that such an effect came about through a number of different mechanisms. Over the period, proto-industrial activities expanded and offered new income opportunities to a good number of families in inland Catalonia. On the one hand, a new social group linked to the production of wool manufactures emerged as middle class. The new group not only increased in number over time but was also crucial in breaking up the typical polarization of rural societies between landowners and agrarian labourers. Indeed, the new proto-industrial middle-income group by and large shows a more egalitarian intra-group distribution of income than other occupations. However, this result is closely linked to some specific features of Moià, in particular how proto-industry was organized in the town, with a wool manufacturing business structure closer to the *Kaufsystem* than to the *Verlagsystem*. That said, a different land distribution or a more hierarchical business structure in the wool sector could have led to different results, and since this was a dynamic process, the internal differentiation among wool dressers could have increased in the long run.

All in all, our study contributes to the recent, growing literature on pre-industrial economic inequality by adding a new piece to the overall picture. In this sense, we believe that the Catalan case is particularly noteworthy not only because it was a society and economy going through significant transformations in the early 18th century but also because the transformations led

Catalonia to become the main industrial region in Mediterranean Europe in the 19th century. Finally, by looking at income inequality across different occupations we explore the impact of proto-industrialization, a general and pan-European phenomenon, on inequality levels, an issue that has been somewhat overlooked in the recent literature and may hopefully represent a new and thriving avenue for research in the future.

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Figures and tables

Figure 1. Catalan towns included in our sample. Map of locations.

1. Alella
2. Artés
3. Balsareny
4. Caldes de Montbui
5. Cerdanyola
6. Granollers
7. Lliçà d'Amunt
8. Matadepera
9. Moià
10. Monistrol de Montserrat
11. Montmany
12. Olost
13. Perafita
14. Sant Feliu de Codines
15. Sant Feliu Sasserra
16. Santa Maria d'Oló
17. Santpedor
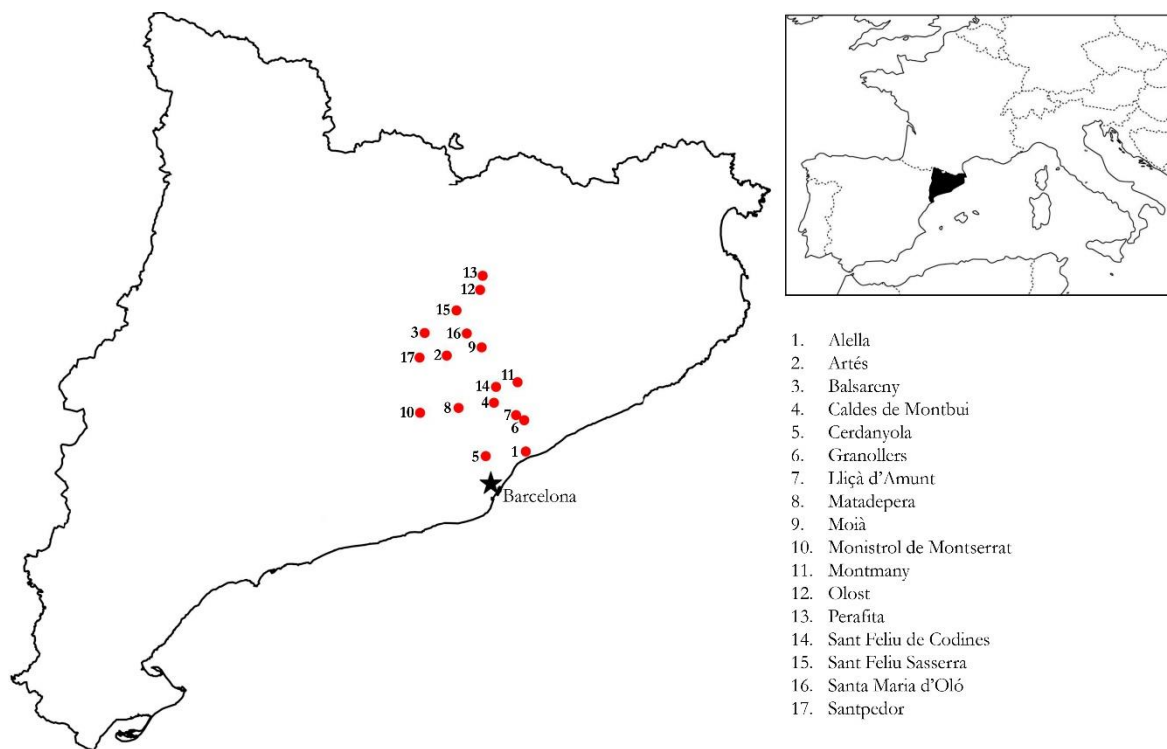
Table 1. Towns included in our sample. Descriptive statistics.

	Town	Pop 1719	Pop (%)	Taxpayers (N)	Taxpayers (%)	Contribution (*rals*)	Contribution (%)	Mean contribution (*rals*)	Mean contribution (avg =1)	Agrarian pop (%)	Proto-industry pop (%)	Gini
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
1	Alella	511	4.8	62	2.4	5,504.9	3.5	88.8	1.5	90.3	0.0	0.401
2	Artés	588	5.6	118	4.5	8,132.4	5.1	68.9	1.1	88.8	2.6	0.394
3	Balsareny	430	4.1	146	5.6	9,860.0	6.2	67.5	1.1	90.0	2.1	0.493
4	Caldes de Montbui	1,391	13.2	382	14.6	19,546.5	12.3	51.2	0.8	73.9	4.5	0.472
5	Cerdanyola	175	1.7	37	1,4	5,638.5	3.5	152.4	2.5	100.0	0.0	0.484
6	Granollers	1,324	12.5	247	9.4	11,926.8	7.5	48.3	0.8	39.2	4.2	0.420
7	Lliçà d'Amunt	200	1.9	45	1.7	6,827.3	4.3	151.7	2.5	97.7	0.0	0.519
8	Matadepera	120	1.1	24	0.9	2,352.1	1.5	98.0	1.6	100.0	0.0	0.422
9	Moià	1,468	13.9	434	16.6	24,037.0	15.1	55.4	0.9	69.4	17.3	0.477
10	Monistrol de Montserrat	339	3.2	174	6.6	9,793.0	6.2	56.3	0.9	56.4	11.0	0.240
11	Montmany*	473	4.5	104	4.0	6,366.2	4.0	61.2	1.0	92.0	0.0	0.445
12	Olost	451	4.3	86	3.3	6,106.0	3.8	71.0	1.2	42.9	32.1	0.422
13	Perafita	357	3.4	57	2.2	3,766.6	2.4	66.1	1.1	81.5	7.4	0.502
14	Sant Feliu de Codines	618	5.9	206	7.9	10,498.9	6.6	51.0	0,8	79.2	3.4	0.416
15	Sant Feliu Sasserra	554	5.2	130	5.0	7,344.9	4.6	56.5	0,9	79.8	4.8	0.501
16	Santa Maria d'Oló	615	5.8	128	4.9	6,466.0	4.1	50.5	0,8	91.3	4.8	0.459
17	Santpedor	948	9.0	237	9.1	14,686.6	9.2	62.0	1,0	83.1	1.9	0.473
	Total	10,562	100.0	2,617	100.0	158,853.7	100.0	60.7	20,7	73.8	7.4	0.474

Notes: N: total adult male taxpayers; % agrarian population calculated excluding "the poor and handicapped" and those of unknown profession. * Montmany i Vallcàrquera.
Source: Own elaboration based on the Cadastre Books, Archive of the Crown of Aragon (ACA), Barcelona. Population in 1719 obtained from Iglésies (1974).

Table 2. Contribution paid to the cadastre by source of income, 1724.

	Contribution (rals)	Contribution (%)	Taxpayers (N)	Taxpayers (%)	Mean contribution (rals/taxpayer)	Median contribution (rals)	Standard deviation	Max	Min	Gini
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Land	62,923.4	39.6	1,459	55.8	43.1	16.4	71.5	544.0	0.1	0.667
House	7,924.8	5.0	1,601	61.2	4.9	4.0	3.7	45.5	0.2	0.355
Labour (*personal*)	76,503.3	48.2	2,320	88.7	33.0	25.0	9.8	45.0	8.3	0.146
Livestock	4,285.8	2.7	570	21.8	7.5	3.0	10.7	83.8	0.8	0.585
Mills	834.5	0.5	43	1.6	19.4	8.0	22.8	108.0	1.0	0.555
Financial assets (*rentas*)	2,880.9	1.8	106	4.1	27.2	10.0	46.1	240.0	0.5	0.665
Business profits (*gananciales*)	3,501.0	2.2	109	4.2	32.1	20.0	26.2	120.0	4.0	0.398
Total	158,853.7	100.0	2,617	100.0	60.7	37.5	72.7	659.6	0.3	0.475

Source: Own elaboration based on the Cadastre Books, Archive of the Crown of Aragon (ACA), Barcelona.

Table 3. Economic inequality by occupation, including and excluding labour income (*personal* tax), 1724.

Including *personal*				Excluding *personal*							
All sample	N	%	Gini	With zeros	N	%	Gini	Without zeros	N	%	Gini
non-agrarian	627	26.2	0.375	non-agrarian	627	26.2	0.727	non-agrarian	488	29.0	0.649
agrarian	1,762	73.8	0.476	agrarian	1,762	73.8	0.779	agrarian	1,195	71.0	0.674
all	2,389	100.0	0.456	all	2,389	100.0	0.768	all	1,683	100.0	0.670
textile artisans	*176*	*7.4*	*0.312*	*textile artisans*	*176*	*7.4*	*0.704*	*textile artisans*	*132*	*7.8*	*0.612*

Source: Own elaboration based on the Cadastre Books, Archive of the Crown of Aragon (ACA), Barcelona.

Figure 2. Income inequality in pre-industrial Western Europe, 1700s (Gini coefficients).

Source: For Tuscany, Piedmont and the Low Countries, Alfani and Ryckbosch (2016); for England and Wales, Allen (2019); for Murcia, Espín-Sánchez et al. (2019); for Castile (Guadalajara), Santiago-Caballero (2011); for Castile (Palencia), Nicolini and Ramos Palencia (2016); for Catalonia, see Table 1.

Figure 3. Histogram of taxpayers' contribution to the cadastre, 1724 (whole sample).

Note: Data normalized to the average, each bar contains a 2% interval.
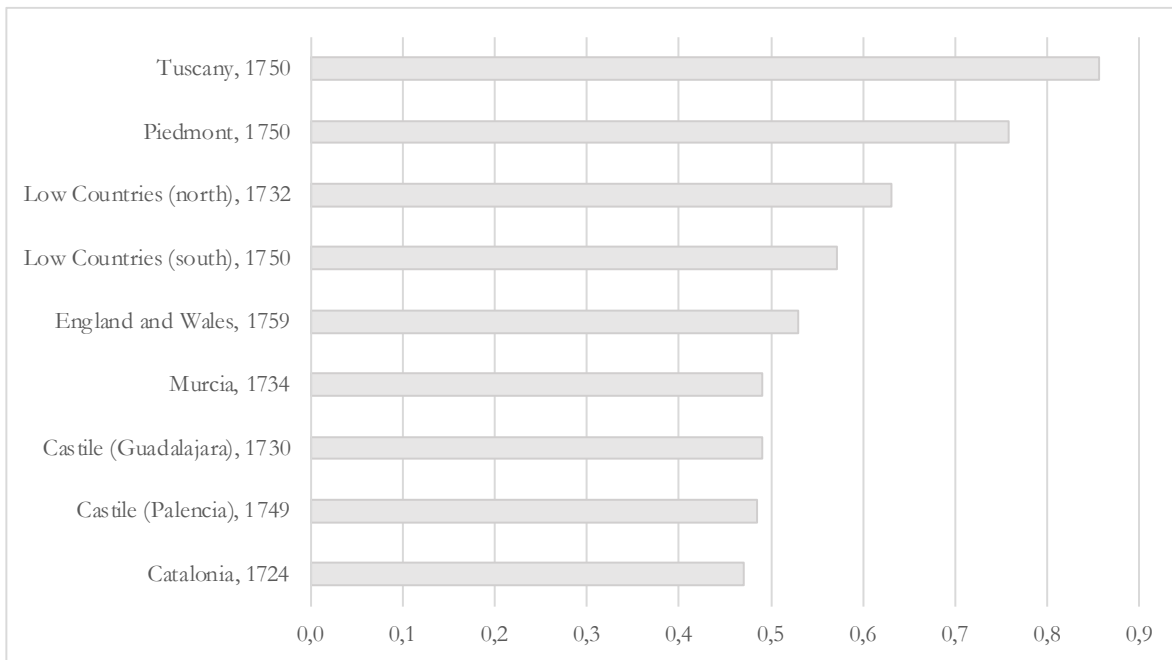Source: Own elaboration based on the Cadastre Books, Archive of the Crown of Aragon (ACA), Barcelona.

Table 4. Income inequality by income group, 1724.

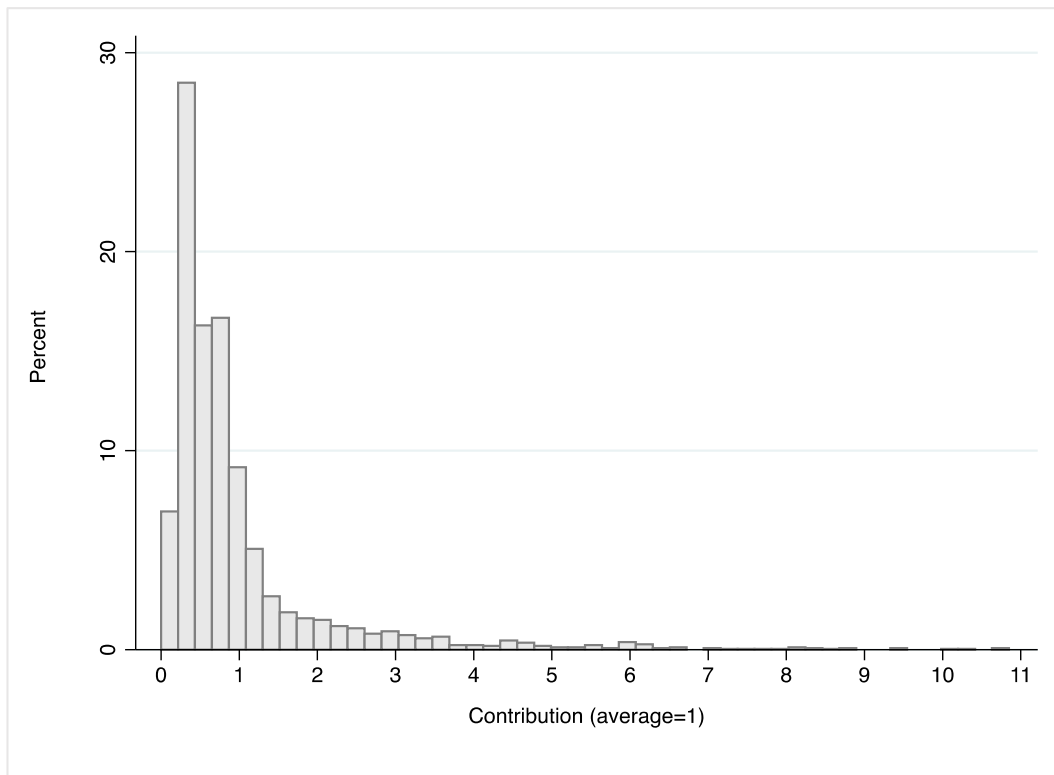|	Taxpayers (N)	Contribution (*rals*)	Contribution (%)	Mean contribution (*rals*)	Mean contribution (avg=1)	Median contribution (*rals*)	Standard deviation	Max	Min	Gini
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Top 1%	26	12,850.6	8.1	494.3	8.1	493.3	83.4	659.6	380.5	0.093
Top 10%	262	62,495.8	39.3	238.5	3.9	198.5	110.7	659.6	128.9	0.237
10% - 50%	1,047	65,097.9	41.0	62.2	1.0	54.3	21.5	128.5	37.5	0.181
50% - 90%	1,046	28,440.4	17.9	25.0	0.4	25.0	3.4	37.5	25.0	0.060
Bottom 10%	262	2,819.7	1.8	7.6	0.1	7.6	8.4	25.0	0.3	0.430
All	2,617	158,853.7	100.0	60.7	1.0	37.5	72.7	659.6	0.3	0.474

Source: Own elaboration based on the Cadastre Books, Archive of the Crown of Aragon (ACA), Barcelona.
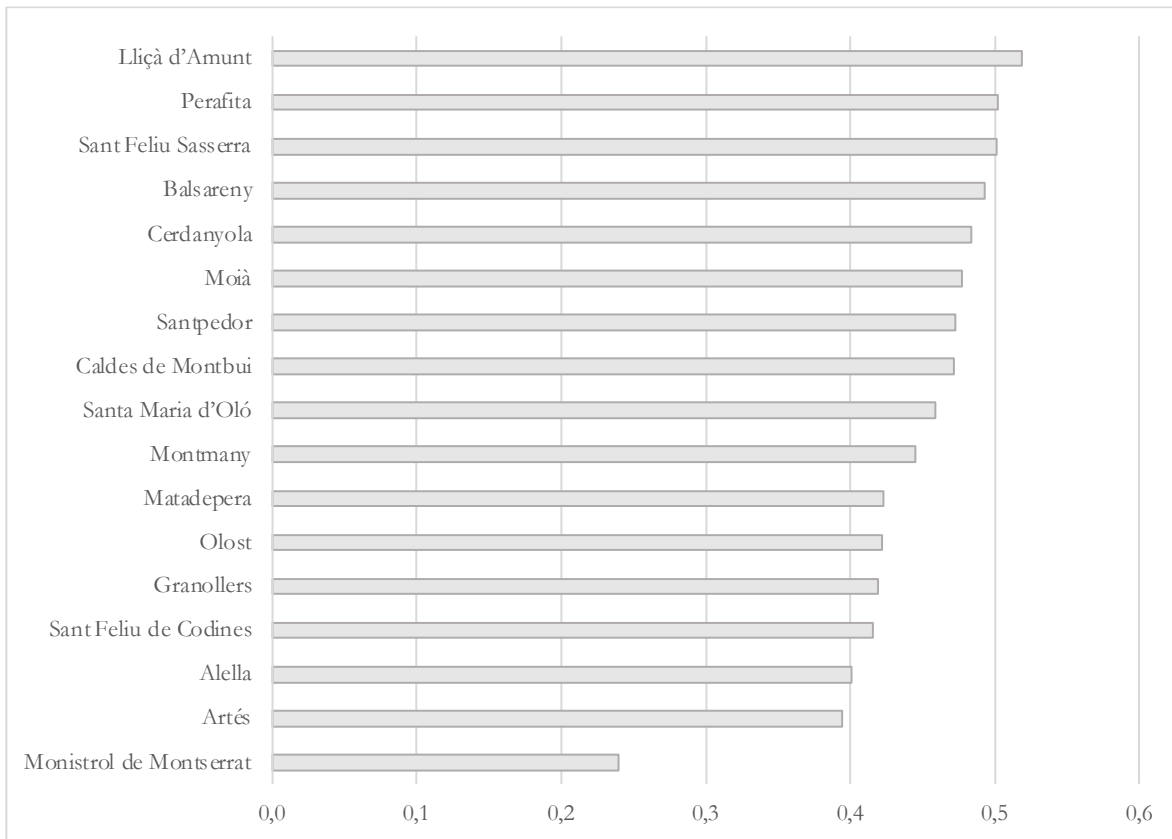
Table 5. Income inequality by occupation, 1724.

	Taxpayers (N)	Taxpayers (%)	Contribution (*rals*)	Contribution (%)	Mean contribution (*rals*)	Mean contribution (avg=1)	Median contribution (*rals*)	Standard deviation	Max	Min	Gini
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
non-agrarian	**627**	**26.2**	**42,664.3**	**27.6**	**68.0**	**1.1**	**52.1**	**67.4**	**659.6**	**0.3**	**0.38**
privileged	33	1.4	5,357.9	3.5	162.4	2.5	63.8	199.3	659.6	0.3	0.62
artisans & liberal prof.	594	24.9	37,306.4	24.1	62.8	1.0	52.0	46.1	539.0	4.0	0.32
owners	*527*	*22.1*	*35,012.2*	*22.6*	*66.4*	*1.0*	*55.0*	*46.8*	*539.0*	*4.0*	*0.30*
labourers	*67*	*2.8*	*2,294.2*	*1.5*	*34.2*	*0.5*	*25.0*	*26.3*	*164.0*	*4.0*	*0.27*
agrarian	**1,762**	**73.8**	**112,079.5**	**72.4**	**63.6**	**1.0**	**34.0**	**76.9**	**653.6**	**1.0**	**0.48**
owners	450	18.8	59,458.9	38.4	132.1	2.0	100.3	117.0	653.6	25.0	0.46
non-owners	1,312	54.9	52,620.6	34.0	40.1	0.6	30.0	33.1	390.3	1.0	0.29
labourers	*1,207*	*50.5*	*43,392.1*	*28.0*	*36.0*	*0.6*	*29.2*	*18.2*	*167.5*	*1.0*	*0.24*
masovers	*105*	*4.4*	*9,228.5*	*6.0*	*87.9*	*1.4*	*51.0*	*86.4*	*390.3*	*25.0*	*0.43*
Total	**2,389**	**100.0**	**154,743.9**	**100.0**	**64.8**	**1.0**	**42.8**	**74.5**	**659.6**	**0.3**	**0.46**

Note: The categories of "the poor and handicapped" and those of unknown profession are excluded.
Source: Own elaboration based on the Cadastre Books, Archive of the Crown of Aragon (ACA), Barcelona.

Figure 4. Income inequality in Catalonia by town, 1724 (Gini coefficient).

Source: Own elaboration based on the Cadastre Books, Archive of the Crown of Aragon (ACA), Barcelona. See Table 1.

Figure 5. The relationship between different socio-economic indicators (x-axis) and income inequality (y-axis) in Catalonia, 1724.

Source: Own elaboration based on the Cadastre Books, Archive of the Crown of Aragon (ACA), Barcelona.

Table 6. Income inequality by income group. Moià, 1724.

	Taxpayers (N)	Contribution (*rals*)	Contribution (%)	Mean contribution (*rals*)	Mean contribution (avg=1)	Median contribution (*rals*)	Standard deviation	Max	Min	Gini
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Top 1%	4	2,323.7	9.7	580.9	10.5	592.6	52.4	625.8	512.6	-
Top 10%	44	10,831.0	45.1	87.6	1.6	177.5	161.1	625.8	86.2	0.349
10% - 50%	173	8,024.5	33.4	46.4	1.6	46.0	13.8	83.9	28.9	0.168
50% - 90%	173	4,430.5	18.4	25.6	0.5	25.0	1.2	28.9	25.0	0.019
Bottom 10%	44	751,0	3.1	17.1	0.3	25.0	9.9	25,0	2.2	0.292
All	434	24,037.0	100	55.4	1.0	28.9	83.0	625.8	2.2	0.477

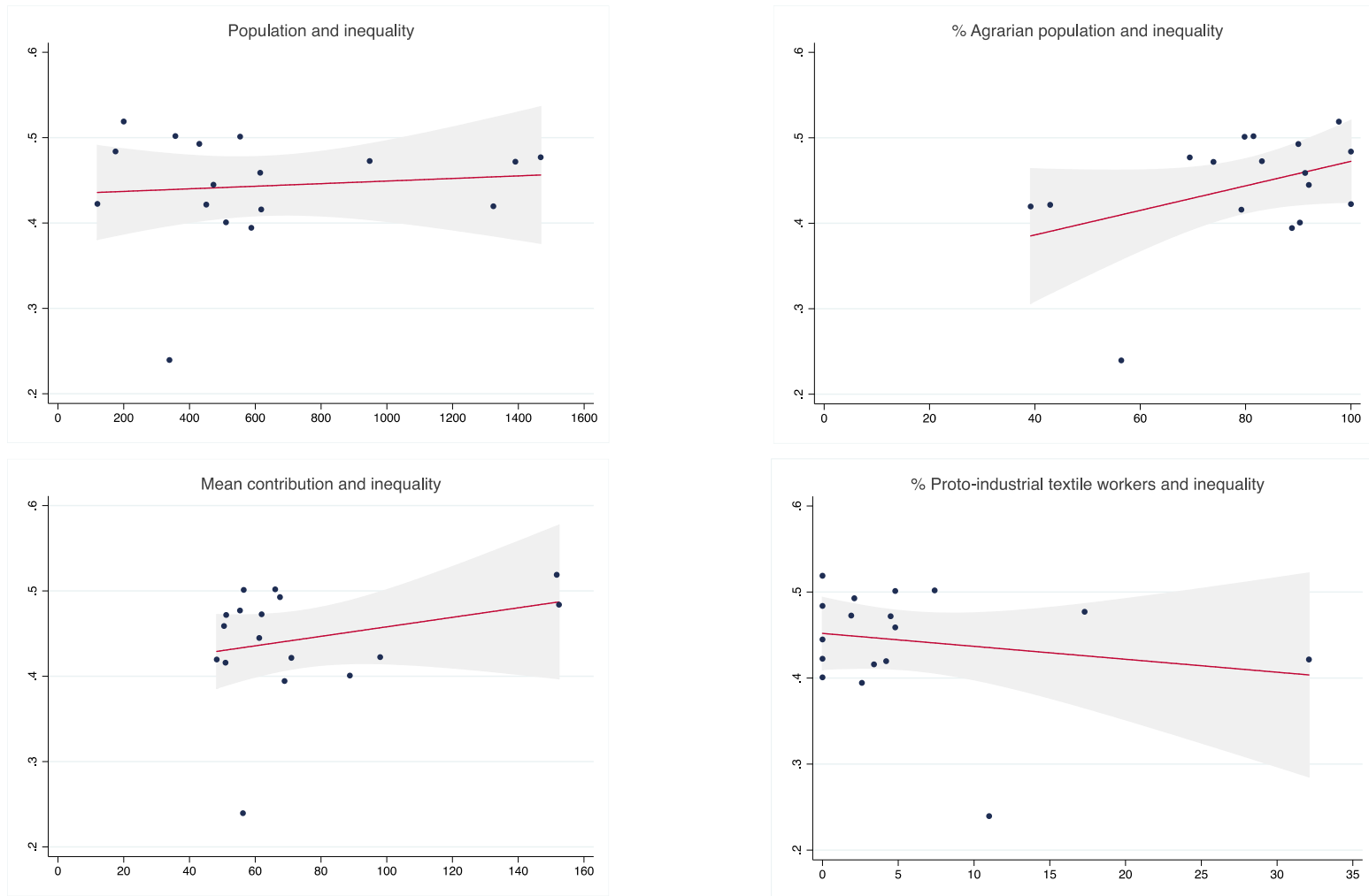Source: Own elaboration based on the Cadastre Books, Archive of the Crown of Aragon (ACA), Barcelona.

Table 7. Income inequality by occupation. Moià, 1724.

	Taxpayers (N)	Taxpayers (%)	Contribution (*rals*)	Contribution (%)	Mean contribution (*rals*)	Mean contribution (avg=1)	Median contribution (*rals*)	Standard deviation	Max	Min	Gini
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
non-agrarian	**127**	**30.6**	**9,211.3**	**39.2**	**72.5**	**1.3**	**52.4**	**82.8**	**625.8**	**10.4**	**0.405**
privileged	4	1.0	1,831.5	7.8	457.9	8.1	458.8	141.0	625.8	288.0	0.148
liberal prof. + artisans	123	29.6	7,379.8	31.4	60.0	1.1	51.9	39.5	290.8	10.4	0.305
owners	*115*	*27.7*	*7,133.4*	*30.4*	*62.0*	*1.1*	*52.8*	*39.9*	*290.8*	*10.4*	*0.297*
labourers	*8*	*1.9*	*246.4*	*1.0*	*30.8*	*0.5*	*25.0*	*16.4*	*71.4*	*25.0*	*0.165*
agrarian	**288**	**69.4**	**14,310.4**	**60.8**	**49.7**	**0.9**	**27.2**	**84.7**	**618.0**	**2.2**	**0.478**
owners	30	7.2	6,486.2	27.6	216.2	3.8	185.3	192.5	618.0	25.0	0.484
non-owners	258	62.2	7,824.2	33.2	30.3	0.5	26.8	14.7	141.8	2.2	0.200
labourers	*247*	*59.5*	*7,015.7*	*29.8*	*28.4*	*0.5*	*25.0*	*10.2*	*86.2*	*2.2*	*0.200*
masovers	*11*	*2.7*	*808.5*	*3.4*	*73.5*	*1.3*	*63.9*	*28.8*	*141.8*	*35.0*	*0.196*
all	**415**	**100.0**	**23,521.7**	**100.0**	**56.7**	**1.0**	**29.0**	**84.7**	**625.8**	**2.2**	**0.480**
textile artisans	72	17.3	4,481.4	19.1	62.2	1.1	52.3	43.4	290.8	25.0	0.324
wool dressers (*paraires*)	39	9.4	2,791.5	11.9	71.6	1.3	60.6	53.3	290.8	25.0	0.364
owners	*34*	*8.2*	*2,666.5*	*11.4*	*78.4*	*1.4*	*63.4*	*53.8*	*290.8*	*25.0*	*0.347*
labourers	*5*	*1.2*	*125.0*	*0.5*	*25.0*	*0.4*	*25.0*	*0.0*	*25.0*	*25.0*	*-*
weavers (*teixidors*)	30	7.2	1,553.9	6.6	51.8	0.9	49.3	24.9	140.0	25.0	0.221
owners	*29*	*7.0*	*1,528.9*	*6.5*	*52.7*	*0.9*	*49.4*	*24.8*	*140.0*	*25.0*	*0.215*
labourers	*1*	*0.2*	*25*	*0.1*	*25*	*0.4*	*25*	*-*	*25*	*25*	*-*

Source: Own elaboration based on the Cadastre Books, Archive of the Crown of Aragon (ACA). Barcelona.

Table 8. Inequality by occupation. Olost, 1724.

	Taxpayers (N)	Taxpayers (%)	Contribution (*rals*)	Contribution (%)	Mean contribution (*rals*)	Mean contribution (avg=1)	Median contribution (*rals*)	Standard deviation	Max	Min	Gini
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
non-agrarian	**48**	**57.1**	**2,714.3**	**44.8**	**56.5**	**0.8**	**49.0**	**49.0**	**105.8**	**25.0**	**0.134**
privileged	-	-	-	-	-	-	-	-	-	-	-
liberal prof. + artisans	48	57.1	2,714.3	44.8	56.5	0.8	49	49	105.75	25	0.134
owners	*47*	*56.0*	*2,689.3*	*44.4*	*57.2*	*0.8*	*49.0*	*15.4*	*105.8*	*45.0*	*0.126*
labourers	*1*	*1.1*	*25.0*	*0.4*	*25.0*	*0.3*	*25.0*	*-*	*25.0*	*25.0*	*-*
agrarian	**36**	**42.9**	**3,337.9**	**55.2**	**92.7**	**1.3**	**25.0**	**119.5**	**528.0**	**25.0**	**0.560**
owners	10	11.9	2,479.6	41.0	248.0	3.4	253.8	133.8	528.0	25.0	0.275
non-owners	26	31.0	858.3	14.2	33.0	0.5	25.0	14.4	78.5	25.0	0.187
labourers	*20*	*23.8*	*522.8*	*8.6*	*26.1*	*0.4*	*25.0*	*4.9*	*47.0*	*25.0*	*0.041*
masovers	*6*	*7.2*	*335.5*	*5.6*	*55.9*	*0.8*	*51.0*	*11.4*	*78.5*	*49.0*	*0.083*
all	**84**	**100.0**	**6,052.3**	**100.0**	**72.1**	**1.0**	**49.0**	**80.6**	**528.0**	**25.0**	**0.418**
textile artisans	27	32.1	1,516.0	25.0	56.1	0.8	49.0	17.0	102.8	25.0	0.143
wool dressers (*paraires*)	18	21.4	1,045.5	17.3	58.1	0.8	49.9	17.3	102.8	47.0	0.135
owners	*18*	*21.4*	*1,045.5*	*17.3*	*58.1*	*0.8*	*49.9*	*17.3*	*102.8*	*47.0*	*0.135*
labourers	*-*	*-*	*-*	*-*	*-*	*-*	*-*	*-*	*-*	*-*	*-*
weavers (*teixidors*)	9	10.7	470.5	7.8	52.3	0.7	49.0	16.7	84.8	25.0	0.151
owners	*8*	*9.5*	*445.5*	*7.4*	*55.7*	*0.8*	*49.0*	*14.0*	*84.8*	*47.0*	*0.110*
labourers	*1*	*1.2*	*25*	*0.4*	*25*	*0.3*	*25*	*-*	*25*	*25*	*-*

Source: Own elaboration based on the Cadastre Books, Archive of the Crown of Aragon (ACA), Barcelona.

Appendix

Table A1. Contribution by tax category and by town (%).

|		Land	House	Labour (*personal*)	Livestock	Mills	Financial assets (*rentas*)	Business profits (*gananciales*)	Total
1	Alella	44.7	4.4	38.3	1.7	0.1	5.3	5.4	100
2	Artés	49.0	5.4	43.2	1.8	-	-	0.6	100
3	Balsareny	50.4	5.0	37.2	1.5	1.1	2.9	1.9	100
4	Caldes de Montbui	42.9	2.7	48.0	2.2	0.5	2.5	1.3	100
5	Cerdanyola	68.9	1.2	23.8	4.1	-	2.1	-	100
6	Granollers	27.2	10.1	54.4	0.9	0.5	1.0	6.0	100
7	Lliçà d'Amunt	71.5	1.7	21.9	3.4	1.5	-	-	100
8	Matadepera	45.5	1.6	39.1	12.3	-	1.5	-	100
9	Moià	34.7	5.1	52.3	3.4	0.4	3.2	0.9	100
10	Monistrol de Montserrat	15.3	5.7	71.4	1.3	0.8	1.7	3.7	100
11	Montmany	37.6	6.7	46.9	6.4	0.9	1.4	-	100
12	Olost	34.5	4.5	53.5	4.4	-	0.1	3.0	100
13	Perafita	44.2	3.7	43.7	4.5	0.3	0.3	3.4	100
14	Sant Feliu de Codines	28.7	9.2	55.8	1.6	0.5	3.6	0.7	100
15	Sant Feliu Sasserra	33.0	3.4	53.9	4.1	1.2	0.3	4.1	100
16	Santa Maria d'Oló	31.6	3.1	59.1	3.0	0.5	0.1	2.6	100
17	Santpedor	45.4	5.2	43.1	1.3	0.4	0.8	3.9	100
	Total	39.7	5.0	48.1	2.7	0.5	1.8	2.2	100

Source: Own elaboration based on the Cadastre Books, Archive of the Crown of Aragon (ACA), Barcelona.

Figure A1. Number of taxpayers (x-axis) and average contribution (y-axis) by town.
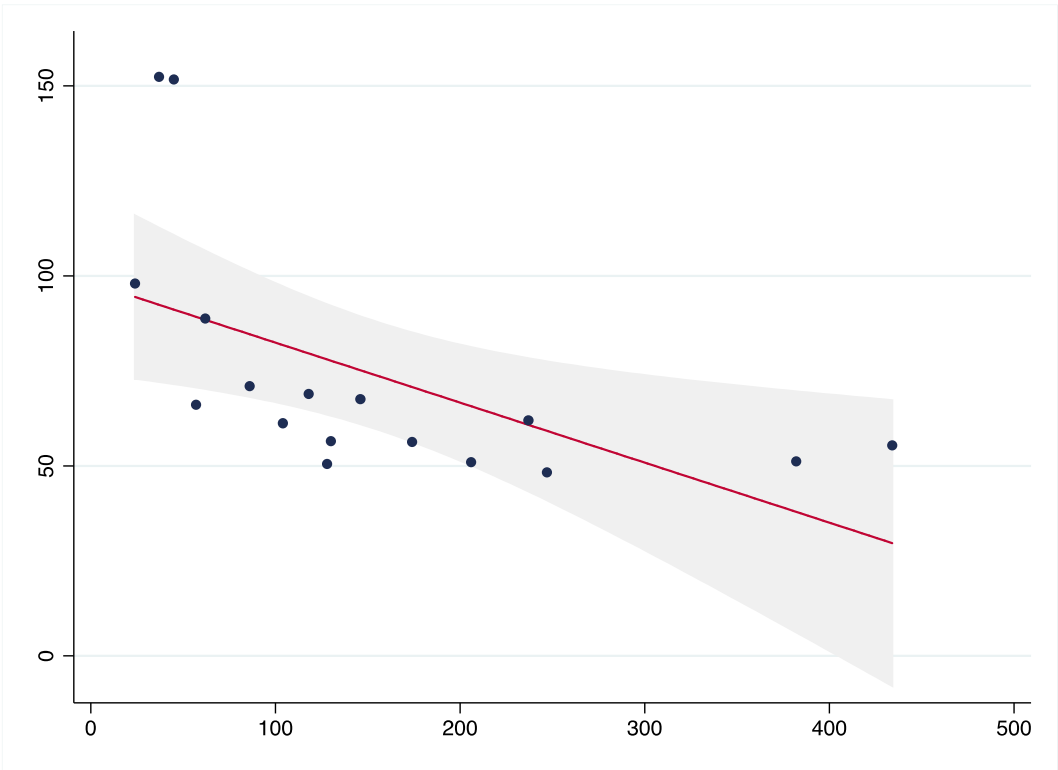
Source: Own elaboration based on the Cadastre Books, Archive of the Crown of Aragon (ACA), Barcelona.

Figure A2. Histogram of taxpayers' contribution to the cadastre. Moià, 1724.
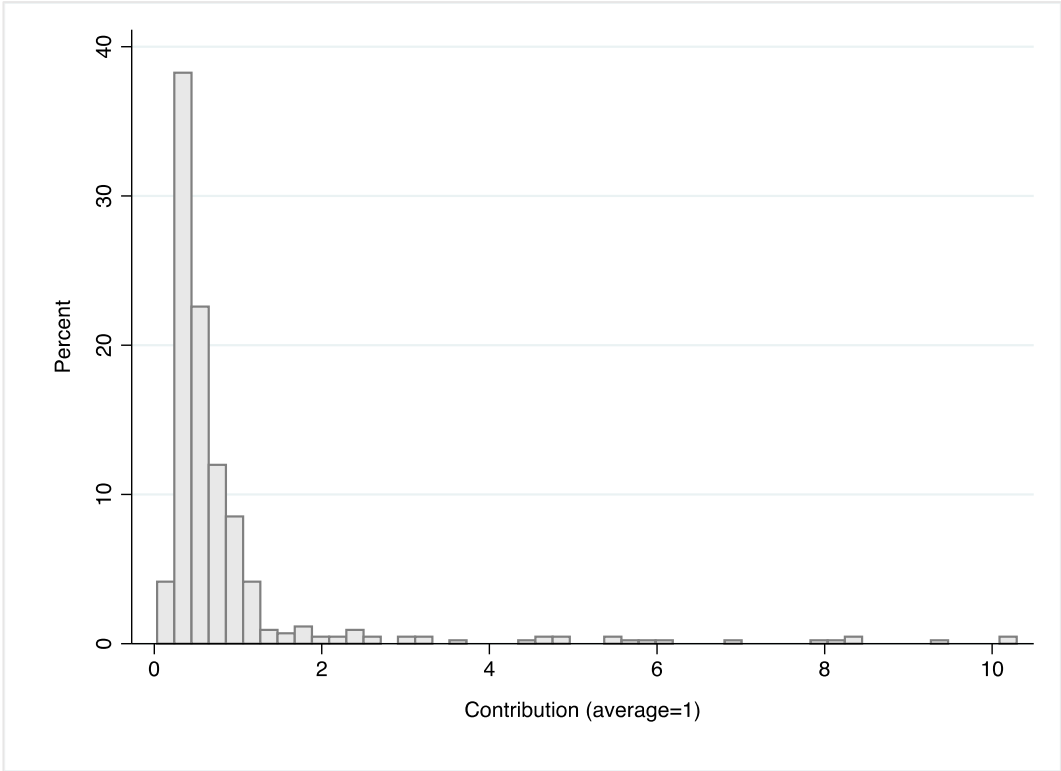
Note: Data normalized to the average, each bar contains a 2% interval.
Source: Own elaboration based on the Cadastre Books, Archive of the Crown of Aragon (ACA), Barcelona.

Table A2. Inequality by occupations, including and excluding labour income (*personal* tax). Moià, 1724.

Including *personal*				Excluding *personal*							
All sample	N	%	Gini	With zeros	N	%	Gini	Without zeros	N	%	Gini
non-agrarian	127	30.6	0.405	non-agrarian	127	30.6	0.779	non-agrarian	91	35.5	0.692
agrarian	288	69.4	0.478	agrarian	288	69.4	0.881	agrarian	165	64.5	0.793
all	415	100.0	0.480	all	415	100.0	0.854	all	256	100.0	0.763
textile artisans	*72*	*17.3*	*0.324*	*textile artisans*	*72*	*17.1*	*0.700*	*textile artisans*	*50*	*19.5*	*0.568*

Source: Own elaboration based on the Cadastre Books, Archive of the Crown of Aragon (ACA), Barcelona.