

GOVERNMENT DEBT, REPUTATION AND CREDITORS' PROTECTIONS:

THE TALE OF SAN GIORGIO

by

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Abstract

San Giorgio (1407-1805) was a formal association aimed at protecting creditors' rights and reducing the risk of debt repudiation by the Republic of Genoa. The behavior of this institution is broadly consistent with debt models that predict lending if lenders can impose big penalties on debtors, and models in which lenders can differentiate between excusable and inexcusable defaults. San Giorgio shareholders enjoyed low credit risk but also lower returns on capital than those prevailing on comparable foreign assets for which creditors' protection mechanisms were lacking. The Republic's *quid pro quo* was a low cost of financing. Differences in credit risk were an important explanation of differences in long-term interest rates across countries in 16th and 17th century Europe, a point not sufficiently emphasized by the literature.

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1. Introduction

The *Casa di San Giorgio* (1407-1805), or simply San Giorgio, was a formal association aimed at protecting creditors' rights and reducing the risk of debt repudiation by the Republic of Genoa. This institution was distinctive in at least four different ways. It was the first institution in history to have achieved a debt-for-equity swap and given creditors significant bargaining power. This, in turn, reduced creditors' fears of government defaulting on its obligations, and ultimately lowered the cost of debt to Genoa. The second was the skill of management in discerning the difference between excusable and inexcusable default. The third is the specialization in gathering and processing information and in the collection of tax revenues. The fourth is the creation of a public deposit institution that anticipates by decades, if not centuries, modern commercial banking. This paper focuses primarily on the first two features, while touching tangentially on the third and fourth ones.

The possibility of repudiation is a prominent feature of many economic models of debt. In some models, the loss of reputation from a default and the consequent lost access to international capital markets may be a sufficient deterrent to repudiation (Eaton and Gersovitz, 1981). In other models, instead, the threat that creditors will never lend again after a default is not costly enough to deter debt repudiation, and the equilibrium solution is zero lending (Bulow and Rogoff, 1989b). Lending can occur if lenders can impose bigger penalties on debtors (Bulow and Rogoff, 1989a). Finally, there are models where positive lending occurs if the government has no alternative to debt and unexpected events are observed by both lenders and debtors (Grossman and Van Huyck, 1988). The debtor, who commits not to repudiate, shifts onto the creditor part or all of the risks from

bad events like wars and famine. Some defaults, complete or partial, are excusable if lenders can discriminate between justifiable and unjustifiable causes. The Bulow and Rogoff and Grossman and Van Huyck models provide some guidance in explaining the behavior of San Giorgio as virtually the exclusive lender to the Republic of Genoa until 1625. The fact that most of San Giorgio's shareholders were domestic residents does not weaken the main implication of international lending models, which rests on the expected benefits and costs associated with repudiation. The benefit from repudiation is the value derived from reallocating interest spending to other types of spending or to lower the tax burden. The cost of repudiation is that the borrower will no longer have access to the capital markets. Since reputation of the lender alone is not sufficient to discourage repudiation, additional costs have to be imposed on the debtor. Conklin (1998, p. 506) lists three specific reasons why Philip II was willing to default on *asientos* (short-term debt owed primarily to foreign lenders) – and not on *juros* (long-term debt held primarily by domestic residents) in 1575: the power of the élites, the close link between those who were in charge of tax collection and *juro* investors, and the existence of an active secondary market for *juros*. Approximately the same conditions, not surprisingly, prevailed in Genoa for much of the period under consideration.

In addition to the implications for debt repudiation, the history of San Giorgio brings new evidence on three other different strands of finance literature. The first is on the connection between transaction costs and the nature of the financial intermediary (Benston and Smith, 1975). San Giorgio was able to lower transaction costs on *compere* both in the primary and secondary markets. The institution was also a hub of information on debtor and economic activities in Genoa; this information facilitated the task of

potential investors in assessing the fundamentals underlying the value of Genoa's debt. The gains from specialization in financial transactions and information were passed along to San Giorgio's shareholders. The second refers to the tradeoff between debtor's reputation and creditor's monitoring activity. Borrowers can either tap the bond market where uncoordinated bondholders have access to public information or a financial intermediary like San Giorgio that invests resources in monitoring the debtor and obtains in return private information. High-reputation debtors can by-pass monitoring, whereas low-reputation debtors rely on monitoring to acquire reputation (Diamond, 1991). In the second case, the cost of credit depends on monitoring; monitoring, in turn, gives the financial intermediary bargaining power with the borrower (Rajan, 1992). San Giorgio monitored Genoa's finances very closely. This monitoring worked as a substitute for reputation and as an automatic mechanism to coordinate widely dispersed bondholders (Rajan, p. 1368). The ensuing higher reputation and lower cost of coordination translated into a lower cost of debt for the Republic. The third implication bears on creditors' rights and the cost of debt, in particular sovereign debt. The accelerating pace of currency and financial crises in emerging markets—Mexico in 1994, East Asia in 1997, Russia in 1998 and Argentina in 2001—has sparked proposals aimed at facilitating the restructuring of sovereign debt. These proposals envision either a weakening of collective representation clauses in sovereign-debt contracts or the creation of an international equivalent of Chapter 11 of the U.S. bankruptcy code (Eichengreen, 2003). In essence, the proposals make it easier for the debtor to restructure. The experience of San Giorgio suggests just the opposite, namely that debt markets function at their best when the rights of creditors are protected; see also Shleifer (2003). The evidence presented in this paper is consistent

with the findings of La Porta et al. (1997) who find that the size of debt markets is positively correlated with the strength of creditors' rights. For the Republic of Genoa, strong creditors' rights meant a low cost of debt.

The paper is structured as follows. After a discussion of Genoese government debt and the role of San Giorgio as the dominant lender of the Republic (Section 2), I move to a description of the principal mechanisms San Giorgio used to protect its shareholders against the risk of debt repudiation (Section 3). Then I provide evidence that San Giorgio was more forgiving than selfish towards the Republic (Section 4) and that returns on capital for San Giorgio shareholders were lower than on comparable foreign assets for which creditors' protection mechanisms were lacking (Section 5). Conclusions follow (Section 6).

2. Government Debt and San Giorgio

The origin of Genoese government debt goes back to 1149 when the Republic sold the right to collect revenues from various dues to obtain a loan needed to finance a war in Spain (Gioffré, 1967, p. 12). The debt instruments were called *compere* (literally purchases). The seller, the government, would receive a stream of certain cash flows and the buyer, the tax farmer, would receive in exchange a stream of uncertain but predictable cash flows generated by the alienated dues, tariffs, or indirect taxes. The value of the certain flows was determined through auctions or bilateral dealings. In addition to tax smoothing, tax farming enhanced specialization in information and the administration of tax collection. Tax farmers had incentives to invest in knowledge about the application of the tax, the link between tax revenues and the tax base, and the extent of tax evasion. Tax farmers had also incentives to improve the method of collection to lower costs. Specialization and

competition in tax farming yielded cost reductions that must have passed onto government.¹

The term *compere*, however, referred also to a different financial transaction in which the government received a loan whose principal and interest were secured by a stream of future tax revenues from a group of individuals (Felloni, 1989b, pp. 9-10). This loan arrangement, whether compulsory or voluntary, had two components. The first consisted of a collateralized loan in which the borrower assigned the cash flows from a specific tax (for example, the salt tax) to a lender against a fixed payment. Given the uncertainty underlying the future cash flows from the assigned tax, the loan in fact carried a variable interest rate. The second was a tax-farming contract, in which the lender would either be the tax collector or, in turn, would farm to a third party the collection of the revenues. In addition to the cost savings from specialization and the benefits of tax smoothing, the loan-type *compera* had the potential benefit of lowering the cost of debt to the borrower by securing the loan with a flow of predictable tax revenues.

Legally, the loan-type *compera* (henceforth, simply *compera*) was treated as an annuity and the interest received was not considered usurious (Felloni, 1989b, p.10). In fact, it was a pure and simple public debt, possibly the first in Europe (Marengo, 1911, p. 22). Each *compera*, or debt issue, was divided in units called *luoghi* with a nominal value of lire 100. *Luoghi* owners were called *luogatari* and their names were registered in special books, *cartulari*. Each *compera* was a separate legal entity and was entitled to a flow of alienated tax revenues, called *proventi*, which were used to cover administrative

¹ For a social profile of the Genoese tax farmer and tax-farming methods in the 15th century, see Heers (1961, pp. 131-36).

expenses, taxes, ordinary and extraordinary contributions to the Republic, amortization funds, and interest (called *paghe*) to creditors; see Felloni (1994 Tomo 4, pp. 179-181).

The popularity of the *compera* grew with the difficulty the Republic of Genoa had of maintaining expenditures in line with tax revenues. In contrast with Venice, Genoa up to 1528 had a notoriously weak government, the result of deep rivalries between feudal nobles and a rising merchant class (Lopez, 1963; De Negri, 1986; Epstein, 1996).² To

² With some degree of approximation, Genoa had four types of government from 1096 to 1798: communal consuls (1096-1194), *podestà* (1194-1339), popular doges (1339-1528), and aristocratic doges (1528-1798); for a general history, see De Negri and the more restrictive Epstein. San Giorgio, whose official name is *Officium procuratorum Sanctii Georgii super diminutione debitorum*, was established in the third phase, when the Republic submitted to the rule of King Charles VII of France and was run by Governor Jean Le Meingre Boucicaut. This phase is particularly difficult and quarrelsome for the Republic. The rising power of the merchant class, the *Popolo*, sets in motion a series of revolts against the feudal aristocracy, the Nobles, and in turn noble counter-revolts. According to the data compiled by Epstein (Appendix), Genoa from 1338 to 1538 suffered from 14 *Popolo* revolts, 11 Noble revolts, 7 joint revolts, 6 revolts led by the Fregoso family, and one civil war. Compared to Venice, Genoa had a weak government. The aristocratic regime of Andrea Doria in 1528 brought political stability through an agreement on power sharing between *alberghi* (family aggregations or clans) representing the Old Nobles and New Nobles; for inter-clan cooperation, read Greif (1995). This elite, divided in 28 *alberghi* of various sizes and lineages, was formally recognized in the *Liber Civitatis* or Golden Book from which the names of those who ran government and San Giorgio were extracted. Having achieved peace at home in 1528, Genoese financiers rose to the top; their international preeminence

protect their interests, lenders organized themselves in associations and appointed officers who were formally recognized by government. By the turn of the 15th century, the size of public debt had become so financially burdensome and its structure so administratively difficult that the Republic created San Giorgio with the express purpose of reducing the burden of public debt on government. Holders of government debt were given the option of either being reimbursed or accepting a conversion of outstanding *compere* yielding from 8 to 10 per cent into a single claim on San Giorgio with a fixed coupon of 7 per cent (Felloni 1989a, p. 19). In addition, fresh capital arrived to San Giorgio from investors who wanted to be purchasers not of specific *compere*, but of the mix of assets owned by the institution. These investors were shareholders in the modern sense of the word; in fact, San Giorgio called them participants, *partecipi* (Marengo, p. 108).³ In 1420, the coupon became variable, or more like a dividend that reflected net

continued for the better part of a century (Lopez, 1964, pp. 462-3; Braudel, 1992, pp. 164-168; Conklin).

³ Heers (p. 147) objects to the definition of *luoghi* as shares and interests on *luoghi* as dividends, without offering much of an economic explanation. Sieveking (1906, p. 28), on the other hand, is very precise on the reasons why *luogatari* were bearing the risk typical of shareholders: "...le compere non potevano essere considerate come prestiti ad interesse. Non si trattava di un mutuo perchè mancava la promessa della restituzione da parte del debitore, né vi erano interessi, perchè l'incasso della rendita era incerto ed in pericolo." Marengo (p. 30 and p.108) agrees completely with Sieveking. Interests on *luoghi* were not guaranteed, and if tax revenues were insufficient to cover the promised rate, the *luogatari* would receive less and could not claim the difference from the Republic. Furthermore, the Republic could also lower the interest burden by applying a given interest flow to a larger number of *luoghi* (p. 97).

cash flows from the loans (Cuneo, 1842, p. 307).⁴ The investment was risky in that these net cash flows were determined by (i) an uncertain flow from alienated tax revenues, (ii) the extent of extraordinary financial support that San Giorgio management felt was necessary to give the Republic, (iii) and periodic debt forgiveness. With the debt consolidation of 1539, Genoese debt was transformed into perpetuity (Marengo, p. 177).

In modern financial parlance, San Giorgio transformed debt into equity and became the prototype of what the British would call engraftment during their financial revolution of the late 17th century. In fact, the act establishing the Bank of England in 1694 explicitly authorized a subscription of capital to finance a loan to government of an equal amount.⁵ According to Baskin and Miranti, Jr. (1997, p. 103), the economic significance of that transaction was that:

“The swap provided the accommodating company with a substantial fund of credit, which ... could be collateralized to support business expansion. The state benefited by concentrating debt into a single institution that could be induced to accept lower interest rates and less stringent repayment schedules in return for the grant of particular privileges that bolstered its ability to make profits”.

San Giorgio had done that much almost three hundred years earlier. The transformation of debt bearing a fixed rate of interest into equity was a remarkable financial engineering of the time, giving San Giorgio the characteristics of a financial intermediary specializing in tax-backed claims on government.

⁴ It was debt in the sense that the Republic had an obligation to repay the principal.

⁵ In addition to the Bank of England, engraftment was practiced by the Million Bank, the East India Company and the South Sea Company; see Neal (1990, p. 51).

Engraftment also enabled equity owners to delegate to management important tasks such as monitoring the creditworthiness of the borrower and shocks that affected the flow of alienated tax revenues. Since governance and management in San Giorgio, as we will see, were of high quality, lenders to government gained considerably from delegation. Sophisticated owner-managers could deal with the Republic much more effectively than in pre-San Giorgio *compere*. Also, these managers were very attentive and informed about the affairs of the Republic and had a keen sense of when risk shifting from borrower to lender was justified.

2.1. *SECONDARY MARKET*

In 1408, San Giorgio launched a bank, which operated until 1445 when transactions were closed to the public but remained open to the state, San Giorgio's shareholders, tax collectors and suppliers (Felloni, 1990, pp. 77-82). External banking activities were resumed in 1530 and lasted until 1805. The primary mission of the San Giorgio bank was to facilitate the management of the *luoghi* (Sieveking, p. 46). A market for *luoghi* had existed since the middle of the 13th century (Epstein, p. 147). By the 15th century, this market had become quite active, liquid, and sophisticated (Heers, pp. 147-162). Not only *luoghi* were bought and sold, but they were used for collateral by bankers, borrowers and tax collectors (Sieveking, pp. 37-38). The secondary market developed its own kind of brokers, who intermediated between sellers and buyers, and specialists, who built inventories of San Giorgio *luoghi*. Nobles, merchants, artisans, priests, churches, convents, and charities were among San Giorgio investors (Heers, pp. 176-190). There was no restriction against foreign ownership, a policy that was consistent with the

economic and financial openness of the Republic. Many San Giorgio shareholders invested for the long term; others for the dowries of their daughters or to endow charities; others bought today with the expectation of selling tomorrow for a capital gain; and finally there were well-meaning Genoese citizens who wanted to help the Republic to repay its debt or free other citizens from odious taxes.⁶

2.2. MONEY MARKET

As a by-product of the active government securities market, Genoa developed in the 15th century also a money market (Heers, pp. 162-173). This found its origin in the time difference between the “booking” of dividends and the actual payments, a difference that was due in part to the delay with which tax collectors delivered due revenues and in part to the scarcity of money. Dividends were credited in early May in accounts denominated in *lire di paghe*. This accounting unit was different from specie or cash transactions (*lire di numerato*). A creditor of, say, 10 *lire di paghe* was promised future delivery of 10 lire in cash. The market value in cash of 10 *lire di paghe* would be naturally less than 10, the size of the discount depending on the equilibrium rate of interest in the money market and the future delivery date. Some investors cashed their *lire di paghe*; most used them as

⁶ Investments for the benefit of the state were called *molteplici* or *moltiplicati*. An individual or an association would designate a certain number of luoghi for the repayment of debt and the elimination of odious taxes. These *molteplici* would be subject to the stipulation that dividends would have to be reinvested until the initial number of luoghi had reached a predetermined number (Wiszniewski, 1865, pp. 40-42).

a substitute for cash.⁷ Tax collectors would credit San Giorgio of due revenues in accounts denominated in *lire di paghe*. San Giorgio, in turn, would credit shareholders' dividends in the same unit of account. Merchants accepted *lire di paghe* and paid in *lire di paghe*. These money-like transactions were facilitated by the fact that San Giorgio acted as a clearinghouse, allowing accounts denominated in *lire di paghe* to change ownership with a simple endorsement; these, in time, became bank notes.

3. Governance and Creditors' Protections

San Giorgio had a complex, and in many ways modern, governance structure consisting of a General Assembly, directors, inspectors, auditors, officers, and even judges; for details see Wisniewski (pp. 179-202). Governance evolved over time and served three basic objectives: protecting creditors' interest, minimizing conflicts of interests, and maintaining independence from government. Preeminent in the structure were the General Assembly (*Consiglio grande*) and the Protectors (*Protettori*). The Assembly, composed of 480 shareholders, met at least once a year and voted on big issues and set the rules of the game. The Protectors, eight distinguished citizens of the Republic, acted as a modern Board of Directors with management responsibilities.⁸ Protectors, in fact, ran San Giorgio and were elected from a pool of eligible *luogatari* through a complex

⁷ Payment of dividends in specie was limited to relatively poor investors and to sums less than 20 lire (Felloni, 1994 Tomo 4, p. 182).

⁸ The Office of the Protectors actually began in 1323 (Gioffré, p. 15), but developed in full under San Giorgio.

method that tended to minimize concentration of power.⁹ Eligible *luogatari* were listed in a secret book, *manuali secreta*, that was updated once a year. In addition, protectors – but it was true also for other top management positions-- had to have two other key attributes: significant ownership in San Giorgio and high professional competence and prudence. The ownership requirement served to align the interest of management with those of shareholders (Heers, pp. 119-120). Professional qualifications and prudence (a proxy for risk aversion) gave San Giorgio a disciplined and long-term view in decision making. To minimize conflicts of interest, protectors were elected for one year, but were given a second year to handle unfinished business of the previous year. Re-election could occur only after three years since holding last previous office.

Top managers of San Giorgio were drawn from the same social groups from which sprang top decision makers in government. Before 1528, both the Nobles and the *Popolo* were represented in government jobs.¹⁰ After 1528, power was shared between Old Nobles and New Nobles. Power sharing also applied to San Giorgio. For example, in the period 1585-1594, San Giorgio had 65 Protectors, 33 representing Old Nobles and 32 New Nobles. Ten of the 65 Protectors would later become doges of the Republic (Bitossi, 2004). In the period 1634-1644, San Giorgio had 72 Protectors, 34 representing Old Nobles and 38 New Nobles. Eleven of the 72 Protectors would later rise to the top position in government. The important point is that the common pool of key decision makers ensured that San Giorgio's interests were aligned with the Republic's. This, in

⁹ For a description of the election procedure, see Felloni (2001, p. 67).

¹⁰ Heers (p. 577) speaks of fixed proportions: 50 per cent of the positions had to go to nobles, 25 per cent to merchants and 25 per cent to the artisans.

turn, reduced the risk that the Republic would repudiate its debt. A similar condition is noted by Conklin in his study of Spain under Philip II.

Among the duties of the Office of the Protectors, two stand out in reducing the risk of debt repudiation. The first is full responsibility over the collection of revenues from alienated dues, taxes and tariffs; the second is judicial competence on all matters pertaining to the *compere* (Felloni, 2001, pp. 325-27).¹¹ Tax evasion was a crime against San Giorgio, and tax evasion cases were heard by Protectors who had the means to hand out stiff penalties, including capital punishment and excommunication (Heers, pp. 129-30).¹² There was no interference whatsoever from government in the carrying of justice (Gioffré, p. 16). Beginning with 1453, each new Doge reaffirmed solemnly the sanctity of the *luoghi* and the prerogatives of San Giorgio (Marengo, p. 94). Furthermore, with the debt consolidation of 1539 the Republic committed not to raise new taxes without the consent of Protectors and thus allayed the fears of San Giorgio's shareholders of revenue dilution (Marengo, p. 117).

In sum, power sharing among the élites, tight control over tax collection and tax evasion, constraints on new taxes, and the solemnity with which the Republic continuously reaffirmed the rights of government creditors gave San Giorgio's shareholders strong protections against the risk of default. This protection was more extensive than elsewhere, for example in Spain under Philip II (Conklin). Overall, this

¹¹ Other critical functions of the Office were supervision of cash transactions, accounting records, and auditing.

¹² Pius II, in 1463, was the first pope to issue an excommunication bull against those who did not pay San Giorgio's claims (Marengo, p. 94).

evidence confirms the importance of creditor-imposed constraints in reducing incentives to repudiate debt and is consistent with those models where lending can occur if lenders can impose big penalties on debtors (Bulow and Rogoff, 1989a).

4. Forgiving or Selfish Lender?

The uniqueness of San Giorgio as a creditors' association has been emphasized by several authors through the ages. Machiavelli (1965, pp. 494-95) is an early admirer of San Giorgio, which he characterizes as a 'state within a state', but a benevolent and well-administered state within the fractious and unstable state that was the Republic of Genoa before 1528. Other admirers of this institution are Cuneo, Wiszniewski, and Marengo who stress the quality of San Giorgio's governance and management. Heers' account of the development of San Giorgio in the 15th century flashes out the contrast, already noted by Machiavelli, between a stable and competently run creditors' association and a divided and unstable debtor. On the other hand, Sieveking, Lopez and Epstein stress the power of San Giorgio in enriching creditors at the expense of the state. In the preface to his volume, Sieveking even warns his Genoese friends that they must "...reflect on the serious social damages of which San Giorgio was an expression..." (p. XI). Later, in the volume, he states that: "The State had alienated to this creditors' organization the greater part of its revenues; and it had become poor for the profit of individual interests, to which San Giorgio had given a hand" (p. 211). Along the same lines, Epstein deems that: "...nobles and merchants passed on to the general public the main burden of paying for government, but, as most observers have noted, after 1490 the state was effectively a

pensioner of San Giorgio” (p. 279). Is the evidence consistent with such harsh judgments?

In the Grossman and Van Huyck’s model, the lender has the same information set of the borrower. The lender can differentiate between excusable and inexcusable lapses in interest and principal payments, and is forgiving if the borrower does not act opportunistically. Debt-service payment consists of a risk-free rate of interest and a stochastic component that essentially captures the state of the economy. When the economy is doing well, the borrower pays a high debt-service. When the economy is doing badly, the borrower pays a low debt-service, thus shifting risk to the lender.

Let us see how closely the history of San Giorgio conforms to the implication of this model. First, on information, San Giorgio appeared to be as knowledgeable as the Republic on the state of the economy and its politics. Not only it shared the same élite that ran government, but San Giorgio collected most of Genoa’s tax revenues, which were a good barometer of economic conditions. The specialization in information to improve revenue collection was a role that individual shareholders could have not performed.¹³ Second, San Giorgio supported financially the Republic in a variety of ways, from yearly fixed-amount contributions to occasional debt forgiveness.¹⁴ Yearly

¹³ For example, San Giorgio’s *officium caratorum* handled customs dues and taxes on external trade; to minimize tax evasion, the office gathered relevant economic and political information in a fashion that resembles today’s research department (Heers, p. 130 and private communication of Giuseppe Felloni).

¹⁴ Giacchero (1979, p. 131) lists eight different ways under which San Giorgio transferred funds to government. Most of what follows is drawn from Giacchero.

ordinary contributions were set at lire 33,000 in 1490 and then raised to lire 50,000 in 1539, but often these were supplemented by extraordinary ones. For example, in 1590 San Giorgio distributed to the Republic and Genoese charities lire 326,639, amounting to approximately one-fifth of dividends (Giacchero, pp. 133-36). Debt forgiveness tended to occur at times of financial crisis for the Republic. With the debt consolidation of 1539, San Giorgio donated the Republic *luoghi* for a nominal value of lire 350,000 (Giacchero, p. 54). Following the plague of 1656-57, San Giorgio forewent the collection of due revenues on customs, grain and wine for a period of at least three years (Giacchero, p. 435). Another act of debt forgiveness took place in 1664 (Giacchero, p. 477). These are examples of risk shifting. These acts of forgiveness were voluntary; there is no evidence of the Republic repudiating debt. On the other hand, an “optimally” forgiving creditor would anticipate the amount of debt that the debtor can bear under times of distress. Third, San Giorgio substituted for the Republic in the provision of public goods such as harbor, roads, fortifications and the defense of Genoa’s colonies (Sieveking, pp. 228-231; Heers, pp. 140-46). To be sure, these expenses were not incurred out of altruism alone. As a case in point, the construction of the warehouses along the harbor in 1641 enhanced San Giorgio’s ability to raise revenues. Finally, San Giorgio administered the so-called *molteplici*, that is *luoghi* earmarked for accumulation and the reduction of government debt (cf. footnote 6). In times of financial distress, the Republic requested that San Giorgio paid to government dividends accrued on the *molteplici*, in direct violation of the donor’s intentions; and San Giorgio acquiesced.¹⁵

¹⁵ Eventually, this practice discredited the Republic and discouraged future potential donors to continue it (Giacchero, p. 632).

In sum, the behavior of San Giorgio is broadly consistent with the implications of Grossman and Van Huyck's model, which envisions that a lender can distinguish between excusable and non-excusable lapses in interest and debt payments. While San Giorgio was unwavering in demanding that the Republic solemnly re-affirm its obligations vis-à-vis the institution, it was also forgiving when the debtor was under financial stress due to reasons beyond its control. As a large creditor, San Giorgio had a lot at stake and knew that its fortunes were tied up to those of the Republic; forgiveness was not pure altruism. Alternatively, we can think of San Giorgio as a private-public institution that internalizes the difficulties of the Republic.¹⁶ A direct way to see whether San Giorgio represented greedy and powerful investors, who extracted extraordinary resources from the Republic, or a benevolent lender is to compute rates of return on San Giorgio's investments and to compare them with equivalent investments outside Genoa. We now turn to this issue.

5. Rates of Return on San Giorgio's Investments

Cuneo (pp. 307-311), an inspector of Genoa's archives, was the first to publish a long series of San Giorgio's *luoghi* market prices (P), dividends (D), and discounted dividends (D^a). The series for D starts in 1409 and ends in 1800; D^a starts in 1559 and ends in 1764; and P starts in 1559 and ends in 1880. P is an annual average. All three series are expressed in lire and soldi (1 lira = 20 soldi = 240 denari) up to 1739 and in scudi after

¹⁶ I owe this characterization to Joost Jonker who deems that "public debt is a very hot political issue in Early Modern Europe, and even a privatized solution was bound up with political issues" (comments to the paper at the Conference on "Early Securities Market").

this date. Cuneo did not give precise archival references for the data. Cipolla (1952, Appendix) found a manuscript in the Library of the University of Genoa that essentially corroborated Cuneo's data, and was also able to recover data for P and D^a all the way back to 1522. Cipolla (Figure 2) used the sample 1522-1625 to calculate the long-term rate of interest on San Giorgio's *luoghi* and the discount rate applied to dividends.

For the long-term rate of interest, Cipolla applied the consol formula, D_t^a/P_t . Since D_t^a is clearly not constant, the consol formula makes sense if D_t^a is the best forecast of future D^a ; i.e., a random walk. For the discount rate, Cipolla (p. 258, footnote 4) relied on a 1597 report written by Doge Senarega who states that half of the dividends were paid in cash on the fourth year after dividend booking and the other half on the fifth year; on average 4.5 years after booking. As to the annual discount rate, Cipolla computed it applying the simple interest formula $(D_t - D_t^a) / D_t * 4.5$.¹⁷ The two Cipolla interest rates have been cited in important works such as Braudel (1995, pp. 700-01) and Homer and Sylla (1991, p. 119).

Figure 1 plots the ratio of cash dividend to price, D^a/P , or what Cipolla labels as the long-term rate of interest; the period is from 1522 to 1739, using Cipolla's data up to 1625

¹⁷ Heers (p. 170, footnote 2) disputes that the delay between dividend declaration and dividend payment is constant over a century and provides evidence for his argument. According to Professor Felloni (private communication), Cipolla's yearly discount rate from 1522 to 1578 is biased upward because the maturity delay of the *paghe* rises from 50 months in 1518 to a maximum of 116 months in 1553, and then settles to 64 months from 1579 to 1751. This upward bias implies a downward bias in the differential between foreign short-term interest rates and corresponding Genoese interest rates, but does not affect the comparisons made in this article.

and Cuneo's data from 1626 to 1739.¹⁸ But San Giorgio's investors received an uncertain rate of return that depended on an uncertain dividend and volatile price changes. The price series P is relatively flat from 1523 to 1570, rises sharply from 1571 to 1622, declines from 1623 to 1692, and is relatively flat from 1693 to 1739. Yearly rates of return, defined as $R_t = (D_t^a + P_{t+1} - P_t) / P_t$, are plotted in Figure 2. The R series appears remarkably stationary, which is confirmed by the absence of any spikes in its autocorrelation function. Autoregressive and/or moving-average time series models of R are rejected against the alternative of a model with a declining trend over the entire period, using traditional criteria of parsimony.¹⁹ The hypothesis of a structural break or breaks is rejected against the alternative of no structural model.

[Insert Figures 1 and 2, here]

Average rates of return and the contributions of dividends and price appreciation to changes in R in the four mentioned periods are shown in Table 1. The dividend to price ratio declines significantly around 1570 and again around 1622 (see Figure 1) and is consistent with the general decline in rates of interest in 17th century Europe (Parker 1974, p. 539; Homer and Sylla, p. 140). Rising prices of *luoghi* were responsible for the historically high average returns in the 1571-1622 period; falling prices and declining

¹⁸ I have stopped in 1739 because in 1740 dividends and prices are quotes in a different unit of account.

¹⁹ The most parsimonious model is an ARIMA (0,0,0) with a constant of 5.48 (and a standard error of 1.03) and a negative time trend of -0.023 (and a standard error of 0.0081). The criterion of parsimony is based on two statistics: the Akaike information criterion and the Schwartz Bayesian criterion (Enders 1995, p. 88). Details of the estimation are available upon request.

dividends were responsible for the historically low average returns in the 1623-1692 period.

[Insert Table 1, here]

5. 1. *CROSS-COUNTRY COMPARISON*

With this knowledge, let us return to our main question of whether San Giorgio the lender was extracting extraordinary resources from the Republic the borrower. Since several governments in Europe had started borrowing in the financial markets in the 16th century to cover budget deficits (Parker, pp. 560-65; Boone et al. 2003), the natural way to answer the question is to compare returns on San Giorgio with returns or yields on equivalent investments outside Genoa. The underlying hypothesis is that differences in yields, under the strong assumption of perfect capital market integration, would reflect exchange rate and credit risks, and would be lowest in those regions with the lowest exchange rate and sovereign risk.

Independent evidence on capital mobility is qualitative but significant. We know that Genoa was an open economy, both in trade and finance, and that Genoese financiers were active if not dominant in important financial markets. They were the leading foreign lenders in Spain from the mid 1550s to the last bankruptcy of 1627 under Philip IV, and controlled the international money market linking specie delivery from Spain to the Low Countries.²⁰ For Braudel (1992, p. 168):

²⁰ For Conklin, the extent of the control of the international money market by the Genoese was such to force Philip II to rescind in 1578 his earlier decision (1575) of debt repudiation. For the role of Genoese financiers in Spain under Philip II, see references in Conklin; for a brief but

By means of the dominant system of the Piacenza fairs, the capital of the Italian cities was all drained towards Genoa. And a multitude of small investors, Genoese and others, entrusted their savings to the bankers for modest returns. There was thus a permanent link between the finances of Spain and the economy of the Italian peninsula –hence the upsets which regularly followed the bankruptcies in Madrid ... At the same time in Venice itself, the Genoese, since they controlled the supply of silver which they delivered in vast quantities to the Zecca, had acquired control of currency exchange and maritime insurance.

Genoese capitalists had a critical role also in 16th century Naples, which was used by the Spanish Crown as a main financing center for the war in the Low Countries (Calabria 1991, pp. 5 and 104). *Juros* were issued in Naples, as in Castile, with the backing of fiscal revenues; by the second half of the 1500s an active market of these securities had developed. By 1563, Genoese investors owned almost a quarter of the entire Neapolitan public debt (Calabria, p. 115). As mentioned in the above passage, Genoese capital was dominant in Venice as well. Between 1617 and 1625, almost half of Venetian new life annuities, totaling more than one million ducats, were held by Genoese investors (Felloni 1971, p. 145). In sum, Genoese bankers and well-to-do Genoese knew about investment opportunities existing outside the Republic and were quite capable of exploiting them.

Calabria (Table 7) reports interest rate data on Neapolitan securities for most of the 16th century. Figure 3 plots the difference between interest rates on redeemable securities in Naples and current yields on San Giorgio from 1522 to 1598 (current yields rather than total returns are closer to Calabria's interest rates).²¹ Interest rates in Naples were consistently much higher than yields in Genoa: 5.5 percentage points, on average,

illuminating account spanning all the way to the 1627 bankruptcy, read Braudel (1992, pp. 164-168; 1995, pp. 500-504).

²¹ Some years are missing in Calabria's data set.

over the 71-year sample period. How much of the difference can be accounted by exchange rate risk? Data on exchange rates are scanty and indirect; I employ two alternative methods. The first is to use the Da Silva (1969, Tome II) data on prices of local monies, such as the Genoese soldo and the Neapolitan ducat, in terms of *écu de marc* at the Besançon fair.²² From the two money prices expressed in *écu de marc* one can compute the implied exchange rate between Genoese money and Neapolitan money. The Da Silva fair data start only in 1575; over the 24-year period 1575-1798, the Genoese soldo appreciates vis-à-vis the Neapolitan ducat by a quarter of one per cent per year, on average. Thus, the exchange rate change is a very small fraction of the interest rate differential. The second method is to approximate changes in the exchange rate by the differences in the loss of purchasing power of local monies measured in terms of specie, gold or silver. Calabria (pp. xiii-xiv) gives data on the loss of purchasing power of the carlino, a subdivision of the ducat, in terms of silver content; Da Silva (p. 347) reports the purchasing power loss of the soldo in terms of gold content starting with 1500. For the carlino, the loss of purchasing power for the period 1522-1798 averages to 0.30 per cent per annum; for the lira, the average loss, using the entire 16th century, is 0.39 per cent. There is very little in the data to suggest significant long-run changes in the exchange between Genoese and Neapolitan monies.

[Insert Figure 3, here]

²² The *écu de marc* was an artificial and stable unit of account used at the Besançon fair (but not only) to price unstable local monies. Fairs met typically four times a year, at the beginning of February, March, August, and November; for more details on the unit of account, see Da Silva (pp. 290-293).

Since the evidence excludes large exchange rate risk, differences in interest rates between Naples and Genoa are consistent with differences in credit risk. Naples was an extension of the Crown in Spain and carried comparable credit risk. Although securities issued and traded in Naples were not included in Philip II's bankruptcies, the market remained edgy about the possibility of default (Calabria, pp. 108-109). Market segmentation, or a mix of differences in credit risk and market segmentation, is the alternative explanation of the large interest rate differential.

Venice is another obvious comparison to Genoa. Debt consolidation in Venice took place with the establishment of the *Monti*, the oldest, *Monte Vecchio*, dating back to the middle of the 13th century. Data limitations prevent a proper comparison of Genoese yields with yields received by holders of Venetian debt. Mueller (1997, Table 11.3) gives current yields on the *Monte Vecchio* for some years all the way to 1578. Yields on Venetian debt differed between forced lenders (mostly residents) and voluntary lenders (for example, foreigners). But yields were also affected by the practice of delaying interest payments, as was true in Genoa. In 1432, the delay was 4.5 years and then increased progressively. After 1454, for securities purchased on the Venetian open market, *paghe* were paid after many years (Mueller, p. 473). Since values of discounted *paghe* in Venice are not available, the Venetian current yields reported by Mueller overstate the true yields.

Swiss cities provide another interesting, albeit relatively unknown, case of public debt. Whereas in the Italian city-states debt served expansionary objectives, for the Swiss republics debt was used to “emancipate [them] both from their lords and from the Empire north of the Alps” (Körner, 1995, p. 513). Having freed themselves of an expensive élite,

the towns controlled expenditures and built a tradition of prudence and frugality that would become the hallmark of modern Switzerland. Lucerne paid off its public debt after 1500 and other cities followed suit a century and half later (Körner, 1999, p. 348). Not surprisingly, the cost of debt in the Swiss Confederation was low. Körner (1995, p. 532) reports that in the 17th century the highest interest rate on loans to Swiss cities was 5 per cent; it had been higher before when life annuities were prevalent.

Table 2 summarizes interest rates on long-term debt in Genoa, Venice, Antwerp and the province of Holland for selected periods. The data are not strictly comparable and have to be interpreted as indicative. For example, for Genoa the interest rate is the current yield measured by the ratio of the discounted *paghe* to the market price of the security; for Venice the current yield it is the ratio of the undiscounted *paghe* to the market price of the security, as discussed above. The key feature of the table is that Genoa enjoyed very low interest rates, despite the fact that it was a large borrower.

[Insert Table 2, here]

The literature acknowledges that long-term interest rates in Genoa were low in relation to virtually all financial centers (Homer and Sylla, p. 138; Parker, pp. 539-40). The preferred explanation is the one originally offered by Cipolla (pp. 264-66) for the period 1570-1620: Genoa, by exploiting its privileged financial relationship with the Crown, became the epicenter of American gold and silver inflows that, in turn, were re-exported to the rest of Europe. The specie inflows expanded the supply of money and lowered interest rates. The assumptions underlying this explanation are that markets were segmented and that lower interest rates in the money market translated in lower long-term

interest rates, which are more sensitive to inflationary expectations.²³ The problem with this explanation is that Genoese long-term interest rates were systematically lower than other interest rates, before 1570 and after 1620. Holland and other Dutch provinces in the 17th century were one place where interest rates approached those in Genoa. The Dutch had achieved a financial revolution by shifting control of tax revenues from the Habsburg Emperors to the rich merchants who had a big say in the running of cities and provinces (Tracy, 1985, p. 217). Like in Genoa, creditors in the United Provinces had a high degree of protection because:

...the chief investors ran the government. After 1572, the local estates of each province in revolt against Spain took over responsibility for raising money to pay for the war...The estates imposed new indirect taxes ... and sold life and redeemable annuities in return for cash... (Parker, p. 572).

The fact that the lowest interest rates were achieved in two different economic environments that shared equivalent institutions with regard to creditors' protections further corroborates the main theme of this article: the nexus between debt and interest rates through a mechanism that protects creditors against the risk of debt repudiation.

6. Conclusions

San Giorgio achieved a massive (for the time) debt-for-equity swap in Genoa; it was the product of high financial engineering and became the prototype of engraftment, practiced widely during the so-called English financial revolution three centuries later. San Giorgio enabled lenders to delegate to management important tasks such as monitoring the creditworthiness of the borrower, verifying what shocks affected the flow from alienated tax revenues, and specializing in information and tax collection procedures.

²³ Cipolla's explanation is repeated by Braudel (1992, pp. 166-67) and Homer and Sylla (p. 120).

Sophisticated owner-managers were dedicated and skillful in protecting creditors' rights and reducing the risk that the Republic of Genoa might repudiate its debt. The aims and governance of San Giorgio were consistent with models of debt that predict positive equilibrium lending if lenders can impose big penalties on debtor. They were also consistent with models in which the debtor is able to shift onto the lender the risks from bad events like wars and famine. In the absence of information asymmetry, the lender can differentiate between excusable acts of partial or complete default from inexcusable ones. San Giorgio was a forgiving lender, on the whole.

San Giorgio shareholders enjoyed low credit risk and their returns on capital were lower, on average, than returns on comparable foreign assets for which creditors' protection mechanisms were lacking. This conclusion is based on the strong assumptions that markets were integrated in the 16th and 17th century and that exchange rate risk was of secondary importance. The marshaled evidence indicates that Genoese capitalists were extremely active in many important financial centers, and that exchange rate risk was modest between Genoa and Naples in the 16th century. The conclusion that differences in credit risk were important in explaining differences in long-term interest rates has not been sufficiently emphasized by the literature.

In addition to debt repudiation, San Giorgio has relevance for the nature of financial institutions. San Giorgio lowered transaction costs in the debt market, specialized in information and invested resources in monitoring the debtor, all essential ingredients of a modern financial institution. Finally, the experience of Sang Giorgio offers lessons to restructurings of sovereign debt: debt markets function best when the rights of creditors are well protected.

References

- Baskin, J. B. and Miranti, P. J. Jr. (1997). *A History of Corporate Finance*, Cambridge University Press, Cambridge, U.K.
- Benston, G. J. and Smith, C. W. Jr. (1975). A Transactions Cost Approach to the Theory of Financial Intermediation, *Journal of Finance Papers and Proceedings* 31, 2: 215-231.
- Braudel, F. (1992). *Civilization & Capitalism, 15th-18th Century, vol 3: The Perspectives of the World*, University of California Press, Berkeley, U.S.A.
- _____ (1995). *The Mediterranean and the Mediterranean World in the Age of Phillip II*, University of California Press, Berkeley, U.S.A.
- Bitossi, C. (2004). Il governo della Repubblica e della Casa di San Giorgio: I ceti dirigenti dopo la riforma costituzionale del 1576. Paper presented at the Conference *La Casa di San Giorgio: Il Potere del Credito*, Genova, November 11-12, 2004.
- Boone, M., Davids, K. and Janssens, P.(eds.) (2003). *Urban Public Debts: Urban Government and the Market for Annuities in Western Europe (14th-18th centuries)*, Brepols Publishers, Turnhout, Belgium.
- Bulow, J. and Rogoff. K. (1989a). A Constant Recontracting Model of Sovereign Debt, *Journal of Political Economy* 97: 155-78.
- _____ (1989b). Sovereign Debt: Is to Forgive to Forget?, *American Economic Review* 79: 43-50.
- Calabria, A. (1991). *The Cost of Empire: The Finances of the Kingdom of Naples in the Time of the Spanish Rule*, Cambridge University Press, Cambridge, U.K.

- Cipolla, C. M. (1952). Note sulla Storia del Saggio d'interesse, corso dividendi e sconto dei dividendi del Banco di S. Giorgio nel Sec. XVI, *Economia Internazionale*, maggio, N. 2: 255-274.
- Conklin, J. (1998). The Theory of Sovereign Debt and Spain Under Philip II, *Journal of Political Economy* 106, 3: 483-513.
- Cuneo C. (1842). *Memorie sopra l'antico debito pubblico, mutui, compere e Banca di S. Giorgio in Genova*, Stampatore dei Sordi Muti, Genova, Italy.
- Da Silva, J-G. (1969). *Banque et Cr dit en Italie au XVII^e Si cle*, Editions Klincksieck, Paris, France.
- De Negri, T. O. (1986). *Storia di Genova*, Aldo Martello Editore, Milano, Italy.
- Diamond, D. W. (1991). Monitoring and Reputation: The Choice between Bank Loans and Directly Placed Debt, *Journal of Political Economy* 99,4: 689-721.
- Eaton, J. and Gersovitz, M. (1981). Debt With Repudiation: Theoretical and Empirical Analysis, *Review of Economic Studies* 48(2): 289-309.
- Eichengreen, B. (2003). Restructuring Sovereign Debt, *Journal of Economic Perspectives* 17,4:75-98.
- Enders, W. (1995). *Applied Econometric Time Series*, John Wiley, New York.
- Epstein, S. A. (1996). *Genoa & the Genoese, 958-1528*, The University of North Carolina Press, Chapel Hill, U.S.A.
- Felloni, G. (1971). *Gli investimenti finanziari genovesi in Europa tra il Seicento e la Restaurazione*, A. Giuffr , Milano, Italy.

_____ (1989a). *Inventario dell'Archivio del Banco di San Giorgio (1407-1805)*, Ministero per i Beni Culturali e Ambientali –Ufficio Centrale per i Beni Archivistici, Roma, Italy.

_____ (1989b). *Inventario dell'Archivio del Banco di San Giorgio (1407-1805), Vol IV –Debito Pubblico- Tomo 1*, Ministero per i Beni Culturali e Ambientali –Ufficio Centrale per i Beni Archivistici, Roma, Italy.

_____ (1990). *Inventario dell'Archivio del Banco di San Giorgio (1407-1805), Vol III –Banchi e Tesoreria- Tomo 1*, Ministero per i Beni Culturali e Ambientali, Roma, Italy.

_____ (1994). *Inventario dell'Archivio del Banco di San Giorgio (1407-1805), Vol IV –Debito Pubblico- Tomo 4*, Ministero per i Beni Culturali e Ambientali –Ufficio Centrale per i Beni Archivistici, Roma, Italy.

_____ (2001). *Inventario dell'Archivio del Banco di San Giorgio (1407-1805), Vol II –Affari Generali- Tomo 1*, Ministero per i Beni Culturali e Ambientali –Ufficio Centrale per i Beni Archivistici, Roma, Italy.

Giacchero, G. (1979). *Il seicento e le compere di San Giorgio*, SAGEP Editrice, Genova, Italy.

Gioffré, D. (1967). *Il Debito Pubblico Genovese: Inventario delle Compere Anteriori a San Giorgio on Non Consolidate nel Banco*, A. Giuffré, Milano, Italy.

Greif, A. (1995). Political Organizations, Social Structure, and Institutional Success: Reflections from Genoa and Venice during the Commercial Revolution, *Journal of Institutional and Theoretical Economics* 151/4: 734-40.

- Grossman, H. I. and Van Huyck, J. B. (1988). Sovereign Debt as a Contingent Claim: Excusable Default, Repudiation, and Reputation, *American Economic Review* 78: 1088-97.
- Hart, M. (1999). The United Provinces, 1579-1806, in Richard Bonney (ed.), *The Rise of the Fiscal States in Europe, c. 1200-1815*, Oxford University Press, Oxford, U.K.
- Heers, J. (1961). *Gênes au XV^e Siècle*, S.E.V.P.E.N., Paris, France.
- Homer, S. and Sylla, R. (1991). *A History of Interest Rates*, Third edition, Rutgers University Press, New Brunswick, U.S.A. and London, U.K.
- Körner, M. (1995). Public Credit, in Richard Bonney (ed.), *Economic Systems and State Finance*, Oxford University Press, Oxford, U.K.
- _____ (1999). The Swiss Confederation, in Richard Bonney (ed.), *The Rise of the Fiscal States in Europe, c. 1200-1815*, Oxford University Press, Oxford, U.K.
- La Porta, R., Lopez-de-Silanes, F., Shleifer, A. and Vishny, R. (1997). Legal Determinants of External Finance, *Journal of Finance* 52,3: 1131-50.
- Lopez, R. S. (1963). Quattrocento genovese, *Rivista storica italiana*, LXXV: 710-727. Reprinted in Robert S. Lopez (1975), *Su e giù per la storia di Genova*, Istituto di Paleografia e Storia medievale, pp. 63-80, Genova, Italy.
- _____ (1964). Market Expansion: The Case of Genoa, *The Journal of Economic History*, 24, 4: 445-464. Reprinted in Robert S. Lopez (1975), *Su e giù per la storia di Genova*, Istituto di Paleografia e Storia medievale, Genova, Italy, pp. 43-62.
- Machiavelli, N. (1965). *Le istorie fiorentine*, Salani editore, Firenze, Italy.

- Marengo, E. (1911). *L'Antico Debito Pubblico Geneovese e la Casa di San Giorgio*, in Emilio Marengo, Camillo Manfroni and Gisepe Pessagno, *Il Banco di San Giorgio*, A. Donath, Editore, Genova, Italy.
- Mueller, R. C. (1997). *The Venetian Money Market - Banks, Panics, and the Public Debt, 1200-1500*, The Johns Hopkins University Press, Baltimore, U.S.A.
- Neal, L. (1990). *The Rise of Capitalism: International Capital Markets in the Age of Reason*, Cambridge University Press, Cambridge, U.K.
- Parker, G. (1974). The Emergence of Modern Finance in Europe, 1500-1730, in Carlo M. Cipolla (ed.) *The Fontana Economic History of Europe: the Sixteenth and Seventeenth Century*, Collins/Fontana Books.
- Rajan, R. (1992). Insiders and Outsiders: The Choice between Informed and Arm's-Length Debt, *Journal of Finance* 47, 4: 1367-1400.
- Shleifer, A. (2003). Will the Sovereign Debt Market Survive?, *American Economic Review Papers and Proceedings* 93,2: 85-90.
- Sieveking, H. (1906). *Studio sulle Finanze Genovesi nel Medioevo e in particolare sulla Casa di S. Giorgio*, Atti della Società Ligure di Storia Patria, Vol. XXXV (Parte Seconda), Tipografia della Gioventù, Genova, Italy.
- Tracy, J. (1985). *A Financial Revolution in the Habsburg Netherlands: Renten and Renteners in the County of Holland, 1515-1565*, University of California Press, Berkeley, U.S.A.
- Wiszniewski, A. (1865). *Histoire de la banque de Saint-Georges de Gènes, la plus ancienne banque de l'Europe*, Guillaumin et C^{ie}, Paris, France.

**Figure 1: San Giorgio's Cash
Dividend-Price Ratio, 1522-1739**

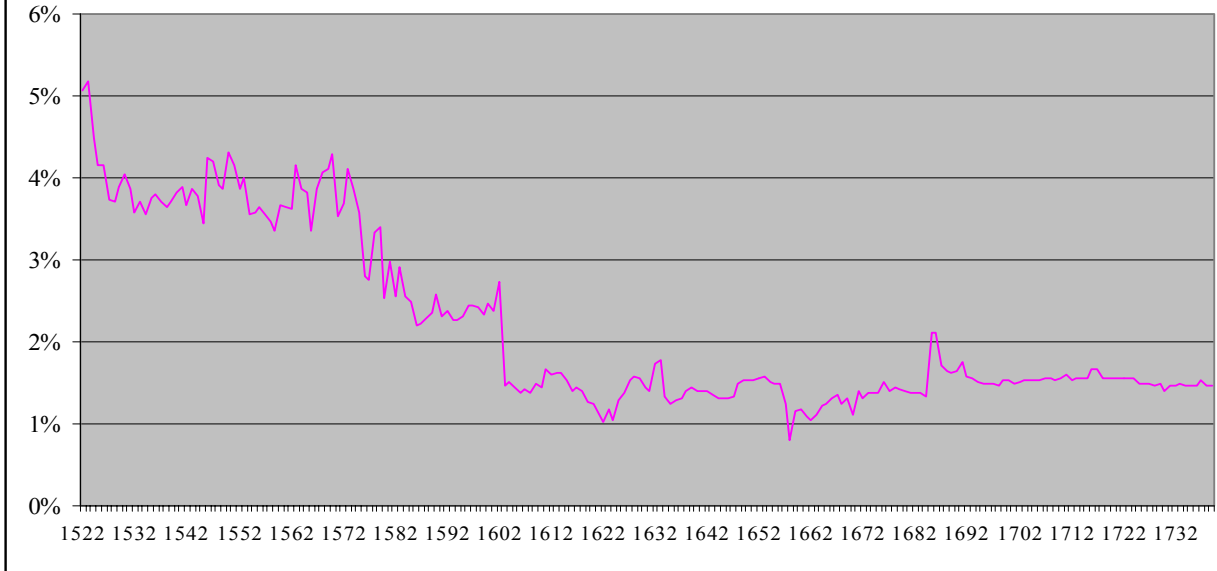
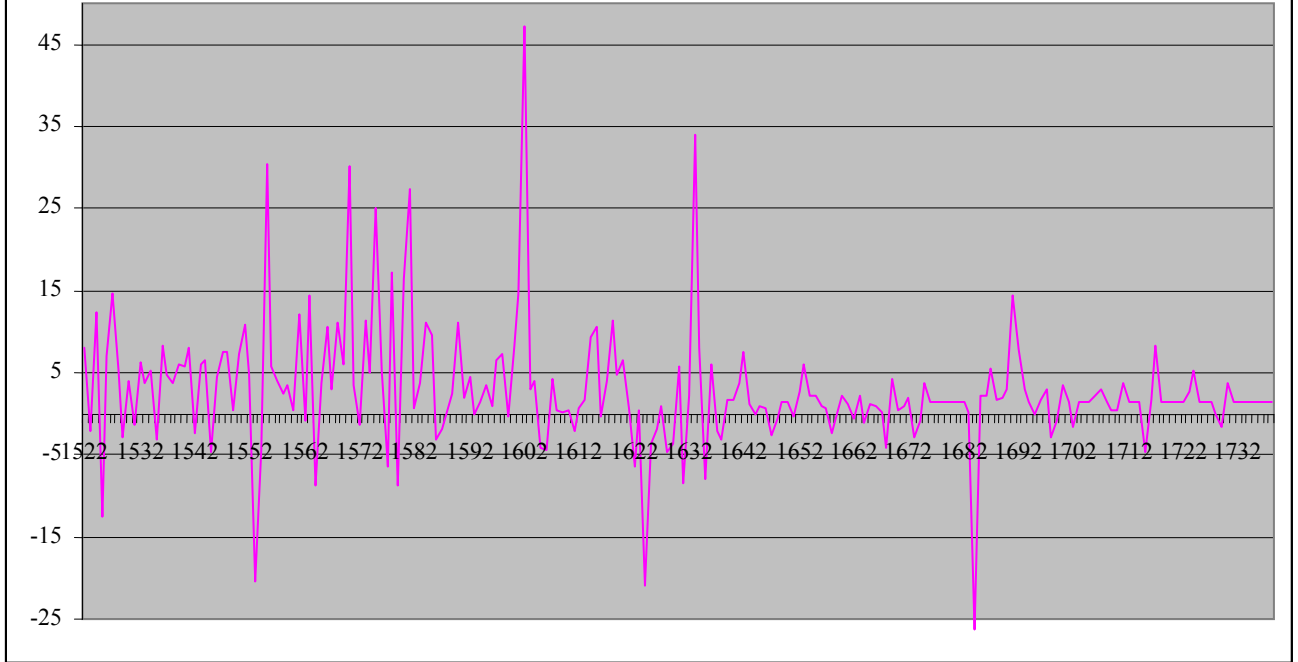
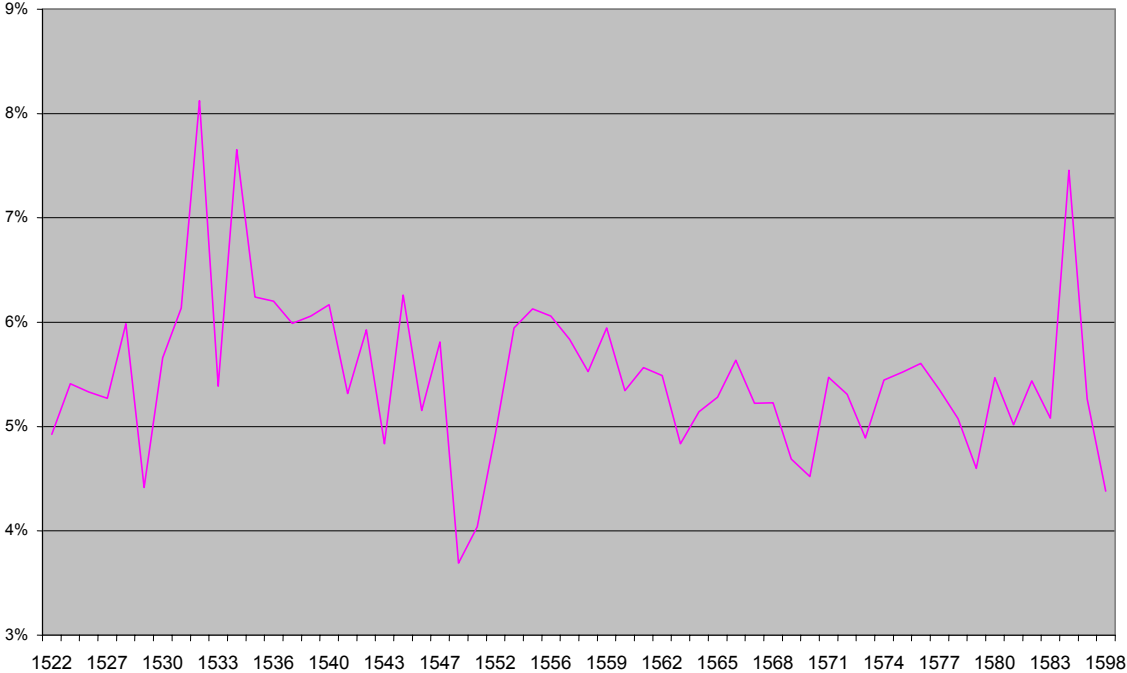


Figure 2: One-year rate of return on San Giorgio's luoghi, 1522-1739



Note: yearly rates of return are defined as $R_t = (D_t^a + P_{t+1} - P_t) / P_t$, where D_t^a = discounted cash dividend and P = the price of the luoghi.

Figure 3: Difference between yields in Naples and Genova



Note: the graph plots the difference between interest rates on redeemable securities in Naples and current yields on San Giorgio from 1522 to 1598.

Table 1: Rates of Return on San Giorgio and Relative Contributions

Period	Average annual rate of return	Dividend contribution	Price appreciation contribution
1523-1570	4.23	3.88	0.35
1571-1622	5.90	2.31	3.58
1623-1692	0.67	1.40	-0.73
1693-1739	1.63	1.53	0.10

Note: annual rates of return are defined as $R_t = (D_t^a + P_{t+1} - P_t) / P_t$, where D_t^a = discounted cash dividend and P = the price of the luoghi; dividend contribution is D_t^a / P_t ; price appreciation contribution is $(P_{t+1} - P_t) / P_t$; all multiplied by 100.

Table 2: Interest Rates in Genoa and in Selected Financial Centers
(per cent)

Period	Genoa	Venice	Antwerp	Holland
1382-85, yearly average	8.83	14.85		
1386-1407, yearly average	7.03			
1386-1420, yearly average forced loans voluntary loans		8.8 6.13		
1522-49, yearly average	3.95		14.25	
1535-48, yearly average	3.82	2.5		
1549-76, yearly average	3.76	4.0		
1549	3.87			6.25
1552	3.87			8.33
1560	3.66			6.25
1574	3.86			20.0
1576	2.79			8.33
1606	1.38			7.28
1610	1.45			6.25
1640	1.41			5.0
1655	1.49			4.0
1664	1.23			3.0
1665	1.23			4.0
1671	1.41			3.8
1673	1.37			4.0

Notes and sources. In Genoa, interest rates are current yields on San Giorgio based on discounted *paghe*; in Venice, interest rates are current yields on the *Monti* based on undiscounted *paghe* (Mueller, 1997, Table 11.3); in Antwerp, interest rates refer to 'aides' (Körner, 1995, Figure 8.9); in Holland, interest rates refer to government loans (Hart, 1999, Figure 9.3).