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## International Trade and Institutional Change: Medieval Venice's Response to Globalization

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## Abstract

International trade can have profound effects on domestic institutions. We examine this proposition in the context of medieval Venice circa 800–1600. Early on, the growth of longdistance trade enriched a broad group of merchants who used their new-found economic muscle to push for constraints on the executive i.e., for the end of a de facto hereditary Doge in 1032 and for the establishment of a parliament in 1172. The merchants also pushed for remarkably modern innovations in contracting institutions that facilitated longdistance trade e.g., the *colleganza*. However, starting in 1297, a small group of particularly wealthy merchants blocked political and economic competition: they made parliamentary participation hereditary and erected barriers to participation in the most lucrative aspects of long-distance trade. Over the next two centuries this led to a fundamental societal shift away from political openness, economic competition and social mobility and towards political closure, extreme inequality and social stratification. We document this 'oligarchization' using a unique database on the names of 8,178 parliamentarians and their families' use of the *colleganza* in the periods immediately before and after 1297. We then link these families to 6,959 marriages during 1400–1599 in order to document the use of marriage alliances to monopolize the galley trade. Monopolization led to the rise of extreme inequality, with those who were powerful before 1297 emerging as the undisputed winners.

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## 1. Introduction

Venice has always presented two faces. As a great medieval trading centre its wealth was used to build not only beautiful architecture, but also remarkably modern institutions. This is nowhere more obvious than in the Doge's palace, whose grand *Sala Maggiore* housed a parliament (established in 1172) composed of the rich merchants that monitored and constrained most of the Doge's activities. But climb up to the top floor of the palace and one enters the clandestine rooms of the secret service. With each passing decade after its establishment in 1310, this secret service was used to buttress the powers of a smaller and smaller number of families whose spectacular wealth was fed by international trade. This paper tracks the evolution of Venice's pre-1300 growth-enhancing institutional innovations and then Venice's dramatic post-1300 shift to political closure, social stratification and extreme inequality at the top end. Our main thesis is that these developments were the outcome of the rise of international trade. International trade led to an increased demand for growth-enhancing inclusive institutions, but trade also led to a shift in the distribution of income that eventually allowed a group of increasingly rich and powerful merchants to capture a large fraction of the rents from international trade.

Two strands of the literature are particularly relevant to this thesis, one dealing with medieval European trade (Greif, 2006a) and the other with the Atlantic trade (Acemoglu, Johnson, and Robinson, 2005). Medieval Europe experienced a massive expansion of long-distance trade during the 'Commercial Revolution' of 950–1350 e.g., de Roover (1965), Lopez (1971) and North and Thomas (1973). At the same time, medieval Europe also embarked on a set of major institutional reforms that laid the groundwork for the rise of Western Europe. Greif (1992, 1994, 1995, 2005, 2006a,b) establishes a causal connection between institutions and long-distance trade: Europe's initial institutions facilitated the expansion of long-distance trade and, more importantly for our thesis, the resulting expansion of trade created a demand for novel trade- and growth-enhancing institutions. These included property-right protections that committed rulers not to prey on merchants (Greif, Milgrom, and Weingast, 1994), a nascent Western legal system that included a corpus of commercial law known as the Law Merchant (Milgrom, North, and Weingast, 1990), publicly provided monitoring and enforcement of commercial contracts (González de Lara, 2008, 2011), and self-governing bodies such as business corporations. All of these are hallmark institutions of modern economic development.

Turning to Early Modern Europe, Acemoglu *et al.* (2005) show that where pre-1500 political institutions placed significant checks on the monarchy, the growth of the Atlantic trade strengthened merchant groups to the point where they were strong enough to further constrain the power of the monarchy. The English Civil War and the Glorious Revolution are the most famous examples (Jha, 2010; Acemoglu and Robinson, 2012, chapter 7). After 1800, this improvement in property rights raised urbanization rates and GDP per capita.<sup>1</sup>

The above research is pervaded by two themes that will be important for our analysis. First, institutional change occurs not because it is efficient, but because it is advanced by powerful

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<sup>1</sup>This success was not a given. As in Greif (2005, 2006a, chapter 6), Acemoglu (2008) and Acemoglu and Robinson (2012), we will argue that constraints on the executive are not enough to guarantee long-term success.

special interests.<sup>2</sup> Second, as trade grows it affects the domestic distribution of income and hence the relative power of competing special interests. It is this change in relative power that drives institutional change.<sup>3</sup>

### *The Story of Venice*

In order to deepen our understanding of the impacts of long-distance trade, via income distribution, on long-run institutional dynamics, we turn to a detailed historical and statistical examination of Venice. The broad outlines of Venetian history that we use to support our thesis are as follows. Through “a series of fortuitous events’ in the ninth century, Venice became politically independent (Cessi, 1966, 261). This, together with Venice’s unique geography, positioned it to benefit from rising trade between Western Europe and the Levant. These two factors combined to enrich Venetian merchants, who used their new-found economic muscle to push for institutional change.

The two key dates for improvements in institutions that constrained the power of the executive are 1032, which marks the end of a de facto hereditary Dogeship, and 1172, which marks the establishment of a Venetian parliament that was to become the ultimate source of political legitimacy. Contracting institutions also displayed extraordinary dynamism during the Commercial Revolution, in part to deal with the commitment and enforcement problems that come with doing business abroad (Milgrom *et al.*, 1990; Greif *et al.*, 1994; Greif, 2006a), but also to deal with the unique demands placed on capital markets by long-distance seaborne trade. This risky trade required large capital outlays and this in turn led to the development of new business forms and legal innovations that supported the mobilization and allocation of capital. One particularly famous innovation was the limited-liability contract known as the *colleganza* in Venice and the *commenda* elsewhere in Europe. It was the direct precursor of the great joint stock companies of a later period. Importantly for our thesis, it allowed even relatively poor merchants — who had neither capital nor collateral — to engage in long-distance trade and profit from it.

These institutional improvements made Venice wealthier overall, but also led to other substantial changes in the Venetian distribution of income. For one, the riskiness of trade together with the widespread involvement of Venetians in this trade, created a great deal of income churning — mostly rags to riches but also some riches to rags. For another, a small group of merchant families grew spectacularly wealthy.

This brings us to the great puzzle of Venetian history. During the period 1297–1323, a defining epoch in Venetian history known as the *Serrata* or ‘closure,’ Venetian politics came under the control of a tightly knit cabal of the richest families. It was, in Norwich’s (1977, 181) words, the triumph of the oligarchs. Further, by the early 1330s this political closure had spilled over into an economic closure that excluded poorer families from participation in the most lucrative aspects of international trade. Finally, by 1400 the political and economic closure had created a

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<sup>2</sup>This point is part of Greif’s notion of ‘coercion-constraining institutions’ (Greif, 2005, 2008; González de Lara, Greif, and Jha, 2008). See also North’s (1990) related critique of North and Thomas (1973). This point is also part of Acemoglu’s (2003) discussion of why there is no political Coase theorem.

<sup>3</sup>See Acemoglu (2008), Acemoglu, Bautista, Querubín, and Robinson (2008), and especially Acemoglu and Robinson (2006, chapter 10) who examine how changes in economic and political inequality affect economic development and transitions to democracy. See also Greif and Laitin (2004) and Greif (2006a) who study the role of changing income distribution for self-enforcing cooperation and institutional change. Do and Levchenko (2009) and Levchenko (forthcoming) develop theoretical models of the impact of trade, via rent creation and the power it confers, on institutions.

society characterized by a new emphasis on rank and hierarchy. In short, after 1323 there was a fundamental societal shift away from political openness, economic competition and social mobility and towards political closure, extreme inequality and social stratification.

To understand this puzzle, we construct a model that highlights the key role played by the evolution of income distribution. To this end, we introduce political and coercive institutions into a version of the Banerjee and Newman (1993) framework in which wealth dynamics are driven by occupational choice under wealth constraints (see also Galor and Zeira, 1993).<sup>4</sup> In our model, as was the case in medieval Venice, political power is tied to mercantile wealth. Along the model's equilibrium path there is economic and political mobility until the wealthiest merchants are powerful enough as a group to restrict entry into political markets. However, long-distance trade continues to generate wealth for up-and-coming merchants, which poses a political and economic threat to the wealthiest merchants. To prevent this without triggering a revolt, the wealthiest merchants co-opt the *nouveau riche* by allowing them into the Great Council. This larger coalition then restricts participation in long-distance trade to Great Council members. That is, barriers to entry into both political and economic markets are erected. The resulting evolution of the distribution of income (and hence of coercive power), permanently supports this outcome.

We show empirically how this replicates the sequence of historical events associated with the *Serrata* of 1297–1323. The key outcome of the *Serrata* was the creation of a hereditary nobility that had the exclusive right to sit in the Great Council and used this right to restrict participation in long-distance trade. To deepen our understanding of the *Serrata*, we develop a database of the 8,178 elected members of the Great Council in the period immediately preceding the *Serrata* (1261–1296). We use this to show that mobility was indeed eroding the political position of the wealthiest families. In particular, they were losing seats to up-and-coming families who had not previously been involved in politics. Building on Kedar (1976) and González de Lara (2008), we also code up hundreds of *colleganza* contracts for long-distance trade that have survived from the period 1073–1342. We use these to show that economic restrictions enacted during the *Serrata* were effective not only in restricting the use of the *colleganza* to the newly created nobility, but in restricting it to the most powerful of these nobles.<sup>5</sup> We then turn to the galley trade, the most lucrative aspect of long-distance trade. After the *Serrata* control over state-sponsored galley convoys was restricted to nobles. To finance them, nobles abandoned the *colleganza* in favour of within-family financing and marriage alliances with other wealthy noble families. We track 6,959 noble marriages recorded during 1400–1599 using techniques from social network theory (Jackson, 2008). We show that families who dominated the post-*Serrata* galley trade were the most important families in the marriage network (as measured by eigenvector centrality). We also show that these same families dominated the Great Council during 1261–1296. Thus, those who were powerful before the *Serrata*

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<sup>4</sup>The importance of the interaction between politics and economics in credit-constrained economies has been investigated by de Soto (1989) and Besley, Burchardi, and Ghatak (2012).

<sup>5</sup>This aspect of our paper is related to Jha's (2010) analysis of the English Long Parliament (1640–1660). He uses detailed data on parliamentarians to examine the formation of the coalition that supported stronger constraints on the Crown. Using data on the investments of about 500 parliamentarians, Jha finds that a particular financial innovation — shares in overseas companies — allowed broader investor participation in overseas trade and thus was key in aligning interests against royal discretion over foreign economic affairs. This is similar to the longer-term role the *colleganza* played in Venice before (but not after) the *Serrata*.

emerged from it as the undisputed economic, political, and social victors.

This paper has three points of contact with the vast literature on Venetian history. (1) The paper deals with the ‘Myth of Venice.’ In its strongest form, the Myth states that the civic-minded Venetian patriciate acted selflessly in the interest of all Venetians and that the *Serrata* was not a major point of discontinuity. See Grubb (1986) and Martin and Romano (2000) for reviews of the literature. The Myth has faced a number of criticisms of which this paper is one. Our post-*Serrata* analysis borrows threads from influential studies by Queller (1986) and Ruggiero (1980) discussed below, while our interpretation of the 1297–1323 *Serrata* is closest to Cracco (1967). However, we agree with Lane (1968) that Cracco’s emphasis on class struggle is misplaced and that more evidence is required to support his thesis. Rather than appeal to class struggle, we focus on special interest politics and institutions as in Acemoglu and Robinson (2006) and Greif (2008). (2) Our paper deals with Venetian social history. We integrate the late fourteenth century social transformation emphasized by Romano (1987) and Chojnacki (1997) into our broader thesis. (3) Our paper has implications for the literature on Venice’s long-term stability, particularly Venice’s ability to put a lid on inter-clan rivalries e.g., Lane (1971, 259–260), Greif (2006a, section 6.4.2) and González de Lara *et al.* (2008). Our analysis of the distribution of economic rents complements Greif’s as well as González de Lara’s (2008, 2010, 2011) analyses of the self-reinforcing nature of constraints on the Doge and the role of policies to sustain rents from international trade. Note that because the very important issue of inter-clan rivalry is dealt with by these authors, we will have little to say about it in our paper. Finally, what sets us apart from the existing literature is our central thesis, namely, that international trade had profound long-term impacts, via wealth distribution, on domestic institutions. We support this thesis with systematic evidence covering eight centuries and tracking Venetian families’ political representation, involvement in international trade, and intermarriage.

Sections 2–3 review constraints on the executive and the rise of contracting institutions during Venice’s early history. Section 4 presents the model. Section 5 reviews the *Serrata* and presents our empirical results about political mobility and the use of the *colleganza*. Section 6 reviews the post-*Serrata* galley trade and our empirical results about marriage alliances and inequality. Section 7 concludes.

## 2. The Rise of Constraints on the Executive

Throughout the ninth and first half of the tenth centuries, Venice experienced a slow revival of long-distance trade (McCormick, 2001, 630–638, and Findlay and O’Rourke, 2008, 84). This trade required Venetian merchants to cooperate in mobilizing resources and in this period we already see numerous examples of Venetian convoys travelling throughout the Mediterranean (McCormick, 2001, 523–529). Further, Venetian naval strength was growing. Venetian navies fought the Arabs in Southern Italy in 827, 828, 840, and 842, though often unsuccessfully. However, by the 860s, Venetian naval power had become an effective deterrent to Arab naval actions (Nicol, 1988, 26–33). Explaining the origins of this success in collectively mobilizing resources is beyond the scope of our paper because it would require both cross-cultural and cross-regional comparisons. We therefore

restrict ourselves to two conjectures. First, Greif (2006a, 25–26) argues that, when comparing Western Europe to the Islamic world, Western society made more allowance for individualistic as opposed to kin-based organizations, legitimized these organizations without appeal to religious authority, and thrived under the radar of relatively weak as opposed to strong states. All of these factors are pertinent to Venetian success.<sup>6</sup> Second, unlike many Western European cities, the geography of the Venetian lagoon created an environment that discouraged agriculture and encouraged seaborne trade. Success in the latter required Venetians to cooperate amongst themselves.<sup>7</sup>

### *Constitutional Change 1: The End of Hereditary Doges (810–1032)*

Long-distance trade picked up substantially in the second half of the tenth century as a result of events in Western Europe and the Eastern Mediterranean. To the west, rising incomes led to a resurgence of trade, especially along the Rhine and Danube rivers north of Venice and the Po Valley emptying into the Venetian lagoon.<sup>8</sup> To the east, between 961 and 969, a resurgent Byzantium regained control of the Eastern Mediterranean sea lanes, notably conquering Crete and Cyprus. As Pryor (1988, 111) writes of these conquests: “Christian reconquest of the Muslim possessions along the trunk [main shipping] routes in the tenth and eleventh centuries laid the foundations for the later Western domination of those routes, with all that implied. The reconquest thus appears as one of the most fundamentally important historical processes in Mediterranean history.” Larger-scale trade between Venice, Constantinople and the Levant quickly re-emerged. Figure 1 shows the main Eastern Mediterranean trade routes.

The rise of long-distance trade had an important implication for Venice: it allowed a relatively large number of merchants to become rich and demand civic recognition. Evidence of this can be gleaned from the lists of endorsers of Dogal documents. Endorsing a Dogal document was a sign of having arrived in society. In the second half of the tenth century the number of endorsers per document increased considerably. Castagnetti (1992a,b) has carefully tracked the names appearing in three extant Venetian Dogal documents from 960, 971 and 982. These documents were endorsed by 65 people in 960, by 80 people in 971 and by 128 people in 982. More interestingly, the percentage of endorsers belonging to families whose names had never before appeared in any Venetian document is high, averaging 59%.<sup>9</sup>

<sup>6</sup>Greif’s point is best illustrated by his cross-cultural analysis of medieval trade in Western Europe versus the Islamic world (including the Maghreb in North Africa). At the start of the medieval period both regions organized trade in kin-based (and community-based) networks. However, as trade expanded, its volume reached a level that was not supportable by kin-based organizations. The Venetian response was to develop business organizations that allowed unrelated individuals to work together and the Venetian parliament passed civil statutes that legalized these business organizations e.g., the *colleganza*. Finally, Venice could claim legitimacy for its parliament and civil statutes only because of the political vacuum left by weak European states. In contrast, such institutional responses were not possible in the Islamic world. See Greif (1992, 1993, 1994, 2005, 2006b).

<sup>7</sup>This second conjecture is related to the issue of Venetian stability that has preoccupied students of Venetian history. See the summaries by Queller (1986, 251–252) and especially Romano (1987, 6–10).

<sup>8</sup>See Lopez’s (1971) seminal book, *The Commercial Revolution of the Middle Ages, 950–1350*. See also North and Thomas (1973), De Long and Shleifer (1993, table 1), and Findlay and O’Rourke (2008, 83).

<sup>9</sup>The number of legible names in 960, 971, and 982 was 48, 72 and 128, respectively. The number of new names as a percentage of legible names was 50%, 81% and 51%, respectively. (For 960, we conservatively assumed that the percentage was 50% based on Castagnetti’s statement that the new names were in the majority.) See Castagnetti (1992a, 624–628).





Figure 1: Medieval Shipping Lanes of the Eastern Mediterranean

While these newly rich merchant families were not individually powerful, within 60 years of the re-opening of the Mediterranean sea lanes to Christian shipping they were collectively powerful enough to significantly constrain the power of the Doge. To analyze this process, one must bear in mind that Dogal institutions in this period present two faces. On the one hand, Doges were weak in that they were elected and were often murdered or forced into retirement by their opponents. They were not autocrats. See, for example, Greif (1995, 738).<sup>10</sup> On the other hand, Doges had wide-ranging powers that no other Venetian commanded. Cessi (1966, 270) describes the Dogal system of the time as “quasi-tyrannical” and Lane (1973, 90) writes that “the Doge was a monarch of unlimited power.”

These two contradictory faces of Dogal power pose a problem for us. In order to analyze constraints on the executive we must first establish that the executive was in fact at least somewhat powerful, even if not as powerful as claimed by Cessi and Lane. To do so we focus on one of the more important powers that a monarch can have, namely, the ability to appoint a family member as successor. Specifically, we consider succession from 810 (when the first Doge recognized by Byzantium was elected) until 1328 (when the last Doge of the *Serrata* period died).

Figure 2 illustrates the dynastic connections among Venetian Doges from 810 until 1328.<sup>11</sup> Time is measured horizontally and the length of each box corresponds to the length of the term in office of one Doge. For each Doge we go back in time to his most recent predecessor with whom he had

<sup>10</sup>Very little is known about Dogal elections; indeed, the earliest account dates from 1071, well after the 1032 constraints on the executive were put in place. In 1071, there was no slate of candidates and the Doge was ‘elected’ by acclamation.

<sup>11</sup>The information underlying this figure and much of this subsection is available from many sources e.g., Castagnetti (1992a). The only contemporary source for most of this period is *Chronicon Venetum* by John the Deacon, circa 1008. (We use the edition by Monticcolo, 1890). Since modern Dogal histories are frequently wrong, we often resort directly to the *Chronicon*.

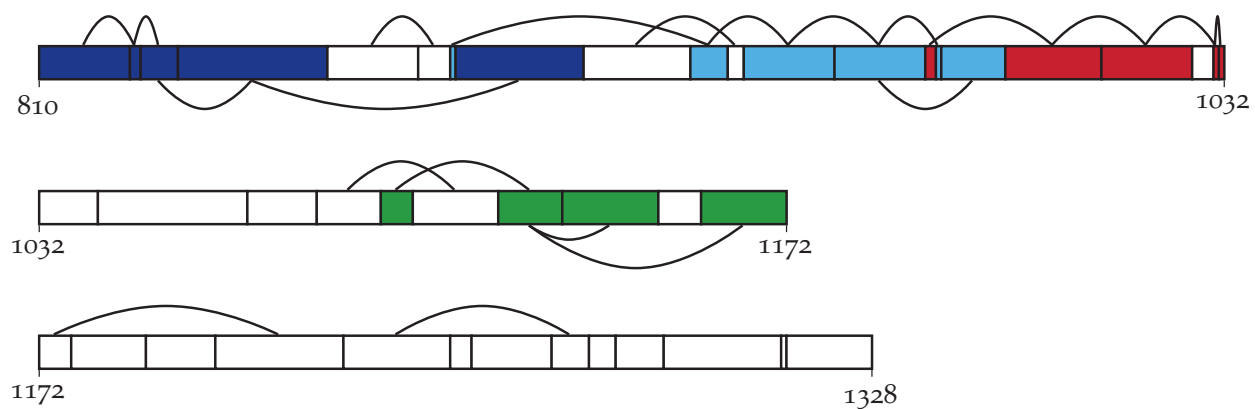


Figure 2: Dogal Dynasties

a family connection. Curves above the box mark connections between father and either son or brother. Curves below the box mark connections involving a son-in-law or nephew. We break the figure 2 bars at the two key constitutional crises of 1032 and 1172. We define a ‘dynasty’ as a set of Doges who pass on the Dogeship within the family at least twice. In the figure, we mark each dynasty with a distinct colour. There are three dynasties between 810 and the introduction of the first constraints on the Doge in 1032. *The striking fact is that during this period, every Doge had a direct family relationship to another Doge and most Doges belonged to one of three dynasties.*

The first dynasty, the Participazio, consists of Agnello Participazio, his sons Giustiniano and Giovanni Participazio, as well as Pietro Tradonico, who had married into the Participazio family, and Pietro’s nephew Domenico Tribuno. The four boxes that are not coloured in the figure in this early period are also Participazio, but it is not clear from contemporary sources whether they were related to the earlier Participazio.<sup>12</sup> The second dynasty, the Candianos, held the Dogeship for four successive generations (Pietro Candiano I, his son Pietro Candiano II, his grandson Pietro Candiano III, and his great-grandson Pietro Candiano IV). This was followed by Pietro Candiano IV’s brother (Vitale Candiano) and son-in-law (Tribuno Menio). The Orseolo were the third and final dynasty of the period. Doge Pietro Orseolo I was succeeded by his son Pietro Orseolo II in 991, who in turn was succeeded by his son Otto in 1009. As was common for Doges, Otto used his position to appoint brothers to the most important church positions. One brother was appointed head of the Venetian church (Patriarch of Grado) and another was appointed to a rank just below this (Bishop of Torcello). In 1026, an already unpopular Otto blocked the appointment of a Flabanico family member to an important church position (Bishop of Olivolo), which sparked a successful revolt led by Domenico Flabanico and resulted in Otto’s exile. Otto almost regained power during 1031–1032, but Domenico Flabanico prevailed and became Doge in 1032.

The election of Flabanico as Doge was a transformative moment in Venetian history. He was a wealthy silk merchant and most subsequent Doges over the next many centuries would also be merchants who were involved in long-distance trade. Flabenico’s election thus represents

<sup>12</sup>The first two boxes are Orso Participazio and his son Giovanni Participazio II. The second two boxes are Orso Participazio II and his son Pietro Participazio.

the triumph of the merchants. Further, Flabanico's reign ushered in two de facto constitutional innovations that significantly constrained the powers of Doges. First, the election of the Doge was to be respected in full: A Doge would no longer be allowed to appoint his successor. Second, Doges were henceforth required to consult with a two-member Dogal Court of judges and abide by the Court's decisions. See Lane (1973, 90) and Cessi (1966, 263 and 270). The constitutional principles embodied in these changes were not new — in principle, a Doge's successor was elected rather than appointed and was accountable to judges. What was new was the willingness of subsequent merchant Doges to respect constitutional principles. This willingness is apparent in figure 2. Comparing the period 810–1032 with 1032–1328, there is a dramatic fall in the number of Dogal successions i.e., in the number of lines connecting boxes. Further, there is only a single dynasty after 1032.

The driving force behind the 1032 constraints on the executive was long-distance trade and the broad-based economic and political power it brought to a growing group of merchants. It is no coincidence that the reforms came relatively quickly after the opening up of Eastern Mediterranean sea lanes to Christian shipping.<sup>13</sup>

### *Constitutional Change II: The Establishment of a Parliament (1032–1172)*

From 969 on Venetian long-distance trade expanded steadily; however, the growth of trade accelerated after 1082. In that year, a remarkable confluence of events on distant shores propelled Venice into a period of unprecedented prosperity and 'globalization.'

In 1071–1081 Constantinople was again in decline, weakened by Seljuk Turks in Anatolia and facing invasion by the Norman kingdom in Southern Italy. A desperate Byzantium enlisted Venetian naval aid to stop the Norman's Adriatic crossing. Byzantium was in dire straights and Venice extracted a heavy price for its naval involvement. The Golden Bull of 1082 granted Venice duty-free access to 23 of the most important Byzantine ports and granted Venetian merchants property-right protections from the caprices of corrupt Byzantine administrators. Most importantly, the Venetians were given buildings and wharfs *within* Constantinople. Venetians thus became the first foreign traders in Constantinople to have their own Quarter. See Brown (1920) for an English translation of the Golden Bull and for details of the Venetian Quarter.

The 1082 Golden Bull was crucial to Venice's maritime expansion. As a result, the number of newly rich merchants who were eager for civic participation increased. In the 1090s we again see

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<sup>13</sup>One obtains a deeper understanding of Venice's 1032 constraints on the executive by comparing them to those in Genoa and England. According to Acemoglu *et al.* (2005) and Acemoglu and Robinson (2012, chapter 7), England's initial constraints prevented the Crown from expropriating merchants' assets, thus removing the fetters to international trade. According to Greif (1995, 2006a) and Greif and Laitin (2004), Genoese constraints on the executive fostered cooperation between clans, thus facilitating the mobilization of resources needed to engage in further trade. Put crudely, English merchants needed to get the Crown off their backs whereas Genoese merchants needed an executive to keep merchant clans off each other's backs. In both cases the resulting institutions involved a strengthened parliament, but the resulting long-term growth outcomes were very different. In the period leading up to the 1032 reforms, Venice lay somewhere between the English and Genoese cases. As in England, the ambitions of key figures (e.g., the feudal ambitions of Doge Pietro Candiano IV and Doge-pretender Stephano Coloprino) actively threatened the merchant economy. As in Genoa, the nepotism of Doges exacerbated inter-clan rivalry and weakened Venice's ability to collectively mobilize naval and mercantile resources. Thus, the 1032 Venetian constraints on the executive were intended both to eliminate expropriation by the executive (as in England) and to promote inter-clan cooperation (as in Genoa).

a jump in the number of new names endorsing Dogal documents. See Castagnetti (1992*b*) and especially Castagnetti (1992*a*, 625–626 and 637–638).<sup>14</sup> The time was ripe for merchants to once again flex their political muscle.

After the reign of four unrelated and long-lived Doges (see the middle bar in figure 2), the Michiel family held the Dogeship for 53 of the 75 years leading up to 1171.<sup>15</sup> Towards the end of this period Venetian-Byzantine relations had become increasingly acrimonious and tensions came to a head on the night of March 12, 1171 when the Byzantine emperor rounded up 10,000 Venetians residing in the Empire and announced that they were being held for ransom.<sup>16</sup> In September of 1171, Doge Vitale Michiel II launched a large armada that was to blockade and harass Constantinople until the hostages were released. The plan failed miserably and in May of 1172 the fleet returned in utter disarray. Venetian frustration was palpable and much of it was directed against the Doge. At a gathering on May 27, he was mobbed and assassinated. It had been almost two centuries since a Doge had been murdered and the unexpected assassination left a power vacuum which the Dogal Court and leading merchant families immediately filled. As in Jones and Olken (2009), the assassination of a powerful ruler was to produce a transition to a less autocratic regime.

The first major change was the introduction of a limited-franchise elected parliament known as the Great Council.<sup>17</sup> With this constitutional change in place, the new legislative body used its power to increasingly constrain the power of the Doge over the next few decades. Many of these constraints were formalized in the Oath of Office that the Doge now publicly swore to uphold. The Oath explicitly listed what the Doge could *not* do e.g., expropriate state property or preside over cases against himself. The Great Council added to this list with the election of each new Doge (Madden, 2003, 95–101, and Hazlitt, 1966, 437). Furthermore, in all important decisions the Doge was required to consult with a strengthened six-member Dogal Council that was elected by and accountable to the Great Council. As Madden (2003, 98) notes: “In short, by 1192 the doge could do almost nothing without approval of the council.”<sup>18</sup>

The establishment of the Great Council and the constraints imposed by the Dogal Oath of Office were major institutional innovations. For Norwich (1977, 90) these were “arguably the most important reforms in Venetian history.” They dramatically limited the power of the Doge and arrogated his powers to a large group of families who owed their wealth and power to long-distance trade.

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<sup>14</sup>Note that we are not selectively looking at jumps in the number of new endorsers: jumps occur only twice (in the second half of the tenth century and in the 1090s) and we have reviewed both instances.

<sup>15</sup>The Michiel Doges were Vitale Michiel I (1096–1102), his grandson Domenico Michiel (1117–1130), Domenico’s son-in-law Pietro Polani (1130–1148) and Vitale Michiel II (1156–1172). Vitale Michiel II is the only case in figure 2 where the relationship is not certain: he is either Domenico’s son or belonged to a different branch of the Michiel family.

<sup>16</sup>These events are described by the contemporary Byzantine historian Choniates. See Choniates (1984, 50–51, 97–98). The figure of 10,000 is from the early thirteenth-century *Historia Ducum Veneticorum* which is reprinted in Berto (1999, chapter 18).

<sup>17</sup>A feature of this change was that it reduced the *arregno*’s (popular assembly’s) role in the election of Doge. It was thus a victory of the leading merchants over the *popolo*. A fuller treatment of our subject would deal with the interactions between merchants and the *popolo* and the rents transferred to the *popolo* in order to maintain their cooperation. On this topic see Pullan (1971) and Romano (1987) and our brief discussion of the Venetian patronage system in section 6.

<sup>18</sup>While the documentary evidence about the election of the Doge in this period is scarce, the Great Council gradually gained control over the election process as the rules evolved towards the election protocol of 1268. This is famous for its alternating use of randomizations and nominations, but behind this neat fact hides something more fundamental: from that date the Doge was elected by the members of the Great Council.

### 3. Institutional Change: The Rise of Contracting Institutions and Inclusive Growth

The two centuries following 1082 were ones of extraordinary dynamism for contracting institutions. By the early fourteenth century, financial innovations included: the appearance of limited-liability business forms; thick markets for debt (especially bills of exchange); secondary markets for a wide variety of debt, equity and mortgage instruments; bankruptcy laws that distinguished illiquidity from insolvency; double-entry accounting methods; business education (including the use of algebra for currency conversions); deposit banking; and a reliable medium of exchange (the Venetian ducat). All these innovations can be related directly back to the demands of long-distance trade.<sup>19</sup>

Equally important is the development of a supporting legal and enforcement framework. The most discussed of these is the Law Merchant, which is universally accepted as the foundation of modern commercial law (Berman, 1983). Its very scope — the use of a court of peers to adjudicate commercial disputes between merchants travelling in distant lands — means that the Law Merchant was a direct and immediate response to the needs of long-distance trade (Kadens, 2004).<sup>20</sup> The Commercial Revolution is also viewed as a key driver of the development of the modern Western legal tradition. This tradition has its origins in a legal revolution that occurred in the period 1075–1122 (Berman, 1983, Landau, 2004). While a general discussion of the origins of this legal tradition is outside the scope of this paper, a comment on timing is not. Civil law was not in use anywhere in Europe in 1000 (Radding and Ciaralli, 2006), but re-emerged in Europe in the second half of the twelfth century when communes began writing statutes governing their constitutions and commerce (Landau, 2004). Second, the first half of the twelfth century witnessed an explosion of secular legal documents. Such documents were rare in 1050, but common by 1150.<sup>21</sup> Venetian law developed rapidly thereafter: Its codification was begun under Doge Enrico Dandolo (1192–1205) and completed in 1242 by Doge Jacopo Tiepolo (1229–1249). See Besta and Predelli (1901).

Thus, civil law and commercial documents both appear just after long-distance trade began its explosive growth. There were other developments in Venetian contracting institutions in this period. See, for example, González de Lara (2008, 2011). Here we simply conclude that the expansion of trade after 1082 was accompanied, especially towards the end of the twelfth century, by a remarkable set of innovations in contracting institutions.

#### *The Colleganza as an Institutional Response to the Demands of Long-Distance Seaborne Trade*

We now take an in-depth look at one particular contracting innovation, the *colleganza*. This was a predecessor of the joint-stock company and is viewed by economic historians as one of the key

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<sup>19</sup>See de Roover (1965), Lopez and Raymond (1967), Lopez (1971), Pryor (1981, 1988), Milgrom *et al.* (1990), Mueller (1997), and González de Lara (2008).

<sup>20</sup>This observation is further supported by the dating of the Law Merchant. Berman and Kaufman (2004) date its inception to the growth of trade in the eleventh century and cite the 1095 Amalphitan maritime code as its earliest written form. Documents that refer to substantive merchant law appear shortly after 1100 and by 1200 formal commercial courts appear (Kadens, 2004).

<sup>21</sup>For Venice, this is apparent from the collection of the earliest commercial contracts (Morozzo della Rocca and Lombardo, 1940). See Wickham (2003) and Radding (1988) for Tuscan and Lombard evidence, respectively.

commercial innovations of medieval times, if not the key innovation e.g., Lopez and Raymond (1967, 174). Our main aim is to draw out the implications of long-distance trade for the evolution of income distribution and to set the stage for the empirical work to come. For further details on the *colleganza* and comparisons with other contemporary commercial contracts, see Lopez and Raymond (1967), Pryor (1987), and González de Lara (2010).

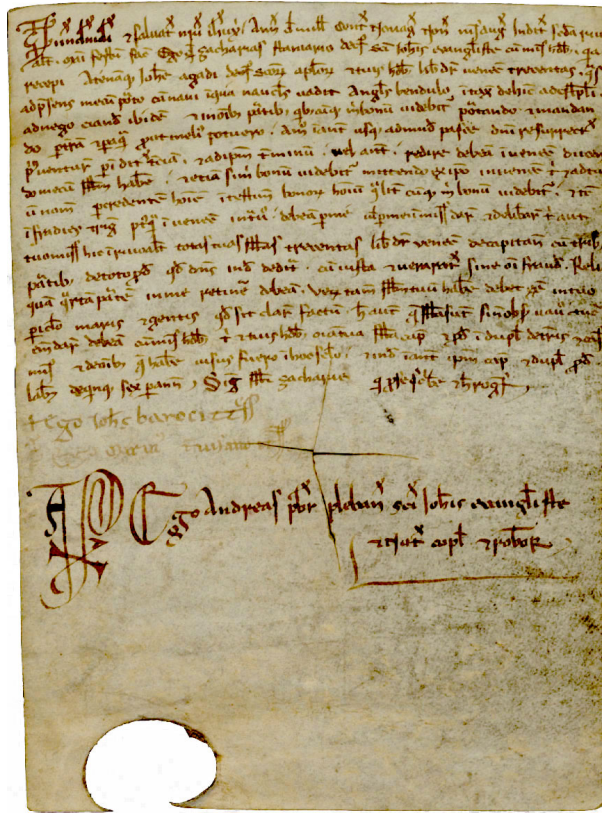
To understand why the *colleganza* was such an innovation, one must first understand the mechanics of long-distance trade. Ships typically left Venice at the end of March when the winter storm season was finished and the prevailing winds had turned favourable. If all went well, ships arrived in Constantinople by the end of April, spent three weeks collecting merchandise for the voyage home, and arrived back in Venice by July. The goods brought back were then sold to merchants travelling to the late summer fairs in Central and Western Europe. See Lane (1966) and Lane (1973, 69–70). Such a trip, if on schedule, would have earned enormous profits, over 100 percent and sometimes much more. While big returns could be had, there were also big risks. Death abroad from illness, shipwrecks, and piracy were common. There was also substantial business risk associated with the thinness of markets. Ships often travelled from port to port for months while merchants searched the hinterland for merchandise. A merchant who arrived in Acre a month late might find that the market was over for the year and be forced to dump his goods at fire-sale prices. Thus, luck but also the business skills and effort of a travelling merchant could make the difference between huge profits and huge losses.

The *colleganza* was a solution to three key problems of long-distance trade. First, this trade required large amounts of capital relative to most other contemporary private commercial activities such as agriculture or manufacturing. Second, collateral was problematic because, unlike in agriculture or manufacturing, the capital literally sailed out of sight. Third, the complex unforeseeable circumstances and large risks involved required balancing high-powered incentives for travelling merchants with risk sharing between them and the investors.

While there were many variants of the *colleganza*, we describe only the simplest and most common of these. There are two parties, the travelling merchant and the investor (or sedentary merchant). In Venice, the sedentary merchant gives cash or wares to the travelling merchant who then boards a ship with other merchants for an overseas destination, say Constantinople. In Constantinople, the travelling merchant sells the wares and uses the proceeds to buy other wares for resale in Venice. A *colleganza* specifies the names of the two parties, itemizes the capital contributed by the sedentary merchant and/or gives it a value (this is the ‘joint stock’), and states how profits will be split. The contract sometimes provides specific instructions, for instance an itinerary of ports to be visited, but very often leaves the travelling merchant a very high degree of freedom. Once the travelling merchant brings or sends the wares back to Venice, the accounts of the voyage are settled and the relationship is dissolved. In the archetypical *colleganza* the sedentary merchant provides all the capital and receives 75% of the profits. The travelling merchant contributes no capital and receives 25% of the profits. If there are losses, these come out of the sedentary merchant’s capital. However, the sedentary merchant’s obligations are limited by his initial investment. Restated, the *colleganza* provides limited liability and, specifically, the liability is limited to the joint stock specified in the contract. This was a major innovation over Roman law and is widely recognized as the origins of the great joint stock companies of a later period.

Figure 3 provides a typical example. The sedentary merchant, Giovanni Agadi, puts up the





Original parchment document (above)

Authors' translation from the Latin (right),  
based on the transcription of the parchment in Morozzo  
della Rocca and Lombardo (1940, document 444)

In the name of the Lord God and of our Saviour Jesus Christ. In the year of the Lord 1199, in the month of August, second indiction, at Rialto. I, Zaccaria Stagnario, from the ward of Saint John the Evangelist, together with my heirs, declare that I have received from you, Giovanni Agadi, from the ward of the Saint Apostles, together with your heirs, 300 pounds of Venetian pennies that I shall carry in the ship on which the helmsman Angelo Bendulo is traveling in convoy from here to Constantinople to do business there and in any other place that seems good to me, carrying and entrusting it through land and water as best I can until the next Paschal Resurrection of our Lord of the third indiction, and at that time or earlier I shall return to Venice carrying with me the aforesaid goods or else send you the same goods to Venice and on your behalf by whatever reliable man in the witness of good men seems good to me and then, within 30 days of having entered Venice, I am to give and deliver here in Rialto, personally or through my messenger, to you or to your messenger your entire capital of 300 pounds of Venetian pennies together with three parts of whatever profit God shall give us with just and truthful account and without any fraud. I am to keep for myself the remaining fourth. However, the aforesaid goods are to remain at your own risk from sea and people if this is clearly apparent. Moreover, if I do not observe all that is written above I am to compensate you and your heirs with double the amount of capital and profit out of my lands and houses and all that I am known to own in this world and let the same capital and the double bear interest of six per five every year from that time onwards. Signed by the aforementioned Zaccaria, who has asked this to be written on his behalf.

+ I, Giovanni Baroci, witness, signed.

+ I, Marino Trevisan, witness, signed.

I, Andreas, presbyter, parish priest at Saint John Evangelist and notary completed and certified this.

Figure 3: Colleganza between Zaccaria Stagnario and Giovanni Agadi, August 1199

joint stock of 300 pounds of Venetian pennies, an unimaginable sum for an ordinary Venetian. The travelling merchant, Zaccaria Stagnario, is to board a privately owned ship that will travel in convoy to Constantinople. No other commercial instructions are given: Stagnario is in charge of all other decisions (including continuing his voyage to 'any other place that seems good to me') and this is why high-powered, profit-sharing incentives are needed. The profit split is expressed in fractions:  $\frac{3}{4}$  for the sedentary merchant and  $\frac{1}{4}$  for he traveling merchant. If instead of profits there are losses, this downside risk is entirely borne by the sedentary merchant: 'at your own risk from sea and people'. The travelling merchant faces stiff penalties for failure to pay back the sedentary merchant.<sup>22</sup>

There is much that is not specified in this contract, so much so that the contract is hard to

<sup>22</sup>The penalty is double the amount of capital and profit plus a 20% annual interest ( $\frac{6}{5} - 1$ ).

understand except in the context of supporting institutions that developed to support merchants travelling in *colleganza*. This point comes out in Pryor (1987, chapters III and IV), who reviews the resolution of hundreds of *colleganza* disputes in order to flesh out the full set of ‘rules of the game’ surrounding the *colleganza*. In addition, González de Lara (2008, 2010, 2011) reviews the private and public institutions that supported the *colleganza* in Venice in the thirteenth century. Thus, the *colleganza* is not just a contract, it is an innovation that created a demand for other supporting institutions.

### *Economic and Political Mobility: The Role of the Colleganza*

The discussion of this section has emphasized that long-distance trade was exceptionally complex and risky and could make or break a merchant. It has also emphasized that the institutional response — the *colleganza* — allowed poor merchants to enter the game. Indeed, most historians have commented on this feature of the *colleganza* e.g., de Roover (1965, 51) who writes: “In a great many cases, the *tractores* [travelling merchants] were ambitious young men who were willing to take heavy risks in order to accumulate sufficient capital to join eventually the ranks of the *stantes* [sedentary merchants].”

As a result of the widespread engagement of the population in long-distance trade and the economic mobility it entailed, newly rich merchants flowed into political power throughout the twelfth and thirteenth centuries. This is a famous feature of Venetian society at this time. See Lane (1973, 20 and 89–90), Hazlitt (1966, 216), Norwich (1977, 182–83), Ruggiero (1980, 4) and Lopez (1971, 67–68 and 70). In Madden’s (2003, 3) words, “the membrane of Venetian nobility was permeable. Indeed, nobility in the sense of a group of families with a hereditary claim to political authority did not exist at all. In Venice, wealth, not land, defined nobility; commercial skill, not military prowess.”

The life of Zaccaria Stagnario provides an example of the economic and political mobility that was possible at this time. His grandfather, Dobramiro, was a Croatian slave who was freed when his Venetian owner died. His father Pancrazio was a helmsman. In 1199 we find Zaccaria travelling in *colleganza* to Constantinople (this is the document we reproduced and translated in figure 3) and this experience paid off handsomely when he moved there after the 1204 conquest. By 1207 he held office as councillor to the first Venetian podestà in Constantinople and was rich enough to be a sedentary merchant in two *colleganzas* for the large sum of 200 Byzantine hyperpeppers, an amount equal to seven months salary of the Duke of Crete. Ironically for the grandson of a slave, these *colleganza* were for travel to the Black Sea fortress of Sudak, a slave-trading centre. Upon his return to Venice, Stagnario integrated himself into the highest social and political circles. In the words of Robbert (1999, 35): “Zaccaria, the grandson of a slave, represented the new man in Venice who climbed to the top because of his business skills.”<sup>23</sup>

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<sup>23</sup>We find multiple references to Zaccaria Stagnario and his family in original commercial contracts of the period. The above paragraph is based on documents 49, 72, 290, 415, 444, 478 and 479 in the collection edited by Morozzo della Rocca and Lombardo (1940), on the original documents from the Archivio di Stato di Venezia with catalog numbers UD81001346 and UD02000581, and on Borsari (1988) and Robbert (1999). The salary of the Duke of Crete in 1224 was 350 hyperpera (Robbert, 1994, table 7).



## *Colonial Empire and Nobility Rents, 1082–1297*

On April 12, 1204 the blind Doge Enrico Dandolo ordered his galley beached under the imposing walls of Constantinople. He urged his men up and over, where they entered the history books as the first foreigners ever to enter Constantinople by force. Constantinople fell and in the upheaval that followed, Venice grabbed a vast swath of colonies spread throughout the Aegean, Eastern Mediterranean and Black Seas. Over the next half century, upwards of 70,000 Venetians would migrate to these colonies, creating a vast commercial network within a colonial empire.

To run its colonial empire, Venice quickly established a colonial bureaucracy. At its apex stood a relatively small number of chief colonial administrators.<sup>24</sup> They occupied extraordinarily lucrative offices: large salaries were paid by the Venetian state (e.g., Robbert, 1994, tables 4–8) and officeholders “usually mixed business with politics” (Lane, 1973, 141). Röscher (1989, 160–161) documents that within just three years of the 1204 conquest, nine Venetians had already earned vast profits. By the time of the *Serrata* in 1297–1323, chief colonial administrators were often drawn from the richest families of the newly formed nobility (O’Connell, 2009, chapter 2). We therefore refer to the benefits of officeholding as ‘nobility rents.’ There were many other forms of nobility rents and we focus on just this one for simplicity.<sup>25</sup>

### **4. The Puzzle and a Model**

We have described a virtuous circle: Long-distance trade created a constituency that supported improvements in public and private institutions and these improved institutions supported the further growth of trade. However, the fourteenth century witnessed a marked decline in economic, political and social mobility. In the years 1297–1323 the *Serrata* created a closed hereditary nobility and in the decade after 1323 this nobility put a stranglehold on the most lucrative lines of long-distance trade.

To understand the events of 1297–1323 and their long-term consequences for Venice’s institutions we develop a model which highlights how wealth dynamics interact with politics to drive institutional change. In this section, we present verbally the key ingredients and implications of our model. A complete formal presentation can be found in the appendix.

We build on Banerjee and Newman (1993), in which individuals are motivated by their own material well-being and the bequest they leave for their children. Initial wealth limits the occupational opportunities available to credit-constrained individuals and this in turn affects wealth dynamics. We tailor the occupation and investment opportunities to our Venetian setting and also add in political economy considerations. In the model, all Venetians can initially participate in international trade. Those without much capital of their own, can either remain in Venice

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<sup>24</sup>These included the Sanudos in Naxos, the Ghisi in Tinos and Mykonos, Marco Dandolo in Andros, Leonardo Foscolo in Anaphe, Marco Venier in Cerigo, Iacopo Barozzi in Santorini, Iacopo Vear in Cerigotto and, of course, the Corners in Crete. See O’Connell (2009, 18). Note that we are not distinguishing between formal and informal colonial possessions.

<sup>25</sup>Nobility rents are famously documented by Queller (1986) who argues that the nobility used the Great Council corruptly and to great personal advantage. Other examples of nobility rents include a welfare system that transferred public funds to impoverished members of noble families, the use of influence peddling, and the subsidization of the nobility-dominated galley trade. See below.

as craftsmen or become travelling merchants by signing a *colleganza* contract with a sedentary merchant who will put up the required capital. Those with intermediate wealth can self-finance their own voyage. Finally, the very wealthy can be sedentary merchants in multiple *colleganza*. International trade is risky and the success or failure of commercial voyages drives economic and social mobility.

As usual, this type of model is tractable if one focuses on parameter configurations such that children's occupational choices depend on their parents' wealth bracket (low or  $L$ , medium or  $M$  and high or  $H$ ) and the success or failure of their parents' projects, but not on the parents' specific wealth levels within each bracket. Rather than analysing every possibility, we focus on a case that captures key elements of the evolution of international trade and political institutions in Venice. Figure 4 represents this case on a simplex where we can follow the evolution of Venice's wealth distribution. The share of low-wealth individuals, denoted  $P_L$ , is measured along the horizontal axis, the share of high-wealth individuals, denoted  $P_H$ , is measured along the vertical axis, and the share of middle-wealth individuals is given implicitly by  $P_M = 1 - P_L - P_H$ . Assume an initial wealth distribution with a mixture of low- and middle-wealth individuals, but very few high wealth individuals, which corresponds to a point like  $A$  on the simplex and characterizes Venice in its early days. In addition, parameters for the returns from international trade and the probability of success and failure are chosen so that, consistent with our earlier discussion, international trade creates substantial mobility, some of it downwards but mostly upwards. The corresponding differential equations, and the patterns of intergenerational mobility that underlie them, can be found in the appendix.

Starting from point  $A$ , over time commercial success allows some middle-wealth individuals and their children to join the high-wealth group, while failure makes others join the low-wealth group. This makes the wealth distribution move upwards and rightwards on the simplex towards point  $B$ .<sup>26</sup> When the size of the group of high-wealth individuals who operate as sedentary merchants increases sufficiently, this reduces their profits. In the model, this is captured in a very simple way. Each sedentary merchant signs *colleganza* contracts with  $\mu$  travelling merchants, drawn from the group of low-wealth individuals. When the wealth distribution crosses the  $P_L = \mu P_H$  line at point  $B$ , all low-wealth individuals are now working as travelling merchants. Any further increase in high-wealth individuals ( $P_H$ ) creates competition among them for travelling merchants, which bids up costs and reduces expected profits for sedentary merchants. This increases wealth churning: the poor are now more upwardly mobile and the rich are now more downwardly mobile. As a result, the economy moves towards the steady state at  $C$ .

The high degree of intergenerational mobility and churning that characterizes this steady state was preempted, as we shall see, by political developments. To capture these developments, we add in coercive political economy considerations. In line with the historical evidence that membership in the Great Council was initially tied to commercial wealth, in our model the Council is made up of individuals who are born to wealthy families as well as those with a more modest background who become wealthy over the course of their lifetime through commercial success. However,

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<sup>26</sup>The movement from  $A$  to  $B$  implies a hollowing out of the middle-wealth group, but this plays no role for our conclusions. See the Appendix, and in particular figure 10, for details.

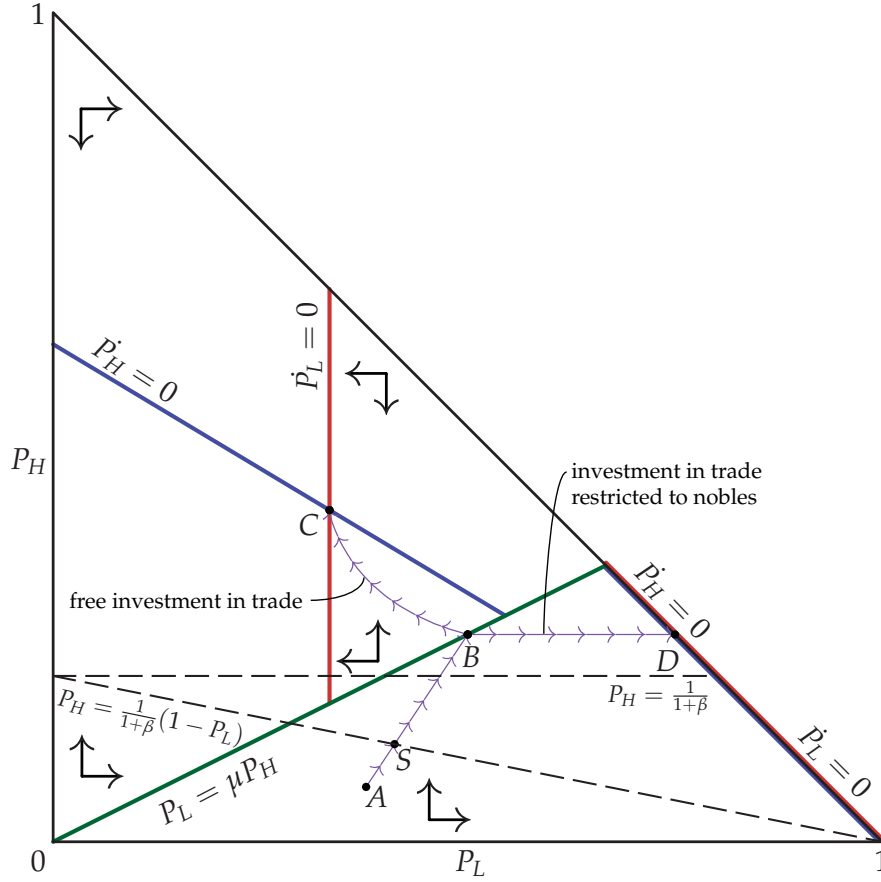


Figure 4: Evolution of the Wealth Distribution

Great Council members can vote to prevent further entry into the Council by making membership hereditary. This allows existing Great Council members to keep all of the rents associated with political power for themselves, but may trigger a violent revolt by those who are excluded. We model the revolt technology in a simple way so that its outcome depends on the relative size of the groups supporting the revolt and opposing it. A vote to close the Great Council benefits its  $P_H$  members and harms the  $P_M$  individuals with middle-wealth who could potentially gain entry for themselves and their children through commercial success. Thus, a revolt against such political closure succeeds whenever  $\beta P_H < P_M$ , where  $\beta > 1$  captures the fact that Great Council members are more powerful because they control the state's coercive capacity. Since  $P_M = 1 - P_L - P_H$ , the revolt condition becomes  $P_H < \frac{1}{1+\beta}(1 - P_L)$ . If this condition is not met then a revolt is defeated and its participants are hanged in Saint Mark's Square.

Figure 4 illustrates the timing of closure i.e., the timing of the *Serrata*. As society moves from point A to point B, international trade creates a rising group of very wealthy merchants. As trade continues to feed the joint wealth and power of this group, which is amplified by their control over the coercive power of the state, eventually the group becomes powerful enough that it can close the Great Council without a successful revolt by up-and-coming merchants. This happens when the wealth distribution crosses the line  $P_H = \frac{1}{1+\beta}(1 - P_L)$  at point S. (S stands for *Serrata*.) Before this point, if members of the Great Council had voted for the *Serrata* they would have faced

a successful revolt. After point  $S$ , members of the Great Council are powerful enough as a group to vote for hereditary membership without facing a revolt. From that point on, a person becomes a member of the Great Council only if his father was a member: Membership, which until then had been associated with commercial wealth, becomes hereditary. A formal nobility is established and equated with membership in the Great Council. This prevents further erosion of political rents through mobility into the Great Council.

After the Great Council becomes hereditary, many non-members continue to accumulate high wealth through commercial success. As they do so, these commoners become sedentary merchants and compete economically with nobles (Great Council members), all of whom are sedentary merchants. This competition squeezes the profits of nobles and, in particular, at point  $B$  the expected profits of sedentary merchants drop discretely.<sup>27</sup> Nobles then have a strong incentive to impose economic restrictions on commoners. A second restrictive measure voted by the Great Council can exclude non-members from investing in international trade. Restrictions on trade help nobles by preserving high profits for their commercial activities. The downside is again that this may trigger a violent revolt by those who are negatively affected. Excluding commoners from international trade harms a larger segment of Venetian society than did excluding commoners from the Great Council. Specifically, it reduces the expected earnings of commoners. At the time of the *Serrata* restrictions on trade would trigger a successful revolt.<sup>28</sup> Thus, to restrict investment in trade, nobles need to co-opt some of the *nouveau riche* commoners who had recently gained high wealth through commercial success but had been excluded from the Great Council. They can do this by increasing membership in the Great Council to  $P_N = \frac{1}{1+\beta}$ , so that  $\beta P_N = 1 - P_N$ , i.e. so that a revolt would be defeated. As we shall see, this increased membership is referred to in Venetian history as the ‘Enlargement of the Great Council.’ With this influx of new members, the Great Council is tremendously powerful: membership defines nobility status and commoners are excluded from the highly lucrative long-distance trade.

In figure 4, as a result of the restrictions on investing in international trade, the wealth distribution moves rightwards from point  $B$  to point  $D$  instead of moving from  $B$  to  $C$ . Despite the political and economic closure, while moving towards point  $D$ , Venice continues to engage in international trade. However, compared with the evolution towards  $C$  that Venice would have followed absent any restrictions, a smaller fraction of Venice’s population is involved in international trade, a larger fraction is involved in manufacturing, Venice’s wealth distribution is more polarized, and social and economic mobility is reduced to a minimum.

To summarise, our model features a *Serrata*-like event with four key characteristics. First, following a phase of substantial mobility into the Great Council, the Council passes measures that implement both political and economic closure. Since restrictions on Great Council membership harm a smaller share of Venetians than do restrictions on participation in the most lucrative aspects

<sup>27</sup>There are many ways of modelling the drop in profits. Here it is caused by competition for inputs (travelling merchants) which drives up costs. Alternatively, it could have been modelled as reduced revenue from greater competition in product markets.

<sup>28</sup>Recall that at the time of the *Serrata*, the noble population share was frozen at  $P_N^S \equiv \frac{1}{1+\beta}(1 - P_L^S)$  where  $P_L^S$  is  $P_L$  valued at point  $S$ . Rearranging this implies that the power of nobles,  $\beta P_N^S = 1 - P_N^S - P_L^S$ , is less than the power of commoners ( $1 - P_N^S$ ).

of trade, the latter come about later in the process and are preceded by co-option. This co-option involves an enlargement of the Great Council that admits more wealthy merchant families. For those who are admitted, their descendants are ensured a seat in the Great Council and a share of the nobility rents, even if those descendants become impoverished. Second, participation in the most lucrative aspects of international trade and in politics become based on family lineage and not on individual merit or commercial success. Third, closure leads to social stratification (decreased social mobility). Fourth, there is a shift in economic activity away from long-distance trade and towards manufacturing.

## 5. The Oligarchs Triumphant

In this section we review three key events in Venetian history through the lens of our model. First, we provide new evidence from the period 1261–1296 that mobility into and out of the Great Council was eroding the power of many established families. Second, we argue that this erosion is essential for understanding the *Serrata* of 1297–1323, the most important constitutional event in Venetian history. Norwich (1977, 181) describes the *Serrata* as “The Oligarchs Triumphant.” Third, we show that towards the end of this period and culminating in the early 1330s, a series of laws were passed that severely restricted the ability of non-nobles to engage in long-distance trade. Further, among nobles, it was the most powerful nobles who benefited most from these restrictions.

### *The Changing Membership of the Great Council*

We start with novel evidence that in the period leading up to the *Serrata*: (1) there was a high degree of mobility into and out of the Great Council; (2) a majority of seats in the Great Council were held by a relatively small number of powerful families; and, (3) some of these families were losing seat shares to merchants that had not previously participated in the Great Council. To this end, we have constructed a database on representation in the Great Council. A Great Council session lasted for one year, starting in October. The Council recorded the names of its members and these lists have survived for each of the sessions in 1261–1262, 1264–1271, 1275–1284, and 1293–1296. The handwritten lists, together with other surviving records of Great Council deliberations, have been transcribed in the *Deliberazioni del Maggior Consiglio di Venezia* (Cessi, 1931–1950).<sup>29</sup>

The lists are complex. They contain 8,178 legible names. As is well known, Venetian society in general and Great Council elections in particular were organized along family (i.e., clan) lines. See, for example, Raines (2003). It is therefore important to group individuals’ names into families.

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<sup>29</sup>There are very partial membership lists for 1296–97. No other years of data are available. Portions of these data have been used by Cracco (1967), Chojnacki (1973) and Röscher (1989). Like us, Röscher (1989) emphasizes that a majority of seats in the Great Council were held by a relatively small number of powerful families. However, his analysis stops in 1282. For us, it is essential to carry the analysis to 1296 so that we can also show that there was a high degree of mobility into and out of the Great Council between the 1260s and the 1290s and that some established families were seeing their seat shares eroded. In addition, it was Great Council membership in 1293–1296 that served as the basis for the hereditary nobility established during the *Serrata*.

Most family names have multiple variants and standardizing these was a lengthy and meticulous process.<sup>30</sup>

Figure 5 graphically portrays the extent of mobility into and out of the Great Council and the erosion of seat shares of families who were initially represented in the Great Council. Consider the dashed line. To construct it, we first rank all families based on their initial seat shares i.e., on the average number of seats the family held during the first three available sessions (1261–1262, and 1264–1266). For example, the Dandolo family (1 on the horizontal axis) held the most seats, 4.7% of the total. This 4.7% appears on the vertical axis. The Contarini family (2 on the horizontal axis) held 4.6% of seats so that the cumulative seat shares held by these two families was 9.3%. This 9.3% is displayed on the vertical axis. Moving rightward along the solid line, 50% of the seats were held by 21 families, 75% of the seats were held by 52 families, and 100% of the seats were held by 162 families. This gives meat and precision to a common observation in the literature that among Venetian families, “between 20 and 50 might be considered great families” (Lane, 1973, 100).

The solid line in figure 5 presents the cumulative seat shares at the end of our sample, during the last three available sessions (1293–1296). We retain the ordering of names from 1261–1262 and 1264–1266 so that 1 is still Dandolo, 2 is still Contarini, etc. Families that did not appear in this initial period are ranked by seat shares in the 1293–1296 period. (This is the concave section at the right end of the solid line.) Three features of figure 5 stand out.

First, at the point where the dashed line reaches 100%, the solid line only reaches 87%. Thus, 13% of the end-period seats were held by families that entered the Great Council after the initial period. There were 50 such new families.<sup>31</sup> This implies considerable mobility into the Council. This was not simply entry of a bunch of small-time players. The seat shares of new families were highly skewed, as can be seen from the concavity of the final portion of the solid line. For example, the new family with the most seats was the Caroso family, who went from no seats to being 28<sup>th</sup> in the seat-share rank of the end period. Further, most of the new families were engaged in long-distance trade, as evidenced by their appearance in commercial contracts. For example, the new family with the second-most seats was the Caotorta, for whom the surviving records include settlements of accounts with Zaccaria Stagnario for trade between Venice and Constantinople. The new families with the third-most and fourth-most seats, the Nicola and the Barastro, also appear in commercial contracts.<sup>32</sup> These four merchant families, with no seats in the initial period, were

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<sup>30</sup>We use an extended definition of family (*casata*). Sometimes a *casata* was made up of multiple branches (*rami*), but separating these systematically is not feasible. See Raines (2003, 23–25), who uses a comparable definition for the post-1297 period. The standardization of family names presents many difficulties. The same family name appears sometimes in Latin and other times in Italian (e.g., Mauroceno or Morosini). There are multiple patronymic prefixes (d', da, de, di, dalla, della, de ca', de cha, de Casa, da Casa, etc.). There are also many spelling variants (up to 13 in the case of the Sesendillo family), the doubling of the 'n' or of the 'l' being the most common variants. Other variations reflect differences between Venetian and Italian, such as the alternative spellings 'ç', 'z' or 'zh' for the interdental voiceless fricative (a sound that is used in Venetian but not in Italian). The standardization was done with careful assistance from Lisa Chen and Jennifer Konieczny. They are Ph.D. students in the Medieval History Department at the University of Toronto. Lisa Chen specializes in Venetian literary texts. Jennifer Konieczny specializes in Florentine legal texts.

<sup>31</sup>Of these 50 new families, only 3 appear in either Rösch's (1989) list of families that were politically prominent in 960–1141 or in Castagnetti's (1995) list of families providing high-office holders in 1142–1204.

<sup>32</sup>The settlement of Caotorta with Zaccaria Stagnario is in document #75 in Lombardo and Morozzo della Rocca (1953). The Nicola were investors in the *colleganza* of document #811 in Morozzo della Rocca and Lombardo (1940). The Barastro appear in the *colleganza* of documents #749, #751, #794, and #834 in Morozzo della Rocca and Lombardo (1940).

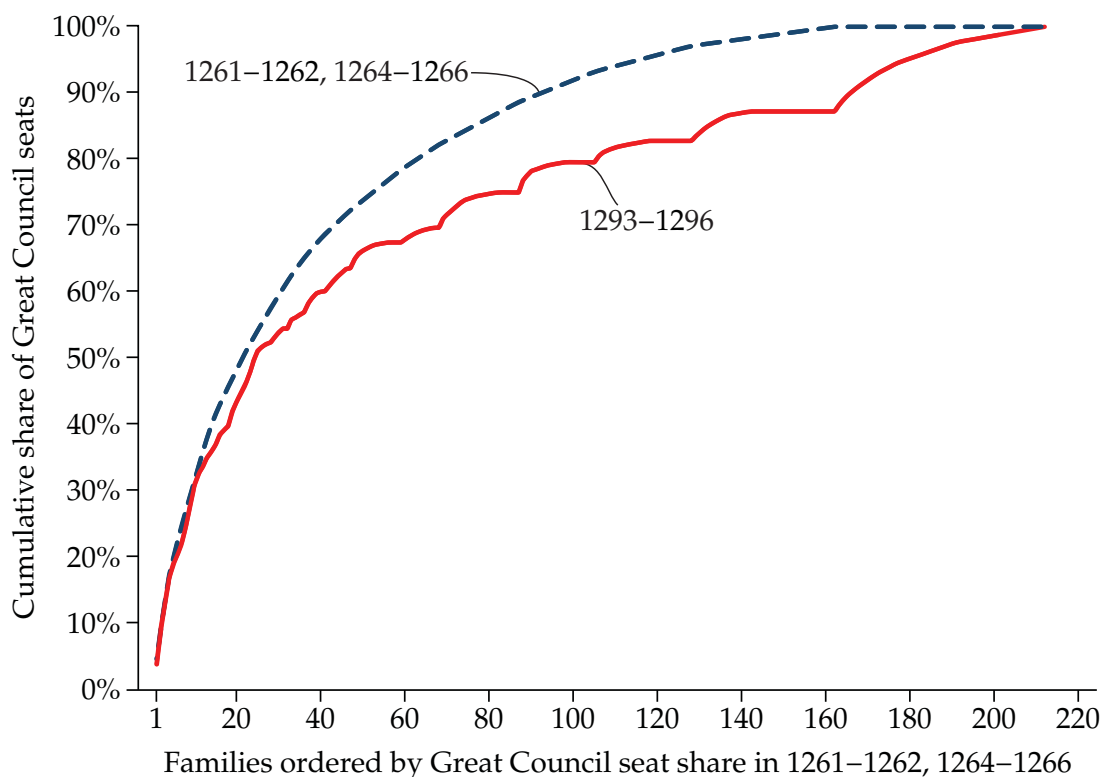


Figure 5: Share of Great Council Seats Held by Families Dating to 1261–1262, 1264–1266

all in the top-50 by seat shares in the end period. Their rank would place them among Lane’s great families. Thus, new families were quickly growing wealthy and politically powerful from long-distance trade.

The second feature of the figure is mobility out of the Council. The flat portions of the solid line are due to families who initially had seats, but ended up with none. There are 47 such families among the initial 162. This implies that the exit rate from the Great Council was 1.2% per year. This was nine times higher than the exit rate after the *Serrata*. For example, in the initial period the Dauro family held 1% of the seats and was ranked 29<sup>th</sup>, yet the family was no longer in the Great Council by the end period.<sup>33</sup>

The third and most striking feature of the figure is that the solid line (1293–1296) is well below the dashed line (1261–1262 and 1264–1266). Established families — even some of the most powerful — were losing seat shares. For example, the Falier family, one of the founding families of Venice who had given the commune two Doges, held 2.5% of the seats and was ranked 6<sup>th</sup> in the initial period but by the end period its rank had dropped to 17<sup>th</sup>. Similarly, the powerful Zane family saw their seat rank drop from 9<sup>th</sup> to 26<sup>th</sup>.

<sup>33</sup>The compounded average annual exit rate between 1265 and 1293 is the  $\gamma$  that solves  $162(1 - \gamma)^{(1293-1265)} = 162 - 47$ , which implies an annual exit rate  $\gamma = 1.2\%$ . We can compare this to the exit rate after the *Serrata* using exit dates for families from Raines (2003, appendix 1). Of the 165 families with seats in 1293–1296, only 36 exited the Great Council between 1323 and 1500, which implies an exit rate after the *Serrata* of 0.14%. Clearly, the decline in the exit rate by a factor of nine after the *Serrata* cannot be explained by demographics e.g., the death of an entire family. If anything mortality rates substantially increased during and after the plague of 1348. The point here is that prior to the *Serrata* there was a high probability of exit from politics for non-biological reasons.

In summary, this discussion surrounding figure 5 shows that there was a high degree of mobility into and out of the Great Council, that new members were engaged in long-distance trade, and that the power even of great families was being eroded by up-and-coming families.

### *The Serrata, the 'Enlargement of the Great Council,' and State Capacity for Repression*

Wealthy families did not take this mobility lying down. Their attack began in the Great Council where they introduced a series of motions aimed at gaining permanent control of the Council. After the failure of four such motions during 1286–1296, a landmark vote on February 28, 1297 effectively handed control of Great Council elections to a small number of powerful families.<sup>34</sup> In particular, control over elections passed into the hands of the Council of Forty, a government organ “which had never before claimed a leading role in the state” (Rösch, 2000, 74), and was controlled by older, powerful families.<sup>35</sup> The initial *Serrata* motion distinguished between those who had served in the Great Council in the previous four years and those who had not. The former group was re-elected automatically, provided they were supported by 30% of the Council of Forty (12 votes out of 40). The latter group had to overcome significant obstacles to membership, unless they had sat in the Great Council recently. Measures approved in 1298, 1300 and 1307 substantially strengthened this asymmetry between Great Council insiders and outsiders. Membership in the Great Council had taken a major step towards being ‘locked in.’ See Hazlitt (1966), Lane (1971, 1973), Todesco (1989), and Rösch (2000).

Political closure was tightened with a series of laws that created a Venetian nobility. In 1310 the concept of nobility was formally introduced for the first time: a *nobiles* was a man “who was or could be a member of the [Great] Council” (Ruggiero, 1980, 9). In 1319, the process for electing new members was eliminated. Henceforth, the only route to entry involved proving that a paternal ancestor had sat in the Great Council. The last of the *Serrata* laws was passed in 1323. It unequivocally made membership in the Great Council a hereditary position. *Only men whose fathers and grandfathers had been in the Great Council could hold seats.*<sup>36</sup>

Likely as a reaction to the *Serrata*, the period 1300–1355 was to be the most internally violent period in Venetian history from 976 to the demise of the Serene Republic in 1797. In early 1300, a popular commoner named Boccono along with 11 of his associates forced their way into the Great Council chambers. Boccono appears to have been intent on murdering several Council members and brow-beating the remainder into re-enfranchising those excluded by the *Serrata*. Arms were not permitted in the chambers so Boccono and his associates represented a real threat, all the more so because they were backed by a crowd of armed supporters waiting outside in St. Mark’s Square. By a stroke of luck, an overheard conversation revealed the plot: the 12 conspirators were disarmed in the Council chambers and executed that night. Their bodies were left hanging in St. Mark’s

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<sup>34</sup>The relevant motions are in Cessi (1931–1950, volume 1), page 156 #118 (October 3, 1286) , pages 156–157, #120 (October 5, 1286), page 157, #123 (October 17, 1286) and page 396 #6 (March 6, 1296), and in Cessi (1931–1950, volume 3), pages 417–418 #104 (‘The Last Day’ of February, 1297).

<sup>35</sup>In 1298, membership of the Council of Forty was formally restricted to families who had been in the Great Council for at least two generations.

<sup>36</sup>Men took their seats at age 25 unless they won the *Balla D’Oro* lottery, in which case they took their seats at age 18.



Square where they served as a warning. In addition, 40 other supporters of the conspiracy were exiled and had their properties confiscated. See Ruggiero (1980, chapter 1).

Violence boiled over again on the night of June 15, 1310 when Venice was rocked by an armed insurrection. By luck, the plot was revealed the night before by a defector, and even this may not have prevented the insurrection: a violent storm wreaked havoc with communications between the two groups of insurgents who were converging on St. Mark's Square and the mis-coordinated attack was repulsed. A successful revolt was barely averted. Ruggiero (1980, chapter 1) emphasizes that the motivation for this revolt was opposition to the *Serrata*.<sup>37</sup>

A sense of panic began to grip the elite: they might not be so lucky next time. It was time for a new, two-pronged approach that involved the building of coercive capacity and co-option. The revolt occurred on June 15, 1310. On June 30, the Great Council declared martial law and on July 10 the first meeting of the infamous 'Council of Ten' was convened. The Council of Ten was initially tasked with tracking down the supporters of the revolt, but it evolved into the Venetian state's repressive apparatus. From its beginnings, the Ten's authority within the state hierarchy was left intentionally ambiguous. For example, it was not appointed by the Great Council nor accountable to it.<sup>38</sup> Over time, the Council of Ten arrogated to itself whatever powers it needed. For example, in 1319 it created its own police force. Even this was not enough to quell the uproar over the *Serrata* for in 1328 the Ten executed the brothers Barozzi for leading a conspiracy against the nobility. By mid-century, the Council of Ten had the necessary resources and experience to repress internal dissent, as evidenced by the Ten's speedy handling of Doge Falier's 1355 attempt to overthrow the Great Council. This brought an end to the stormy period of post-*Serrata* violence.<sup>39</sup>

In addition to building up the state's coercive capacity, the elite co-opted key potential opponents to the *Serrata* by granting them membership in the Great Council.<sup>40</sup> This one-off 'Enlargement of the Great Council' is famous in Venetian history and happened quickly, essentially between 1297 and 1310.<sup>41</sup> By the time membership of the Great Council became fully hereditary

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<sup>37</sup>Rösch (2000) disagrees, arguing that the revolts were personally motivated, while Hazlitt (1966, chapter xx) points to inter-clan rivalry.

<sup>38</sup>Its membership was secret and drawn exclusively from the most powerful families. As few as twenty families controlled the Council of Ten in the fourteenth century (Ruggiero, 1980, 16).

<sup>39</sup>Note that in our model, the state's coercive capacity is exogenous and captured by the parameter  $\beta$ , which measures the fighting effectiveness of Great Council members (nobles) relative to non-members. The build-up of state capacity could be introduced into our model by having  $\beta$  be a concave function of the costly effort devoted by nobles to building coercive capacity. There would then be some optimal combination of co-option (i.e., Enlargement) and coercion that would be used by families in the Great Council to accomplish the *Serrata*.

<sup>40</sup>This included some who had displayed their loyalty by fighting to defeat revolts.

<sup>41</sup>Chojnacki (1973) argued that Great Council membership was open for up to seven or eight decades after 1297 but his argument has since been shown to be inaccurate. See in particular the criticism by Ruggiero (1979, 248–249): "A yet more troubling aspect of Chojnacki's statistics is his failure to look for differential rates of change in the additions of new families to the Major Council in the period 1298–1379. Most scholars agree that there was a very rapid addition of families in the years immediately following the *Serrata*. [...] Considering as a whole the period from the 1290s to 1379, thus, gravely distorts the real picture of elite stability following 1310." Todesco (1989, 8, authors' translation) similarly notes that 'a restrictive policy was instead implemented from 1310, when the admission of new members was made increasingly selective. While initially twelve votes in the Council of Forty were sufficient for their approval, after various changes, from 29 June 1310, thirty votes in the Council of Forty and a two-thirds majority of the Great Council were required.' Todesco also notes that "[t]he final closure occurred around 1320. [...] Any further admissions were limited to cadet branches of old families that returned from the colonies, or the lords of *terra firma* or the governors whose appointment, however, only had an honorary meaning" Todesco (1989, 126–127, authors' translation). The only exception was the admission in 1381 of families who had made significant contributions to the Battle of Chioggia.

in 1323, its size had more than doubled from 415 members on average in 1261–1296 to around 950 members.<sup>42</sup> To get a sense of the scale of the co-option we have examined all 257 families that were present in the Great Council in 1323. 150 of these families had seats in the Great Council in 1293–1296 and so were essentially guaranteed hereditary membership. Another 107 families had no seats in 1293–1296 but were co-opted. These co-opted families included 31 who had sat in the Great Council recently, lost all their seats as a result of the intense churning during 1261–1296, and were brought back in. The remaining 76 co-opted families had not been in the Great Council during the period for which records exist (1261–1296). Thus, the *Serrata* made Great Council membership hereditary, locked in those Great Council members who had seats just before the *Serrata* (1293–1296), and co-opted many families who, if excluded, could have threatened the stability of the new system.<sup>43</sup>

### *The Closure of Long-Distance Trade*

In the decade following 1323, the newly-defined nobility passed a series of laws whose consequence was to limit participation by commoners in the most lucrative aspects of long-distance trade. The most important of these was the re-organization of the galley trade, though wealth-based restrictions on who could trade also played a role.

Galleys had long handled the most lucrative traded goods, including cloth, silk, cash, bullion and spices (Lane, 1963, 181). Their speed allowed them to escape capture by pirates, their maneuverability allowed them to stay together in convoys, and their small cargo holds made them impractical for anything but valuable light-weight goods. They were also excellent war machines. Towards the end of the *Serrata* the Venetian state completely overhauled the organization of the galley trade: instead of convoys of primarily privately owned and operated galleys, Venice moved to a system of publicly owned galleys that were auctioned off to private operators. Under the new system, which evolved rapidly between 1321 and 1329, the state chose the destinations and sailing dates of convoys of galleys and then auctioned off the galleys for the duration of the trip (*muda*). Crucially, “only nobles were allowed to participate in this auction, an exclusive privilege that gave them control of the financial and commercial operations of the fleet” (Doumerc, 2003, 157). In 1329, this system became a permanent feature of the *muda* to Greece, Constantinople and the Black Sea. In 1331, it was extended to the rest of the Western Mediterranean and a decade later to Flanders.

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<sup>42</sup>The average size in 1261–1296 is calculated from our Great Council membership data. No systematic records of Great Council membership have survived for the period immediately afterwards, so all counts after 1297 are estimates. The approximate size circa 1323 is calculated on the basis of the 670 and 664 votes cast in the Great Council for the 1320 and 1324 elections of the Procurator of Saint Mark and a typical absentee rate of 30% during such elections (Todesco, 1989, 120 and appendix 1).

<sup>43</sup>Raines (2003) provides the most careful systematic analysis of the presence of different families in the Great Council from 1297 onwards, recording the first and last known presence of each family. Combining the data in Raines (2003, appendix 1) with our data for 1261–1296 results in (a) 76 families that she records as present in the Great Council in 1323 but who had no seats in 1261–1296 and (b) another 31 families present in the Great Council in 1323, with no seats in 1293–1296, but who had seats in earlier years. Of the 76 new families, only 6 appear in either Röscher’s (1989) list of families that were politically prominent in 960–1141 or in Castagnetti’s (1995) list of families providing high-office holders in 1142–1204.

The new system allowed a handful of powerful noble families to corner what was by far the most lucrative facet of long-distance trade.<sup>44</sup>

In addition to sewing up the galley trade, the noble-run Commune directly restricted who could trade on the most lucrative routes. In 1324, just one year after the completion of the *Serrata*, a law was introduced (the *Capitulare Navigantium*) that forbade any merchant from shipping wares with a value in excess of the merchant's assessed wealth. Wealth assessments were used by the Commune to determine taxes and, since only the very wealthy paid taxes, the *Capitulare Navigantium* excluded the poor from long-distance trade. Indeed, it ensured that only the very richest merchants (those with large assessments) could engage in large-scale long-distance trade. The *Officium de Navigantibus* was created to enforce the new law. It was initially active for less than a year, but was reinstated in 1331–38 and again in 1361–1363 (Cessi, 1952). While there were a variety of reasons for the *Capitulare Navigantium*, restricting trade to nobles and wealthy citizens was an important one (e.g., Hocquet, 1997, 595). This in turn reduced the economic and political mobility long promoted by Venetian trade: Thus, the *Capitulare Navigantium* “must have galled many ambitious merchants on the make” (Lane, 1973, 140).<sup>45</sup>

To examine the impact of the reorganization of the galley trade in the 1320s and the 1324 *Capitulare Navigantium*, we look at the characteristics of merchants who used the *colleganza* before and after 1324 to see (a) whether non-nobles were excluded and (b) whether, among nobles, usage shifted to those with greater political power (as measured by seat shares in the Great Council). We begin by examining *colleganza* contracts that have survived for the period 1073–1342. In particular, we examine all contracts that appear in Morozzo della Rocca and Lombardo (1940, 2 volumes), Lombardo and Morozzo della Rocca (1953), Tiepolo (1970), and Sebellico (1973, 2 volumes). These volumes are collections of all types of commercial contracts, such as dowries, wills, lease agreements, loans, settlements, etc. We first identify which of these commercial documents are *colleganza* or settlements of a *colleganza*. In some of these volumes, each contract is preceded by an editorial header giving the date, place and type of contract; however, these headers are often vague or inaccurate so we instead reviewed each of the 2,833 documents individually. Identification is tricky and requires a considerable investment in time to learn how to distinguish *colleganza* from other related contracts.<sup>46</sup> In all we identified 381 *colleganza* for the period 1073–1342. Some of

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<sup>44</sup>See Doumerc and Stöckly (1995), Doumerc (1997), Hocquet (1997), Judde de Larivière and Doumerc (1998), and Stöckly (1995) for detailed discussions of the overhaul of the galley trade.

<sup>45</sup>Other reasons for the *Capitulare* included prevention of tax evasion and exclusion of non-citizens from long-distance trade e.g., Cessi (1952). The *Capitulare* also addressed periodic inventory build-ups in Venetian warehouses (Hocquet, 1997, 595–597).

<sup>46</sup>We have benefitted enormously from numerous discussions with Yadira González de Lara on the coding of *colleganza*. *Colleganza* contracts are most clearly identified by the statement that, in the event of profits, the travelling merchant receives a share of these profits e.g., “*Reliquam quartam partem in me retinere debeam.*” See the *colleganza* in figure 3. Settlements of *colleganza* require a careful reading to understand what type of contract is being settled. The most common difficulty is distinguishing between a *colleganza* and a sea loan. Where no other distinguishing features are available, we follow González de Lara (2008) in classifying a contract as a *colleganza* if the travelling merchant rendered accounts under oath. Sometimes both the original *colleganza* and its settlement have survived, in which case we count only the original contract; however, most often only one of the two has survived, in which case we date the contract to the date of the original *colleganza* (which is almost always specified in the settlement). There are a small number of other related contracts dealing with the transfer of *colleganza* obligations, and we include these as well. There are two settlements of *colleganza* for which only a fragment of the original parchment has survived. Since the names of the merchants are missing, we exclude these two.

Table 1: Commoner Involvement in *Colleganza*

(1) Period	(2) Number of surviving <i>colleganza</i>	(3) Number of <i>colleganza</i> involving commoners	(4) % of <i>colleganza</i> involving commoners	(5) Median merchant's family seats per session in the Great Council	(6) Officium de Navigantibus
1073–1200	65	27	42%	1.5	
1201–1220	63	24	38%	1.0	
1221–1240	79	42	53%	0.9	
1241–1261	59	30	51%	0.8	
1310–1323	81	22	27%	3.0	
1324	3	0	0%	1.8	In force
1325–1330	19	1	5%	4.8	
1331–1338	10	0	0%	5.4	In force
1339–1342	2	0	0%	13.6	

these *colleganza* have also been coded by Kedar (1976) and by González de Lara (2008): Kedar (1976) examines contracts dated 1240–1323 and González de Lara (2008) examines contracts dated 1073–1261. Although neither codes contracts dated after the *Capitulare Navigantium*, we have been deeply influenced by their work.

For each *colleganza* we identify the sedentary and travelling merchants and match their family names to the names of families with seats in the Great Council. This involves standardizing family names using the same procedure described in footnote 30 above. We have data on Great Council membership and seat shares for 1261–1296. From Raines (2003, appendix 1), we also have Great Council membership (but not seat shares) for 1297–1323. We match the merchants' family names in the *colleganza* with the 1261–1296 and 1297–1323 Great Council family names and the 1261–1296 seat shares. For the remainder of this section, we refer to merchants with family members in the Great Council in 1261–1323 as 'nobles' and to all others as 'commoners'.<sup>47</sup>

Table 1 presents the results. Column 1 displays the period. The reader will immediately notice one bit of historical irony — no *colleganza* have survived for 1262–1309 i.e., for the period which includes Great Council membership records. This is not crucial because our primary interest is in comparing the pre- and post-1324 periods. The grey-shaded rows are the years in which the *Officium de Navigantibus* was in operation (1324 and 1331–1338). Recall that the *Officium* was in charge of enforcing the *Capitulare Navigantium*.

Column 2 reports the number of *colleganza* that have survived for each period. Column 3 reports the number of *colleganza* in which at least one of the merchants was a commoner i.e., a merchant with no family in the Great Council from 1261 onwards. Column 4 reports these *colleganza* as a

<sup>47</sup>Recall that 1323 marks the completion of the *Serrata* of the Great Council.

share of all *colleganza* in the period. Comparing 1310–1323 with all later periods, there is a sharp drop in commoner participation after the *Capitulare Navigantium*. During 1310–1323, commoners participated in 27% of all *colleganza*. After 1324 there is only a single *colleganza* with commoner participation.<sup>48</sup>

By 1310, Venice was already deep into the *Serrata* so we might expect that an informal process of commoner exclusion may already have been under way. That is, a comparison of the 27% figure for 1310–1323 with the essentially 0% figure for 1324–1342 may understate the full extent of commoner exclusion. It is therefore useful to look further back, to 1241–1261 and even further. Indeed, commoner participation was higher in earlier years, making the 1324 break starker. Commoners were involved in 51% of all *colleganza* during 1241–1261.<sup>49</sup> As far back as 1073–1200, commoners were involved in 42% of all *colleganza*.<sup>50</sup>

Column 5 moves the discussion away from commoner participation and to the power of the nobles that participated. In each period we draw up a list of all the merchants involved in a *colleganza*. We then assign each of these merchants a ‘power score,’ which is simply his family’s number of seats in the Great Council. (The number of seats is the family’s average number of seats per session during 1261–1296.) We then examine how power scores of the median merchant evolved across periods. Similar results hold for averages. The first observation from column 5 is that the median number of seats is positive i.e., the median merchant had family members in the Great Council. Prior to 1310, the median merchant’s family presence in the Great Council was modest. For example, in 1241–1261, the median family had less than one seat, which signals that this median family alternated in and out of the Council. During the *Serrata* but after the Enlargement (1310–1323), the median merchant’s family held almost three seats. After the *Serrata* (1325–1338), it jumped even higher, to about five seats. Thus, after the *Serrata* and, especially after

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<sup>48</sup>This 1326 *colleganza* is a bizarre ‘coals to Newcastle’ *colleganza*. The non-noble travelling merchant is carrying mink fur to Tana on the Black Sea on behalf of a nobleman and his partner, despite the fact that Tana was a centre for fur exports.

<sup>49</sup>In his excellent book, Kedar (1976) also documents this decline in commoner participation in *colleganza* between 1240–1261 and 1310–1323. However, he does not look at commoner participation after the *Capitulare Navigantium*. He is also unclear about how he defines nobility — he certainly does not define it by reference to Great Council participation.

<sup>50</sup>The table 1 numbers for 1310–1342 are accurate and establish our point. The pre-1261 numbers are less accurate. We explain the inaccuracy by way of two examples. (a) If a merchant in 1240 whose family had never sat in the Great Council entered the Great Council in 1261 he is classed as a noble, thus leading us to understate commoner participation. (b) If a merchant in 1240 was in the Great Council in 1240 but not after 1261 he is incorrectly classified as a commoner, thus leading us to overstate commoner participation. It is hard to see how such misclassifications could account for the drop in commoner participation after 1323. However, as a robustness check we also classified a merchant as noble if his family name appears in Rösch’s (1989) list of families that were politically prominent in 960–1141 or in Castagnetti’s (1995) list of families providing high-office holders in 1142–1204. This reduces commoner participation rates in 1073–1261 by just 6 percentage points, from 46% to 40%; it reduces commoner participation rates in 1310–1323 from 27% to 25%; and it still leaves a single *colleganza* involving a commoner after 1324. In short, it is hard to make a case that pre-1261 misclassification of nobles and commoners explains away our result. A second potential source of concern is that data for different periods comes from different notaries who may have worked with different types of customers. If we restrict ourselves to the period 1317–1342, we can compare commoner participation in *colleganza* contracts from a single notary who worked both before and after 1324, the priest Felice de Merlis. We also know that he worked for all sorts of customers e.g., see the many references to his social contacts in Romano (1996). Looking only at this notary’s contracts we see commoner participation dropping from 16% in 1317–1323 (commoners were involved in 7 contracts out of 44) to 3% in 1324–1342 (a commoner was involved in a single contract out of 34). Restated, even looking at contracts from the same notary and starting in a late period when the *Serrata* was almost complete, there is a sharp drop after 1324. Thus, it is highly unlikely that our results can be explained by differences across notaries.

the *Capitulare Navigantium*, use of the *colleganza* shifted to more and more powerful families.<sup>51</sup>

Note that after 1330, there is a very significant drop in the number of extant *colleganza*. This does not appear to be the result of changes in notarial contracts: we do not see similar trends for other types of contracts. The most convincing explanation has to do with the re-organization of the galley trade. As we discuss next, this led to a shift in financing away from the *colleganza* and towards financing through family and marriage alliances.

## 6. Economic Inequality, Social Stratification, and Resource Reallocation

The political and economic *Serrata* had very significant long-run implications for economic inequality, social stratification, and resource reallocation. We turn to the three of these in the following subsections.

### *Economic Inequality*

The capital requirements of the galley trade were huge. A winning bid in the galley auction averaged 793 ducats during 1332–1345. This was only a minor item in the total cost of chartering the galley, which reached 9,200 ducats (equivalent to 33 kg. of fine gold) by the late 1400s. In addition to the charter costs, it was necessary to cover salaries and provisions for a crew in excess of 150 men for a period of five to eleventh months. All of these costs were in turn dwarfed by the cost of the freight, often valued at over 150,000 ducats in the early 1400s.<sup>52</sup> In an earlier, pre-*Serrata* age, these huge up-front fixed costs would have been shared by many merchants, both noble and commoner, and financed with a large number of *colleganza*. In the post-*Serrata* age, we initially see broad-based noble participation in the galley trade. However, over the next 150 years an ever-narrower group of nobles came to monopolize the galley trade.

To understand how this happened, one must understand the details of how the state-run galley trade was financed. Each galley in its entirety was auctioned off to a single noble bidder (the *patrono*), who in turn divided the galley into 24 shares and up to 24 shareholders.<sup>53</sup> In the years immediately following the *Serrata* there was wide-spread noble participation in the galley trade. This was necessary because not even the richest families could afford the high up-front capital costs of a successful bid.

The mid-1300s were a difficult time for trade, with the plague of 1348 and on-going wars with Genoa until 1380. After 1380, however, Venice began to recover and with this recovery a slow process of concentration in the galley trade began. At the start of the recovery, participation was still widespread: Two-thirds of noble families participated in the galley trade and more than a one-third provided *patroni* (Doumerc and Stöckly, 1995, 143). By the mid-1400s, evidence of

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<sup>51</sup>Our results should not be misconstrued to mean that only the rich traded. There continued to be trading by commoners in less profitable routes, mostly on bulk commodities (e.g., Apellániz, 2013). Our results mean that it was now much more difficult for commoners to break into the most lucrative segments of long-distance trade.

<sup>52</sup>Numbers for the cost of the charter and freight of galleys are from Doumerc (2003, 158), who also notes that the five galleys in the 1409 *muda* to Flanders were carrying merchandise worth 460,000 ducats, the equivalent of one and a half tonnes of gold. Data on winning bids are from Hocquet (1997, table 1, page 595).

<sup>53</sup>Ships had long been divided into shares and these shares appear as investments in *colleganza*. Indeed, they are referenced in the earliest extant *colleganza* dating from 1073 (Lopez and Raymond, 1967, document 82).

increasing concentration in the galley trade was inescapable. In Doumerc and Stöckly's (1995, 140–142) analysis of 121 galleys during 1445–1452, the *patrono* held the majority of shares, either alone or with his brothers and sons, in 60% of galleys. On average, the *patrono*'s family held 56% of the shares. And more and more often the *patrono* was from a particularly prominent family.

To become a majority shareholder in a galley, a noble typically had to give up the advantages of risk diversification and concentrate his investment in that galley. During 1445–1452, 85% of shareholders were invested in a single galley (Doumerc and Stöckly, 1995, 146). By 1500, it was common for a single family to hold all of the shares in a galley. One even begins to see instances where all the galleys in a *muda* (convoy) are controlled by a family or small group of families. For instance, the brothers Alvise, Andrea and Pietro Marcello held all 24 shares in a galley of the *muda* to Trafego in 1496. They raised their stake with 12, and then 18, and then 23 shares in a second galley in 1497, 1498 and 1499, and finally held all 48 shares in two of the three galleys of the *muda* to Trafego in 1500 (Doumerc and Stöckly, 1995, 147, Judde de Larivière, 2008, 181).

The greatest advantage of cartelizing a *muda* came from price fixing. Michiel da Lezze, son-in-law of Pietro Marcello, left detailed evidence of this practice in his business correspondence (Braudel and Tenenti, 1966, 62). In 1506 he instructed his son Luca, *patrono* of a galley of the *muda* to the Barbarie Coast, to collude with the other *patroni* as monopsony buyers to drive down the price of wool in Valencia. Upon returning home, they colluded again as monopolists to drive up the sale price in Venice. These and other anti-competitive practices begin to appear frequently in court cases from 1450 on. "The abuses are more and more frequent as financial concentration increases" (Doumerc and Stöckly, 1995, 147, authors' translation).

Controlling an entire *muda* required vast financial resources and during the course of the 1400s a uniquely *un-Venetian* solution emerged. Family members, typically brothers, raised capital within a family. Since even this was rarely enough to control one or several galleys, marriage alliances were established with other powerful families and additional capital was raised within the alliance. This in part explains the decline of the *colleganza* documented above: It is a step backwards from impersonal relationships to kin-based relationships as the basis for Venice's long distance trade. It is also a step backwards from the era of pre-*Serrata* economic mobility. In its place a period of spectacular inequality at the top end of the income distribution was ushered in.

The use of marriage alliances had a profound impact on financing and hence on concentration in the galley trade. The 46 galleys sent in the *muda* to the Levant between 1519 and 1528 had an average of just 2 shareholders, despite a cargo value worth between 150,000 and 200,000 ducats per galley (Doumerc and Stöckly, 1995, 152). Further, the lists of shareholders after 1500 are dominated by the Contarini, Garzoni, Marcello, Loredan, Pisani, Priuli, Michiel, Morosini, and a very small handful of other rich families. During the period 1495–1529, 30 individuals from just 17 noble families owned 38% of all shares in the galleys of the different *muda* (Judde de Larivière, 2008, table 8, page 140). Over the same period, the families of the shareholders were linked by marriage in almost every single galley (Judde de Larivière, 2008, 144).

The problems of monopolization, both the anti-competitive costs and the implications for extreme inequality, were decried by contemporary chroniclers such as Sanudo and members of the Great Council. Ideally, we would like to track the extreme inequality associated with the rise

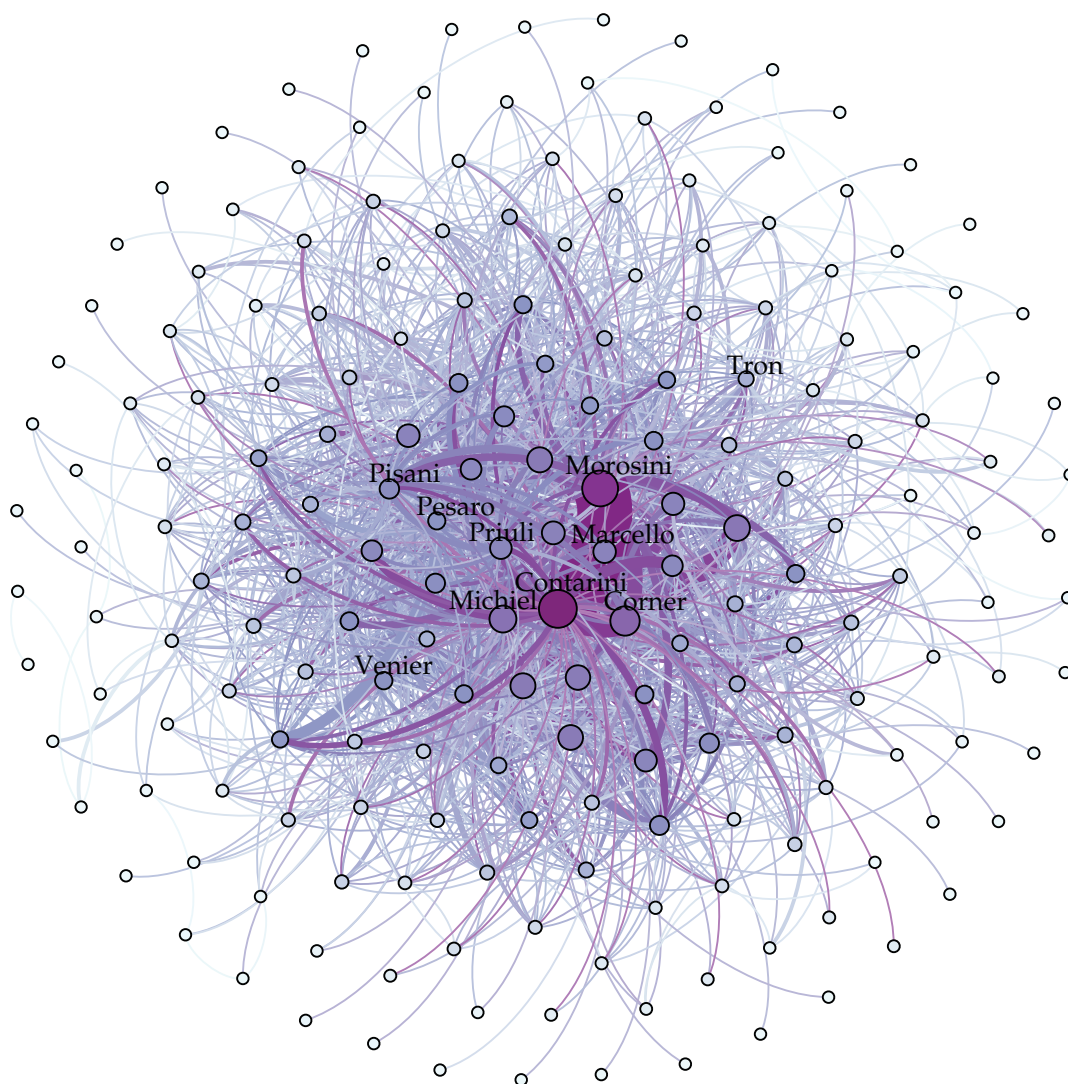


Figure 6: Marriage network among noble families in 1400s

of this ultra-rich elite, especially after the post-1380 Venetian expansion. One certainly sees it visually in the ornate palazzos that began lining the Grand Canal in this period (Goy, 1992, 10). Unfortunately, there are no systematic data that would allow us to track economic inequality.<sup>54</sup> Nevertheless, we have been able to exploit a source that has not previously been systematically examined, namely records of Venetian noble marriages.<sup>55</sup> Since, as we have seen, these marriages were intimately connected with cartelization, this will give us a systematic portrait of post-*Serrata* Venetian economic polarization.

<sup>54</sup>The only systematic wealth data source is the tax register (*estimo*) of 1379, prepared to finance the war with Genoa. Unfortunately this comes just before the period of recovery and expansion in Venetian trade and provides no time dimension.

<sup>55</sup>Marriage networks have been studied in other contexts. Perhaps the best-known example is the study by Padgett and Ansell (1993) documenting the rise of the Medici family in Florence through the strategic use of marriage alliances. While they do not explicitly link their study of high ‘marriage inequality’ to high economic inequality, if these two were as correlated in Florence as we show they were in Venice then Padgett and Ansell’s work suggests that high inequality was not unique to Venice.



After the *Serrata*, given the patrilineal hereditary nature of Great Council membership, it became increasingly important for the state to keep a record of marriages of sons of male nobles. The process went hand in hand with the closing of any grey areas surrounding eligibility for Great Council membership e.g., sons born out of wedlock. It is a process that was not completed until the early 1400s (see Chojnacki, 1994, 2000, and the discussion later in this section.) We are therefore able to examine records of marriages starting in 1400. A handwritten list kept at the Archivio di Stato di Venezia records Venetian marriages involving a noble husband. This was compiled in the late nineteenth century by archivist Giuseppe Giomo from multiple sources, including the records of *Avogaria di comun* and an earlier compilation by Marco Barbaro. We have digitized this list and use all 6,959 marriages among noble families for the period 1400–1599 in our analysis.<sup>56</sup> <sup>57</sup> We have performed the same standardization of family names as used for the Great Council seat data of the previous section, and have merged both data sets. This allows us to track the evolution of power within Venice’s nobility.

Figure 6 shows the network of marriages among noble families in 1400–1499. Each circle (node of the network) represents a family and each arc is a marriage connecting two families. All marriages for this period are plotted, with thicker and darker arcs representing more marriages between two families. The heaviest line is between Contarini and Morosini (52 marriages). There are also thick lines connecting Michiel to Contarini, Corner to both Contarini and Morosini, etc. Roughly speaking, families that appear closer to each other in the graph are more strongly connected. So, for instance, Michiel is more closely related to Contarini (17 marriages) than to Morosini (6 marriages).<sup>58</sup> The size of the circles increases with the family’s importance in the network as measured by eigenvector centrality (Bonacich, 1972). This assigns relative scores to all nodes in the network based on the idea that a node is more important when it is better connected to other important nodes.<sup>59</sup>

Given that marriage alliances were used to mobilize the vast financial resources required to control entire galleys or even *muda*, eigenvector centrality gives a measure of families’ ability to monopolize routes in the galley trade and how this evolved over time. Consider figure 7. Each point is a noble family’s eigenvector centrality in the marriage network of 1400–1499 plotted against the family’s percentile in the Great Council seat share distribution of 1261–1296. Families with extremely high centrality in the 1400s had extremely high pre-*Serrata* seat shares. This strong persistence is in contrast with the remarkable mobility we documented for the pre-*Serrata*

<sup>56</sup>The handwritten list also contains a few earlier marriages (23 in 1398 and another 33 scattered over the period 1348–1397), but these are far too few to be useful.

<sup>57</sup>The list only contains marriages involving a noble husband. Interestingly, the frequency of noble husbands marrying non-noble wives falls over time, from 11.8% in 1400–1499 to 7.7% in 1500–1599. This is another way in which non-noble families were increasingly excluded.

<sup>58</sup>Nodes are arranged following the Fruchterman and Reingold (1991) algorithm, which applies stronger attractive forces to more heavily connected nodes and repulsive forces to all nodes.

<sup>59</sup>Let  $M$  be a matrix where each element  $m_{ij}$  is the number of marriages between family  $i$  and family  $j$ . The centrality of family  $i$ , denoted by  $c_i$ , is proportional to the weighted sum of the centrality of the families it has married, with weights given by the respective number of marriages:  $\lambda c_i = \sum_j m_{ij} c_j$ . In matrix notation,  $\lambda c = Mc$ . Thus,  $c$  is an eigenvector of  $M$  and  $\lambda$  its corresponding eigenvalue. To obtain a measure with non-negative values, eigenvector centrality is defined as the eigenvector  $c$  associated with the largest eigenvalue. Note that  $c$  is unique only up to a scaling factor, so it allows for comparisons within a network, but not across networks or across periods of a given network.

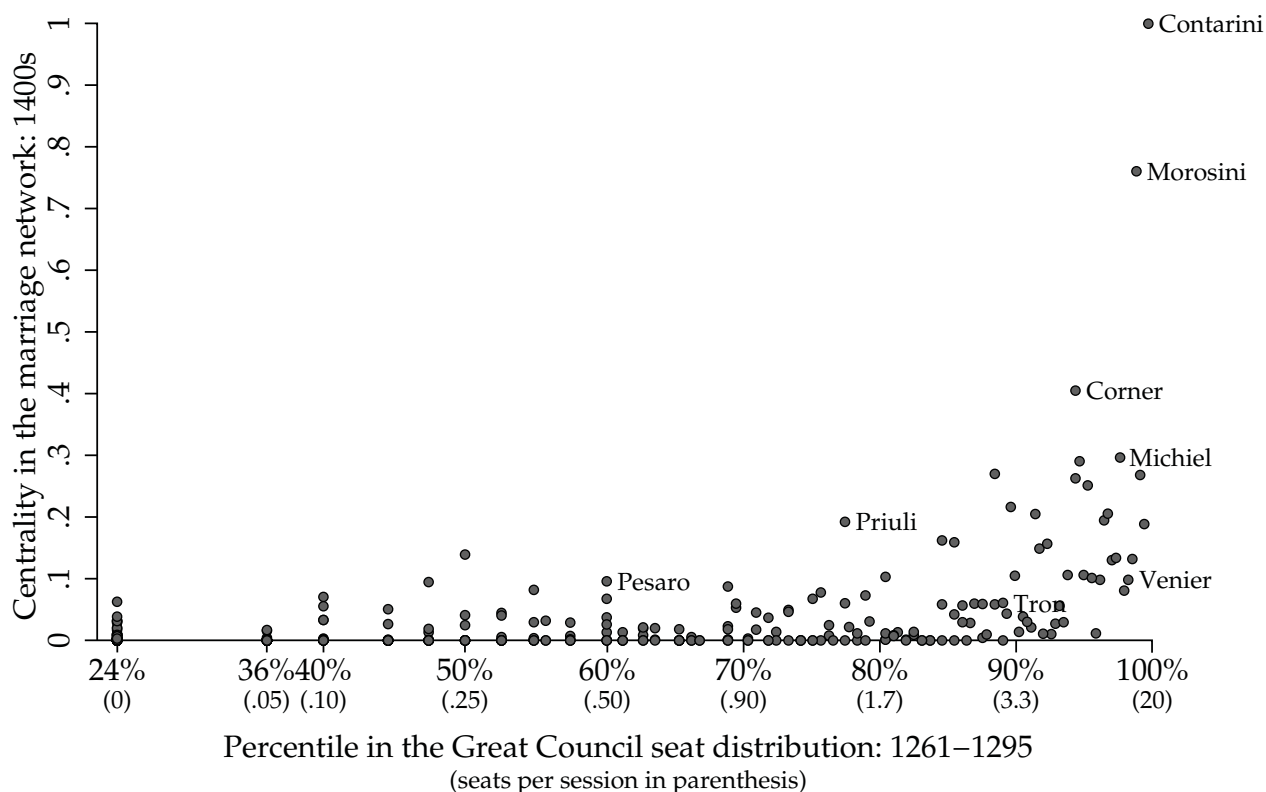


Figure 7: Centrality in the marriage network in 1400s against Great Council seat share in 1261–1296

period. More specifically, in figure 7 only families in the top quartile of the pre-*Serrata* seat-share distribution appear in the top decile of marriage centrality in the 1400s.

To externally validate the relevance of our centrality measure, we compare high-centrality families with those who are prominent in the galley trade. In the galley trade data from 1495–1529 there are 12 families with at least 10 participants and at least 100 galley shares. As expected, these 12 families are all in the the top decile of marriage centrality in the 1400s. Together, they accounted for one-half of all of the galley trade in terms of shares invested. This externally validates our eigenvector centrality measure. It also shows that the most powerful families in the Great Council in the period leading up to the *Serrata* strategically used marriage alliances to monopolize the galley trade, diverting the public resources devoted to the *muda* to their own private benefit.<sup>60</sup>

From figure 7, high pre-*Serrata* seat shares did not guarantee high post-*Serrata* marriage centrality e.g., Tron and Venier. These two families did not manage to intermarry as well as others and were increasingly excluded from the galley trade. Contemporary chronicles and debates in the Senate, the body that regulated international trade, reflect growing tensions in the 1500s about the capture of the galley trade by a handful of families. Summarizing these tensions, Doumerc and Stöckly (1995, 156, authors’ translation) describe how the families “exploiting the galley trade

<sup>60</sup> A second possible external validation of our marriage centrality measure is to compare it with the tax assessment of 1379. The Spearman rank correlation between eigenvector centrality in the marriage network and wealth in the 1379 assessment for individual families is 0.74 (the rank in the 1379 assessment is based on the transcription in Luzzatto, 1929, 139–195). This is another strong indication that our marriage centrality measure is informative of economic status.

defend inch by inch the advantages gained, often through abuses against the law, to preserve their privileges. On the other side, fiercely opposing the ongoing activities of the *muda*, are the families whose names no longer appear as shareholders. First among them one should mention Tron and Venier.” In short, a high pre-*Serrata* seat share was necessary but not sufficient for success in the post-*Serrata* era.

Further to the left of figure 7, it is interesting to look at Priuli and Pesaro. Priuli’s seat share only just placed it in the top quartile of the pre-*Serrata* seat-share distribution. Thus, the family would have required very strategic marriage alliances to penetrate the cartelized galley trade. This sometimes meant marrying with top families and, during the 1400s, the Priuli established marriage links on three occasions with each of the two most central families, Contarini and Morosini. However, sometimes it meant entering into exceedingly complex alliances with other families of intermediate centrality so that together they could control a *muda*. This is illustrated by the 1504 *muda* to Flanders where all three galleys were jointly controlled by the Priuli and Pesaro families. The families were linked in 1499 by the marriage of Alvise Priuli’s daughter to one of Nicolo Pesaro’s sons and even though the son died shortly afterwards, the marriage link was quickly re-established in 1502 by having the Priuli widow marry her late husband’s brother Pietro Pesaro. Now consider the three galleys of 1504. In the first galley, Alvise Priuli held 8 of the 24 shares jointly with his son-in-law Pietro Pesaro and another 4 jointly with his brothers Bernardo and Giovanni Priuli. Pietro Pesaro held another 4 shares and his father, Nicolo Pesaro, held the remaining 8 shares ( $8 + 4 + 4 + 8 = 24$ ). In the second galley, Alvise Priuli held 10 shares, Pietro Pesaro held 6 shares and the family of Alvise’s wife held the remaining 8 shares ( $10 + 6 + 8 = 24$ ). In the third and final galley, the Priuli family (including Alvise and his brothers) held 18 of the 24 shares. This Priuli-Pesaro example illustrates how complex it was for all but the richest families to break into the galley trade. The Priuli family was far from poor — it ranked 18th among noble families by wealth in the 1379 assessment — yet it still required complex marriage alliances to succeed. This example also illustrates the huge payoffs from monopolizing a *muda*: By the 1500s, Priuli had already become the fourth most central family in the noble marriage network and two Priuli brothers held the Doge position *consecutively* after 1556.<sup>61</sup>

In all our figures, the Contarini are the most prominent family. Interestingly, five Contarini were to hold the Dogeship between 1623 and 1684, an uncomfortable regression towards an earlier era where the Dogeship was passed on from father to son.

At the very left of figure 7 we see that 24% of noble families had no seats in the Great Council in 1261–1296. These are the ‘Enlargement’ families, co-opted into the Great Council during the *Serrata*. None of them became important in the noble marriage network, as shown by their low eigenvector centrality in the 1400s. They also had little participation in the galley trade, and less so as time went by. As we shall see, being in the nobility was no guarantee against poverty.<sup>62</sup>

<sup>61</sup>This example is pieced together from information in Tucci (1981, 183), Judde de Larivière and Doumerc (1998, 16–17), Judde de Larivière (2008, 181), Chojnacki (1973, appendix II), and our marriage database.

<sup>62</sup>The only family with no pre-*Serrata* seats to play a significant role in the *muda* was the Garzoni. However, this is a case of geographical mobility, not wealth mobility. When Bandin Garzoni arrived in Venice from Lucca, he was already immensely wealthy from the grain trade, so much so that he ranked in the top four in the 1379 wealth assessment. He was granted citizenship in 1374 and his two sons were ennobled in 1381 as an exceptional reward for his enormous contribution to the Battle of Chioggia.

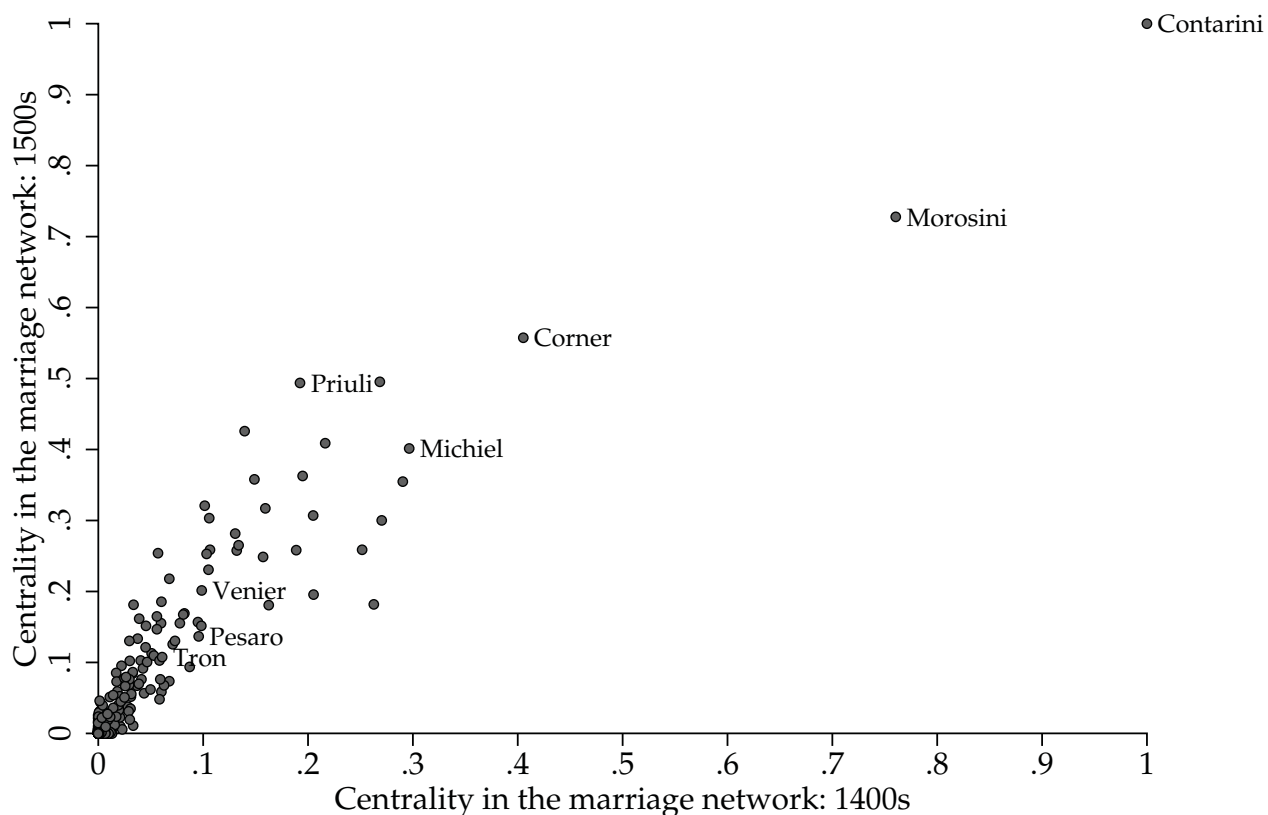


Figure 8: Persistence in centrality in the marriage network

We have demonstrated that the distribution of power was remarkably persistent from 1261–1296 to 1400–1499. We next show that this persistence was even more pronounced between the 1400–1499 and 1500–1599 periods. Figure 8 tracks the evolution of families' eigenvector centrality in the marriage network between the 1400s and the 1500s. The inter-temporal correlation is very high, which shows that the same families dominated over these two different centuries. This extreme persistence over such an extended period is in stark contrast to the high mobility and permeability that characterized Venice before the *Serrata*.

To summarize, restrictions to commoner participation in long-distance trade and the reorganization of the galley trade dramatically reduced the economic competition faced by the most powerful families. The result was a tremendous strengthening of the economic and social position of those families who held the most seats in the Great Council in 1261–1296 and who stood to gain the most from the *Serrata*.

### ***Social Stratification***

The *Serrata* transformed Venetian politics and economics. This in turn led to a fundamental shift in society away from one characterized by political, economic and social mobility and towards one of political immobility, economic polarization and social stratification. In the words of Romano (1996, xv), the “values of the early fourteenth century gradually gave way in the last quarter of the fourteenth century and the early fifteenth century to a new emphasis on rank and hierarchy.”

Further, these changes “signalled a major transformation of the social foundations of the Venetian Renaissance state” Romano (1987, 38). This transformation has been famously emphasized and documented by Chojnacki (1973, 1985, 1997). We briefly relate it to the *Serrata* and the consequent reorganization of the galley trade.

The starting point of the great social transformation was the implicit bargain contained in the Enlargement of the Great Council. The Enlargement guaranteed that patrilineal descendants of co-opted members would also be nobles, but the Enlargement did not guarantee that these descendants would be successful in long-distance trade. During the difficult economic years from the plague (1348) to the Battle of Chioggia (1379–1380), a very large number of nobles became impoverished: “many, probably most, nobles were poor” (Queller, 1986, ix).<sup>63</sup> This could not be ignored by rich nobles: Poor nobles could potentially organize a revolt, which was precisely what their co-option during the Enlargement was intended to prevent. To prevent revolt, the old system of patronage (*grazie*) that had been dominated by rich families was reshaped during the second half of the 1300s to meet the demands of poor nobles. Queller (1986, chapter II) famously describes the new patronage system as “welfare jobs for poor nobles.”<sup>64</sup>

Immediately after the *Serrata* the most important government jobs were reserved for the nobility. Because these jobs paid well and because there were increasingly many more poor nobles than government jobs, a great deal of attention and rent-seeking behaviour was focussed on job allocation. Traditionally, the allocation was done through the old patronage system: Rich noble ‘patrons’ handed out jobs to their ‘clients’ rather than to needy nobles. Poorer nobles objected strenuously to this favouritism. They were particularly frustrated by the fact that not enough of these jobs went to poor nobles, that the scarce jobs were not spread fairly among these poor nobles (these were typically annual jobs that could easily be rotated), and that too many jobs went to non-noble relations of the richest nobles. Such non-noble relations included underaged children of nobles, illegitimate children of nobles and non-noble branches of noble families.

Poor nobles fought back using their voting power in the Great Council. In 1367, legislation was passed requiring Great Council approval of all candidates for government jobs. This legislation was strongly opposed by the richest families and only passed on the fifth vote (Chojnacki, 1997, 677). Then, during 1380–1420, a series of new laws began formalizing precisely which jobs were reserved for poor nobles.<sup>65</sup>

Of course, none of this mattered unless there was a clear definition of nobility. We thus see in this same period a series of initiatives aimed at eliminating all grey areas in the definition of nobility. In 1367, a law was passed that excluded illegitimate sons from retaining noble rights. In 1414, a requirement was passed to create written lists of all children who were eligible to become

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<sup>63</sup>See also Chojnacki (1985, 245) and cites therein.

<sup>64</sup>*Grazie* are also documented by Romano (1987, chapter 6) and, in the context of *stato da mar*, by O’Connell (2009, chapter 5). O’Connell’s view of the new system is somewhat less cynical than Queller’s (O’Connell, 2009, 43). On the role of *grazie* in preventing revolt see Romano (1987, 125) and Chojnacki (1997, 676–677). On the poverty of nobles, revolt and *grazie* in the fifteenth and sixteenth centuries see Pullan (1971). *Grazie* had many other dimensions beside government jobs; however, for simplicity we focus only on this one element. Venetian historians refer to *grazie* when referring to the entire period, both pre- and post-*Serrata*. We depart from this by referring to the system that emerged after *grazie* came under the control of the Great Council as ‘the new patronage system.’ This is not common usage and ignores the many elements of continuity in patronage before and after the *Serrata*.

<sup>65</sup>See Chojnacki (1985, 246) and especially Queller (1986, chapter II).

nobles, thus excluding the underaged from government jobs and creating proper record-keeping of noble status. Finally, since marriage alliances had become so central to the economic workings of the nobility, in 1422 the status of marriageable woman was also clarified: sons born to mothers of 'low or vile condition' could not inherit their father's noble status. As a result, it became necessary in the patrilineal system to document the parentage and pre-marital behaviour of mothers in order to claim noble status (Chojnacki, 1994).

These developments led directly to the social stratification that was *the* hallmark of Venetian society after 1400. The consolidation of social stratification during the period 1380–1420 has been richly documented by Chojnacki (1973, 1985, 1994, 1997, 2000) and Romano (1987) and is widely recognized by social historians of Venice as a key event in Venice's social history.<sup>66</sup>

While the richest nobles would have preferred a fluid definition of nobility, poor nobles wanted clarity so that the richest nobles could not abuse the new state-controlled patronage system. The process of social stratification must thus be understood in the context of the Enlargement of the Great Council, which laid the groundwork for the appearance of so many poor nobles. In short, the *Serrata* reduced social mobility and replaced it with a stratified system emphasizing rank and hierarchy.

### *The Relative Shift Away from Maritime Activities*

A prediction of our model is that oligarchization and the resulting entry barriers to maritime trade cause a shift out of maritime occupations and into craft-based (industrial) occupations.<sup>67</sup> More generally, entry barriers lead to a shift into non-maritime activities. In the early 1400s Venice expanded dramatically into the Italian mainland and, as well, there began a steady expansion of industry (woollen cloth, chemicals, glass, leather work, and printing). By the mid-1500s, industrial activities had overtaken maritime activities as the primary driver of the Venetian economy. For example, Venice was a leading centre in the production of woollens, which in turn was one of the biggest sectors within European manufacturing (Lane 1973, 309–312; Braudel 1984, 135–136). Stöckly (1995, 345) argues that the monopolization of the galley trade directly explains why nobles increasingly turned away from the sea. In short, the *Serrata* marked the beginning of the end of Venice's maritime economy. "Never again was Venice so largely a maritime nation as it had been in the thirteenth century" (Lane, 1973, 170).

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<sup>66</sup>See the Romano (1996) quote at the start of this subsection. Note that as socially stratified as Venice was, there remained interactions between nobles and non-nobles e.g., Martin and Romano (2000). Note also that our discussion of the formalization of the definition of the nobility is quite similar to Chojnacki (1997) (though as documented in footnote 41 above it is not similar to the argument in Chojnacki, 1973).

<sup>67</sup>The monopolization of the galley trade, besides restricting entry, also led to regulatory capture. By decree, galleys could always be requisitioned for state service such as war. However, after 1500 the families that controlled the galleys increasingly subverted such state demands when they conflicted with the families' mercantile needs. See Stöckly (1995), Doumerc and Stöckly (1995), Judde de Larivière and Doumerc (1998), Doumerc (2003) and Judde de Larivière (2008). For other negative impacts of oligarchization see Acemoglu (2008). These impacts include rent-seeking behaviour, misallocation of talent, and a decline in entrepreneurship, all of which are apparent in Venice by 1500.

## 7. Conclusion

Beginning in 800, Venice was launched on a path of political independence for over 1,000 years. This allowed us to examine the Venetian response to Europe's great wave of medieval globalization, the Commercial Revolution. Venice's unique geographic and cultural location between Byzantium and Western Europe benefited its Venetian merchants, especially after the opening of Mediterranean shipping lanes to Christian shipping in 976 and the preferential trade arrangements with Byzantium after 1082. The Venetian (Fourth Crusade) conquest of Constantinople in 1204 created a Venetian colonial system in the Eastern Mediterranean that massively expanded Venetian trade. Between 976 and 1297, rapidly rising long-distance trade empowered Venetian merchants, who used their clout to push for novel institutional arrangements. In 1032 they reigned in the Dogeship (it stopped being hereditary) and in 1172 they created a parliament (the Great Council). That is, they successfully pushed for improved constraints on the executive. Further, they showed remarkable dynamism in developing new contracting institutions. We examined one of these in detail, the *colleganza*, and showed how it promoted income mobility and, with it, political mobility.

Over time, a group of powerful merchants emerged and, starting in 1297, they used their resources to block political and economic competition. In particular, they made parliamentary participation hereditary and erected barriers to participation in the most lucrative segment of long-distance trade (the galley trade). We documented this rise and fall of political and economic competition using a unique database on the names of 8,178 parliamentarians and their families' use of the *colleganza*. We also linked this database to data on the galley trade and 6,959 marriages to track the rise of an ultra-rich and socially stratified oligarchy. These data demonstrate Venice's fundamental shift after 1297 from a society characterized by political, economic and social mobility and toward one of political immobility, economic polarization and social stratification.

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## Appendix. A Formal Dynamic Model of Wealth and Politics in Venice

This appendix provides a formal presentation of the model on which section 4 is based. Venice has a continuum population of constant measure 1. Each person inherits wealth as a bequest from his parent. He is also endowed with one unit of labour from which he earns additional income. Time is continuous, individuals reach the age of maturity at a rate  $\lambda$ , and when maturity is reached the following sequence of events occurs instantaneously.

1. Mature citizens with inherited wealth above  $w_N$  become members of the Great Council. In the Council they vote on two issues (votes are decided by simple majority):
  - (a) Whether membership in the Great Council is hereditary i.e., passed on from father to son.
  - (b) Whether commoners can invest in international trade. ('Commoners' are citizens with inherited wealth less than  $w_N$ .)
2. Mature citizens who are unhappy with the Great Council's decisions choose whether to revolt. Great Council members and their supporters choose whether to fight the revolt.
3. Mature citizens choose one of four occupations (detailed below), which determines how they invest their labour and capital. They then realize investment outcomes.
4. If Great Council membership is hereditary (the vote in 1a above) and if a mature citizen's wealth exceeds  $w_N$  after investment outcomes are realized, then the citizen enters the Great Council.
5. Members of the Great Council enjoy a non-pecuniary benefit that accrues to Great Council members. This benefit corresponds to the 'nobility rents' of section 3 above.
6. Each mature citizen consumes, dies, and leaves a bequest to his only child.

There is a single physical good in the economy that may be consumed or used as capital. All citizens have identical preferences:

$$U = \left( \frac{c}{1-\gamma} \right)^{(1-\gamma)} \left( \frac{b}{\gamma} \right)^{\gamma} - l + g - d, \quad (\text{A1})$$

where  $c$  is the individual's consumption,  $b$  is the bequest to his offspring,  $l$  is the labour effort he exerts and  $g$  is the rents from Great Council membership. For non-members,  $g = 0$ . For members,  $g$  is positive and decreasing in the number of Council members.

Turning to  $d$  in equation (A1), citizens whose interests are harmed by Great Council votes may choose to revolt.  $d$  in the utility function captures the ex post cost of a revolt:  $d = 0$  if there is no revolt or if there is a revolt and the individual is on the winning side.  $d > 0$  if there is a revolt and the individual is on the losing side. We assume that  $d$  is so large that no one participates in a revolt they cannot win (the individual is hanged in St. Mark's square). Details of the revolt 'technology' appear below.

Turning to occupations, a Venetian's capital and labour may be employed in one of four occupations:

- Craftsman: He uses his labour effort to produce  $v$  units of output, where  $v > 1$  is fixed by technology.
- Travelling merchant: He signs a *colleganza* contract with a sedentary merchant. The sedentary merchant puts up the capital; the travelling merchant contribute his labour (effort) but needs to be monitored. The voyage yields a high rate of return  $\rho_1$  with probability  $\sigma$  and a low rate of return  $\rho_0 > 0$  with probability  $1 - \sigma$ . The expected rate of return is  $\bar{\rho} = \sigma\rho_1 + (1 - \sigma)\rho_0$ . The travelling merchant receives an endogenous share of profits.
- Self-financed merchant: He makes a fixed indivisible investment  $I$  and uses his labour effort on a ship to foreign ports. The voyage yields a high rate of return  $\rho'_1$  with probability  $\sigma$  and a low rate of return  $\rho'_0 > 0$  with probability  $1 - \sigma$ . The expected rate of return is  $\bar{\rho}' = \sigma\rho'_1 + (1 - \sigma)\rho'_0$ .
- Sedentary merchant: He makes a fixed indivisible investment  $\mu I$  and uses his labour effort to monitor  $\mu$  travelling merchants. Monitoring is an indivisible activity and one cannot monitor another monitor, so that as in Banerjee and Newman (1993),  $\mu > 1$  is an exogenously given constant. Returns are assumed to be perfectly correlated across a sedentary merchant's  $\mu$  *colleganza*, and he receives an endogenous share of profits.

There is also a safe divisible asset that yields a fixed rate of return  $r$ , where  $0 < r < 1/\gamma - 1$  and  $\gamma$  is defined in equation (A1).<sup>68</sup> We also assume  $\bar{\rho} > r$  and  $\bar{\rho}' > r$  so that investing in *colleganza* is always preferred to investing in a safe asset.

Following Banerjee and Newman (1993), we assume that, due to capital market imperfections, people can borrow only limited amounts. As a result, occupations that require high levels of investment are beyond the reach of individuals with lower wealth levels.<sup>69</sup>

Let  $w_M = I$  ( $M$  for middle wealth) denote the minimum wealth level required to become a self-financed merchant and  $w_H = \mu I$  ( $H$  for high wealth) denote the minimum wealth level required to become a sedentary merchant. To capture the historical evidence, we assume that being a sedentary merchant opens the doors to participation in the Great Council. That is,  $w_H = w_N$ . (See point 4 above.) Let  $P_L$  be the share of the population with wealth  $w < w_M$ , let  $P_M$  be the share with

<sup>68</sup> $r < 1/\gamma - 1$  ensures that if someone invests all his wealth in the safe asset and gets no labour income, then his offspring will be poorer than him:  $\gamma(r + 1)w < w$  or  $r < 1/\gamma - 1$ .

<sup>69</sup>More specifically, the ability of a borrower to default on a loan, subject to a fixed non-monetary punishment if caught, leads to credit rationing. As in Ghatak and Jiang (2002), we let the probability of being caught be zero so that only those with enough wealth can invest. (If we let the probability of being caught be strictly positive, all wealth thresholds described below are simply raised by a constant).

$w_M \leq w < w_H$ , and let  $P_H$  be the share with  $w \geq w_H$ . Since wealth  $w$  evolves endogenously, the  $P$ s evolve endogenously.

As in Banerjee and Newman (1993), this type of model is tractable if one focuses on parameter configurations such that children's occupational choices depend on their parents' wealth bracket (low or  $L$ , medium or  $M$  and high or  $H$ ) and the success or failure of their parents' projects, but not on the parents' specific wealth levels within each bracket. Rather than analyzing every possibility, we focus on a case that captures key elements of the evolution of international trade and political institutions in Venice. A second case is also discussed below.

Consider the market for travelling merchants. Suppose there are very few high-wealth people (all of them are sedentary merchants). Then very few travelling merchants are needed and the returns to being a travelling merchant are low — so low that they are no better off than craftsmen. This implies that the travelling merchant's profit share is:<sup>70</sup>

$$\underline{\alpha} = \frac{v}{\bar{\rho}I}. \quad (\text{A2})$$

If there are many high-wealth people (all of them are sedentary merchants) then they will demand so many travelling merchants that there will be no more craftsmen. At this point the returns to being a travelling merchant rise, which squeezes the profits of sedentary merchants. In equilibrium, high-wealth people ( $w > w_H$ ) are so squeezed that they are indifferent between being sedentary merchants and self-financed merchants. This implies the following profit share for travelling merchants:<sup>71</sup>

$$\bar{\alpha} = \frac{\mu(\bar{\rho} - r) - (\bar{\rho}' - r)}{\mu\bar{\rho}}. \quad (\text{A3})$$

Recalling that there are  $P_H$  sedentary merchants, each hiring  $\mu$  travelling merchants, equation (A2) applies when there are relatively few high-wealth people ( $\mu P_H \leq P_L$ ) and equation (A3) applies when there are relatively many high-wealth people ( $\mu P_H > P_L$ ).<sup>72</sup>

### **Few Rich Merchants ( $\mu P_H \leq P_L$ )**

Panel (a) in figure 9 presents wealth dynamics when the demand for travelling merchants is low ( $\mu P_H < P_L$ ). It plots the size of an individual's bequest  $b$  against his initial (inherited) wealth level

<sup>70</sup>An individual with inherited wealth  $w < w_M = I$  ends up with wealth  $v + (r + 1)w$  if he chooses to become a craftsman and with expected wealth  $\underline{\alpha}\bar{\rho}I + (r + 1)w$  if he chooses to become a travelling merchant. Equating the two yields  $\underline{\alpha}$ . (Recall that  $\bar{\rho}$  is the expected return on investment  $I$  and  $\underline{\alpha}$  is the travelling merchant's share of *colleganza* profits, so that  $\underline{\alpha}\bar{\rho}I$  is a travelling merchant's expected income from a *colleganza*.)

<sup>71</sup>Consider an individual with inherited wealth  $w > w_H = \mu I$ . If he chooses to become a self-financed merchant he expects to end up with wealth  $[\bar{\rho}' + 1]I + (r + 1)(w - I)$ . If he chooses to become a sedentary merchant he expects to end up with wealth  $[(1 - \bar{\alpha})\bar{\rho} + 1]\mu I + (r + 1)(w - \mu I)$ , where  $(1 - \bar{\alpha})\bar{\rho}\mu I$  is his expected profits after payments to travelling merchants,  $\mu I$  is the capital invested in *colleganza*, and  $(r + 1)(w - \mu I)$  is the wealth invested in the safe asset plus returns on this. Equating the expected returns to self-financed and sedentary merchants yields  $\bar{\alpha}$ .

<sup>72</sup>A reader whose knowledge of *colleganze* is from secondary sources may think that profit shares are fixed at  $1/4$ . This is not the case: we observe many *colleganze* with alternative profit shares. Venetian law was explicit that profit shares need not be  $1/4$ . In the *Gli Statuti* (Besta and Predelli, 1901) in the chapter (16) on Observing Contracts we have "We decree also concerning contracts that it ought to be observed that he who receives money from anyone, so that he may make a profit with it, disregards nothing in the contract, but profiting with the received money up to the time stated, holds for himself from the success the fourth part or as much as is contained in the contract. Moreover, in the accustomed manner he simultaneously ought to give to the creditor the remaining parts with the capital." (Authors' translation, italics added.)



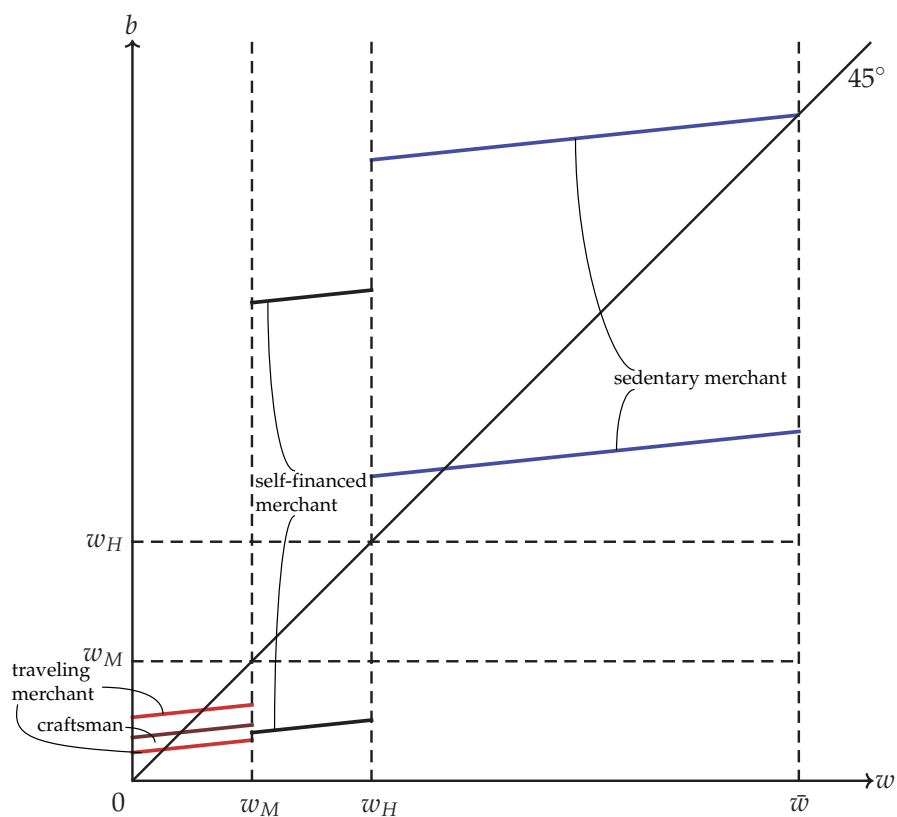
$w$ . The size of a bequest depends on the individual's choice of occupation and the success or failure of his projects. In every case, the bequest is simply a share  $\gamma$  of the wealth of the individual at the end of his life. The choice of occupation in our credit-constrained economy depends on initial wealth: sedentary merchants require wealth  $w \geq w_H$ ; self-financed merchants require wealth  $w \geq w_M$ ; while travelling merchants and craftsmen do not require any wealth.

Consider first the three upward-sloping lines to the left of  $w = w_M$ . A low-wealth individual who inherits  $w < w_M$  can choose between being a craftsman and being a travelling merchant. If working as a craftsman, his labour income is  $v$  (middle line). If working as a travelling merchant, his labour income is  $\underline{\alpha}\rho_1 I$  with probability  $\sigma$  (top line) and  $\underline{\alpha}\rho_0 I$  with probability  $1 - \sigma$  (bottom line). Whether a craftsman or a travelling merchant, he also earns non-labour income  $rw$  from placing his inherited wealth in the safe asset. Note that  $\gamma(r + 1)$  is the slope of all three lines, which reflects the fact that those with higher initial wealth  $w$  end up with higher non-labour income  $rw$ . In panel (a),  $\underline{\alpha}$  adjusts to keep an individual indifferent between being a craftsman and a travelling merchant. As drawn in the region  $w < w_M$ , initial wealth  $w$  is not enough for the child to become a self-financed merchant (i.e.,  $b < w_M$ ). This will be what matters for the wealth dynamics of the poor (we discuss below an alternative scenario with upwards mobility for low-wealth individuals).

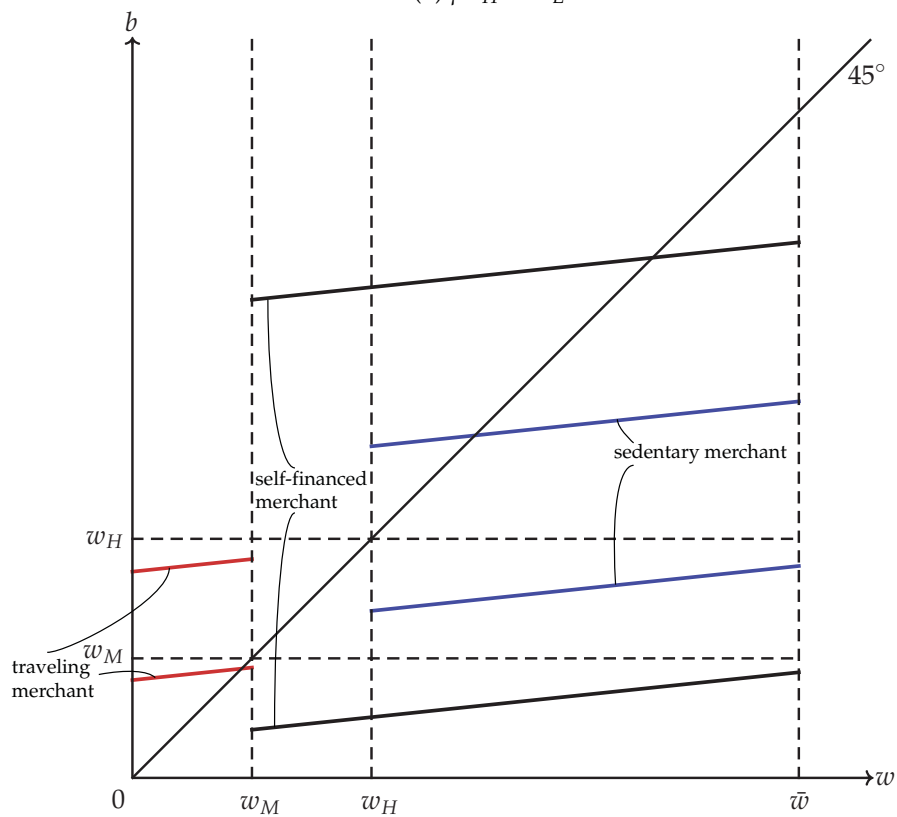
Staying with panel (a), consider an individual in the middle-wealth region  $w_M \leq w < w_H$ . He is wealthy enough to be a self-financed merchant ( $w_M \leq w$ ), but not a sedentary merchant ( $w < w_H$ ). Further, expected returns are higher for self-financed merchants than for craftsmen or travelling merchant. Hence he chooses to be a self-financed merchant. He thus makes a fixed indivisible investment  $I$  and the voyage yields profit  $\rho'_1 I$  if successful (probability  $\sigma$ ) and profit  $\rho'_0 I$  if unsuccessful. He also receives a return  $r(w - I)$  from placing his remaining wealth in the safe asset. The involvement in international trade of middle-wealth individuals creates mobility in the wealth distribution: a successful self-financed merchant bequests  $b > w_H$  and so his offspring begins life as a high-wealth individual, while an unsuccessful self-financed merchant bequests  $b < w_M$  and so his offspring begins life as a low-wealth individual.

Looking finally at high-wealth individuals, someone with inherited wealth  $w \geq w_H$  always becomes a sedentary merchant (it gives higher expected returns than any other occupation). He makes a fixed indivisible investment  $\mu I$  in *colleganza*. His profit net of payments to travelling merchants is  $(1 - \underline{\alpha})\rho_1 \mu I$  if successful and  $(1 - \underline{\alpha})\rho_0 \mu I$  if unsuccessful. He also receives a return  $r(w - \mu I)$  from placing his remaining wealth in the safe asset. When there are relatively few high-wealth individuals and relatively many low-wealth individuals, the returns for a sedentary merchant are always high enough that he bequests  $b > w_H$  and his child also begins life with high wealth.

Stepping back from the details of panel (a), all wealth mobility comes from middle-wealth individuals. Depending on their success as self-financed merchants, their children are either upwardly mobile (with probability  $\sigma$ ) or downwardly mobile (with probability  $1 - \sigma$ ). The children of all others (low- and high-wealth) remain in the same wealth groups as their parents. This immediately



Panel (a)  $\mu P_H < P_L$



Panel (b)  $\mu P_H \geq P_L$

Figure 9: Occupations and Bequests by Individual Wealth

implies the following dynamics:

$$\begin{pmatrix} \dot{P}_L \\ \dot{P}_M \\ \dot{P}_H \end{pmatrix} = \lambda \begin{pmatrix} 0 & (1-\sigma) & 0 \\ 0 & -1 & 0 \\ 0 & \sigma & 0 \end{pmatrix} \begin{pmatrix} P_L \\ P_M \\ P_H \end{pmatrix}, \text{ if } \mu P_H \leq P_L \quad (\text{A4})$$

where a dot indicates a time derivative. (Recall that  $\lambda$  is the share of the population that is active.)

#### *Many Rich Merchants* ( $\mu P_H > P_L$ )

Panel (b) presents the case where the relative number of high-wealth individuals increases sufficiently ( $\mu P_H > P_L$ ) that the returns to travelling merchants are given by equation (A3) instead of equation (A2). Low-wealth individuals now all become travelling merchants and, if successful, bequest to their children  $b > w_M$ , so that these begin mature life as middle-wealth individuals. For middle-wealth individuals, nothing changes. For, high-wealth individuals, there is now indifference between being self-financed or sedentary. The children of successful high-wealth individuals inherit high wealth. The children of unsuccessful high-wealth individuals inherit middle wealth if their parents were sedentary merchants and low wealth if their parents were self-financed merchants. This implies the following dynamics:<sup>73</sup>

$$\begin{pmatrix} \dot{P}_L \\ \dot{P}_M \\ \dot{P}_H \end{pmatrix} = \lambda \begin{pmatrix} -\left(\sigma + \frac{1-\sigma}{\mu}\right) & (1-\sigma) & (1-\sigma) \\ \left(\sigma + \frac{1-\sigma}{\mu}\right) & -1 & 0 \\ 0 & \sigma & -(1-\sigma) \end{pmatrix} \begin{pmatrix} P_L \\ P_M \\ P_H \end{pmatrix}, \text{ if } \mu P_H > P_L. \quad (\text{A5})$$

#### *Wealth Dynamics*

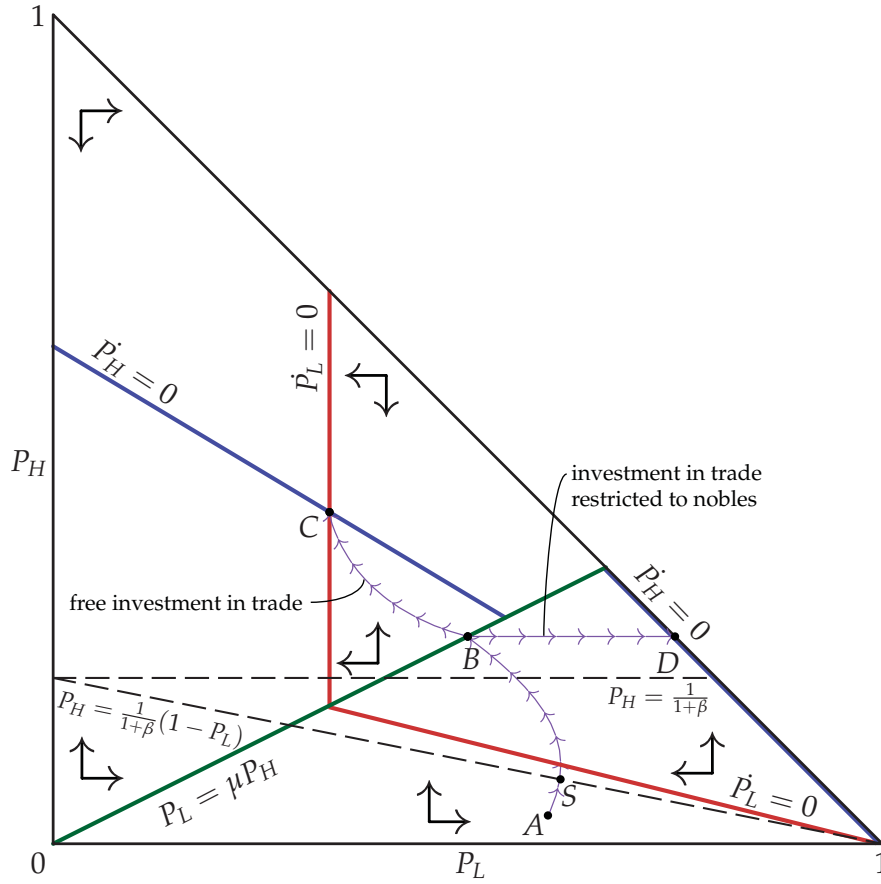
Since total population is fixed, we can express the above dynamics of equations (A4) and (A5) in terms of  $P_L$  and  $P_H$  only, with  $P_M = 1 - P_L - P_H$ :

$$\dot{P}_L = \begin{cases} \lambda(1-\sigma) - \lambda(1-\sigma)P_L - \lambda(1-\sigma)P_H & \text{if } \mu P_H \leq P_L, \\ \lambda(1-\sigma) - \lambda\left(1 + \frac{1-\sigma}{\mu}\right)P_L & \text{if } \mu P_H > P_L. \end{cases} \quad (\text{A6})$$

$$\dot{P}_H = \begin{cases} \lambda\sigma - \lambda\sigma P_L - \lambda\sigma P_H & \text{if } \mu P_H \leq P_L, \\ \lambda\sigma - \lambda\sigma P_L - \lambda P_H & \text{if } \mu P_H > P_L. \end{cases} \quad (\text{A7})$$

These dynamics are represented on a simplex in figure 4 in the main text.

<sup>73</sup>The explanation is as follows. Consider the first row, which deals with the change in the measure of low-wealth people. This can be written as  $\dot{P}_L = \lambda[-\sigma P_L + (1-\sigma)P_M + (1-\sigma)(P_H - \frac{1}{\mu}P_L)]$ . Among those who initially have low wealth, a fraction  $\sigma$  are successful as travelling merchants and so their children will start life as middle-wealth individuals. This accounts for the term  $-\sigma P_L$ . Among those who initially have middle wealth, a fraction  $(1-\sigma)$  are unsuccessful as self-financed merchants and so their children start life as low-wealth people. This accounts for the term  $(1-\sigma)P_M$ . Among those who initially have high wealth, there is one sedentary merchant for every  $\mu$  travelling merchants i.e., there are  $\frac{1}{\mu}P_L$  sedentary merchants. The rest,  $P_H - \frac{1}{\mu}P_L$ , are self-financed merchants. A fraction  $(1-\sigma)$  of these are unsuccessful and their children begin life as low-wealth people. This accounts for the term  $(1-\sigma)(P_H - \frac{1}{\mu}P_L)$ . Finally, individuals mature at a rate  $\lambda$  and the dynamics apply only to them.



### Wealth Dynamics with upwards mobility by low-wealth individuals

In the parameter configuration discussed so far, chosen for its expositional simplicity, all wealth mobility comes from middle-wealth individuals. The experience of Zaccaria Stagnario discussed in the text is an example of upwards mobility starting from low wealth instead of middle wealth. It is straightforward to incorporate this into our model with a single parameter change: we simply increase  $v$ , the output of craftsmen, which improves outside opportunities for travelling merchants and allows them to obtain a greater profit share  $\underline{\alpha} = \frac{v}{\delta l}$  when  $\mu P_H \leq P_L$ .

Relative to the individual wealth dynamics represented in figure 9, this implies a single change. In panel (a), which presents wealth dynamics when the demand for travelling merchants is low ( $\mu P_H < P_L$ ), the wealth attained by a low-wealth individual who succeeds as a travelling merchant ( $\underline{\alpha}\rho_1 I$ ) is now enough for his child to become a self-financed merchant i.e., the top line in the low-wealth range now lies above the  $w_M$  horizontal threshold instead of below it. This implies that the children of the  $\mu P_H$  low-wealth individuals working as travelling merchants begin mature life as middle-wealth individuals with probability  $\sigma$ . Thus, compared with the population wealth dynamics when  $\mu P_H \leq P_L$  given by equation (A4), the element in the first row and first column of the matrix is now  $-\sigma\mu P_H$  instead of 0, while the element in the second row and first column of the matrix is now  $\sigma\mu P_H$  instead of 0. The population wealth dynamics when  $\mu P_H > P_L$  are still given

by equation (A5). Expressing the population wealth dynamics in terms of  $P_L$  and  $P_H$  only, with  $P_M = 1 - P_L - P_H$  yields:

$$\dot{P}_L = \begin{cases} \lambda(1 - \sigma) - \lambda(1 - \sigma)P_L - \lambda[1 - \sigma(1 - \mu)]P_H & \text{if } \mu P_H \leq P_L, \\ \lambda(1 - \sigma) - \lambda\left(1 + \frac{1 - \sigma}{\mu}\right)P_L & \text{if } \mu P_H > P_L, \end{cases} \quad (\text{A8})$$

with  $\dot{P}_H$  still given by equation (A7). Figure 10 plots the evolution of the wealth distribution according to these alternative wealth dynamics. This features a *Serrata*-like event with the same key characteristics as those discussed in the main text around figure 10. The only difference is that in the transition from point *A* to *B* in figure 10 there is upwards mobility out of the low-wealth group whereas in figure 4 all mobility comes from the middle-wealth group.