

# What did Notaries and Town Secretaries Do? The Pricing of Risk in Local Credit Markets in the Low Countries, 1500-1800.<sup>1</sup>

Very, very preliminary draft

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## Abstract

We explore financial market development in preindustrial Europe by examining the services supplied by notaries and town secretaries. Using a new dataset of 13,000 credit transactions registered in six different cities in the Low Countries between 1500 and 1780, we analyse who used these financial services, for which purposes, and at what price. We find that large sums could be allocated to businessmen and small loans to individual private borrowers, and that notaries and town secretaries used the information available to them to assess the risk of individual loans. Yet they failed to obtain a commanding position on the capital market in the way Parisian notaries did. In the Low Countries notaries and town secretaries remained locked up in one, comparatively small, market segment, largely because they did not possess the information advantage of their French counterparts. Our findings highlight the degree to which subtle regulatory differences profoundly affected the dynamics of financial market evolution.

## 1. Introduction

Well-functioning financial systems contribute to the growth and development of economies (Levine 1997, Sylla 2002), but countries with similar performance show wide differences in how their respective financial systems are configured. Despite a long-running debate about the respective merits of particular configurations, say banks versus markets or the presumed advantages of *Universalbanken*, we do not know what the optimum configuration is, still less what explains the differences from one country to another (Sylla and Toniolo 1991; Fohlin 1999; Levine 2002; Carlos and Neal 2011; Calomiris and Haber 2014). This matters all the

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more in the light of the recent financial crisis, which affected some systems far more than others (e.g. Bordo et al. 2015).

The history of Europe before the Industrial Revolution can help to explain differences between financial systems but we have to tread carefully. Financial history research all too often focuses on early examples of deposit banking and securities trading in Holland and England in the seventeenth and eighteenth centuries, or Italian and Flemish cities in the late medieval period. Tracing the pedigree of institutions that dominate financial markets today is important, but it also distorts our view on the funding of business in Europe before the Industrial Revolution. Not only were most firms financed directly, through family deposits, partnerships, suppliers' credit or money market loans, but there also existed a very large and diverse group of intermediaries – money changers, notaries, cashiers, attorneys, and town magistrates – who have long gone but at the time played a very important role in the financing of business operations.

The pioneering work of Hoffman, Postel-Vinay, and Rosenthal (2000) on French notaries has taught us how capable intermediaries other than banks and stock exchanges were in performing key financial functions. Parisian notaries exchanged the information they gathered from the sales of property, the issuing of government debt, and the management of the estates of deceased clients, and then build on this pool of shared knowledge to match the supply and demand for funds of their respective clients. In subsequent work Hoffman et al. (2015) documented similar operations by notaries elsewhere in France. But notaries were not the only public officials offering such services. In several counties in seventeenth-century England attorneys played a similar role, while in German towns, already in the late medieval period, local magistrates organized the sales of private annuities, which throughout the early modern era remained one of the principal credit instruments capitalizing future income from landed property and real estate (Schnapper 1956; Baum 1976; Van Bochove et al. 2013) .

In this paper we explore the case of the Low Countries, where from the sixteenth century onwards both forms of debt registration and related intermediation existed side-by-side. Just like in Germany, town secretaries throughout the Netherlands registered life and term annuities from the fourteenth century onwards (Soly 1974; Van der Heijden 2006; Zuijderduijn 2009). Then, from around 1530, public notaries widened their range of legal services. Working under a public seal they started supporting local entrepreneurs wanting to formalize miscellaneous contracts either as a precautionary measure or as a first step in legal proceedings. In doing so notaries in the Netherlands also built a valuable store of information which they could use to provide businessmen with an even wider range of services, including the writing of freight contracts and the buying and selling of real and financial assets. Thus, from the late sixteenth century onwards, entrepreneurs in the Low Countries could choose between the town hall and the offices of local notaries to register private credit transactions.

Wanting to establish the relative importance of these solutions, we built an extensive, new database of almost 13,000 credit transactions registered by town secretaries and notaries in six different cities in the Low Countries between 1500 and 1580. The six cities are Amsterdam, Utrecht, Den Bosch, Leiden, Antwerp, and Ghent. The sample was compiled to reflect differences in political regime and economic outlook. Until the end of the sixteenth century all six cities belonged in the Habsburg empire, but thereafter the northern cities - Amsterdam, Utrecht, Leiden, and from 1628 onwards, Den Bosch – became part of the Dutch Republic, whereas Ghent and Antwerp remained in the Habsburg empire. As for their economic position, Antwerp and Amsterdam were major international financial and trading hubs, while Ghent and Leiden were manufacturing cities.

Using this new dataset, the present paper tries to answer three related questions. First, we measure the relative importance of each of the two forms of intermediation through a comparison of the number and value of loans – both in absolute numbers and per capita – registered in the six towns from the sixteenth through eighteenth centuries. Second, we analyse what kind of debts were registered looking at the loan terms, purpose, and possible personal relationships between debtors and creditors. Finally, we use these loan characteristics in a multivariate regression analysis to determine how risk was priced in these credit markets and with what level of precision this was done.

## **2. Urban private debt in the Low Countries**

In the late medieval period real estate owners all over Europe habitually sold annuities to discount future revenue from the land and houses they owned.<sup>2</sup> In the fourteenth century urban governments also began to sell life- and term-annuities to anticipate future tax revenues.<sup>3</sup> As a result, at the turn of the sixteenth century, private and public annuities markets thrived in large parts of Europe.<sup>4</sup> The Low Countries were no exception. By 1500 every major town in the Habsburg Netherlands had become used to selling annuities to meet its financial obligations towards the central government. As a matter of course, urban and rural property owners mortgaged their land and houses, either to fund the initial purchase or to free up capital for other investments.

Local governments in the Low Countries obviously administered their own debts but they also took on the registration private annuities. Debts recorded before the town

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<sup>2</sup> Munro

<sup>3</sup> E.g. Van der Heijden\*\*\*

<sup>4</sup> On Tuscany: Herlihy; on Catalunya: Fynn-Paul; on France: Schnapper; on Germany: Baum; on Flanders: Dambryne; on Brabant: Soly; on Holland: Zijderduijn\*\*\*, Zijderduijn, De Moor, and Van Zanden\*\*; England was the exception: Van Bochove et al.

secretaries offered legal security to borrowers and lenders, including clear proceedings for debt recovery in case of default, and the limitation of the amount of debt heaped upon individual properties. At the same time the town councils did not limit the recording of debts to life and term annuities. In market towns it was common practice for the local authorities to record whichever debts issued from commercial transactions on its weekly markets or annual fairs.<sup>5</sup> The cities also began to register *schepenkennissen*, a public alternative to the promissory notes used by merchants and other private entrepreneurs. In some of the bigger cities in Holland we find a further elaboration of this practice in the seventeenth century, with local orphan chambers issuing so-called *weesmeesterkennissen*. These were loans from the estates of orphaned children, contracted between the local orphan masters and private individuals.

To establish how important local officials in the Low Countries were for the organization of private credit markets between 1500 and 1800 we systematically collected data from the two main debt registries: the private annuities secured on real estate and the *schepenkennissen*. For six cities we extracted the data from these municipal records for up to eighth benchmark years: 1500, 1540, 1580, 1620, 1660, 1700, 1740, and 1780.

*Table 1. The Annual Number of Debt Contracts Recorded by Town Secretaries in Six Cities in the Low Countries, 1500-1780*

<b>Year</b>	<b>1500</b>	<b>1540</b>	<b>1580</b>	<b>1595</b>	<b>1620</b>	<b>1660</b>	<b>1700</b>	<b>1740</b>	<b>1780</b>
Amsterdam <sup>a</sup>			116	527	1149	1187	506	530	522
Antwerpen	355	297	109		172	236	131	82	48
Den Bosch			211		485	170	273	80	29
Gent	748	499	112		105	56	13	1	20
Leiden					160	190	73	155	61
Utrecht		50	76		184	92	43	97	48

Source\*\*\*; (a). From 1620 onwards, the total number of contracts for Amsterdam is based on all contracts recorded in the city's *Rentenboeken* and a 20% sample from the city's *Schepenkennissen*.

The annual number of contracts, reported in Table 1, shows that town secretaries in each of these cities were active registrars of private debt contracts. The intensity of their efforts varied over time, however. In Antwerp and Ghent the municipal government recorded decidedly more contracts in the first half of the sixteenth century than in any of the later years. Towards the end of the sixteenth century we already find considerable numbers of

<sup>5</sup> Cf. the *lettres de foire of Ypres*, recorded as early as the twelfth centuries but also the debt registries kept by towns like Gouda (pilot Heleen Kole) and Utrecht (see below) around 1500. Cf. also the debts recorded in villages in Holland in the fifteenth centuries: Zuijderduijn, Medieval capital markets.

contracts in Amsterdam and Utrecht. In 1620 and 1660 the secretaries in the northern cities were most active. Thereafter, their recording activities gradually became less intense.

For a proper comparison between the six cities – with populations of very different size – we must calculate the number of contracts per 1,000 inhabitants. This ratio, recorded in Table 2, shows that the involvement of the town secretaries in credit transactions was generally very limited. Only in Ghent and Antwerp in 1500, in Amsterdam in 1620, and in Den Bosch between 1580 and 1700, the town secretaries recorded 10 or more debt contracts per inhabitant. In all other cities and other years the municipal registration was limited to anywhere between 0 and 10 contracts per inhabitant.

*Table 2. Number of Credit Transactions per 1,000 Inhabitants Recorded by Town Secretaries in Six Cities in the Low Countries, 1500-1780*

Year	Amsterdam	Den Bosch	Leiden	Utrecht	Antwerpen	Gent
1500				0,0	10,8	16,6
1540				2,1	5,4	8,3
1580	3,9	11,9		2,8	1,3	2,7
1620	10,9	26,9	3,6	6,1	3,2	2,8
1660	6,7	18,9	2,8	3,1	4,1	1,2
1700	2,2	25,3	1,1	1,6	2,0	0,3
1740	2,4	6,4	4,1	3,8	1,3	0,0
1780	2,4	2,3	2,0	1,5	0,8	0,4

Source\*\*\*

Even though the number of debt contracts was relatively small, the sums of money involved may still have been considerable. Table 3 shows that Amsterdam's market in particular was quite sizeable. The loans registered in 1620 amounted to more than 1 million guilders, and forty years later, in 1660, the total value of loans amounted to no less than 2.5 million guilders. In the eighteenth century the amount of loans per year in Amsterdam varied between 1.2 and 1.8 million guilders. None of the other markets came even close to Amsterdam in terms of loan volume. This was only partially due to the smaller size of the other cities. As Table 4 shows, the per capital value of loans was almost nowhere as high as in Amsterdam in 1620 (10,50 guilders) and 1660 (14,10 guilders). Only Den Bosch stood out with similar levels in 16120 and 1700. In all other cities the per capita value of loans seldom exceeded 5 guilders.

*Table 3. Annual Value of Credit Transactions Recorded by the Town Secretaries in the Six Cities in the Low Countries, 1540-1780*

Year	1500	1540	1580	1620	1660	1700	1740	1780
Amsterdam				1,098,797	2,509,129	1,230,535	1,807,757	1,500,816
Antwerpen	41,535	69,795	58,424	152,908	320,724	186,020	71,996	52,944
Den Bosch			30,384	193,030	79,050	147,966	57,360	16,327
Gent	28,424	31,437	28,336	50,925	57,232	18,759	5,400	66,900
Leiden				75,360	214,890	57,962	119,195	48,434
Utrecht		5,500	20,064	96,232	94,484	33,755	115,818	50,208

Source\*\*\*

*Table 4. Per Capita Value of Credit Transactions Recorded by Town Secretaries in Six Cities in the Low Countries, 1500-1780 (guilders)*

Year	Amsterdam	Den Bosch	Leiden	Utrecht	Antwerpen	Gent
1500					1,3	0,6
1540				0,2	1,3	0,5
1580		1,7		0,7	0,7	0,7
1620	10,5	10,7	1,7	3,2	2,8	1,4
1660	14,1	8,8	3,2	3,1	5,6	1,2
1700	5,3	13,7	0,8	1,2	2,8	0,4
1740	8,2	4,6	3,1	4,6	1,2	0,1
1780	6,8	1,3	1,6	1,6	0,9	1,3

Source

### 3. Notaries in the Low Countries

In *Priceless Markets* Hoffman et al. show how notaries in early modern Paris stood at the center of the financial system. As drafters of formal legal documents, they possessed detailed information on the financial demands and creditworthiness of their clients. The notaries used this information to place public loans and to match borrowers and lenders in the private market. The notaries also shared information with each other which reduced information asymmetries even further. In subsequent work Hoffman et al. have shown that notaries in other French towns and villages operated in a similar fashion.

In the Low Countries a royal ordinance issued by Charles V in 1530\* formally sanctioned the right of notaries to act as registrars of private contracts. Over the course of a century notaries established offices in towns across the Low Countries. In our sample of six cities the number of active notaries rose from a few dozen in the late sixteenth century to more than 200 from 1660 onwards (Table 5).

*Table 5. Active Notaries in the Six Cities in the Low Countries*

Year	Antwerp	Ghent	Den Bosch	Utrecht	Leiden	Amsterdam	Total
1500							
1540	2			1			3
1580	11			6	2	2	21
1620	25	10	7	10	12	16	80
1660	67	30	14	32	25	64	232
1700	100	65	18	48	31	73	335
1740	45	40	16	49	15	57	222
1780	29	55	16	60	13	57	230

Source:

We find the largest number of notaries in the biggest towns, Antwerp and Amsterdam. This was not just because of their bigger populations but also because notaries were more active in these cities. When we measure the number of deeds per notary (Table 6) we find that they were the most active registrars in Amsterdam with 240 to 470 deeds per notary per year. Notaries in Antwerp must have been equally active in the sixteenth century, with some 400 deeds per notary already in 1540, but their business was clearly disrupted by the Dutch Revolt in the second half of the sixteenth century, and never really recovered thereafter. In all the other cities the average notarial office was much smaller throughout the entire period. Only Leyden notaries seem to have developed business of some scale with, on average, some 100 to 150 deeds per notaries in most years.

*Table 6. The Average Annual Number of Notarial Deeds in Six Cities in the Low Countries*

Year	Antwerp	Ghent	Den Bosch	Utrecht	Leiden	Amsterdam	All Cities(avg)
1540	413			10			212
1580	43			7	147		66
1620	163	37	11	55	146	472	147
1660	131	72	39	46	132	381	134
1700	78	45	64	32	52	238	85
1740	64	33	43	33	149	398	120
1780	68	40	54	36	101	469	128

Source:

So what role did notaries in the Low Countries play in local credit markets? A first answer to this question comes from a tabulation of the number of credit transactions recorded by the notaries in our benchmark years. (Table 7). From this overview it is very clear that notaries were hardly involved in the registration of credit in the sixteenth century. It was only in 1660 that that notaries in Amsterdam and Antwerp, and also in Leyden and Ghent, drafted several hundreds of contracts per year. Their ranking vis-à-vis each other changed markedly over time, however. In 1660 Leyden had by far the most active notarial market with 636 contracts; in 1700 Antwerp notaries were at the top of the table but in 1740 it was Amsterdam and in 1780 Ghent.

*Table 7. The Annual Number of Credit Transactions Recorded by Notaries in Six Cities in the Low Countries, 1540-1780*

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<b>Year</b>	<b>1540</b>	<b>1580</b>	<b>1620</b>	<b>1660</b>	<b>1700</b>	<b>1740</b>	<b>1780</b>	<b>1500-1780</b>
Amsterdam	0	0	52	354	176	386	239	<b>1,207</b>
Antwerpen	14	2	59	272	479	148	162	<b>1,136</b>
Den Bosch	0	0	0	31	125	128	216	<b>500</b>
Gent	0	0	7	257	437	302	444	<b>1,447</b>
Leiden	0	6	62	636	79	47	44	<b>874</b>
Utrecht	0	3	9	64	81	93	193	<b>443</b>
<b>Total</b>	<b>14</b>	<b>11</b>	<b>189</b>	<b>1,614</b>	<b>1,377</b>	<b>1,104</b>	<b>1,298</b>	<b>5,607</b>

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Source\*

A more stable pattern emerges when we compare the number of loans with the size of the population of each of the six cities. Our calculation of the number of notarial credit contracts per 1,000 inhabitants reveals how marginal the role of the notaries really was (Table 8). In most cities in most years five or less contracts per 1,000 inhabitants were signed every year. Only in Leyden in 1660 and in Den Bosch and Gent in the eighteenth century this number rose to 10 contracts per 1,000 inhabitants.



*Table 8. Notarial Credit Transactions per 1,000 inhabitants in Six Cities in the Low Countries, 1540-1780*

Year	Amsterdam	Den Bosch	Leiden	Utrecht	Antwerpen	Gent
<b>1540</b>					0,3	
<b>1580</b>			0,5	0,1	0,0	
<b>1620</b>	0,5		1,4	0,3	1,1	0,2
<b>1660</b>	2,0	3,4	9,5	2,1	4,8	5,3
<b>1700</b>	0,8	11,6	1,2	2,9	7,3	8,8
<b>1740</b>	1,8	10,2	1,2	3,7	2,4	6,8
<b>1780</b>	1,1	16,8	1,4	6,0	2,7	8,7

Source

The limited number of transactions translates into equally limited amounts of debt contracted per year. As Table 9 shows, the annual value of loans registered by notaries in the six cities was extremely low before the middle of the seventeenth century. Then it picked up with the value of notarized loans increasing tenfold between 1620 and 1660 in the six cities combined. In 1700 the total value of loans had decreased again, notably because few loans were recorded in Amsterdam and Leiden. By 1740 Amsterdam had by far the largest notarial credit market, equalling the other five in size. The total value of contracted loans doubled between 1740 and 1780, again with Amsterdam taking up almost one half of the total. The steep rise in Amsterdam in 1780 should be treated with some caution, however, as it was entirely due to only four extraordinarily large loans (out of 239 loans) totalling 1,1 million guilders. Without these four loans the notarial activity in Amsterdam in 1780 was at a par with that of 1740.

*Table 9. Annual Value of Notarial Credit Transactions in Six Cities in the Low Countries, 1540-1780*

City	1540	1580	1620	1660	1700	1740	1780
Amsterdam			42,068	424,446	316,800	1,233,656	2,440,907
Antwerpen	3,150	122	60,770	323,952	427,268	138,824	483,570
Den Bosch				22,165	84,125	133,248	254,664
Gent			3,822	226,160	469,775	437,900	994,560
Leiden		1,026	20,088	573,036	78,368	131,177	109,516
Utrecht		2,997	3,123	58,624	66,420	151,218	306,098
<b>Total</b>	<b>3,150</b>	<b>4,145</b>	<b>129,871</b>	<b>1,628,383</b>	<b>1,442,756</b>	<b>2,226,023</b>	<b>4,589,315</b>

Measuring the flow of loans at forty years' intervals only provides a first approximation of the development of notarized credit. Following the lead of Hoffman et al. (2002) we can use the stated maturity of loans to derive the stock of credit at the benchmark years. Unfortunately notaries in the Low Countries did not always record the maturity or the actual extinction of debts, but in the two largest cities, Amsterdam and Antwerp, they often did. Thus, for 68% of the contracts in Amsterdam and 71% of the contracts in Antwerp we know the actual maturity of the loans.<sup>6</sup> If we now combine the information on the maturity of notarized loans with the number of contracts signed in our benchmark years, we obtain a very rough approximation of the stock of notarial debt in Antwerp and Amsterdam. Table 10 shows very low numbers for the seventeenth century. After 1700 the estimated stock of debt in Amsterdam grows to 2,8 million guilders in 1740 and double that amount in 1780. In Antwerp the stock of debt decreases in the first half of the eighteenth century, but then it grows very fast to almost 2.4 million guilders in 1780.

*Table 10. Estimated Stock of Notarized Loans in Antwerp and Amsterdam in selected benchmark years (1620-1780)*

<b>Stock of debt</b>	<b>1620</b>	<b>1660</b>	<b>1700</b>	<b>1740</b>	<b>1780</b>
Amsterdam	47,327	343,094	504,240	2,868,250	5,695,450
Antwerpen	81,533	599,311	747,719	433,825	2,389,642

Source

To put these numbers in perspective we should compare them, first of all, with some of the figures calculated by HPVR for Paris. Table 11 records their estimates for 1740 (expressed in Dutch guilders).

*Table 11 Notarized loans in Paris, Antwerp and Amsterdam in 1740 (values in guilders)*

	<b>Paris</b>	<b>Antwerp</b>	<b>Amsterdam</b>
Population	576,000	62,500	220,000
Number of loans	6,155	148	386
Loan value	20,406,866	138,824	1,233,656
Avg. Loan size	3315	938	3196
Avg. maturity (years)	11	3	2,5
Stock of debt	241,732,167	433,825	2,868,250

Source<sup>7</sup>

<sup>6</sup> This information is much more sparse for Den Bosch (42%), Ghent (4%), Leiden (19%) and Utrecht (22%).

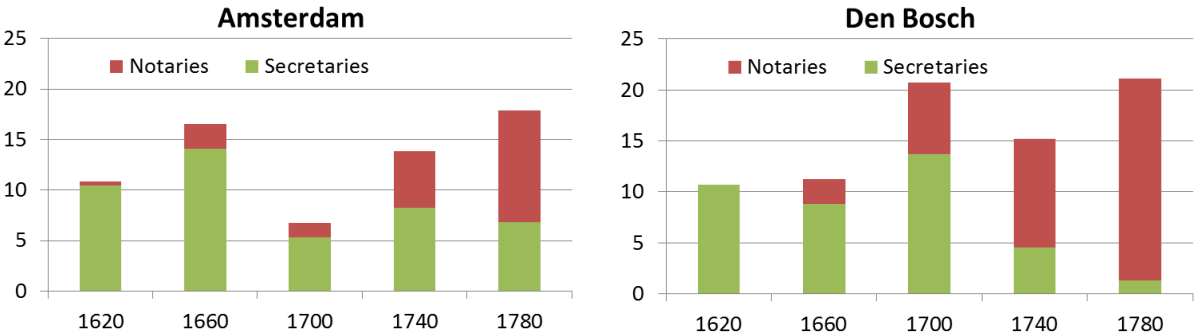
<sup>7</sup> Data for Paris: Philip T Hoffman, Gilles Postel-Vinay and Jean-Laurent Rosenthal, "Priceless Markets II: Time and Space (<http://people.hss.caltech.edu/~jlr/events/2013-HPVR.pdf>). One livre is 4,45 gram of silver. One guilder is 9,61 gram of silver.

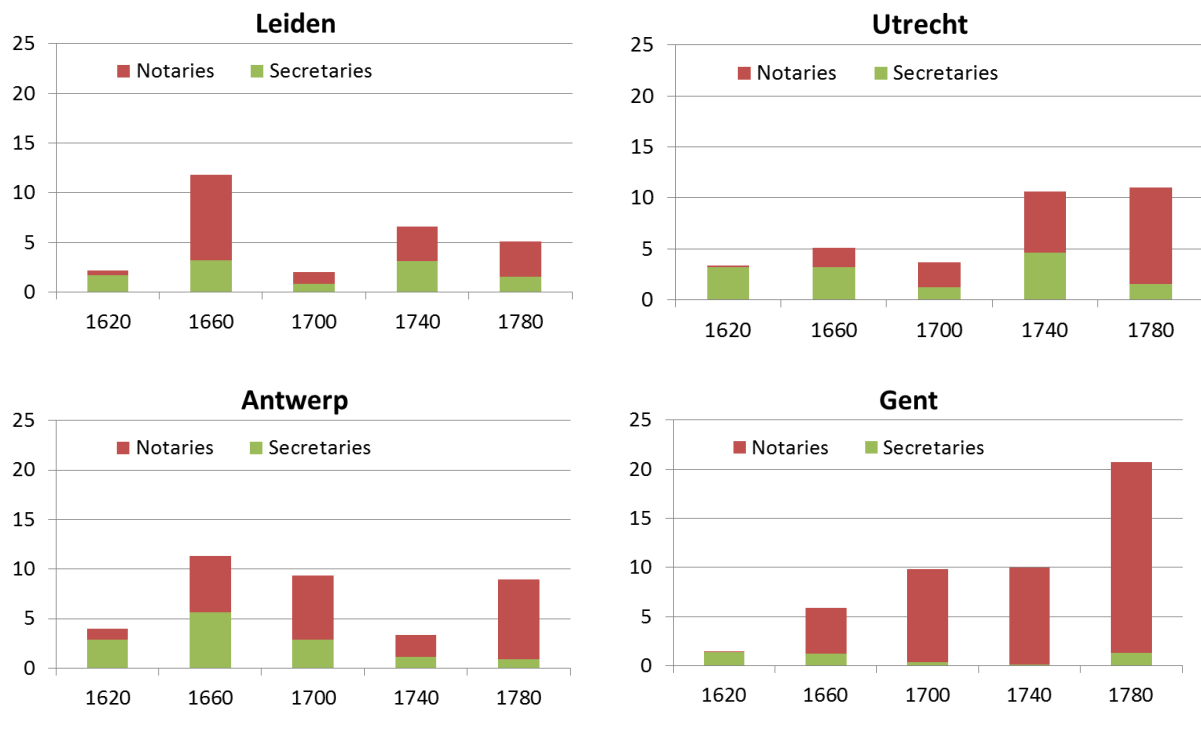
The difference with the two major cities in the Low Countries is very big. For instance, with a population that is less than three times that of Amsterdam, the notaries of Paris contracted 16 times as many loans as their Dutch counterparts. The average loan sizes in Paris and Amsterdam were similar but as a result of the much larger population *and* the much longer maturity of loans, the stock of notarized loans in Paris was 85 times bigger than in Amsterdam. This suggests that notarized credit was far less important in Amsterdam than it was in Paris, and that in turn raises the question what notaries did differently in the Low Countries, compared with France.

#### 4. Segmented Credit Markets

One explanation for the apparently very small size of the notarial credit market in the Low Countries would be the competition from town secretaries. This we can explore by comparing the total value of loans per 1,000 inhabitants between the two registrars in separate years. Figure 1 does so for the six cities in our sample. Amsterdam. These data show a marked difference between the seventeenth and eighteenth centuries. In all six cities notaries actually became far more important registrars compared with town secretaries after 1700. In all cities except Amsterdam the administrative role of town secretaries in local credit markets had almost disappeared by the end of the century.

*Figure 1. The Value of Notarial and Secretarial Loans per 1,000 inhabitants in six cities in the Low Countries, 1620-1780 (in guilders)*





This then creates an even bigger puzzle. For if, throughout the Low Countries, notaries were the more important of the two registrars in the eighteenth century, yet their credit operations were very small compared to those of notaries in France, they must have catered for a very specific market segment. To explore what this segment was, we can look at the stated purposes of the notarial and secretarial loans. For both functionaries this purpose is stated in about half of all contracts (Tables 12a, 12b).

*Table 12a. Purpose of Secretarial Loans in Six Cities in the Low Countries, 1500-1780*

	Real Estate transactions	Business transactions	Cash-in-Hand	Other	Unknown	Total
Value of loans	1292,171	354,706	688,911	43,166	2,549,231	4,928,185
(%)	26.2%	7.2%	14.0%	0.9%	51.7%	
Number of loans	838	892	741	92	3,989	6,552
(%)	12.8%	13.6%	11.3%	1.4%	60.9%	
Average Value	1,542	398	930	469	639	
Median Value	700	71	400	192	216	

The stated purpose suggests that more than half of the contracts registered by the municipal authorities (Table 12a) concerned loans for the purchase of real estate, with another third of these contracts involving the payment of cash-in-hand. Both the average and media values of these real estate loans were considerably higher than loans with other purposes. The biggest difference in this respect existed between business-related credit transactions and real estate transaction: loans in the former category were typically much smaller.

*Table 12b. Purpose of Notarial Loans in Six Cities in the Low Countries, 1500-1780*

	<b>Real Estate transactions</b>	<b>Business transactions</b>	<b>Cash-in-Hand</b>	<b>Other</b>	<b>Unknown</b>	<b>Total</b>
Value of loans	782,964	1,968,083	1,861,647	284,146	4,924,809	9,821,649
(%)	8.0%	20.0%	19.0%	2.9%	50.1%	
Number of loans	201	873	1,505	112	2,785	5,476
(%)	3.7%	15.9%	27.5%	2.0%	50.9%	
Average Value	3,895	2,254	1,237	2,537	1,768	
Median Value	800	600	599	603	600	

Notaries also recorded loans for the purchase of real estate but the share of these loans in their portfolio was much smaller: in terms of value less than a third of similar loans recorded by town secretaries. The dominate purposes of notarial loans were business transactions and cash-in-hand: about 40% of the value of all loans with known loan purposes. When comparing the number and value of notarial loans with different purposes it becomes clear that individual loans related to real estate transactions were fewer in number but larger in average size, while the opposite true for cash loans, which were three times as small on average, but seven times more numerous.

At this point it is worth spending a few words on the size distribution of loans. The size of loans increased over time, and that was not because of inflation. The impact of inflation was moderate, as it stood at about 2% annually in the fifty years prior to 1609 and at 1% in 1609-1659. Afterwards, up until the end of the 18<sup>th</sup>-century, there was no persistent trend in the price level (Quinn & Roberds, 2007). The real size of registered loans thus went up. This can also be seen by looking at the ratio between loan size and the annual wage of unskilled laborers (see table 2). The loans were relatively large, standing at more than double the annual wage of an unskilled laborer in Holland in 1580 and going up to nearly sixteen times this annual wage in 1780. When compared to other kinds of credit like shop credit and

pawn shop credit, the large size of registered loans stands out as well. The median of pawn shop credit stood at a mere 8.5 guilders (McCants, 2007a). Moreover, as noted by McCants (2007b), even in 18<sup>th</sup>-century Amsterdam the poor and middling classes usually had assets and debts totaling less than 200 guilders (i.e. less than their annual wage). This indicates that the majority of participants active in the registered private credit markets were probably rather well-off. But still, more than 21% of all registered loans were equal to or smaller than 100 guilders.

Very large loans (over 5,000 guilders) made up about 4% of all loans registered but they constitute 41.9% of all the funds. Thus, for the size of these markets large loans were fundamental. This is especially true for Amsterdam where the large loans represent 10% of all loans and nearly 60% of the market size. Large loans also become more important over time. While only one contract of more than 5,000 guilders was registered in 1580, 164 were registered in 1780.

*Table 13. The Size of Notarial and Secretarial Loans in Six Cities in the Low Countries, 1500-1780 (in guilders)*

	1500	1540	1580	1620	1660	1700	1740	1780
<b>NOTARIES</b>								
Average		225	377	679	1008	1051	2051	3594
Median		84	200	282	500	500	800	1000
Observations		14	11	184	1603	1358	1062	1262
<b>SECRETARIES</b>								
Average	61	126	263	594	1418	1120	1416	1749
Median	35	60	136	300	800	550	800	1000
Observations	1021	811	484	1286	1039	635	513	305

So much is clear that notaries and town secretaries both substituted and complemented each other. Town secretaries were the obvious officials to go to record credit transactions related to real estate, but notaries could and regularly did offer their services in this segment as well. Still the notaries seem to have been more closely linked to the business world of the various cities, with a much larger share of their loans issuing from business transactions. Yet town secretaries also catered for this segment, notably when smaller sums of money were concerned. This then suggests that the cities in the Low Countries were able to sustain a large, diversified financial market with various intermediaries offering sometimes overlapping services. At the same it is clear that each of these segments was relatively small.

## **5. A Model for Pricing Risk**

The segmentation of local credit markets in the Low Countries is consistent with two opposite interpretations. One is that this was an efficient way to match supply and demand in a very heterogeneous market for loans. The other is that this was an inefficient way to organize credit operations, one that shows the inability of these cities to adapt to changing economic circumstances. To try and determine which of these two interpretations holds, we can explore the ability of creditors and debtors to adequately price risks.

A very basic measure is to look at the average interest rates on notarial and secretarial loans in the six cities, and compare these to the yield on bonds of the Estates of Holland. As Table 14 shows, the start of the 17<sup>th</sup>-century roughly marks the beginning of the downward trend in interest rates, both public and private, due to more certainty and general economic growth along with financial innovations. The rates charged in the private markets followed market developments but they were usually higher than the yield on Holland bonds (see figure A1).<sup>8</sup>

*Table 14. The Interest Rate on Notarial and Secretarial Loans in Six Cities in the Low Countries, 1500-1780 (in guilders)*

	1500	1540	1580	1620	1660	1700	1740	1780
<b>HOLLAND BONDS</b>			12.00	6.25	4.00	3.00	2.47	2.58
<b>NOTARIES</b>								
Average		8.13	5.51	6.12	4.87	4.76	3.84	3.96
Median		8.13	6.25	6.25	5.00	5.00	4.00	4.00
Observations		2	5	86	1249	1134	941	1195
<b>SECRETARIES</b>								
Average	7.21	6.49	7.09	6.46	6.28	4.67	3.99	3.40
Median	6.25	6.25	6.25	6.25	6.25	4.50	4.00	3.50
Observations	362	409	233	9	870	661	376	423

To determine how well risks were priced in these two markets, we want to do more. We want to be able to measure rate of return on the one hand and risk on the other. However, due to data limitations we can often only use ex ante information. Frequently there is no information on if and when a loan was repaid, for example. Moreover, the exact riskiness of a loan is hard to measure as, for instance, the collateral is often only described and no exact value is given. Presumably, the creditor knew more about the exact value of the collateral

<sup>8</sup> There is a possibly very important technicality here: from about 1680 onwards public bond holders paid a withholding tax on Holland's bonds which stood at 1.5% from the early seventeenth century onwards. It is quite conceivable that loans that were formally registered also fell under this tax regime, which would imply that the yield on these private loans was actually on par with the public loans.

than what is noted in our database. Limitations are thus certainly present. Nevertheless, given the size of the database and the richness of information in other respects (e.g. interest rate, loan size, collateral type and the presence of a guarantor and family relations) it is possible to examine the issue at hand.

We are interested in the relationship between return on the one hand and risk on the other. As we do not exactly know the riskiness of each loan, multiple proxies are used for risk. We use OLS to estimate our independently pooled cross section model. As the dependent variable we take the interest rate premium which is the interest rate minus the risk-free rate at the time. The interest rate on bonds issued by the province of Holland is taken as the risk-free rate. The explanatory variables capture different dimensions of risk. Loan size, the kind of collateral (real estate, movable goods, financial assets, others, and general), the location of the debtor (local, non-local, and foreign), and the presence of a guarantor and family relations are the main explanatory variables. Control variables include the year, the location and the type of contract (life annuity, redeemable annuity, obligation, and general debt notice), although these variables are also of interest by themselves. The specification is as follows:

$$Y = \beta_0 + \beta_i X_i + \varepsilon$$

<b>Table 15: Variable definitions</b>	
Interest rate premium	Dependent variable, interest rate on the loan minus the risk-free rate in that year
Principal	Size of the loan
Collateral, real estate	Dummy, 1 if real estate as collateral
Collateral, financial assets	Dummy, 1 if financial assets as collateral
Collateral, movable goods	Dummy, 1 if movable goods as collateral
Collateral, others	Dummy, 1 if other as collateral
Debtor, non-local	Dummy, 1 if debtor is non-local
Debtor, foreign	Dummy, 1 if debtor is foreign
Guarantor	Dummy, 1 if a guarantor is present
Family	Dummy, 1 if family relations are present
City	Dummy, for the different locations
Year	Dummy, for the different years
Contract type	Dummy, for the different contract types

Real estate was seen as the safest kind of collateral, especially so in the Low Countries because it was publicly registered wherefore ownership and the possible presence of competing claims and other mortgages could be checked for (Van Bochove et al., 2013). If real estate was provided as collateral, a lower risk premium would thus be expected. The



above specification allows us to test this, *ceteris paribus*. Also, financial assets were liquid and easy to price, wherefore they also made fine collateral (Gelderblom & Jonker, 2004). Movable goods and other types of collateral (e.g. wages, rental income, company profits) were more risky. For a sizeable amount of loans the “person and goods” of the debtor were provided as collateral. This meant that the debtor put all his assets and income up as collateral, which might indicate that the creditor knew the debtor and therefore could estimate the security and value of his or her collateral. However, this type of collateral was often used by default if no specific collateral was provided. Therefore, the exact riskiness of this kind of collateral is unsure. Our model controls for familiarity between the creditor and debtor, but otherwise it is unclear what to expect. In our estimation we take this general type of collateral as the reference group. Concerning the collateral, our hypotheses then are:

- Real estate:  $H_0: \beta = 0, H_1: \beta < 0$
- Financial assets:  $H_0: \beta = 0, H_1: \beta < 0$
- Movable goods:  $H_0: \beta = 0, H_1: \beta \neq 0$
- Others:  $H_0: \beta = 0, H_1: \beta \neq 0$

The location of the debtor is important as the farther away a debtor is, the harder it is to check on him or her. This can work in multiple ways. For one, outsiders are usually not in the same social network, wherefore social control is less, moral hazard might thus increase. Next, the collateral of outsiders is harder to check if it is not located in the city. Also, in case the debtor defaults there will be more costs involved to the creditor as he needs to travel to claim the collateral. In short, compared to locals, non-locals (and especially foreigners) are more risky. Concerning the debtor’s location, we thus hypothesize:

- Debtor, non-local:  $H_0: \beta = 0, H_1: \beta > 0$
- Debtor, foreign:  $H_0: \beta = 0, H_1: \beta > 0$

The presence of a guarantor and family ties both hint to the presence or lack of a relationship between the creditor and debtor. If they were family, this should reduce the risks involved as family members often know about each other’s assets and purposes. Social control would also be strong. The effect of the presence of a guarantor is somewhat unclear. If all variables are controlled for, then adding a guarantor would reduce risks, *ceteris paribus*. But with our database it is not possible to control for everything. The presence of a guarantor might thus capture an effect of omitted variables. For instance, if a creditor does not fully trust a debtor’s assets or what he intends to do with the loan, he might demand a guarantor. The presence of

a guarantor would then actually signify higher risks, which cannot be captured by other variables in our model. It might point to some form of credit rationing: only those bad risks that can provide a (trustworthy) guarantor can get a loan. The ultimate effect of a guarantor is therefore unclear. Our hypotheses are:

- Guarantor:  $H_0: \beta = 0, H_1: \beta \neq 0$
- Family ties:  $H_0: \beta = 0, H_1: \beta < 0$

Our control variables include the city, the year, and the type of contract. The city is of importance as our six cities differed widely, with respect to population size, economy, political situation, legal system and geographical location. All these features might impact the market interest rate in said cities and how private credit is organized and priced. Time is also important as our database covers 280 years. Over such a long time span major changes could happen, and they did. The most relevant to our model is that the interest rate on Holland bills, what we take as our risk-free rate, substantially changed over the years. In the 16<sup>th</sup>-century the survival of the Dutch government was still very unsure, wherefore Holland had to pay high rates on its debt. During the 17<sup>th</sup>-century the Dutch government became more secure and expanded its financial capabilities, made possible by a booming economy, which drove down the interest rate charged on Holland bills (Gelderblom & Jonker, 2011). Relative to Holland bills, the riskiness of private credit thus increased over time. In the 16<sup>th</sup>-century the interest rate on Holland bills actually often lay above the average rate of private credit. Taking Holland bills as risk-free instruments before the 17<sup>th</sup>-century is thus not without problems.

Our third set of control variables, the types of contract, is included because different contracts had different purposes. Especially life annuities constituted a separate segment of the market as they were more a means of insurance than a loan (Poterba, 2005). The rate on life annuities was also much higher as it involved more risk: it was unsure when the person (the life) on which the contract was written would die. Next to this, redeemable annuities differed from obligations as the former were readily redeemable upon short notice. The latter had a fixed maturity, upon which the contract could be rolled over, but the creditor could also call back the loan. Obligations were usually more short-term. Next to these three distinct contract types, there is also the general debt notice. With these contracts it is unclear what exactly the contract structure was. In short, concerning our control variables, we can formulate several hypotheses:

- Year, for each year between 1520-1780:  $H_0: \beta = 0, H_1: \beta > 0$
- Contract type, life annuity:  $H_0: \beta = 0, H_1: \beta > 0$

## 6. The pricing of risk

This section looks more closely at what influenced the interest rate charged on private loans.<sup>9</sup> Next we also take a brief look at what influenced the size of loans and at what influenced the presence of a guarantor. A main component in the interest rate is risk and we isolate this component by subtracting the risk-free rate from the rate charged on private loans. The remaining risk-premium is determined by multiple factor. We estimate the following equation with OLS:

$$Y = \beta_0 + \beta_i X_i + \varepsilon$$

The risk-premium is the dependent variable and multiple loan characteristics that are taken to capture different aspects of risk are the independent variables. Table 16 shows the results.<sup>10</sup> Column I shows the regular estimation results, column II is with robust standard errors, column III is with standard errors clustered by years.

<b>Table 16: Estimation output pricing of risk</b>			
	<b>Dependent variable: Interest rate premium</b>		
<b>Independent variable</b>	<b>Column I</b>	<b>Column II</b>	<b>Column III</b>
Loan size (ln)	-0.141***	-0.141***	-0.141**
	0.0135	0.0194	0.049
Collateral - Financial assets	-0.0284	-0.0284	-0.0284
	0.0655	0.0462	0.0695
Collateral - Real estate	-0.315***	-0.315***	-0.315**
	0.0396	0.0449	0.104
Collateral - Movable goods	0.405***	0.405**	0.405*
	0.122	0.164	0.215
Collateral – Other	0.151	0.151	0.151
	0.119	0.105	0.209
Debtor - Non-local	0.101***	0.101**	0.101*
	0.0363	0.0397	0.0462
Debtor - Foreign	0.559**	0.559***	0.559
	0.223	0.151	0.301
Guarantor	0.154***	0.154**	0.154

<sup>9</sup> Determination has to be used cautiously here. We cannot strictly speak about causality as the interest rate, loan size, collateral and other aspects are jointly determined in a negotiation between the creditor and debtor. Besides, by pooling all observations, the time factor is basically taken out of consideration. Exact causality is thus hard to determine.

<sup>10</sup> The same model has also been estimated using only the observations from 1620 onwards in order to exclude the somewhat less full observations from earlier time periods. The results, however, were similar.

	0.0428	0.0674	0.19
Family	-0.352***	-0.352***	-0.352***
	0.0691	0.0542	0.0434
City - Antwerp	-0.221***	-0.221**	-0.221
	0.0528	0.105	0.304
City - Den Bosch	-0.503***	-0.503***	-0.503
	0.0668	0.11	0.336
City - Gent	0.379***	0.379***	0.379
	0.0597	0.118	0.445
City - Leiden	-0.441***	-0.441***	-0.441
	0.0547	0.0848	0.237
City - Utrecht	-0.319***	-0.319***	-0.319
	0.0607	0.108	0.414
Year - 1540	-0.164*	-0.164***	-0.164*
	0.0919	0.0633	0.0717
Year - 1580	0.352***	0.352**	0.352**
	0.108	0.149	0.11
Year - 1595	0.539	0.539**	0.539*
	0.427	0.222	0.25
Year - 1620	2.231***	2.231***	2.231***
	0.0865	0.116	0.118
Year - 1660	3.050***	3.050***	3.050***
	0.0842	0.0783	0.142
Year - 1700	3.663***	3.663***	3.663***
	0.085	0.081	0.179
Year - 1740	3.384***	3.384***	3.384***
	0.0879	0.0774	0.164
Year - 1780	3.516***	3.516***	3.516***
	0.0893	0.0852	0.21
Debt title - Life annuity	4.456***	4.456***	4.456***
	0.114	0.189	0.55
Debt title - Redeemable annuity	0.141***	0.141***	0.141
	0.0452	0.0506	0.0861
Debt title - Obligation	-0.138***	-0.138***	-0.138
	0.0454	0.0339	0.106
Constant	-1.119***	-1.119***	-1.119**
	0.109	0.141	0.384
N	8219	8219	8219
R-sq	0.476	0.476	0.476
adj. R-sq	0.475	0.475	0.475
F	298	737	.
Note: Standard errors in cell below coefficient estimate.			
Significance levels given as follows: * p<0.10, ** p<0.05, *** p<0.01.			

The results show that larger loan sizes are related to lower interest rate premia. This makes sense as the relative importance of fixed costs involved with credit decline as the size of the

loan increases. Moreover, larger loan sizes probably capture other aspects, like the wealth of the debtor, on which we have no data and are therefore omitted. The creditors presumably knew more about the debtors than we can capture from the archived deeds. All in all, the market seems to work as expected.

When looking at the impact of different types of collateral, it is important to remember that our reference group is a very general type of collateral, namely “my person and all my goods”. This kind of collateral was used as the norm wherefore it might indicate one of two things: (i) either the creditor knew and trusted the debtor and/or estimated the debtor’s assets to be of enough value to cover the loan in case of default, so the creditor did not demand specific collateral; (ii) the debtor actually had nothing specific to offer as collateral wherefore the contract reverted to the norm, thereby actually indicating a rather risky loan. It is hard to distinguish between these two possibilities. However, we control for family relations, the presence of a guarantor, and the location of the debtor. Most of these loans might therefore indicate the second possibility: a rather risky loan.

Unexpected is that the use of financial assets as collateral does not lead to a lower premium. These assets were supposedly easy to price and highly liquid. Perhaps this is due to the fact that many financial assets that were used as collateral here were actually not, for example, highly liquid VOC shares, but rather parts in smaller shipping companies or deeds of private loans. When real estate is used as collateral, the premium goes down. This is as expected as real estate was seen as the safest type of collateral. Movable goods, however, are priced as less secure than the very general collateral. This is most likely due to them being rather unstable in value and hard to control, especially if the debtor retained them in his or her own control. Moreover, movable goods might already have been used as collateral for other loans. There was no public registry for movable goods as there was for real estate. Furthermore, movable goods were likely mainly used by merchants who demanded short-term credit and subsequently collateralized their stock. This might be an omitted impact here as we do not control for maturity.<sup>11</sup> Also, it might indicate that the debtor was actually perceived as rather risky, wherefore the creditor demanded collateral, and all the debtor could provide were movable goods. This would be a type of credit rationing: only bad risks that could provide something extra, some extra security, would be able to get a loan. Still, due to data limitations it is difficult to pinpoint the exact mechanism at work here.

As expected, non-locals and foreigners paid a premium. These debtors represented a higher risk as they were harder to control; the risk of moral hazard was higher. Also, apart from real estate for which the public registry was available, other types of collateral would be harder to value. Still, even when real estate was used as collateral, any prior use of it as

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<sup>11</sup> It is hard to control for maturity due to the lack of observations. Moreover, the observations that we do have might be biased as it is unsure why sometimes the maturity was noted down and why often it was not.

collateral might only be registered in the debtor's town. The creditor could check this, but it would entail travel and time costs. In case of default, it would also be more costly for the creditor to claim the collateral. These considerations weigh even heavier when a foreigner was involved, explaining the higher economic relevance of the coefficient ( $0.559 > 0.101$ ). This type of risk was thus properly priced.<sup>12</sup>

The presence of a guarantor and a family relationship also matters in setting the interest rate. The latter has an unambiguous effect: it signifies less risk and is related to a cut in the interest rate premium. The presence of a guarantor, however, has a less clear effect. Adding a guarantor seems to be related to an increase in the risk premium. If all relevant variables would be controlled for, then this would be unexpected indeed as adding a guarantor would contribute to the security of the loan, *ceteris paribus*. What we are observing here, however, are probably the effects of certain omitted variables. If the creditor does not trust the creditworthiness of the debtor, he or she is more likely to demand a guarantor. In this case, the presence of a guarantor actually points to a deficient creditworthiness of the debtor. Many of these debtors might be unable to attain a loan contract if they are unable to provide a proper guarantor. Credit might thus be rationed along these lines and the guarantor variable would then capture this effect. In any case, the variable fails to have a significant effect in the third specification.

The same holds for the place variables which are insignificant in the third specification. The place variables are included in order to control for the differences between the cities. The significance of these variables indicates a lack of market integration between the cities. In other words, limited arbitrage is present. This is unexpected, certainly for the cities within the same political entity (since the 17<sup>th</sup>-century): Amsterdam, Den Bosch, Leiden and Utrecht in the Dutch Republic, and Antwerp and Gent in the Southern Netherlands. The flow of information between cities has been characterized as quick and continuous due to multiple transport links. Particularly inland waterways were important. The fact that the place variables become insignificant when the standard errors are clustered by year might indicate that the markets in different cities are mainly differing over time, and this has an effect on our estimation as our sample of observations differs between cities over time. For example, the vast majority of our observations from 1500 and 1540 are of the two southern cities: Antwerp and Gent. For the period 1620-1780, in contrast, these two cities provide less than 40% of the observations. Clustering by years subsequently puts more emphasis on the within-year variation. The differences between cities within the same year then turn out to be insignificant, actually supporting relatively strong market integration and arbitrage. Because the results here are inconclusive, further research is required.

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<sup>12</sup> However, the foreigner variable does become insignificant in the clustered estimation.

The year dummies are, unsurprisingly, generally significant. These variables are included in order to control for the sundry changes in the financial, economic and political environment that took place in our 280-year timeframe. The year 1500 is the reference category, wherefore the positive coefficients indicate that the interest premium has increased over time. This is probably due to the rapid decrease in the rate on Holland bonds, our risk-free rate. Particularly from 1620 onwards, the first year in our sample in which the Dutch Republic's chances of survival can be seen as quite high, is the difference consistently both statistically and economically significant.

The different types of contract, besides life annuities, are not consistently relevant in the interest rate setting decision. Life annuities present a truly different type of contract as it provided a kind of insurance to the creditor (the buyer of the life annuity) and a kind of gamble to the debtor (the seller) as it was unsure how much longer the life on which the contract was written (the nominee) would remain alive. Besides, the principal did not have to be repaid. Once the contract was sealed with the transfer of credit, the debtor only had to make the periodical interest payments until the life annuity extinguished along with the life of the nominee. This type of contract justified a higher interest rate, as is evident in our dataset too.

All in all, the market seems to have worked well in pricing different aspects of risk. At a minimum, the market was able to distinguish between aspects of a loan that made it more risky and those that made it less so. This is quite remarkable as, compared to modern times, the collection and dispersion of information was limited. The data from the Low Countries indicate that any kind of information, no matter how limited or sparse, is useful in the pricing of risk and will be used by the market whenever it can.

<b>Independent variable</b>	<b>Dependent variable: Loan size (ln)</b>		
	<b>Column I</b>	<b>Column II</b>	<b>Column III</b>
Collateral - Financial assets	0.692***	0.692***	0.692***
	0.0503	0.0577	0.163
Collateral - Real estate	0.510***	0.510***	0.510***
	0.028	0.0282	0.044
Collateral - Movable goods	0.331***	0.331***	0.331
	0.0598	0.0641	0.193
Collateral - Other	0.138	0.138	0.138
	0.0862	0.11	0.154
Debtor - Female	-0.190***	-0.190***	-0.190***
	0.0311	0.0315	0.0531
Debtor - Institution	1.065***	1.065***	1.065***
	0.112	0.128	0.263
Debtor - Non-local	-0.288***	-0.288***	-0.288***
	0.0267	0.0255	0.0401

Debtor - Foreign	0.567***	0.567**	0.567*
	0.132	0.223	0.271
Guarantor	0.142***	0.142***	0.142
	0.0308	0.0316	0.0766
Family	0.272***	0.272***	0.272***
	0.0488	0.0561	0.0566
City - Antwerp	-0.811***	-0.811***	-0.811***
	0.037	0.0394	0.169
City - Den Bosch	-0.913***	-0.913***	-0.913***
	0.0407	0.0407	0.0546
City - Gent	-0.995***	-0.995***	-0.995***
	0.0397	0.0401	0.12
City - Leiden	-0.458***	-0.458***	-0.458***
	0.0387	0.0392	0.0968
City - Utrecht	-0.786***	-0.786***	-0.786***
	0.044	0.043	0.0587
Year - 1540	0.461***	0.461***	0.461***
	0.0505	0.0467	0.026
Year - 1580	1.356***	1.356***	1.356***
	0.0619	0.0569	0.0602
Year - 1595	1.173***	1.173***	1.173***
	0.0679	0.0754	0.0776
Year - 1620	1.758***	1.758***	1.758***
	0.051	0.0486	0.0956
Year - 1660	2.464***	2.464***	2.464***
	0.045	0.0424	0.0671
Year - 1700	2.546***	2.546***	2.546***
	0.0447	0.041	0.05
Year - 1740	2.819***	2.819***	2.819***
	0.0473	0.0442	0.0589
Year - 1780	3.201***	3.201***	3.201***
	0.0468	0.0431	0.0527
Debt title - Life annuity	-0.0587	-0.0587	-0.0587
	0.0845	0.073	0.109
Debt title - Redeemable annuity	0.392***	0.392***	0.392***
	0.0272	0.027	0.107
Debt title - Obligation	0.0768**	0.0768**	0.0768
	0.0328	0.0342	0.0902
Constant	4.142***	4.142***	4.142***
	0.0493	0.047	0.0889
N	12113	12113	12113
R-sq	0.535	0.535	0.535
adj. R-sq	0.534	0.534	0.534
F	534.7	609	.
Note: Standard errors in cell below coefficient estimate.			
Significance levels given as follows: * p<0.10, ** p<0.05, *** p<0.01.			



Next, in order to further explore the market we look at the same model but then with the natural log of the loan size as the dependent variable (see table 17).<sup>13</sup> Here we investigate how the loan size and different aspects of the contract are related. The results indicate that any specific form of collateral is related to a larger loan size. As in modern times, those with wealth (in the form of assets) used that wealth to gain greater access to credit. Particularly the wealthiest slice of society, those with other financial assets, had access to bigger loans. This also means that the default category, a general non-specific form of collateral, probably indicates that the debtor lacked access to any good collateral, particularly because we control for family relations. Loan size is also related to the debtor's gender as women seem to have borrowed smaller sums than men. This can be explained by the fact that these women, who act independently in the financial market, are mainly widows or young unmarried women and therefore generally poorer. Institutions borrow greater sums than both men and women as can be explained by their greater needs. When institutions like churches, guilds and orphanages borrowed they preferred to make one or two large loans as compared to many small ones. They could use their reputation and strong collateral assets to back up their credit demands.

As mentioned in the previous descriptive chapter, non-locals borrowed smaller sums than locals, but foreigners borrowed larger sums. This is apparent here too. As explained earlier, this is probably mainly due to the fact that wages and prices in the countryside were generally lower; while the foreigners mainly consisted of rich traders involved in (inter)continental trade and foreign nobles. Both latter groups had demand for greater sums and could give proper collateral: their reputations in both cases, and trade goods and business assets in the case of the traders, and real estate and financial assets in the case of the foreign nobles.

The last two loan characteristics, the presence of a guarantor and of family relations, are important too. Both are related to larger loan sizes. The latter relationship is clear-cut: family members are more willing to lend each other larger sums, *ceteris paribus*. The former, however, is somewhat unclear. As noted in our discussion of the first model, the presence of a guarantor can indicate an extra kind of security, but it can also indicate the problem of omitted variables as only those debtors who are required to bring forward a guarantor would do so. This latter issue would point to a form of credit rationing. The fact that presenting a guarantor would then lead to a larger loan would not make sense, as credit rationing usually not only takes place through higher interest rates, but also due to smaller sums being lent out. In any case, in the third specification the guarantor variable becomes insignificant, as in the first model. The effect of adding a guarantor therefore remains unclear due to the

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<sup>13</sup> The number of observations here is larger as our database has less missing values for the loan size than for the interest rate.

inherent problems related to historical data. Further archival research might shed light on this issue. The third model below looks at what determined of the presence of a guarantor in order to further understand this complicated issue.

Still, in the loan size model, as expected, the city control variables show that loan sizes were biggest in Amsterdam, the financial center. Also, loan sizes grew over time as indicated by the time dummies. Many different factors are at play here: economic growth, inflation, expanding financial markets, and perhaps a move away from the registered markets by smaller players. People who offered and required smaller sums might have moved out of the registered market as other options, like pre-printed forms available at bookstores, became available. The fact that in 1500 almost 88% of all loans were smaller than 100 guilders, while in 1780 only 2.2% were, also points to this movement.

<b>Table 18: Logit estimation output presence of a guarantor</b>			
	<b>Dependent variable: Guarantor</b>		
<b>Independent variable</b>	<b>Column I</b>	<b>Column II</b>	<b>Column III</b>
Loan size (ln)	0.171***	0.171***	0.171***
	-0.0193	-0.0186	-0.0369
Collateral - Financial assets	-1.237***	-1.237***	-1.237***
	-0.181	-0.187	-0.446
Collateral - Real estate	-1.073***	-1.073***	-1.073***
	-0.0719	-0.0721	-0.284
Collateral - Movable goods	-0.477***	-0.477***	-0.477
	-0.18	-0.181	-0.31
Collateral - Other	-0.453*	-0.453*	-0.453
	-0.27	-0.27	-0.492
Debtor - Female	0.200**	0.200**	0.200*
	-0.0883	-0.0877	-0.104
Debtor - Institution	-2.269***	-2.269***	-2.269***
	-0.72	-0.714	-0.254
Debtor - Non-local	0.444***	0.444***	0.444***
	-0.0691	-0.0692	-0.15
Debtor - Foreign	0.105	0.105	0.105
	-0.351	-0.343	-0.299
Family	-1.582***	-1.582***	-1.582***
	-0.243	-0.245	-0.222
Constant	-2.725***	-2.725***	-2.725***
	-0.122	-0.118	-0.277
N	12113	12113	12113
Note: Standard errors in cell below coefficient estimate. Significance levels given as follows: * p<0.10, ** p<0.05, *** p<0.01.			

Lastly, we employ a logit estimation to look at the factors behind the presence of a guarantor (see table 18). As the dependent variable we have the guarantor dummy variable. The independent variables are the loan size, the various kinds of collateral, debtor gender, debtor location, and the presence of family relations. The results indicate that the larger the loan, the larger the likelihood of a guarantor being present. This makes sense as the more there is at stake for the creditor, the more security he or she would demand. A guarantor who backs up the debtor would provide that extra bit of security. Also, the presence of any form of specific collateral reduces the likelihood of a guarantor backing up the debtor. The specific forms of collateral were probably seen, and rightly so, as a form of security by themselves. If the debtor could not provide any collateral except for the general version of “my person and all my goods”, then it was more likely that he or she had to provide a guarantor. However, this could work both ways: if the debtor provided a guarantor, perhaps there would be less need for specific collateral. The exact causality is hard to pinpoint here, but the relationships are clear. The results also confirm that presenting financial assets as collateral was the surest sign of creditworthiness as it reduced the likelihood of having to present a guarantor the most. This is probably so due to collateralizable financial assets being mainly owned by the wealthy, while other assets like collateralizable real estate was more widely spread (e.g. many people from the middle class owned at least a room in urban areas or a small plot of land in rural areas).

Besides those without any specific collateral, females were more likely to bring a guarantor along too. This is related to two issues mentioned earlier: (i) the females independently active on financial markets were mainly widows and young unmarried women, these were generally perceived as less creditworthy due to lower earnings; (ii) if the females were in fact married, they often had no legal personhood of their own and would thus be required to bring (male) guarantors along, depending on the local customs. Institutions naturally were less often required to present a guarantor as their reputation and assets were often enough to signal their creditworthiness. Moreover, since their credit demands were usually larger than those of average market participants, it would have been hard to find reliable guarantors. This is why less than 2% of all institutions had a guarantor, while individual citizens presented a guarantor in almost 13% of all cases.

Compared to locals, non-locals had a higher likelihood of presenting a guarantor too. This is related to the perceived higher risk of dealing with non-locals. Their collateral might be in their own town instead of in the creditor’s city and thus hard to check on and perhaps hard to claim in case of default. Non-locals usually also were outside of any local social groups and therefore not bound by the social pressures going along with those groups. The problem of moral hazard would thus be more severe. For these reasons, non-locals were more likely to have to present a guarantor in order for them to attain the credit they desired. For

foreigners these issues would seem to be of even more importance, but the results show they are not significantly different from local debtors. This can be explained in two ways. Firstly, most of those ‘foreigners’ were not actual foreigners, but rather local merchants currently operating from and based in foreign lands. They were therefore part of local social and business groups. Moreover, they presumably had repeated dealings with multiple creditors and debtors in the trade credit network. Secondly, the actual foreigners had no way of presenting a guarantor as they would not be able to find a local person willing to be their guarantor. They therefore had to make up for this in other ways, for instance by having to pay a higher interest rate as noted in the first model above. Lastly, family members naturally were less likely to have to bring a guarantor.

These three models have utilized our historical database in order to shine a light on the workings of pre-industrial financial markets in the Low Countries. The results show that those markets worked well in estimating what made a loan riskier and what made it less so. Moreover, several mechanisms existed to calibrate the allocation and pricing of credit: laying down different forms of collateral, presenting a guarantor, and of course using the services of notaries and secretaries to make sure creditors had legal preeminence in case of default. Multiple issues still remain unclear and open to further research. More archival data extraction will enable further research.

## **7. Conclusion**

By the mid-sixteenth century the unification of the Netherlands under Burgundian and Habsburg rule had created an institutional framework for private and public credit markets that was remarkably similar across the realm. Key features were the introduction of a funded public debt organized by urban governments; private annuities, mortgages, and other medium- and long-term loans registered by these same rulers; the admission of notaries as formal registrars of an even broader variety of debt and equity contracts; and the enforceability in local courts of privately recorded loans. In the major commercial cities, Antwerp and Amsterdam in particular, local judges supported an even wider range of negotiable instruments, notably bills of exchanges and bills obligatory, and they regulated the work of various financial intermediaries, including brokers, moneychangers, and cashiers.

In this paper we explored the functioning of two important market segments in various cities in the Low Countries: the loans recorded by town secretaries and notaries between 1500 and 1780. We find that notaries and town secretaries allocated large sums to businessmen and small loans to individual private borrowers and used available information to assess the risk of individual loans. The pricing of different loan characteristics reveals that

riskier clients consistently had to pay higher interest rates, while mechanisms existed to mitigate risk (e.g. putting down collateral, presenting a guarantor) which broadened access to credit. Yet the notaries and town secretaries failed to obtain a commanding position on the capital market in the way Parisian notaries did and remained locked in a comparatively small segment of the total market, largely because they did not possess the information advantages of their French counterparts. The notaries, for instance, played no role in either the marketing of public debt or in the mortgage market. The town secretaries were central in the mortgage market, but of only secondary importance in the wider loan market, dominated as it was by a highly liquid form of commercial lending on collateral of personal bonds or of securities (Gelderblom, Jonker and Kool, 2015). These findings highlight the degree to which subtle regulatory differences profoundly affected the dynamics of financial market evolution.

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Appendix

