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by

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# **Decomposing Economic Inequality in Early Modern Venice (ca. 1650-1800)**

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## **Abstract**

This article analyses trends in economic inequalities in Venice between the seventeenth and the eighteenth centuries. Based on largely unpublished archive sources, changes in income and consumption inequalities have been studied, while the bootstrap method was used to determine if these changes are statistically significant. The households studied were divided into subgroups to better understand the dynamics between and within the different population components. We show that changes in consumption inequality are significant, whereas those relating to income inequality are not. We argue that this is due to the inability of the economy to generate wealth, whereas families were better able to face the major structural changes in the European economy in the last two centuries of the early modern period.

**Keywords:** economic inequality; consumption inequality; early modern period; Venice; Little divergence.

**JEL classification:** D31, N33, N93.

## 1 Introduction

One of the outcomes of the worldwide economic crisis of 2007 is the growing attention to the issue of inequality. Brief research on Google Scholar shows that between 2008 and 2018 over one million research articles and papers have been devoted to the theme of ‘economic inequality’. The vast majority were dedicated to the various dimensions of inequality in the last two centuries (Milanovic, 2011; Piketty, 2013; van Zanden et al., 2014; Vecchi, 2017).

Before the Great Recession, this topic was not absent from the research agenda of medieval and early modern economic historians: some ground-breaking studies were published (van Zanden, 1999; Allen, 2001; Hoffman et al., 2002), although they mainly focused on early industrialised economies. Nevertheless, the increased sensitivity to inequalities after the crisis of the 2000s led many scholars to deepen their analysis. Thanks to these studies we have not only enhanced our understanding of the various engines of inequality (Alfani and Ryckbosch, 2016) but also our knowledge of trends of economic disparities in peripheral and late industrialised economies (Hanus, 2012; Santiago-Caballero, 2013; Nicolini and Ramos Palencia, 2016; Alfani and Ammannati, 2017). In other words, these studies helped to definitively tear down many of the Kuznetian biases restricting our knowledge of historical trends in economic inequality.

This paper follows this line of research with the aim of studying more effectively the welfare impact of wealth changes between the seventeenth and the eighteenth centuries at the household level. We want to understand if, and how, changes in economic wellbeing was mirrored by modifications in material living standards.

Although the last two centuries of the early modern period are now acknowledged as the foundation of consumer society and the relationship between income and consumption inequalities is one of the most hotly debated topics in economics (Krueger and Perri, 2006), economic history is lacking in research on consumption inequality. It must be said that this gap is mainly due to the sources which do not allow, either for quality or quantity, the kind of ‘structured’ approach to economic inequalities applied to the Middle Ages and the early modern period. Based on unpublished archive sources, the household budgets of the Venetian judiciary of the *Giudici di Petizion*, this paper will overcome this gap.

This is not the only contribution to the existing literature, which includes two further methodological advances. First, particular attention is paid to the decomposition of the indices to better understand the anatomy of inequalities. This aspect is often poorly developed but is essential to understand if the trends detected are uniform in the population. Second, we use bootstrapping techniques to derive confidence intervals and thus verify if the changes measured are or are not statistically significant. Although the use of statistical inference is not widespread in this branch of literature in economic history<sup>1</sup>, our opinion is that it is necessary to obtain results that are as complete and informative as possible.

Our case study consists of the city of Venice between the seventeenth and the eighteenth centuries. Venice is often underestimated and forgotten by specialist scholars of this period because it is traditionally considered a city in profound crisis. On the contrary, Venice is a *unicum* within the debate on the ‘Little Divergence’. Undoubtedly, the city was going through tough economic times due to the advance of the more dynamic urban economies of northern Europe. However, in this period, the *Serenissima* was fiercely dynamic and was therefore able to survive in the new balance of continental economies.

The paper is organized as follows. Section 2 provides a historical background of the Republic of Venice between the seventeenth and the eighteenth centuries, while section 3 introduces the data and the methodology. Sections 4 and 5 analyse inequality respectively in general and specific terms. In section 6 conclusions are drawn.

## **2 Historical background**

For a long time, historiography considered the last two centuries of the Venetian Republic as one long sunset. The conviction was that irreversible economic, financial and institutional decline set in as far back as the early seventeenth century was taking place (Sella, 1961; Rapp, 1976; Cozzi, 1997).

In the last two decades, this gloomy view has been the object of a growing number of critiques. Many scholars have provided a more complex picture of Venice and the Venetian Mainland between the seventeenth and the eighteenth centuries, during which

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<sup>1</sup> Some first experiments were realised by Rossi, et al. (2001), but few researchers followed that line.

difficulties in some sectors were counterbalanced by extreme vivacity in others (Panciera, 1998; Vianello, 2004; Lanaro, 2006; Caracausi, 2011; Demo, 2013; Pezzolo, 2013).

From an economic point of view, in this period undoubtedly Venice underwent a decline in its centuries-old role of commercial intermediary, which had made the *Serenissima* the centre of a complex network of exchanges linking the East and the Mediterranean, and thereby also the heart of the European continent. During the seventeenth and eighteenth centuries the city suffered under the superiority of the Anglo-Dutch navies (Fusaro, 2015). Gradually, it became not much bigger than a supra-regional port (Knapton, 2004; Pezzolo, 2013), impacting severely on the manufacturing sector, including the backbone of the sixteenth century Venetian economy, the wool industry, which fell into serious decline (Panciera, 1996, 2006).

However, even after the severe plague of 1630<sup>2</sup>, the city remained an important urban centre with a population of over 100,000. It enjoyed high levels of consumption and continued to dazzle visitors with its affluence and magnificence. The notion of a drastic and all-embracing fall into an impoverished state seems far-fetched (Pezzolo, 1997, 2013; Ciriaco, 2018).

Therefore, some of the most attentive scholars of the Venetian economy in the early modern period have blunted the idea of profound crisis, replacing it with the hypothesis of a major restructuring of the Venetian economic system in the last two centuries of the period in an attempt to react to the rise of northern European economies. On the one hand, land and financial investments became increasingly important for the local ruling classes. On the other hand, more energy went into the consolidation of secondary sectors, such as silk manufacturing or glass production, in which the Venetians retained a significant market share. These factors were the basis of the entry flows that ensured a high standard of living for wealthy groups, allowing the widespread consumption of luxury products and vivifying the whole economy, maintaining high demand for goods and services even in the most troubled periods (Fornasin and Zannini, 1999; Belfanti, 2006; Della Valentina, 2006; Trivellato, 2006; Panciera, 2014).

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<sup>2</sup> The violence of the plague struck was devastating, with mortality over 30 percent, and substantial and long-lasting damage to the Italian economic system. For a further discussion of the long-term effects of early modern epidemics see Alfani (2013a, 2013b).

### 3 Sources and methodology

In recent years, there has been renewed interest by economic historians in the use of household budgets as a source to study trends of wellbeing<sup>3</sup>. These documents are well known to economists and social scientists, and since the advent of the Industrial Revolution they have been first order tools to understand how the benefits of economic growth were (and are) distributed among the population (Deaton, 1997). Despite the importance of household budgets, their use for the study of economic dynamics in the *Ancien Régime* has always been rather limited because of the belief that they were available in small numbers and only for a few great aristocratic families, and hence were unsuitable for statistical treatment.

In light of the documentation at the State Archive of Venice and using some simple bootstrap methods, these issues can be overcome. In seventeenth and eighteenth-century Venice there was no national statistics bureau, as there is today, but one of the duties of the judiciary (so-called *Giudici di Petizion*) was to gather information on dozens of household budgets every year. On the death of the breadwinner, Venetian law dictated that a Trust be set up, with a trustee to manage the family wealth where minors or the infirm needed to be protected. The *Petizion* acted as protector, overseeing the (good) behaviour of the trustees. Among their obligations they drew up a regular budget of all revenues and expenses, preventing scams by trustees.

Unlike other obligations imposed by the law, the establishment of a Trust was an obligation that Venetian families, of any social class, can hardly avoid. The strongest proof of this affirmation lies in the heterogeneity (speaking of wealth) of the families that have undergone the control of the *Petizion*, and in the abundance of documents that can be traced in this archive. In fact, we are talking about an exceptional documentary patrimony that covers a period from 1436 to 1797 and that preserves the documents of hundreds of households<sup>4</sup>.

The exceptionality of the *Petizion* archive also lies in the quality of the data present. It is true that there were no close constraints on the way in which the trustees had to present

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<sup>3</sup> Two major projects have been based on household budgets: the ‘Historical Household Budget Project’ launched by the University of Rome Tor Vergata, headed by Giovanni Vecchi, and the ‘Global Income Inequality Project’ of the University of Sussex co-directed by Ian Gazeley and Andrew Newell.

<sup>4</sup> We must highlight that, as it often happens with this kind of historical sources, the most numerous are the documents of the most recent centuries.

their accounts. Nevertheless, it is also true that the attention given by this court in the control of their management is quite high: each trustee had to present receipts and the like as a supporting evidence for every expense made on behalf of his or her beneficiaries, and he or she had to ask for a special authorization in case he or she wanted to sell some significant parts of the assets that he or she had under control. This effort to oblige the trustee to behave like a good father allows us to have complete and well-articulated budgets representing actual schemes of household behaviour. This makes these documents invaluable sources for the study of inequalities, showing if (and how) changes in income impacted on consumption.

However, these sources are not without weaknesses. First, as in many pre-industrial economic documents, the poorest families are absent. Without sufficient assets for management, no Trust was necessary. Even if, as we said, this archive has an heterogeneous composition, it represents inevitably the medium-high portion of the Venetian social pyramid: craftsmen, merchants, small landowners, the nobility on the Mainland, and patricians<sup>5</sup>. Second, in a city with at least 120,000-140,000 inhabitants and with a so strong legal ‘tradition’ in Trust establishment, the availability of this kind of sources for hundreds of households is notable and remarkable if compared to other Italian or European cities, but still too few to provide statistically robust results especially when working through samples.

For our analysis, for instance, a dataset was used comprising all the documents presented to the *Petizion* over three decades between the seventeenth and the eighteenth centuries: the 1670s, the 1720s and 1770s. In total, we collected almost 100 household budgets belonging to 37 different family units<sup>6</sup>.

Therefore, to strengthen our results we decided to implement a bootstrap method to test the significance of changes in inequality measures. Bootstrapping provides a way of estimating standard errors (Efron, 1979). Suppose that we have a dataset containing  $N$  observations, and we draw, with replacement,  $N$  observations from this  $N$ -observation dataset. In this random drawing, some of the original observations will appear once, some more than once, and some not at all. Using the resampled dataset, we apply the

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<sup>5</sup> Although they represent a small share of the population, top incomes have attracted a growing interest in recent years. Data for this subgroup are in fact easier to collect respect to others, and this allow a more systematic research on changes in the distribution of wealth across space and time (Atkinson et al., 2011).

<sup>6</sup> For a more detailed description of the composition of the sample, see footnote 7.

estimator and calculate the statistics. This process is repeated many times, and each time a new random sample is drawn and the statistics are recalculated. This process builds a dataset of replicated statistics from which we can calculate the standard error:

$$(1) \quad \widehat{se} = \left\{ \frac{1}{k-1} \sum (\widehat{\theta}_i - \bar{\theta})^2 \right\}^{1/2}$$

where  $\widehat{\theta}_i$  is the statistic calculated using the  $i^{\text{th}}$  bootstrap sample and  $k$  is the number of replications. This formula gives an estimate of the standard error of the statistic, according to Hall and Wilson (1991). Although the average,  $\bar{\theta}$ , of the bootstrapped estimates is used in calculating the standard deviation, the original observed value of the statistic,  $\widehat{\theta}$ , is used, meaning the value of the statistic computed using the original  $N$  observations.

Confidence intervals with nominal coverage rates  $1 - \alpha$  are calculated on the basis of the normal-approximation method:

$$(2) \quad \widehat{\theta} - z_{1-\alpha/2} \widehat{se}, \widehat{\theta} + z_{1-\alpha/2} \widehat{se}$$

where  $z_{1-\alpha/2}$  is the  $(1 - \alpha/2)^{\text{th}}$  quantile of the standard normal distribution.

The accuracy with which the bootstrap distribution estimates the sampling distribution depends on the number of observations in the original sample and the number of replications in the bootstrap. In the application we use 3,000 replications.

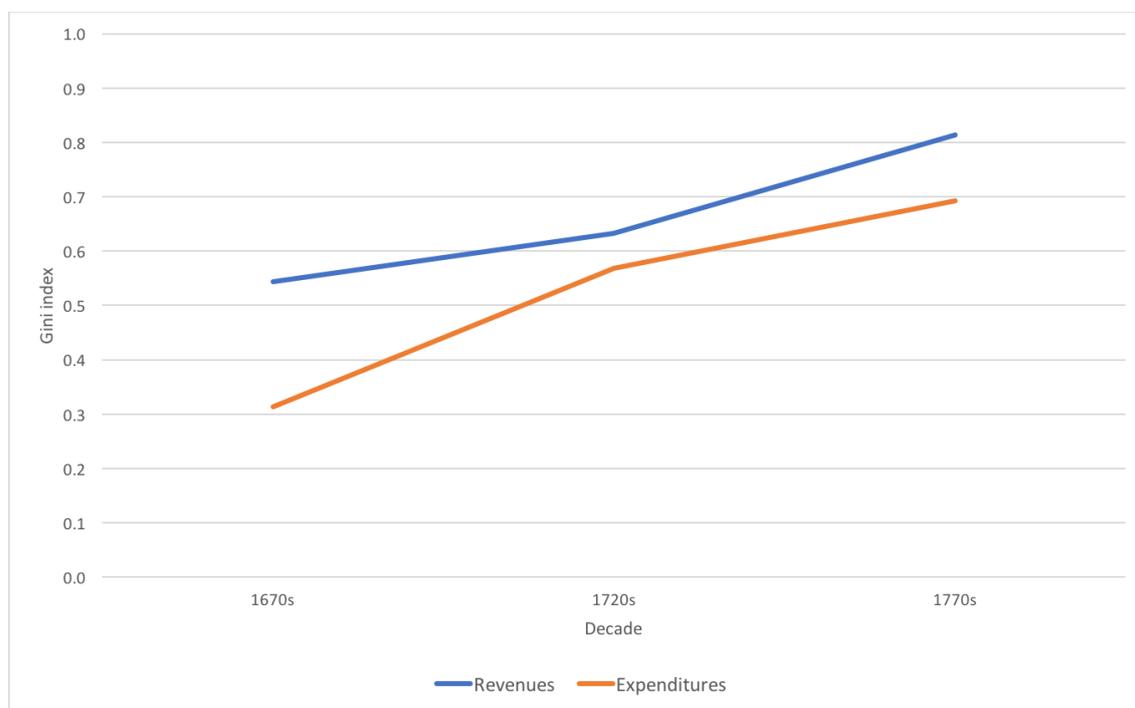
#### 4 General trends in inequality

We begin our analysis with a general view, calculating the Gini coefficient ( $G$ ) and the Theil measure ( $T$ ) for the entire distribution both in terms of revenues and expenditures. For revenues, we calculate the Gini coefficient and the Theil measure using the figures for average monthly incomes. To calculate the Gini and Theil for expenditures, a different approach was followed, controlling for the composition of the household. The total amount of expenses was first divided by the number of months the trust lasted and then by the number of beneficiaries, thus calculating average monthly spending per

capita<sup>7</sup>. This is because expenditures are strongly influenced by the number of beneficiaries, whilst income is unrelated to number<sup>8</sup>.

The results are shown in **Figure 1** and in **Figure 2**. First, some preliminary considerations: in both graphs, unsurprisingly, the coefficients of income inequality are higher than consumption inequality over the entire period. The distribution of wealth was largely unequal, as most of the real estates were concentrated in the hands of the aristocracy and numerous religious institutions. Noble families were more able to allocate money to financial and commercial investments, leading to a further increase in their incomes.

**Figure 1 – Gini index of inequality calculated with respect both revenues and expenditures for the decades 1670s, 1720s, and 1770s.**

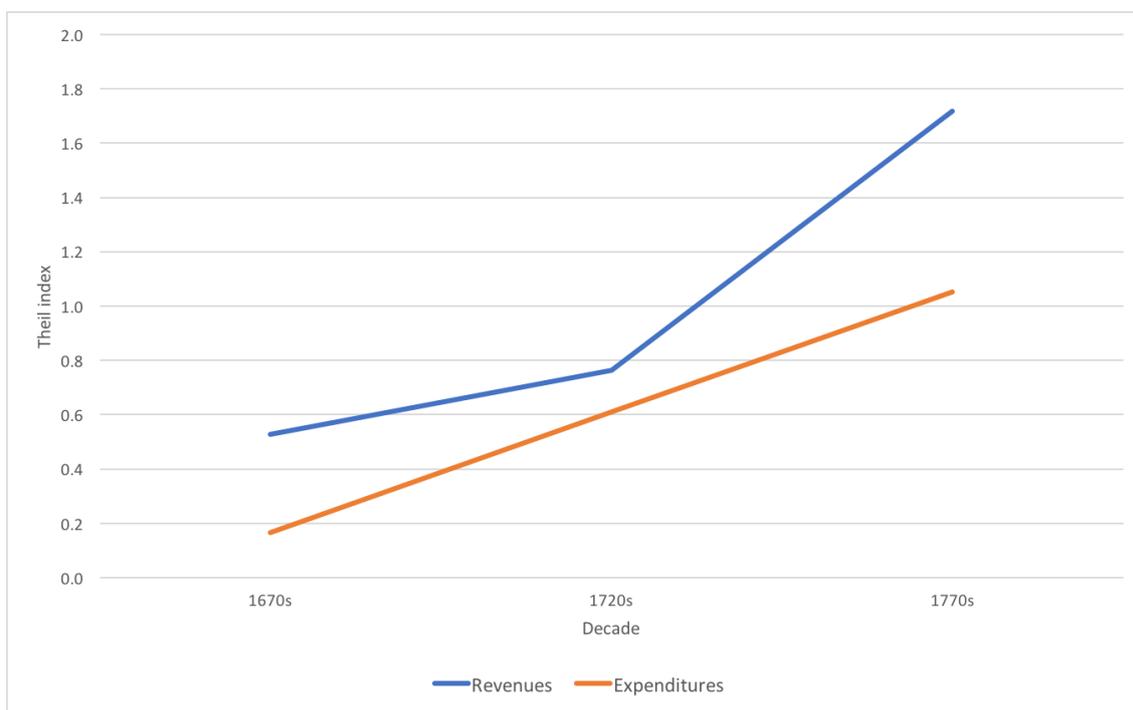


Source: authors' elaborations.

<sup>7</sup> Since two different approaches are used, the consistence of the sample when we analyse revenues differs a little respect to when we analyse to expenditures. Regarding revenues, we have eight families for the decade of the 1670s, seven for the 1720s, and 19 for the 1770s. As for expenditures, the sample consists of 11 households for the 1670s, seven for the 1720s, and 19 for the 1770s.

<sup>8</sup> For both these calculations we used nominal figures. Thus, all the calculations reported in the next pages are based on nominal levels of revenues and expenditures. For the sake of completeness, we performed all the calculations also with real values. When controlling for the inflation rate, all the results are the same while there are some minor variations in the bootstrap standard errors. Nevertheless, none of these latter affects the statistical significance (or its absence) in the changes of Gini and Theil indexes.

**Figure 2 – Theil measure of inequality calculated with respect both revenues and expenditures for the decades 1670s, 1720s, and 1770s.**



Source: authors' elaborations.

Regarding the levels of consumption inequality, in the seventeenth century the values of  $G$  and  $T$  are both relatively low. Are these low figures a sign of general poverty, or, on the contrary, of a general affluence? Because the average spending per beneficiary is always quite high, the latter seems more likely. Converting these amounts into litres of wheat per day per beneficiary<sup>9</sup>, the values range from 3 to 24 litres, and in seven cases out of 10 the daily expenses recorded by the trustees were 9 litres of wheat<sup>10</sup>. This figure is interesting because in roughly the same period an Italian building labourer earned a wage of 9.3 litres of grain per day (van Zanden, 1999, p. 185). Of course, it should be remembered that our sample comprises families from the middle-upper levels of society and the values of  $G$  and  $T$  are representative only of this group.

Now we come to the trends of the Gini indices alone. The rate for both indices increases in the long run: 0.27 points for revenues and 0.37 points for expenditures. The increase in consumption inequality is particularly noteworthy because, in less than a century, there is a leap from 0.31 (low inequality) to 0.69 (a high level of inequality). These

<sup>9</sup> We used a standard month of 30 days for calculation purposes.

<sup>10</sup> The calculation was based on wheat prices for Udine, the capital of the easternmost province of the Republic of Saint Mark in this period (Georgelin, 1978).

trends are confirmed by the Theil measure. Here too, both inequality indices increase quite sharply between the 1670s and 1770s. For revenues, the increase was 223 percent, whilst expenditures increased 537 percent.

Are these changes statistically significant? **Table 1** shows the pair-wise differences for the Gini and Theil indices for the three sample decades, shown respectively with  $\Delta G$  and  $\Delta T$ . The percentile confidence intervals at 90 percent (90% CI) and the percentage variations (% $\Delta$ ) are also shown. With the exception of only one comparison, for the revenues data no variation is statistically significant. For data on expenditures, all the variations in the indices (hence for both  $G$  and  $T$ ) between the 1670s and the 1720s and between the 1670s and the 1770s are significant.

**Table 1. Changes in the Gini coefficients and Theil measures between the 1670s, the 1720s, and the 1770s.**

GINI							
Revenues				Expenditures			
		1720s	1770s			1720s	1770s
<b>1670s</b>	$\Delta G$	0.0889	0.2704	<b>1670s</b>	$\Delta G$	0.2551*	0.3789**
	90% CI	(-0.1599, 0.2448)	(-0.0783, 0.4957)		90% CI	(0.0199, 0.3660)	(0.1327, 0.4922)
	% $\Delta$	23%	50%		% $\Delta$	81%	121%
<b>1720s</b>	$\Delta G$		0.1815	<b>1720s</b>	$\Delta G$		0.1238
	90% CI		(-0.1807, 0.5022)		90% CI		(-0.1545, 0.4041)
	% $\Delta$		23%		% $\Delta$		22%
THEIL							
Revenues				Expenditures			
		1720s	1770s			1720s	1770s
<b>1670s</b>	$\Delta T$	0.2359	1.1756*	<b>1670s</b>	$\Delta T$	0.4468*	0.8856**
	90% CI	(-0.1904, 0.6422)	(-0.1843, 1.5321)		90% CI	(0.0808, 0.7943)	(0.1723, 1.1407)
	% $\Delta$	61%	223%		% $\Delta$	271%	537%
<b>1720s</b>	$\Delta T$		0.9397	<b>1720s</b>	$\Delta T$		0.4387
	90% CI		(-0.5203, 1.4420)		90% CI		(-0.3734, 0.8848)
	% $\Delta$		103%		% $\Delta$		72%

CI = percentile confidence interval.

% $\Delta$  = percentage changes.

\* =  $p < 0.05$ ; \*\* =  $p < 0.01$ ; \*\*\* =  $p < 0.001$ .

The first result is very interesting: in the long run, there was a significant change in the standards of living of Venetian families between the seventeenth and the eighteenth centuries without a solid simultaneous change in the distribution of wealth. At the beginning of this section we saw how the low levels of consumption inequality were followed by quite a high level of expenditure. It seems natural to ask whether the significant increase in consumption inequality was the result of an expansion or of a

contraction in the level of consumer affluence. By calculating the medians of monthly expenditure per beneficiary for all three decades under review, an increase in the monetary outflows can be observed, more than 13-fold between the 1670s and the 1770s.

Thus, despite the stability in the distribution of revenues in this group of Venetian society, its members increased the portion of their wealth for consumption, albeit at different rates.

## 5 Decomposing inequality

At this stage of the analysis the big questions arise: which households see their material living standards increase due to this growth in expenses? Are there some layers of the population that benefit from these changes more than others? To which social category do the families that push up the levels of inequality belong? Is this a phenomenon completely attributable to members of a particular group, or is it a more blurred and complex? To try to answer these questions, we investigated the inequality between and within the groups. Unfortunately, we are not able to precisely pinpoint families in our sample on the social ladder. We may know the occupation of the deceased breadwinner, but little of the economic history of the family and their overall wealth. Therefore, the first comparison to be made is between noble and non-noble households. This distinction is not entirely satisfactory but is still useful in providing some insights into the socioeconomic dynamics at the time<sup>11</sup>.

One of the main strengths of the Theil measure is that it is easily decomposable. If the population in our analysis can be divided into several subgroups, the Theil measure can be divided into between (*T between*) and within (*T within*) group components, and the sum of these two components is equal to the overall Theil index. In this way, the major contributors to inequality can be identified.

Looking at the data in **Table 2** for the Theil decomposition, we can see how the dynamics of economic inequality in Venice is (almost) completely dominated by intra-

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<sup>11</sup> Regarding revenues, noble households in the original sample are 2 out of 8 in the 1670s, 1 out of 7 in the 1720s, and 7 out of 19 in the 1770s. As for expenditures, always considering the original sample, they are 3 out of 11 in the 1670s, 1 out of 7 in the 1720s, and 7 out of 19 in the 1770s.

group forces. With the exception of the figure for revenues in the 1720s, in all cases the impact of *T within* is equal or greater than 57 percent of the total value of T. In relation to long-term changes, the data for revenues and expenditures follow quite different paths. For revenues, the *T within* component loses about 28 percent of its weight over a century in favor of the *T between* component. The behavior regarding expenditures is precisely the opposite. In the 1770s the behavior of the two social groups increased the general level of inequality by almost 40 percent compared to the 1670s.

**Table 2 – Gini coefficient (*G*) Theil measure (*T*), Theil between groups (*T between*), and Theil within groups (*T within*).**

	REVENUES			EXPENDITURES		
	1670s	1720s	1770s	1670s	1720s	1770s
<i>G</i>	0.5431	0.6320	0.8135	0.3139	0.5690	0.6928
( <i>se</i> )	(0.1090)	(0.1551)	(0.1438)	(0.0567)	(0.1354)	(0.1145)
<i>T</i>	0.5263	0.7621	1.7018	0.1648	0.6117	1.0504
( <i>se</i> )	(0.1946)	(0.3131)	(0.5673)	(0.0527)	(0.2467)	(0.3405)
<i>T between</i>	0.0005	0.5342	0.4890	0.0701	0.0008	0.2088
( <i>se</i> )	(0.0812)	(0.3738)	(0.2953)	(0.0489)	(0.0893)	(0.1793)
<i>T within</i>	0.5258	0.3126	1.2292	0.0947	0.6108	0.8416
( <i>se</i> )	(0.2002)	(0.3162)	(0.3618)	(0.0498)	(0.2569)	(0.2263)

Bootstrap standard errors in brackets

Turning to the statistical significance of these trends (**Table 3**), the only significant changes are those of  $\Delta T$  in relation to expenditures, in particular the shifts between the 1670s and the 1720s and between the 1670s and the 1770s. Thus, we can conclude that the increase in consumption inequality observed at the beginning is due to changes in the dynamics of spending within both social groups in our analysis, rather than a diversification of behaviour between them.

This is an interesting finding, which enriches the overall picture. Not only is there an increase in consumption inequality without a link to some significant movements in income dynamics, but this increase is common to both noble and non-noble households.

For the former, this may be due to drainage of the stock of wealth built up over many years, decades, and sometimes generations<sup>12</sup>.

**Table 3 – Changes in the Theil measures of inequality between the 1670s, the 1720s, and the 1770s.**

THEIL BETWEEN							
Revenues				Expenditures			
		1720s	1770s			1720s	1770s
1670s	$\Delta T$	0.5337	0.4885	1670s	$\Delta T$	-0.0693	0.1387
	<i>between</i>				<i>between</i>		
	90% CI	(-0.1746, 1.0392)	(-0.0518, 0.8300)		90% CI	(-0.1544, 0.0713)	(-0.1051, 0.4630)
	% $\Delta$	108922%	99700%		% $\Delta$	-99%	198%
1720s	$\Delta T$		-0.0452	1720s	$\Delta T$		0.2080
	<i>between</i>				<i>between</i>		
	90% CI		(-0.8364, 0.8018)		90% CI		(-0.0530, 0.5011)
	% $\Delta$		-8%		% $\Delta$		25362%

THEIL WITHIN							
Revenues				Expenditures			
		1720s	1770s			1720s	1770s
1670s	$\Delta T$	-0.2132	0.7034	1670s	$\Delta T$	0.5162*	0.7469**
	<i>within</i>				<i>within</i>		
	90% CI	(-0.5369, 0.5622)	(-0.1581, 1.1046)		90% CI	(0.0341, 0.9155)	(0.2039, 0.9312)
	% $\Delta$	-41%	134%		% $\Delta$	545%	789%
1720s	$\Delta T$		0.9166	1720s	$\Delta T$		0.2308
	<i>within</i>				<i>within</i>		
	90% CI		(-0.3044, 1.2730)		90% CI		(-0.4114, 0.6457)
	% $\Delta$		293%		% $\Delta$		38%

CI = percentile confidence interval.

% $\Delta$  = percentage changes.

\* =  $p < 0.05$ ; \*\* =  $p < 0.01$ ; \*\*\* =  $p < 0.001$ .

Returning to our analysis, the question arises as to the detailed dynamics within the two groups. At this stage, we turn away from revenues to focus our attention on consumption. The Gini index and the Theil measure were calculated considering the two social groups independently. Unfortunately, there are no  $G$  and  $T$  for the noble group for the 1720s because the sample comprised only one family unit and thus the calculation was not feasible. The results are shown in **Table 4**. In both groups there was an increase in consumption inequality. The trend of the latter, for both the Gini and the Theil, is extremely marked in noble households. In the seventeenth century the figures

<sup>12</sup> For the non-noble the situation seems much more complex, and considerably more intriguing: what are the resources involved in this phenomenon? The answer to this question lies beyond the scope of this paper. However, it is a conundrum that certainly deserves investigation via a different approach to archive records and another research methodology.

are quite low, while at the end of the eighteenth century they reach rather high levels. For the Gini, for instance, there is an overall gain of 0.64 points. Among non-noble families the increase is less evident, 0.23 points. As can be seen in **Tables 5** and **6**, this polarisation in the patterns of spending inside both groups is statistically significant (with the only exception of the transition between the 1720s and the 1770s).

The polarization occurs through a considerable increase in the monetary outflows of the various families: once again calculating the median value of monthly expenditure per beneficiary for each group, nobles increase their expenditures almost seven-fold in a century, while non-nobles, in the same period, as many as 14-fold. In other words, not only was a small group of nobles able to increasingly distance their peers, but the same phenomenon within the group of non-nobles. The advance of what we might call a ‘non-noble elite’ is so acute that some families were able to overcome the spending power of a growing number of aristocratic families. Considering the distribution of households based on expenditures and examining the composition at the top (say the upper 30 percent), in the 1670s non-noble families were 30 percent of the total, while in the 1770s they were 50 percent.

**Table 4 – Gini and Theil measures of expenditures for noble and non-noble households.**

<b>GINI</b>		
<i>Decade</i>	<i>Nobles</i>	<i>Non-nobles</i>
1670s	0.04	0.33
1720s		0.61
1770s	0.68	0.56
<b>THEIL</b>		
<i>Decade</i>	<i>Nobles</i>	<i>Non-nobles</i>
1670s	0.004	0.18
1720s		0.70
1770s	0.98	0.55

**Table 5 – Changes in the Gini coefficients and Theil measures of consumption inequality between the 1670s and the 1770s. Only noble households.**

<b>THEIL</b>		
<i>Expenditures</i>		
		<b>1770s</b>
<b>1670s</b>	$\Delta G$	0.6421***
	<i>90% CI</i>	(0.2448, 0.6959)
	$\% \Delta$	1502%
<b>GINI</b>		
<i>Expenditures</i>		
		<b>1770s</b>
<b>1670s</b>	$\Delta T$	0.9729**
	<i>90% CI</i>	(0.1355, 1.1688)
	$\% \Delta$	27176%

CI = percentile confidence interval.

$\% \Delta$  = percentage changes.

\* =  $p < 0.05$ ; \*\* =  $p < 0.01$ ; \*\*\* =  $p < 0.001$ .

**Table 6 – Changes in the Gini coefficients and Theil measures of consumption inequality between the 1670s, the 1720s, and the 1770s. Only non-noble households.**

<b>GINI</b>			
<i>Expenditures</i>			
		<b>1720s</b>	<b>1770s</b>
<b>1670s</b>	$\Delta G$	0.2814*	0.2307*
	<i>90% CI</i>	(0.0088, 0.4480)	(0.0749, 0.4520)
	$\% \Delta$	86%	71%
<b>1720s</b>	$\Delta G$		-0.0507
	<i>90% CI</i>		(-0.1999, 0.2397)
	$\% \Delta$		-8%
<b>THEIL</b>			
<i>Expenditures</i>			
		<b>1720s</b>	<b>1770s</b>
<b>1670s</b>	$\Delta T$	0.5228*	0.3667*
	<i>90% CI</i>	(0.0614, 0.9188)	(0.1155, 0.7215)
	$\% \Delta$	293%	206%
<b>1720s</b>	$\Delta T$		-0.1561
	<i>90% CI</i>		(-0.5258, 0.3214)
	$\% \Delta$		-22%

CI = percentile confidence interval.

$\% \Delta$  = percentage changes.

\* =  $p < 0.05$ ; \*\* =  $p < 0.01$ ; \*\*\* =  $p < 0.001$ .

## 6 Conclusion

The pages above analyse trends in economic inequalities in Venice between the seventeenth and the eighteenth centuries. With the use of an unpublished archival source, the household budgets of the *Giudici di Petizion*, and using some simple statistical techniques we analysed not only trends in the disparities of revenues and expenditures, but also dissected them to better understand their internal evolution over time. First of all, although initially appearing very straightforward (an increase in income inequality followed by a ‘natural’ increase in consumption inequality), the situation proved much more complex. Using a bootstrap method, the changes in income proved non-significant and therefore inequalities in consumption were independent. We looked for the welfare impact of wealth changes, and finally found welfare changes without a wealth impact.

The driver of the positive trend in consumer inequality was not the spending behaviour of a single social group, but the internal dynamics of both noble and non-noble households. We found that at the origin of the increase in consumption inequalities in Venice was an endogenous phenomenon driven by the wide variety of consumption attitudes in all the families in the city during the early modern period. Every household behaved in a very specific way, based on its set of preferences and the degree of risk appetite, rather than the macro-economic situation.

Our research helps to provide a more complete picture of the internal dynamics that shaped the Little Divergence, showing how this was anything but a linear. We have seen that between the seventeenth and the eighteenth centuries the economy of the Republic was restlessly in search of a new equilibrium, with some sectors in profound crisis and others pushing back (more or less effectively) against the advance of the new competitors.

Turning from the macro to the micro level and hence analysing the behaviour of individual families, the situation was even more complex due to two different and contrasting phenomena. The stagnation of incomes, on the one hand, caused by the inability of the manufacturing sector to redistribute the benefits of its dynamism (which helped Venice stay afloat despite the blows of the northern European economies) to the population.

On the other hand, the stagnation of incomes did not translate into a stagnation of consumption. Looking at the trends in expenditures, Venetian households significantly modified their purchasing patterns, improving their material living conditions.

For the *Serenissima*, the Little Divergence was a matter of wealth rather than of consumption patterns, and therefore a matter of macroeconomics rather than microeconomics: the economy was slower than households to grasp the opportunities offered by the new economic environment established in the continent.

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