

Italian city-states and financial evolution

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The term financial revolution has been abused in the literature. Revolution connotes a sharp and unique break from the past that should stand up to careful historical scrutiny, but in fact it does not. Evolution describes financial history better than revolutions. We compare the classic ‘financial revolutions’ with the financial innovations of Genoa, Venice and Florence in the *Quattrocento* and *Cinquecento* and the upshot is that these Italian city-states – the two maritime cities more than Florence – had developed many of the features that were to be found later on in the Netherlands, England and the United States. The importance of the early financial innovators has been eclipsed by the fact that these city-states did not survive politically. Instead, the innovations were absorbed in the long chain of financial evolution and, in the process, lost the identity of their creators.

1. Introduction

By ‘financial revolution’ most economic historians refer to the series of events surrounding the Glorious Revolution of 1688 in England, from the creation of a national debt to the establishment of the Bank of England (Dickson 1967). Approximately a hundred years later, the young United States went through a ‘financial revolution’ of its own, according to Sylla’s (1998) assessment. Under the leadership of the capable and strong-willed Alexander Hamilton, the Congress launched a series of financial reforms which transformed the United States from a risky emerging market to a magnet for foreign capital. For Tracy (1985) and Neal (1990), a financial revolution had already occurred in the United Provinces approximately 150 years before the English revolution and 250 years before the Federalist revolution in America. Van der Wee (1963) claims that Antwerp had its own financial revolution at the end of the sixteenth century. Cipolla (1952) notes a general decline in interest rates across the main European commercial centres by the mid 1500s and calls it a revolution as well.

Our thesis in this article is that the term financial revolution has been abused in the literature. Revolution connotes a sharp and unique break

from the past that should stand up to careful historical scrutiny; but it often does not. As Roseveare (1991, pp. 2–3) writes, ‘... sooner or later many of our cherished “revolutions” ... suffer this redefinition and are shown to have antecedents or discontinuities which spoil their symmetry and dissolve their cohesion.’ Evolution describes financial history better than revolutions. Naturally, evolution is not a smooth process: changes do not occur at a steady rate. At times, the pace of change is so rapid to appear unique in history. But what appears unique in relation to fifty or a hundred years, may not be if viewed against centuries. The main contention of this article is that the financial innovations that took place in the Italian republican city-states of the *Quattrocento* and *Cinquecento*, especially in Genoa and Venice, are part of what the literature has called financial revolution, or what we prefer to call financial evolution.

Two important points should be made at the outset. The first is that we are not claiming that the literature has ignored the contributions to financial innovations of Italian city-states, but that the full potential of the financial revolution was realised by England at the end of the seventeenth century – see, for example, Neal (1990, p. 14); Baskin and Miranti (1997, pp. 90–91); and Ferguson (2001, pp. 15–16). The Dutch, with their ‘product’ innovations before England, and the United States, with their ‘revolution’ patterned after the English, are treated as junior partners. The second is that there is no single, unique, financial evolutionary path. Different paths emerge from different institutions; and institutions differ because, among other things, incentive structures and commitment mechanisms to honour debts differ. Genoa, Venice and Florence cannot be lumped together as a single episode of strong financial evolution; there is diversity in their experiences. As an implication, we should not expect that what happened in these three city-states in the 1400s and 1500s is a mirror image of what would later happen in Holland, England and the United States. For one thing, England and the United States were nation-states with a large domestic economy, whereas Genoa, Venice and Florence were large commercial and financial centres with a small domestic economy. Second, small states are less likely to survive than large states for no other reason than the economies of scale in the provision of public goods. Thus, the dimensions of Genoa, Venice and Florence made them closer to the Dutch provinces than to a Westphalian nation-state.¹ The upshot is that the origin of the innovations made by Genoa, Venice, and Florence – but again primarily Genoa and Venice – has been lost because these city-states were absorbed into larger political territories. In contrast, England and the United States not only survived,

¹ Tracy (1985, p. 220) recognises this aspect of dimension: ‘... the task of creating a wider field for the kind of public debt pioneered by the city-states was left to provincial parliaments whose territories were intermediate between the medieval city-states and the emerging nation states...’

but became leading economic and financial centres in the world. We are reminded of British and American innovations because we observe them today, whereas Genoese, Venetian and Florentine innovations have been absorbed into the long chain of financial evolution.

The article proceeds as follows. We start by briefly reviewing the classic ‘revolutions’ of the Netherlands, England, and the United States in terms of three basic criteria – the ‘commitment to honour debt’ mechanism, the role of public banks, and the extent and depth of financial innovations (Section 2). We then analyse in some detail the innovations undertaken by Genoa, Venice, and Florence in the 1400s and 1500s, and compare to what extent the innovations of the later centuries were already present in the earlier period (Section 3). Conclusions are drawn in Section 4.

2. Three pillars of the financial revolution

The literature on ‘financial revolution’ is rich with lots of details and insights and we cannot possibly do justice to it in a single article. Instead, we distil from those insights and identify three pillars of that revolution: the institutional mechanism through which the debtor commits not to renege on debt, the public bank, and innovations in financial instruments and markets. These criteria have been recognised as critical in launching a ‘financial revolution’ by other authors; see, for example, Ferguson (2001, pp. 15–16) and Sylla *et al.* (2004).

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 inability to tap the capital markets may be a sufficient deterrent to repudiation (Eaton and Gersovitz 1981). But in other models lending can occur if lenders can impose bigger penalties on debtors (Bulow and Rogoff 1989) or if there is an institutional mechanism that underpins the commitment not to renege, as described in North and Weingast (1989). The ascent to power of the English Parliament, especially its fiscal power, was the key political aspect of the Glorious Revolution. The rule of law superseded the divine rights of the monarch, property rights became more secure and government gained credibility in its commitment not to renege on debt (North and Weingast 1989, p. 824). The US Congress, unlike the British Parliament, did not share power with a king and could legitimately raise taxes for servicing the Federal debt. In Habsburg Netherlands, Charles V, seeking an alternative to borrowings from bankers like the Fuggers, was partly responsible for the launch of a Dutch debt. The Emperor spurred the provincial governments to pledge taxes to service the debt issued to finance the Habsburg state (Tracy 1985). This debt was backed by the full faith and credit of government and gave investors confidence in government honouring its promises. The North-Weingast commitment mechanism was

just as present in the United Provinces of Habsburg Netherlands as it was in the England of the Glorious Revolution: legitimate governments that can tax credibly can commit to pay their debts.²

A public or central bank not only provides liquidity in the market for government securities, but enlarges the options available to government in satisfying the intertemporal budget constraint. During times of stress – such as during wars – when government spending is temporarily high and the commitment mechanism not to renege on debt is perceived to be weak, access to central bank credit relieves the pressure from raising tax rates. While this option has a cost in terms of inflation, the alternative of raising tax rates would be costlier and slower in marshalling the required resources. The establishment of a national bank was a shared feature of both the English and the American ‘financial revolutions’. Neither one was a central bank in the proper sense of the term.

The Bank of England, established in 1694, was restrained from lending to the Crown unless explicitly authorised by Parliament (North and Weingast 1989, p. 821). This authorisation acted as an effective constraint imposed by creditors on debtors and thus lowered default risk. By concentrating debt into a single institution, the Bank was in a position to co-ordinate creditors and impose a larger punishment on the defaulting debtor; hence, government would face a lower credit risk (Wells and Wills 2000, p. 422). The Act also authorised the Bank to issue notes, which were not legal tender, for an amount equal to the subscribed capital. In 1697, the Bank began ‘engrafting’ government debt onto the bank’s capital, a practice that today would be called a debt-for-equity swap (Neal 1990, p. 51).³ This transformation of debt bearing a fixed rate of interest into equity was the key financial engineering of the time; more on this below. The First Bank of the United States (BUS) was created in 1791 and was patterned after the Bank of England, except that notes issued by BUS, unlike those of the Bank of England, were subject to a 100 per cent specie requirement (Cowen 2000, p. 12). BUS lent to the Federal government, paid interest on US government securities held in Europe (mainly in Amsterdam and London), held government deposits, and transferred these deposits and its own notes throughout the country (Cowen 2000, pp. 139–40). Quickly, BUS became the critical player in the US money market.

The Wisselbank of Amsterdam, established in 1609 as a public deposit bank, was given a monopoly on money changing, bills of exchange valued in excess of 600 guilders, and bullion transactions. Merchants brought

² The link between the creation of good institutions and low credit risk need not emerge instantaneously; it may take time for the markets to learn the lesson. This is the key point made by Sussman and Yafeh (2005) who show that institutional changes first generate instability before being properly priced in the financial markets.

³ Engrafting was not unique to the Bank of England; it had been done with the Million Bank, the East India Company and most of all with the South Sea Company (Neal 1990, p. 51).

all foreign coins to the bank and received credit in deposit accounts denominated in bank guilders. The Wisselbank was at the centre of the Dutch payment mechanism. In absence of bank fees, money settlements through the *giro* system – debiting and crediting deposit accounts with the bank – were cheaper and faster than settlements using coins.

Financial innovations are the lymph of expanding markets and flourish in a competitive environment, as Neal (1990) so well illustrates. In terms of timing, some financial innovations may occur after the commitment mechanism has been set in place, and should be interpreted as a consequence rather than as ultimate causes of the new regime. Other innovations, instead, may be part of the set of fundamentals that spark the new regime. Whether consequences or causes of the financial revolution, product innovations are an observable indicator of the breath and depth of the new regime.

According to Neal (1990), much of the English financial revolution is owed to the standardisation, marketability and liquidity imbedded in the new financial instruments issued by the Bank of England, the East India Company and the South Sea Company. These characteristics led to a thickening of markets and a decline in transaction costs. Perpetual but potentially redeemable debt was first issued in 1723 in the form of the 3 per cent South Sea Annuities and later with the 3 per cent Consols as part of the strategy of the British government to lengthen the maturity of the national debt and lower its servicing cost (Dickson 1967, pp. 241–2).⁴

Credibility of the funded debt, an emerging banking system, and liquid financial markets attracted foreigners to purchase US government securities (Sylla 1998, p. 98). The 3 per cent, 6 per cent, and deferred 6 per cent of the 1790 – redeemable at the pleasure of the US government – were popular with European investors and regularly traded in Amsterdam and London in the early part of the nineteenth century (Sylla *et al.* 2004). The American banking system brought its own innovation in the form of the call loan, a loan by New York banks to out-of-town banks. The loan was secured by securities and soon became an integral feature of modern money markets.

3. Fiscal and financial innovations in Italian city-states

The essential ingredients of the ‘financial revolutions’ reviewed above will be our benchmark for the following discussion of the three Italian city-states and their contribution to financial evolution.

Medieval Genoa, Venice, and Florence were at the frontier of economic development and capitalism in the *Quattrocento* and *Cinquecento*. Commerce, international trade, and finance were the key to their success. Genoa and

⁴ For yields on both the Annuities and the Consols from 1727 to 1800, see Homer and Sylla (1991, Chart 5).

Venice were maritime economies and fought for dominance of overseas routes. Geographic specialisation occurred after Genoa and Venice fought their third and last war in 1378–81. After that the Venetians dominated the routes to the East, leaving to the Genoese room for growth in trade with the West. Both centres traded with the North of Europe. Characterisations of the relative importance of Genoa and Venice vary in the literature, but Venice is often described as having the stronger political and economic models of the two. Florence's economic success came much later than that of Genoa and Venice and was based on a strong comparative advantage in the manufacturing and distribution of high-quality woollen cloth and silk products, as well as on the export of banking services (Brucker 1969, ch. 2; Goldthwaite 1980, ch. 1).

Both Genoa and Venice shared republican political institutions and the rule of law, which gave them legitimacy and credibility to issue large amounts of long-term and marketable debt. Venice had a strong and stable government, willing and able to interfere with the economy. Genoa, instead, was 'factious and unstable', a characterisation noted by Machiavelli in his *Istorie fiorentine* (1965, pp. 494–5). Genoa had more proclivity for individualism than 'stateness' (Epstein 1996, p. 234). Republican Florence was closer to Genoa than to Venice. After 1434, however, the rules of the political game were set by the Medici family (Rubinstein 1971; Molho 1995, p. S 118).⁵

3.1. *Commitment mechanisms*

The earliest evidence of long-term urban debt dates back to 1149 for Genoa and 1164 for Venice. In both cases lenders gave the state a fixed amount of funds against a stream of uncertain but predictable future cash flows supported by a tax or income-generating property (Tracy 2003, pp. 20–1). The debts of the state were called *compere* (literally purchases) in Genoa and *Monti* (Funds) in Venice and Florence. *Compere* were compulsory at first but became voluntary in time (Sieveking 1906a, p. 54; and 1906b, p. 40). In Venice, in contrast, lending to government was compulsory and based on assessments of one's wealth. The governing élite in Venice was not keen to relinquish control of tax revenues to private creditors (Luzzato 1929, p. xii).

Venetian debt was structured between a floating debt and a long-term funded debt (Pezzolo 2003, p. 62). The Grain Office, the Salt Office and banks were the sources of short-term credit to the Republic (Mueller 1997, p. 426). Long-term debt was funded through assigned tax revenues. The act of a legitimate government setting aside specific tax revenues to service

⁵ The Medici family exerted 'informal' hegemony from 1434 to 1494 and then more formally from 1512 to 1526; after 1530, their power became absolute.

the public debt is a credible commitment, one where elected officials do not merely promise to follow ‘a precedent of “responsible behavior”’ but are ‘... constrained to obey a set of rules that do not permit leeway for violating commitments’ (North and Weingast 1989, p. 804). The earliest such commitment dates back to 1262 when the Grand Council, the governing body of Venice, gave the *Ufficiali degli Prestiti* (Loan Officers) the charge to collect tax revenues assigned for the repayment of public debt. The same officers ‘were required to swear a solemn oath that... they would use the revenues under their control to pay interest on loans’ (Tracy 2003, p. 21). The credibility mechanism was reinforced by the fact that the largest holders of government securities came from the same élite governing Venice (Mueller 1997, ch. 12).

Debt consolidation in Venice took place with the establishment of the *Monti*. The oldest was the *Monte Vecchio*, dating back to the middle of the thirteenth century. Loans were compulsory and their sizes were based on ability to pay. A Loan Office kept the books, collected taxes and paid interest twice a year. As early as 1262, the Venetian public debt became a perpetuity (Mueller 1997, p. 459). Suspensions or delays in interest payments occurred in 1379–81, 1463–79 and in 1480; there was no default on principal. Prices of government securities declined through most of the 1400s (Mueller 1997, p. 462). To rejuvenate interest in public debt, the *Monte Vecchio* was superseded by *Monte Nuovo* in 1482, *Monte Nuovissimo* in 1509, and finally *Monte Sussidio* in 1526. But the root of the problem was in forcing citizens to lend to government. In 1528, the Mint in Venice began to pay a market rate of interest on specie deposits, the so-called *depositi in Zecca*. The government also issued life annuities, as was done in Holland. Venice had finally replaced the compulsory loan system with a market-friendly approach to debt management (Pezzolo 2003, pp. 67–8). By 1600, the city had repaid all its debt (Pezzolo 2003, Table III) and thus enhanced its reputation and creditworthiness in the market place.

In Genoa, as in Venice, government debt went through a series of consolidations – one as early as 1274 – before being purchased by the new institution of San Giorgio in 1407. The consolidation of 1407 put under one roof *compere* yielding anywhere from 8 to 10 per cent into a single San Giorgio asset bearing a 7 per cent interest rate. Investors who had funded San Giorgio would now hold not specific *compere* but Genoese public debt. This is exactly the technique of engraftment we discussed earlier in connection with the Bank of England. San Giorgio’s investors faced risks typical of a shareholder, but two in particular (Fратиanni 2006). The first risk emanated from the uncertain flow of alienated tax revenues underlying the *compere* contracts. As the economy grew and contracted, so did tax revenues. The second risk came from the close relationship that existed between the Republic and San Giorgio. While San Giorgio was formally and fiercely independent of government, in practice the fortunes of one were tied to those of the other.

In addition to giving a fixed yearly amount, San Giorgio helped the Republic through extraordinary contributions, debt forgiveness, and even by running the city's overseas territories and colonies.

San Giorgio's *luoghi* were owned widely by Genoese and foreigners. According to Heers (1961, pp. 147–62), by the fifteenth century the secondary market for *luoghi* had become active, liquid, and sophisticated. Not only were *luoghi* bought and sold, but they were used as collateral by bankers, borrowers and tax collectors (Sieveking 1906b, pp. 37–8). Each *luogo* was entitled to a variable dividend, called *paga*. However, dividends were often paid with a significant time delay with respect to their declaration, as was true also in Venice. Declared *paghe* were also actively traded and were sold for specie at a discount; more on this below. Statistical information on yearly market prices (p), declared dividends (d), and discounted dividends (d^a) was published by Cuneo (1842, pp. 307–11). The three series have different starting and ending points, with the d series covering the longest period (1409–1800). Carlo Cipolla (1952, Appendix) expanded the Cuneo series recovering data for p and d^a all the way back to 1522. All series are expressed in *lire*, *soldi*, and *denari* (1 lira = 20 soldi = 240 denari) up to 1739 and in *scudi* after this date. The p series is a yearly average; for more details see Fratianni (2006).

Figure 1, line RL, shows current yields on San Giorgio's *luoghi*, computed as $(d^a/p) \cdot 100$ for the period 1522–1739. Yields start at about 5 per cent and quickly decline to an approximate average of 4 per cent all the way to 1573. After that year, they decline again until 1603 and then settle at about 1.5 per cent.⁶ Data limitations prevent us from comparing Genoese yields with those received by holders of Venetian and Florentine 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 and voluntary lenders (such as foreigners); and these differences are noted by Mueller. But yields were also affected by the noted practice of delaying interest payments. 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 1997, p. 473). Since values of discounted *paghe* are available for Genoa and not for Venice, the current yield for Venice, d/p , has an upward bias relative to the yields in Genoa, d^a/p . Ignoring this bias, Genoese yields, on average, were very close to Venetian yields for the period 1535–76; see Table 1.⁷ Homer and Sylla

⁶ The average value of the yields from 1522 to 1573 is 3.88 per cent, from 1574 to 1603 2.59 per cent, and from 1604 to 1739 1.45 per cent.

⁷ Our series on Genoese debt starts in 1522 and overlaps the data in Mueller's Table 11.3 for the period 1535–76. Mueller gives four yields for the period 1535–48 and again four yields for the period 1549–76. The average of the four yields for the first period is 2.5 per cent and for the second is 4 per cent. The average for the 14 Genoese yield observations from 1535 to 1448 is 3.82 per cent and for the 27 observations from 1549 to 1576 is 3.76 per cent.

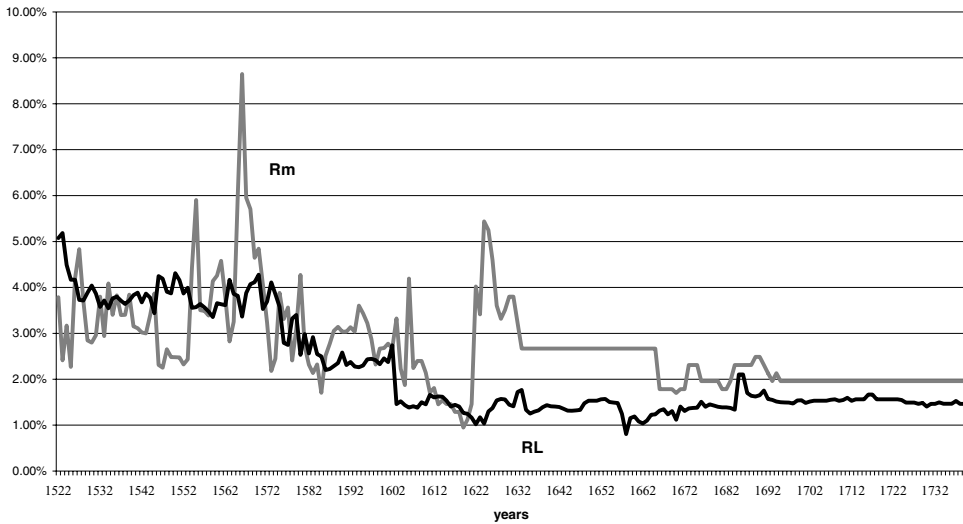


Figure 1. Short and long-term yields on San Giorgio.

Table 1. Interest rates in Genoa, Venice and Holland (per cent).

Period	Genoa	Venice	Holland
1382–85, yearly average	8.83	14.85	
1386–1407, yearly average	7.03		
1386–1420, yearly average			
Forced loans		8.8	
Voluntary loans		6.13	
1522–49, yearly average	3.95		
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 Holland, interest rates refer to government loans (Hart 1999, Figure 9.3). The data on Genoese yields from 1386–1407 come from Day (1963).

(1991, pp. 120–1, Table 9) compare interest rates in sixteenth century Genoa and Venice, but that comparison mixes money market rates in Genoa with perpetuity yields in Venice.

Yields on San Giorgio *luoghi* were among the lowest if not the lowest of the period under consideration. Table 1 shows that San Giorgio current yields were lower than interest rates on government loans in high-reputation Holland in the sixteenth and seventeenth centuries. This pattern of interest rates is consistent with our account that San Giorgio was perceived to be solid and of low credit risk. The evidence reported by Day (1987, Table 8.1), that the difference between interest rates based on par-value debt in Genoa and Venice and Florence fell after the creation of San Giorgio, further reinforces this assessment.

In Florence, early lending to government – dating back to the thirteenth century – was compulsory and, as in Venice, based on a wealth census, the *estimo* (Molho 1971, ch. 4; Conti 1984, pp. 10–16). In 1343, debt was consolidated in the *Monte Comune*, along the Venetian model, at a 5 per cent interest rate (Conti 1984, pp. 30–1). Large losses were incurred by *Monte* owners. Pressure to restore market interest rates led to shady practices such as creating *Monti* issuing units with nominal values twice or three times the amount actually borrowed (Molho 1971, pp. 64–5). A new debt consolidation at a 5 per cent interest rate took place after the 1378 Ciompi revolution (Molho 1971, pp. 66–7). When compulsory loans turned out to be inadequate to cover budget deficits, and this was the case during times of war, government resorted to short-term voluntary loans. In Medicean Florence, this voluntary lending was heavily concentrated in the hands of a financial élite who were often key decision-makers in the administration of communal finances. Interest rates charged on these loans were not only much higher than interest rates received by citizens on compulsory loans but higher than rates prevailing in either Genoa or Venice (Molho 1971, pp. 164–82; Molho 1995, p. S 1210; Pezzolo 2003, p. 74).

Monte Comune units, issued with a par value of 100 florins, traded at a sharp discount because of the low coupon relative to market interest rates and the risk that government may tax, reduce, delay, or skip interest payments altogether. In fact, all these possibilities occurred. Interest payments were first taxed at 25 per cent at the start of the fifteenth century and then reduced repeatedly through the century. Interest payments were delayed in 1444, 1449, 1450, 1454 through 1459, and after 1467; back payments were cancelled in 1483 and 1489; and interest was paid only in part from 1488 to 1492 (Conti 1984, pp. 31–5, 57, 362–3). Data on market prices of *Monte Comune* are incomplete. Its highest value was 61 florins, during the period 1418–1423, and before the war against Milan in 1423 (Conti 1984, p. 32). Then, prices fell to 25 in 1432 as Florence was fighting another disastrous war, this time against Lucca; fell further, to 16 in 1444, as the after-tax coupon was reduced; fell further, to 14 in 1453–57, as Florence was fighting the

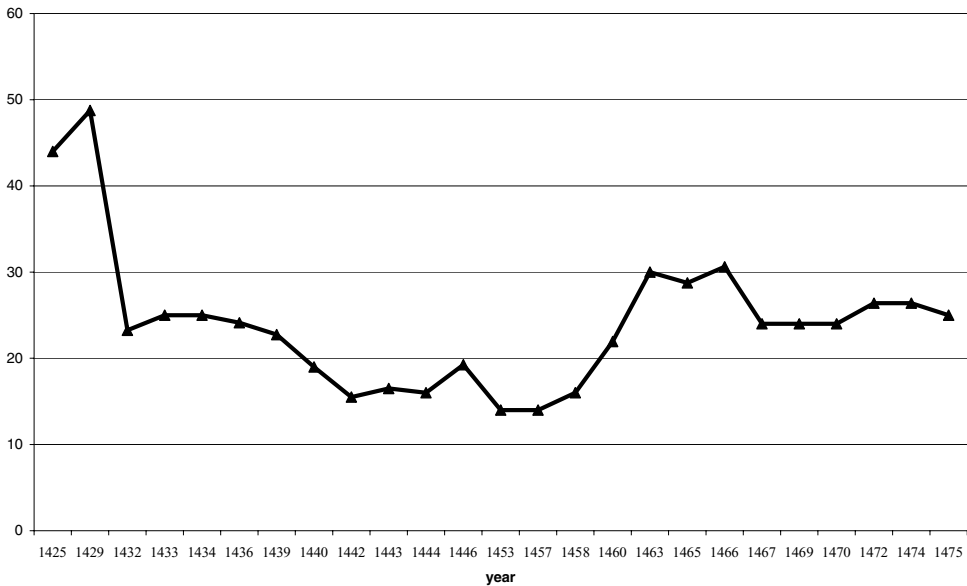


Figure 2. *Prices of Monte Comune debt, 1425–1475.*

Source: Conti (1984, 1).

Aragonese and implemented a new tax on interest payments; rose steadily for the next ten years before taking another downturn (see Figure 2). By 1491, prices had reached 11.5 florins (Conti 1984, p. 363). In brief, *Monte Comune* was a financial disaster for the taxpayer-investor.

In Florence, long-term voluntary lending to government was introduced in 1425 in the form of a specialised social insurance system called *Monte delle Doti* (Dowry Fund). This Fund had the twin purpose of providing finance capital to starting families and reducing the large stock of the *Monte Comune* (Molho 1994). After a few false starts, it became very popular: the investment was much better than *Monte Comune* shares in terms of yields and market risk. Initially, a father could deposit into the Fund 100 florins for each of his daughters for a term of either seven and half years or fifteen years, yielding an annual compound interest rate of 12.99 per cent and 11.33 per cent, respectively. If the daughter died before the deposit maturity, the yield would be zero and the initial amount of the deposit was returned to the father (Molho 1994, pp. 34–8). With the probability of payment before the age of 20 estimated at approximately 0.75, the expected annual yield of a 15-year deposit was 8.5 per cent.⁸ This was the current yield on *Monte Comune* shares in 1425 (Conti 1984, p. 34), but these shares carried a very

⁸ The probability of non-payment is the sum of the probability of death and the probability of a girl becoming a nun. Morrison *et al.* (1977, pp. 491–92) estimate the former at 0.21 for girls registered in the Fund and the latter at 0.025.

substantial market risk. Hence, it is not surprising that the Dowry Fund grew in relation to the *Monte Comune*: it combined aspects of a social insurance system with promised yields that were competitive with the current yields of the risky *Monte Comune* shares.

The Dowry Fund failed in the second objective, the reduction of government debt. The Fund was backed by shares of the *Monte Comune*: increases in deposits implied a reduction of *Monte Comune* shares in the market, and *vice-versa*. The creators of the Fund thought that a successful Fund would have brought about a steady reduction of privately-held government debt. But they did not count on government's low reputation for restraining expenditures, driven often by costly and lengthy wars. Prices of the *Monte Comune* suffered a secular decline, as we have shown above. This meant that the Fund was selling more *Monte Comune* shares for each florin of redeemed deposits than it was buying for each florin of created deposits (Conti 1984, p. 42). Furthermore, the Fund had characteristics of modern pay-as-you-go social security systems. As the Fund grew so did its surplus, the difference between deposit creation plus interest and deposit redemption. That surplus became too tempting for government officials not to tap into. In fact, it soon became difficult to separate the Dowry Fund's accounts from the the city's general budget accounts (Molho 1994, p. 50). By 1470, the Fund had failed to pay 50,000 florins to husbands entitled to dowries (Molho 1994, p. 51). Many reforms to make the Fund viable were discussed and implemented but all of them failed to go to the heart of the problem, the weak commitment of government not to raid the Fund to cover budget deficits. The Fund withered and was virtually dead by the end of the Republic in 1530 (Conti 1984, p. 69).

To sum up, commitment mechanisms differed in Genoa, Venice and Florence. In Genoa, current government spending had to match current borrowing, primarily from San Giorgio. In Venice and Florence, the state set tax rates and forced borrowing to match government spending, including interest payment on debt. The state was the protagonist of the commitment device in Venice and Florence, but in Florence this commitment was weaker than in Venice. The weaker commitment mechanism in Florence, in turn, reflected weaker property rights institutions driven by the power of the élites, an outcome that is consistent with the empirical analysis on modern data by Acemoglu and Johnson (2005). The Venetian state was not only more impartial than in Florence but more involved in creating a public environment for trade and finance (González de Lara 2005).

Genoa stands in sharp contrast to the other two city-states: the state relinquished the commitment mechanism to San Giorgio. Machiavelli (1965, pp. 494–5), an early admirer of San Giorgio, coined the felicitous phrase of San Giorgio being a 'state within a state', but a benevolent and well-administered state within the fractious and unstable state that was the Republic. While it is true that San Giorgio represented the interests of

the Republic's creditors, it was also concerned about the economic and political viability of the state. San Giorgio's management monitored closely the affairs of the Republic and was able to differentiate financial difficulties due to opportunistic behaviour from difficulties caused by exogenous shocks. By being lenient under moments of stress, the creditor was ensuring the economic viability of the debtor. It was compassionate behaviour, but it was also a smart strategy (Fratianni 2006). The commitment mechanism in Genoa passed through the creditors' association of San Giorgio, which, by imposing effective constraints on the debtor and by being forgiving in times of financial stress, greatly diminished default risk.⁹ Neither Venice nor Genoa defaulted on debt principal, but they often delayed paying interest. Thus, the commitment mechanism of these two republics must be judged weaker than the English.

3.2. *Public banks*

Genoa, Venice and Florence were major finance centres in the period under consideration.¹⁰ According to De Roover (1966, p. 125), Florence was at the frontier of banking in the *Quattrocento*. The superior organisational structure of the Medici bank, based on the modern holding company, facilitated the internationalisation of banking business, so important for the payment mechanism and papal remittances. Florentine banking fortunes declined with the demise of the Medici bank in 1494. Then, the frontier moved to Genoa and Venice. As with international commerce, traditional accounts give an advantage to Venice. But a more careful analysis of actual records yields a different assessment, with Genoa being the more innovative of the two in financial instruments and markets. For example, Lopez (1964, pp. 462–3) states that 'shortly before 1600, Genoa virtually became the financial capital of the Catholic world, even as Amsterdam was becoming the financial capital of the Protestant countries'. Ramón Carande (2000, p. 533) dates the dominance of Genoese bankers at the Spanish court in 1553. Braudel (1992, p. 157) summarises that the period 1557–1627 is the age of Genoese finance, when '...the merchant-bankers of Genoa, through their handling of capital and credit, [called] the tune of European payments and transactions.' For Felipe Ruiz Martín (1991), the age of the Genoese, at

⁹ This is also the implication of sovereign debt where reputation alone is not sufficient to sustain a positive amount of lending; the creditor must be able to impose a large enough penalty on the debtor; see Jeremy Bulow and Kenneth Rogoff (1989). An example of debtor's constraint was the imposition, in 1539, not to raise taxes without the consent of San Giorgio's management. This constraint was qualitatively similar to the prohibition that the Bank of England could not lend to the Crown without the explicit approval of the English Parliament.

¹⁰ The roots of banking can be traced all the way back to 1150 in Genoa (Sieveking 1906b, p. 49) and 1164 in Venice.

least insofar as Spanish finances are concerned, extends until the end of the seventeenth century.

Genoa and Venice developed public banks, whereas Florence did not (De Roover 1966, p. 19). In Genoa, the first public bank emerged in 1407 with the creation of *Banco di San Giorgio*, a unit of the *Casa*. The *Banco's* primary mission was to facilitate the management of the *luoghi* (Sieveking 1906b, p. 46). The *Banco* was in competition with other banks (Sieveking 1906b, p. 49). Banking transactions to the public were closed in 1445 and were resumed again in 1530; during this time interval, banking activities were restricted to the state, shareholders, tax collectors and suppliers (Felloni 1990b, pp. 77–82). The *Banco* was permanently closed in 1805.

The *Banco* carried four types of transactions: deposits, specie transactions, loans, and handling of interest payments on *luoghi* (Assini 1995). Deposit accounts were used by customers to settle payments. The giro system reduced the use of scarce specie and raised the velocity of narrowly defined money. The *Banco* and other Genoese bankers, furthermore, dominated the Besançon and Piacenza fairs where the bulk of the international settlement took place (Van der Wee 1977, p. 321). Cash transactions involved the deposit and withdrawal of specie. Being a public bank, *Banco di San Giorgio* had to guarantee that the depositor could receive specie on demand. Despite this constraint, the *Banco* extended loans to the Republic, tax farmers, and its own clients by allowing deposit accounts to run overdrafts (Assini 1995, p. 270). These were exchanged among clients as part of an extended credit network. Interest on San Giorgio *luoghi* were credited in the accounts of *luogatori* four times a year (February, May, August, and November) but before they could be cashed (Assini 1995, p. 277). Initially, the payment delay was nine months but later it grew. The books registered the date of maturity of the *paghe*; *luogatori* who had claims on a future cash flow would use the *paghe* to extinguish a debt. For example, an owner of *paghe* could use them to settle a debt maturing into the future or to pay taxes. When the maturity of the *paghe* was longer than the maturity of the debt, the *paghe* had to be discounted. *Paghe* were actively exchanged at their own money of account, *lire di paghe*. Jacques Heers (1961, pp. 159–72) has an extensive discussion of the *paghe* market and of the use of *lire di paghe* as bank money. This was Genoa's money market and was a great innovation.

As mentioned, *Banco di San Giorgio* suspended operations with its 'external' clientele in 1445 and resumed them again in 1530; this for two reasons. The first was the increasing pressure the Republic was exerting on the *Banco* to obtain short-term loans. According to archival data compiled by Felloni (1990a, Table 2), loans to government grew at a compound annual rate of almost 20 per cent from 1409 to 1432. The second was the government imposition that the *Banco* make cash payouts at the legal rate of 42 *soldi* for

one florin when the market price was higher.¹¹ This gave incentives to deposit *soldini* in the bank and withdraw florins. To adhere to the legal exchange rate, the *Banco* was forced to acquire florins at market prices and lose on each cash withdrawal. According to its income statement, the *Banco* made a profit in only 6 out of the 37 years it was in existence (Felloni 1990a, Table 3). Losses were the norm and were large. The enforcement of the legal exchange rate was bleeding the *Banco di San Giorgio*. In 1445, when faced with the ultimatum of either respecting the loss-making legal exchange rate or close operations, San Giorgio opted for the latter (Felloni 1990a, p. 243). Banking transactions for *luogatari*, government and tax farmers continued as usual. When the *Banco di San Giorgio* reopened in 1530, it accepted deposits with all types of large coins valued in terms of the bank's unit of account, the *lira in numerato*. As early as 1610, bank notes were introduced in circulation and became a substitute for coins.

The first Venetian public bank was the *Banco della Piazza di Rialto*, or *Banco di Rialto* for short, established in 1587. A second public bank, *Banco Giro*, was created in 1619. *Banco Giro* gradually displaced the *Banco di Rialto*, which ceased operations in 1637 (Tucci 1981, p. 250). Technically, the *Banco di Rialto* was no different than the older script banks (*banchi di scritta*) in the Rialto that accepted *giro* accounts, an innovation prompted by currency scarcity and high costs of information regarding the vast range and often poor quality of coins. The critical difference was that the *Banco di Rialto* had a solvency guarantee from the state and the older *banchi* did not.¹² Like its successor, the Wisselbank of Amsterdam, the *Banco di Rialto* was a monopolist and centralised the clearing mechanism. Payments through the *giro* system were less costly than payments settled with specie; hence, a premium rose for payments *in banco* relative to those in specie, as would happen later with the Wisselbank in Amsterdam (Kohn 1999, p. 23).

¹¹ Money scarcity prevailed in much of 14th and 15th century Europe (Day 1987, ch.1). This scarcity was driven by a decline in gold and silver production and a chronic deficit in the European current account with respect to the Levant. Mining was plagued by diminishing returns, given a stagnant technology. In an attempt to cope with money tightness, the Genoese government lifted import duties on bullions and coins in 1400 and placed an embargo on the exports of gold coins in 1402 (Day 1987, pp. 27–8). At the same time, the price of the high-value florin coin was rising in relation to the small-value *soldino*. Popular sentiment was that bankers were responsible for the premium on gold coins, and government felt compelled to resist the appreciation of the florin by enforcing its legal price in terms of *soldino*. Against this background, the *Banco di San Giorgio* emerged in 1407 with a charter to stabilise the currency, in particular the exchange rate between high and low-value coins (Felloni 1990a, p. 228).

¹² For early banking in Venice, see Mueller (1997, ch. 1). It should be pointed out that the first public bank was the *Taula de Canvi*, established in Barcelona in 1401. However, the *Taula* was not as purely a payments bank as the *Banco di Rialto* inasmuch as it lent heavily to the city.

In 1619, the *Banco Giro* was launched to manage Venice's floating debt. This bank lent to government at short maturities and obtained, in exchange, that its deposit liabilities be treated as legal tender (Day 1987, p. 153; Zannini 1998, p. 444). In other words, the *Banco Giro* was an issue bank, except that rather than issuing bank notes like the Bank of England, it issued book-keeping entries. These soon rose to a premium with respect to currency. Over time, the *Banco Giro* out-muscled and out-competed the *Banco di Rialto* because of the close connection it had with government.

In summary, if the closest predecessor to the Wisselbank of Amsterdam is the *Banco di Rialto*, the closest predecessor to the Bank of England is the *Banco Giro*.

3.3. *Financial and monetary innovations*

Our discussion, so far, has emphasised the institutional mechanisms that permitted Genoa and Venice to issue large amounts of public debt at relatively low cost for the issuer. Florence, instead, had to pay a much higher cost of debt for its much weaker commitment to honour debt. These mechanisms, with their differences, developed in conjunction with innovations in financial and monetary instruments and in markets. In what follows we emphasise five innovations: the perpetual debt instrument, the marketability of debt instruments, the money market, the interaction between credit and money markets, and the social insurance system.

In Venice, public debt was a perpetuity as early as 1262, in Florence a century later, and in Genoa in 1538. We have seen that both Genoa and Venice could borrow at relatively low rates of interest. Their governments, like the government of England in the 1700s, understood well the gain in financial freedom from lengthening the maturity of debt; but this could not be done unless the issuer was reputable. Credibility in servicing the debt was of the essence. The Venetian commitment to service the debt in the 1400s and 1500s was qualitatively similar to the English commitment of the late 1600s. The Genoese commitment was different in having transferred to the monopolist creditor the burden of reputation and ability to keep the debtor 'honest'. The Venetian approach was statist; the Genoese market friendly. Both survived for centuries. The Venetian was copied, the Genoese was not.

The second innovation resided with the very nature of San Giorgio. This institution engrafted – using English financial terminology of the seventeenth century – public debt onto its capital; or, what today we would call a swap of debt for equity. In addition to the credibility of the equity-issuing firm, this conversion was successful because of the gain associated in transforming high transaction cost and difficult-to-trade debt instruments into transferable and liquid shares (Neal 1990, pp. 96–7).

The third innovation was the Genoese money market, arising from interest payment delays on San Giorgio *luoghi*. Recent archival research by Professor

Felloni has revealed that dividend payment delays varied greatly over time, rising from 50 months in 1518 to a maximum of 116 months in 1553, and then settling to 64 months from 1579 to the end of our sample period.¹³ It follows that investors were unsure of the exact time of interest payments. Assuming perfect foresight on time delay (t) and the data on declared dividends (d) and discounted dividends (d^a), we can compute the expected money market interest rate, R_m :

$$R_m = (d/d^a)^{1/t} - 1. \quad (1)$$

Figure 1 displays the R_m series as well as the R_L series discussed above. R_m tends to be higher than R_L . Furthermore, it is much more variable than the long-term rate, a likely contributing factor to the differential between R_m and R_L . Important as this innovation was for the domestic market, there is no evidence that it had a direct spillover onto the practice of discounting bills of exchange until the time when these were endorsed.¹⁴ This may not be for lack of knowledge, given that the Genoese also brought to life the prototype bill of exchange.¹⁵ It may well be that the Church ban on charging interest without bearing a risk was the main reason preventing the spreading of discounting (De Roover 1974, pp. 210–11).

The fourth innovation deals with the method Genoese merchant bankers used to link the so-called Besançon exchange fairs to the international means of payment. The Genoese set up these fairs, among which were those in Besançon and later in Piacenza, in 1535, after having been forced out of the fairs in Lyons. The Besançon fairs became a large credit market, where letters of exchange were not only cleared but re-issued time and again (Day 1963, p. 148). Braudel (1992, p. 168) arrives at the conclusion that as a result of these 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.’ These funds were used by the Genoese merchant bankers to lend to the Spanish Crown. Starting with 1566, the Genoese obtained from the Crown long-term securities (*juros de resguardo*) as collateral for their loans; the contracts specified that these securities would be sold if the Crown did not repay the loans (Lovett 1980, p. 905). The Genoese received an interest rate equal to the difference between the interest rate on the loan and the interest rate on government securities; in essence, the bankers had worked out an interest

¹³ We thank Prof. Felloni for the data on dividend delays.

¹⁴ According to De Roover (1974, p. 221), endorsement became diffused in the seventeenth century.

¹⁵ Raymond de Roover (1974, p. 203), the acknowledged expert on bills of exchange, arrives at this conclusion from a notarial instrument called *instrumentum ex causa cambia* found in Genoa’s archives.

rate swap. Furthermore, the Crown sold silver spot in Spain to the Genoese in exchange for future delivery of gold in Antwerp, where the gold was used to pay Spanish troops fighting in the Low Countries. The cost to the Genoese delivering gold up north, through letters of exchange, was a fraction of the cost of shipping silver – including the high risk of predation – from Spain to Antwerp. The Genoese advantage was driven by ‘increasing returns to scale in international financial services’ (Conklin 1998, p. 499). The Genoese sold silver to Italian merchants who, in turn, shipped it to the Far East to settle a trade deficit. In exchange, the Genoese received letters of exchange that allow them to buy gold for delivery in Antwerp. Thus, the merchant bankers of Genoa brought into equilibrium a web of long and short positions through the use of credit (Braudel 1992, p. 168; Conklin 1998, p. 499). This was global finance at its best.

The fifth and last innovation is Florence’s *Monte delle Doti*, an imaginative and successful social insurance scheme aimed at solving a serious demographic problem. A great deal of experimentation was required before the Fund became successful: by trial and error the Fund’s creators learned about the degree of risk aversion of Florentine fathers (Molho 1994, pp. 34–5). Modern pay-as-you-go social insurance systems are based on the same principle of the Dowry Fund, with the exception that deposits in the Fund were voluntary whereas in modern social security systems are compulsory. Whether voluntary or compulsory, however, the solidity of the Fund depends ultimately on the borrower’s commitment to honour debts. Just as with modern governments, the Florentine government in the 1400s could not resist the temptation to raid the surplus of the Fund and, consequently, undermine its ultimate viability. The big difference between now and then is that in Florence the fathers had a choice and, having understood that the borrower’s commitment was weak, eventually refused to deposit florins for their daughters’ dowries.

4. Conclusions

Our main question whether the term financial revolution applied primarily to late seventeenth century England overstates the case in the sense that it ignores a long chain of financial evolution, in particular the contributions of Italian city-states a couple of centuries earlier. The upshot is that three Italian city-states, but especially Genoa and Venice, had developed many of the features that were to be found later on in the Netherlands, England and the United States.

Long-term debt in Venice was funded by a legitimate government setting aside specific tax revenues to service the public debt. In the early period, loans to the state were compulsory and based on income; later they became voluntary. The same was true in Florence, although with a much

weaker commitment mechanism. In Genoa, the commitment mechanism was different from Venice. Genoa, more politically divided than Venice, relinquished control over most of its tax revenues to San Giorgio. San Giorgio represented the interests of the state's creditors, but at the same time it was also concerned about the economic and political viability of the debtor. Both Venice and Genoa did not default on debt principal, but often delayed paying interest. Thus, the commitment mechanism of these two republics must be judged weaker than the English. On the other hand, both Genoa and Venice – Genoa more than Venice – carried a low cost of debt. Despite interest payment arrears, investors believed in the state honouring its promises and were willing to accept a lower return on invested funds. Genoa and Venice, more than Florence, understood the importance of the link that exists between reputation and the cost of debt.

Both Genoa and Venice had their own public banks. San Giorgio was also a predecessor of the Bank of England inasmuch as it invented engraftment, the modern debt-for-equity swap. The three cities had a perpetual debt. The Genoese more than the Venetians were financial innovators; Florence came behind. Genoese merchant bankers had a global reach and understood how to operate in both the credit and money markets, linking the two to exploit profitable arbitrage opportunities.

Clearly, there is a limit to how far we can carry the comparison of the three Italian city-states of the 1400s and 1500s with more recent 'financial revolutions'. Genoa, Venice and Florence did not have stock exchanges and the intense trading that occurred in Amsterdam, London or New York in later centuries. Another difference is the potential role of capital flows on economic development and growth. Genoa was a net capital exporter, in contrast to capital-importing Amsterdam, London and New York. Traditionally, economic development occurs with a current-account deficit and net capital inflows. Could there be a negative association between capital export and the persistence of good institutions? We leave this as a question for future research. One could also argue that San Giorgio was too dominant in Genoa and prevented the creation of a vibrant financial industry. Yet, a monopolised market structure was not unique to Genoa; the *Wisselbank* in Amsterdam was a monopolist as well. Again, this is a theme for future research. Lastly, we cannot ignore the fact that Genoa, Venice and Florence did not survive as political entities and, consequently, had no opportunity to refine their innovations. It is tempting to suggest that political survival declines, other things being the same, as the size of the nation shrinks. What is surprising to most modern readers is that Genoa, Venice and Florence lasted that long. Their economic and financial greatness – again, Genoa and Venice primarily – postponed the inevitable political demise. When that demise arrived, their innovations were absorbed in the long chain of financial evolution and, in the process, lost the identity of the creators.

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