

# **The impact of the 1848 financial crisis on bank and non-bank lending: evidence from a new database on notarized credit in Antwerp**

Maite de Sola Perea<sup>a\*</sup>, Ruben Peeters<sup>a</sup> & Marc Deloof<sup>a</sup>

<sup>a</sup>University of Antwerp, Prinsstraat 13, 2000 Antwerp, Belgium

\* Corresponding Author

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## **Abstract**

In 1848, the major Belgian commercial banks suffered a bank run triggered by the revolution in France. The liquidity loss reduced their lending to firms and smaller banks. However, commercial bank credit coexisted with other sources of funding, including notarized lending. The crisis provides a unique opportunity to study the behavior of these different types of lending, and their complementary or substitute character, at the time of modern bank development. To do so, we exploit a new database of notarized credit in Antwerp. We find that notarized lending grew in the city of Antwerp during the crisis, while it did not change in rural areas. For notarized lending there is no evidence of a restriction in supply or an increase in risk aversion through tighter loan conditions. Thus, notarized lending provided an alternative to bank lending during a bank crisis caused by an exogenous shock.

Keywords: 1848 crisis, liquidity shock, notarial credit, bank lending, Belgium

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## 1. Introduction

Financial systems are usually characterized by the presence of different forms of funding, which typically interact in a dynamic manner. Credit can vary in a plurality of ways (by source, maturity, collateral...), which helps serve to different purposes and satisfy different financial needs. This raises the question of whether these forms of funding behave as complements or substitutes, and which circumstances determine the type of interaction at each moment.

Given the prevalence of commercial banks in the financial landscape since the late 19th century, studies on these interactions often oppose bank to non-bank credit, such as stock markets or trade finance. Research on this topic, however, has remained limited for the earlier years of commercial banks, when their activity coexisted with other sources of funding. Recent economic literature argues that banks and (stock) markets developed as complements rather than a zero-sum game (Song and Thakor, 2010; Ugolini, 2021). Cull et al. (2006) shows that modern financial institutions and local financial intermediaries financed different economic segments in 19<sup>th</sup> and early 20<sup>th</sup> century North Atlantic Core. Hoffman, Postel-Vinay, and Rosenthal (hereafter HPVR 2000, 2015, 2019) find that (modern) banks and (traditional) notarial credit markets in France complemented each other in the 19<sup>th</sup> century.

This paper investigates the joint functioning of bank and non-bank credit markets in the province of Antwerp during the 1848 banking crisis. It aims to shed light on whether non-bank (notarized) lending was a substitute or a complement to bank lending, using evidence from an exogenous shock. To our knowledge, this is the first paper that examines the relationship between bank and notarial lending during a banking crisis, and can therefore assess the potential substitution effect between both forms of credit when one of them is constrained. Furthermore, it does so for a period of industrialization and financial transformation. If banks and notaries were true complements and their products were poor substitutes, borrowers could have been left without much recourse when a lending channel disappeared (Taketa and Udell, 2007). On the other hand, if their products could function as substitutes, this could smoothen the impact of liquidity shocks and support local economic activity. Thus, answering this question is important because it improves our understanding of the flexibility and resilience of financial systems in the past and the functions of modern and traditional intermediaries. It also adds insight on the role of modern finance on economic growth in an industrializing economy, and on how different financial market segments fitted together at a time of transformation.

For France, HPVR showed that (modern) banks and (traditional) notarial credit markets in France offered different products, often in the same geographical areas. Nonetheless, it remains unclear whether the products banks and notaries offered could have been used as substitutes in periods when one of both was restricted. We study instead the case of Belgium, the first country on the European continent to industrialize, and one which, since its independence in 1830, pioneered an important universal banking system that spurred industrial development (Sylla, 1991). Belgium also had a notarial system very similar to the French, as it had been reformed during the French occupation of the Austrian Netherlands.

Within Belgium, Antwerp was a wealthy city with the presence of an important branch of the largest universal bank, a local stock exchange, a vibrant notarial capital market, as well as seasoned business owners and wealthy notables looking for investment opportunities (Peeters and van Kooten, 2024). This meant that firms potentially had access to funding alternatives, including bank lending, but also trade credit, mortgage loans, or additional equity. Therefore, Antwerp provides an perfect case to study the joint functioning of bank and non-bank credit markets, and the 1848 financial crisis a particularly interesting period to do so.

The Belgian 1848 crisis, provoked by the French February Revolution of 24 February, proved a severe shock to Belgian banking. In response to the revolution, Belgian savers ran the commercial banks to redeem their banknotes, causing them to enter into distress, restrict lending, and suspend bill discounting. The Banque Commerciale d'Anvers suspended payments on 29 February, and by early March Antwerp was suffering from lack of cash (Gille, 1963). Stock listings fell by half and the stock exchanges of Brussels and Antwerp closed on 25 and 26 February respectively (Mardini and Schuler, 2014). While the political turmoil quickly disappeared, bank distress continued until May 1848 after multiple government interventions to support the banking system.

To study the relationship between bank and non-bank lending between 1846 and 1850, we rely on a unique database of notarized credit contracts in the city and province of Antwerp, and newly gathered balance sheet and discounting information of the major banks in Belgium. The quantitative material is complemented with archival material including yearly reports, ministerial communications, as well parliamentary discussions. We employ econometric analyses to assess the impact of the crisis on notarial lending, both at the aggregate level (new notarial lending on a monthly frequency) and the loan level. The latter approach allows us to observe the effect of the crisis on different loan characteristics, which can help disentangle

supply- vs demand-side effects. We find that notarized credit substituted, at least partially, for constrained bank lending during the 1848 banking crisis, as notarial lending volumes increased, while terms and conditions did not show signs of tightening.

The paper proceeds as follows. The second section describes the historical context and the chronology of the 1848 crisis, highlighting why this period provides interesting research opportunities. The third section provides an overview of the economic theory on bank and non-bank lending during financial crises. The fourth section describes the source material and introduces the unique characteristics of the newly collected datasets of notarized credit contracts and banking information. Section five investigates lending through banks and notaries to find a significant increase in the amount of notarial credit contracted during the crisis period in the city of Antwerp, as opposed to rural areas. It also assesses the tightness of credit conditions for notarized lending during this period. The sixth section discusses the possible explanations for the increase in notarial lending and whether this was due to a possible substitution effect between the bank and notarial lending. The seventh section presents additional evidence and robustness checks, while the eighth section concludes.

## **2. Background to the 1848 Crisis**

In the early 1840s, Belgium was a young country with an emerging economy. The first country on the European continent to industrialize, the transformation of its economic system went hand in hand with the development of a modern, universal banking and financial system that would become one of the most important in the world (Chlepner, 1926; Sylla, 1991, p. 54; Ugolini, 2021). The booming port town of Antwerp formed its commercial heart, while industry was mainly located around coal mines in Walloon areas. The growing international trade and local firms required a large amount of short-term credit provided by local banks, trading firms, and credit markets (Veraghtert, 1980).

In 1822, William I, King of the Netherlands, founded the first modern commercial bank in Belgium, the *Société Générale*, which, particularly after the country's independence in 1830, contributed greatly to Belgium's industrialization. The banking sector continued to grow with the foundation of the *Banque de Belgique* in 1835. Both banks dominated the Belgian banking landscape for decades and were allowed to issue banknotes and discount bills. Over the years, they spread across Belgium through their branches and patronized banks. A fundamental part of their business model involved investing directly in industrial companies. In this way, they not only contributed to the country's industrialization, but also to the development of securities

markets (Ugolini, 2021). These long-term investments, however, represented a sizable maturity mismatch with liabilities that consisted, to an increasingly large extent, of short-term deposits.

Like other trade, industrial and financial activities, the new commercial banks were typically located in larger settlements. This may have implied that, at the time, their services, including discount activities, were mainly used by urban inhabitants (Chlepner, 1926, p. 83). Outside the main centers, small firms and entrepreneurs would have relied on private banks to obtain liquidity through discounts, or on non-bank credit such as notarized lending.

After 1830, Belgium experienced a period of rapid development and industrialization that concluded with the economic and financial crisis of 1838-1839. The crisis was triggered by the renewed threat of war with the Netherlands and resulted in the default of the Banque de Belgique, followed by bank runs across the country. The illiquidity of the banks' investments took their toll. While the Société Générale could count on loans from Parisian banks to increase liquidity, the Banque de Belgique was only saved by the government after a default, to safeguard the financial system (Mardini and Schuler, 2014). After 1838, the Banque de Belgique reduced her involvement with industry and focused on maintaining a high liquidity. The Société Générale, unscathed by the crisis, continued its industry equity investments, although it decreased the attractiveness of its savings bank deposits<sup>1</sup> to reduce the magnitude of its liquidity mismatch and the cost of its liabilities (Chlepner, 1926).

By the early 1840s, the two largest commercial banks were strongly intertwined with large industrial enterprises, while local bankers provided bill discounting facilities to smaller firms (Mardini and Schuler, 2014).

The 1845-1846 famines troubled the economic recovery, particularly in still predominantly rural Flanders, where unemployment was high (Ó Gráda et al., 2007). However, while political revolutions raged across Europe in 1848, the political landscape remained relatively calm in Belgium (Beyen, 2019; Gooch and Rooney, 2005). Still, a financial crisis occurred when news of the French Revolution reached Belgium on 25 February 1848 and fear of revolution and war with France caused a bank run (Luyten, 1986). Stock prices of commercial banks fell rapidly and stock markets closed immediately (Figure 1). The *Banque d'Anvers*, a semi-independent subsidiary of the Société Générale, provided 11 to 18 million Belgian Francs annually through bill discounting in the years leading up to 1848; but like the Société Générale, it stopped

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<sup>1</sup> This included lowering the interest rate on savings deposits and lengthening the notice period before funds could be withdrawn (Chlepner, 1926).

discounting during the crisis (Veraghtert, 1980, p. 201).<sup>2</sup> Contemporary accounts stated that “nowhere was the convulsion, alarm, and destruction of credit more prominent than in the kingdom of Belgium” (Lumley, 1857, p. 61).

Figure 1: Index of bank stock prices, 1833-1850.

(monthly data; December 1831 = 100; capital-weighted index)



Source: SCOB. The shaded area represents the crisis period from February until May 1848. The index includes stock prices of the Société Générale (from December 1830), Banque de Belgique (from February 1835), Banque Foncière (from June 1835), and Banque Nationale (from May 1850), weighted by market capitalization.

Belgian banks operated in a free banking system, meaning that banks were free to issue their own notes limited to a maximum share of their capital. In a free banking system, the quantity of notes was set by the interaction between the demand for notes (amount of notes held by the public) and the supply of notes (notes issued by banks).<sup>3</sup> This time, the Société Générale was in trouble and its note circulation fell by a third in a matter of days, as people demanded their conversion in coins (Figure 2).

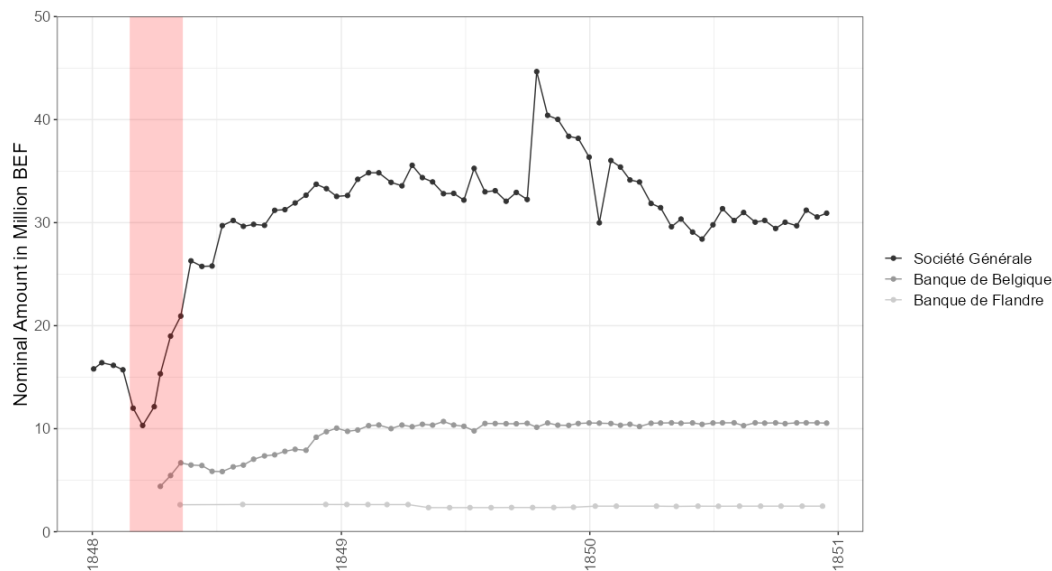
To deal with the demand for repayment, the Société and the Banque de Belgique halted all bill discounting and lending, which led to a liquidity shock in the economy. Unlike in 1838, the government could not issue new treasury notes and thus had no financial space to directly bail out the banks in trouble (Chlepner, 1943). Instead, to reduce pressure on the banks, on 3 March

<sup>2</sup> Antwerp trading firms often did not have strong relations with the two large universal banks and therefore lost access to discount facilities when several local banks ceased operations, as the banks privileged the firms with closest relations to them (Buyst and Maes, 2008, p. 160). We do not have any information on the operations of other banks [We need to still collect the data for Banque Le Grelle].

<sup>3</sup> During periods of growth, banks can easily expand note circulation through lending, but shrinking demand is more difficult to manage. Banks can do so by increasing the interest rates on deposits (attracting bullion), increasing discount rates (reducing demand for credit) or offer favorable conditions for banknotes of other institutions to facilitate interbank clearing. For a theory of note circulation see (Mardini and Schuler, 2014)

the government proclaimed that it would continue to accept the notes of both banks, and on 20 March it suspended the forced convertibility of banknotes in coins, giving legal tender to the notes of commercial banks (Luyten, 1986).<sup>4</sup> On top, banks were allowed to issue 30 million francs in new notes. In return the banks had to deposit collateral (real estate or securities) with the Treasury.

Figure 2: Bank Notes in Circulation by Bank, Dec 1847-December 1850.



Source: *Moniteur Belge* and Annex to the 1848 Annual Report of the Société Générale p.33 (National Archives 2 - Joseph Cuvelier repository, Archives of Société générale de Belgique, 6th transfer, nr. 75.). Shaded area represents the crisis period from February 25 1848 until 15 May 1848.

The laws had the goal to renew trust in the banking institutions and provide them with enough liquidity to maintain their discounting facilities. However, while the issuance of new inconvertible banknotes provided the Société Générale with some room to maneuver, the bank used it mostly to redeem the deposits withdrawals that were requested in large amounts (Buyst and Maes, 2008). Over the year, saving deposits, which amounted to 20 percent of total liabilities, halved (see Figure 3). As a result, the total amount of banknotes in circulation increased. The law of 22 May furthered this trend by allowing the issuance of another 20 million francs specifically for the repayment of deposits.<sup>5</sup> By the end of 1848, banknotes in circulation reached 46 million BEF, of which a large share would have ended in the hands of

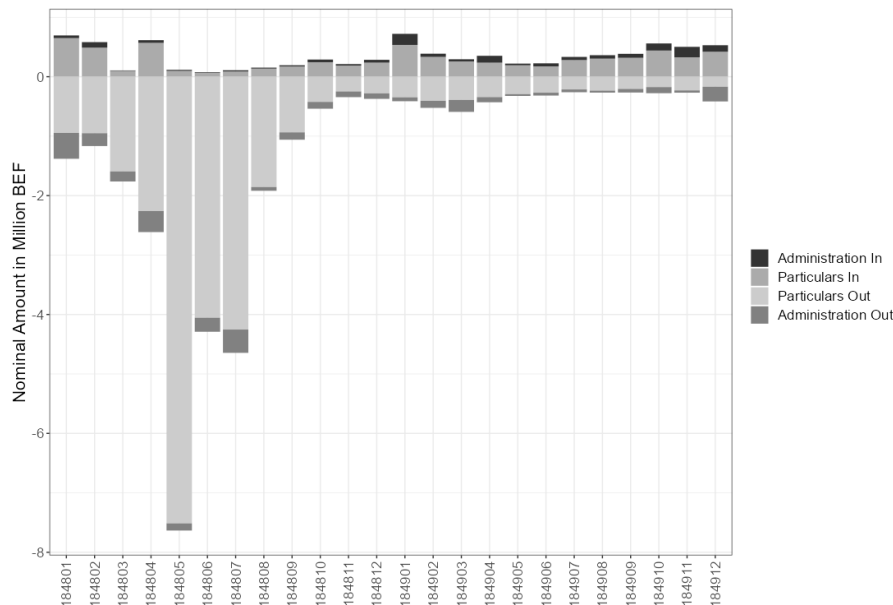
<sup>4</sup> The law was passed five days after the French government suspended convertibility (Guillaumin et al., 1850, p. 356). Chlepner (1943) incorrectly states that the law was published on 20 May 1848.

<sup>5</sup> Chlepner (1943, pp. 23–24) argued that because the circulation of banknotes rapidly increased while not experiencing depreciation, this made people acquainted with the use of (fiat) banknotes. In most crisis situations, people would shy away from fiat money. During the crisis, banks were also allowed to issue banknotes with lower denominations (most notably 5 BEF, equivalent to a few days' salary for industrial workers and laborers). Because there were penalties attached to note issuing, the banks never issued the maximally allowed amount of banknotes.

saving banks' costumers that removed their deposits, before further spreading out in the whole economy.

The withdrawal of saving deposits from the Société Générale continued for several months after the start of the crisis, partly as a consequence of the notice periods required (up to 60 days). Flows in savings deposits became comparable to those pre-crisis only in September 1848. By the end of that month, saving deposits had dropped by 33 million BEF (70 percent of the amount at the start of the year), though they recovered somewhat in the following months. By the end of 1848, savings deposits of the Société Générale had halved compared to December 1847, and total assets had dropped by 22 percent compared to the previous year (54 million BEF).

Figure 3: Monthly In and Outflow of Deposits at the Société Générale de Belgique, 1848-1849



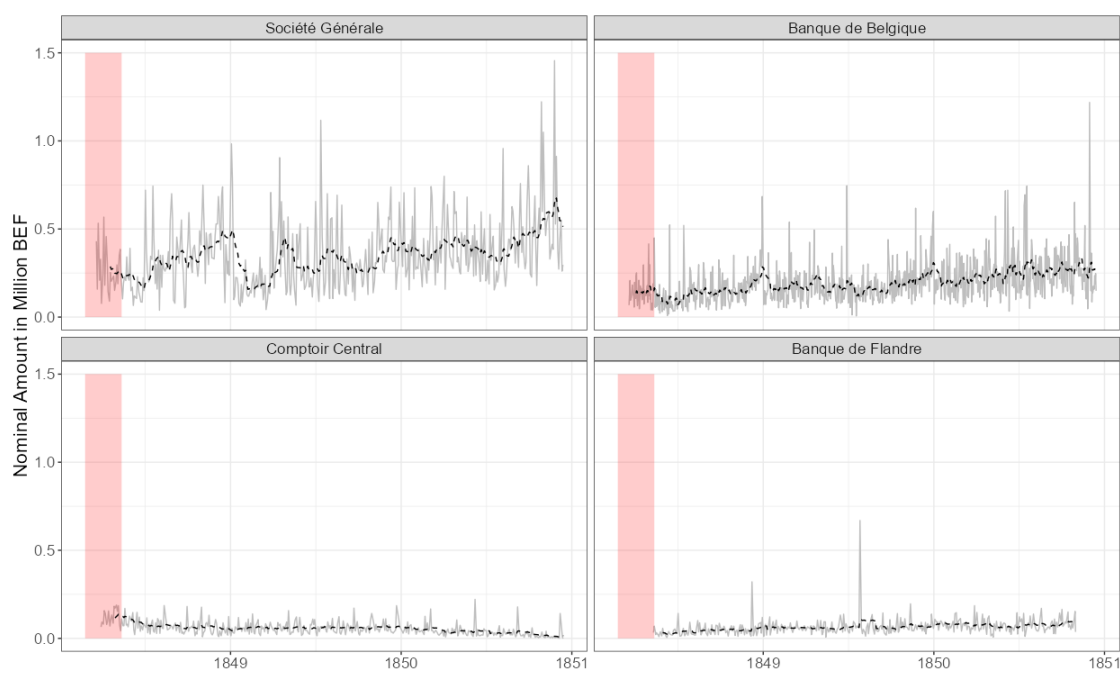
Source: Archives SG (National Archives 2 - Joseph Cuvelier repository, Archives of Société générale de Belgique, 6<sup>th</sup> transfer, nr. 75). Annex to the 1849 annual report.

To ensure the continuity of bill discounting, the law of 20 March 1848 also founded a special discount office in Brussels called the Comptoir Central (Central Counter). The Société Générale and the Banque de Belgique each contributed 8 million BEF to the capital of the Comptoir and it started operations immediately. On top, Brussels-based firms set up a credit union to discount bills on 26 May 1848, but it only started operations on 1 July 1848 and thus came too late to provide relief during the crisis (Denis, 1899).<sup>6</sup>

<sup>6</sup> According to Denis (1899) L'Union du Crédit de Bruxelles was the first credit union founded in Europe. Dating back to 26 May 1848 it predates the better known Raiffeisen credit union (first established on 5 February 1849) and the first Schulze-Delitzsch union, from 1850.



Figure 4: Discounts by bank, 13 April 1848 – 31 December 1850.



Source: *Moniteur Belge*. Shaded area represents the crisis period from February 25 1848 until 15 May 1848.

The Comptoir Central provided 19.3 percent of the amount of discounts in April 1848 but, as the Société Générale and the Banque de Belgique regained strength, its market share fell to an average of 7.6 percent in 1849 and 3.5 percent in 1850 (Figure 4).<sup>7</sup> In number of bills the Comptoir was more important; it discounted nearly 15,000 bills in 1848, half the amount of the Banque de Belgique, and slightly more than the Société Générale. A third of them (4,710 bills) were discounted in April and May. This suggests that, at the height of the crisis, the Comptoir Central lent to small and medium size enterprises which were excluded from the largest banks' discounting facilities and no longer had access to discounting through local bankers (Buyst and Maes, 2008). However, its scope was very local. In 1848, 94 percent of the bills came from Brabant (the province it was located in) for 66 percent of the total amount. The bills from the provinces Hainaut and Luxembourg each represented 14 percent of the total, while bills from province of the Antwerp amounted to 1 percent of the total.<sup>8</sup>

The 1848 banking crisis eventually led the government to reform and regulate the Belgian banking sector, including the establishment of the National Bank of Belgium as an issuance

<sup>7</sup> *Moniteur Belge*.

<sup>8</sup> This local focus of the new Comptoir Central was suspected by some members of the Parliament during the discussions that led to the approval of the law of 20 March, given the difficulties to transact across Belgian cities (session of 20 March 1848, Senate. Source: [Search Plenum](#))

and discount institution in 1850 (Buyst et al., 2005), with discount offices all across the Belgian territory..

### **3. Theoretical Overview**

The coexistence of and interaction between different forms of finance has been long studied, both from a historical perspective (e.g. for Belgium, Ugolini (2021)) and on the basis of contemporaneous data from developed and developing economies. From a review of firms' financing around the world, Allen et al. (2013) examine the relative importance of market- and bank-finance and alternative financing channels (internal funding, trade credit, informal loans) across economies. They find that such alternative funding is large, and often dominant in fast-growing economies. One aspect of particular relevance to researchers and policy-makers relates to the extent to which firms can use different forms of funding to replace constrained credit from a given source of finance. The role of trade credit as a replacement to the financing of (bank) credit-constrained firms, in particular, has been often studied (among others, Petersen and Rajan (1997), Nilsen (2002), Danielson and Scott (2004)). Alternative sources of finance may also replace bank credit when banks' presence in a community is scarce or reduced (Maskara et al., 2021).

The relationship between different forms of corporate funding need not be unique. Tang (2019) finds that peer-to-peer lending platforms can act both as substitutes and complements to bank credit. In the same line, Afrifa et al. (2023) find that peer-to-peer or trade finance and short-term bank lending are complementary for firms with more restricted access to funding, but substitutes for companies with easier access to external finance.

Additionally, the interaction between different types of finance may vary over time, and in function of the macroeconomic or institutional environment. A large strand of this literature has focused on the impact of (financial) crises and a drop in bank funding on non-bank finance. As a shock impacts the relationship between finance instruments, some lending channels expand while others, more affected by the crisis, contract. This may depend on instrument or lender characteristics (on this, for instance, Cornett et al. (2011)). Constrained firms resort to alternatives such as non-bank intermediated credit and money markets, trade credit, or raising capital (Berger and Udell, 2006; Cornett et al., 2011; Dewally and Shao, 2014; Garcia-Appendini and Montoriol-Garriga, 2013; Taketa and Udell, 2007). Nilsen (2002) shows that small firms expand trade credit when bank lending is contracted. Casey and O'Toole (2014) find that European SMEs applied more often to trade credit and informal funding when bank

credit was constrained. The expansion of non-bank credit, thus, can act as a counter-cyclical relief for corporate funding, supporting the economy at a difficult time (Huang et al., (2011)).

To a large extent, these findings are consistent with theories on information asymmetry. Asymmetric information can determine access to finance (see, among others, Sharpe (1990) Mishkin (1990); Rajan (1992); von Thadden (2004)), as lenders “face uncertainty about borrowers’ credit worthiness to the extent that they cannot observe some of the borrowers’ characteristics and actions” (Dell’Ariccia, 2001). According to Greenwald and Stiglitz (1990), “if information is asymmetrically distributed between the buyers and sellers of financial instruments, then certain financial markets (...) may break down or be severely limited (...). In loan markets, there may be credit rationing.” Burkart and Ellingsen (2004) find that access to trade credit is linked to suppliers’ informational advantage, while trade credit terms are also linked to the availability of information on the buyer (Ng et al., 1999). Asymmetric information, additionally, “provide incumbents with an advantage over new lending institutions,” and, in this way, condition banking structure and behavior (Dell’Ariccia, 2001).

For smaller firms, access to finance can be more difficult due to limited access to information on their creditworthiness, lack of collateral, and problems related to information asymmetries (Berger and Udell (2006), Beck and Demirguc-Kunt (2006)). Such curtailed access to funding can translate into increased financial distress (Khwaja and Mian, 2008) and, for firms with low liquidity, a drop in assets growth, investment and employment (Berg, 2018). Cull et al. (2006) show that local financial intermediaries used their local information networks to extend credit to small and young firms during the 19th and early 20th century. Economic research highlights the special role of relationship banking between local banks/lenders and small firms as a way to reduce information asymmetries (among others, Deloof et al., (2019)), in particular during financial crises (Sette and Gobbi, (2015); Banerjee et al., (2021). Theory and empirical evidence also points at the importance of non-bank private debt for riskier firms (Denis and Mihov, 2003).

During the first decades of modern banking, a better knowledge of local borrowers may have provided incumbent lenders (in this case local individual investors) and intermediators with an advantage over commercial banks. This may be particularly the case for notaries: as argued by HPVR, their role in the community, registering properties and contracts, would have made of the notarial office a knowledgeable intermediary between lenders and borrowers.

Our main hypothesis states that notarized lending (partially) substituted for constrained bank lending during the 1848 crisis, in a manner analogous to the role played by relationship banking (vs other banks) and alternative finance sources (such as trade credit) which has been documented in the literature on contemporaneous finance. Thus, we expect notarized lending to increase as a response to the tightening in bank lending.

Furthermore, we expect a stronger reaction to the banking crisis in urban areas rather than in smaller settlements: given the larger role of banks in cities, the impact of bank lending constraints would be stronger there, which would also imply that demand for notarized credit during the crisis grows more in the city of Antwerp than outside it. Our second hypothesis states that demand for notarial lending increased more in the city.

#### **4. Data**

The analysis in this paper is based on two newly collected datasets. The first dataset comprises a sample of 2,465 notarial credit contracts notarized in the province of Antwerp between 1 January 1833 and 31 December 1837, and 1 January 1846 and 31 December 1850. From these contracts, we transcribed information on the size, interest, and maturity of the loan, the type of collateral used, the names, residences, and occupations of contracting parties, the name and location of the registering notary. On top, we collected any additional qualifications for the loan, such as the repayment specifications (in bank bills or coins) or conditional interest rates as well as the addresses of real estate collateral located in the city of Antwerp. Names of municipalities in Belgium were geocoded to 1960 NIScodes,<sup>9</sup> and street addresses within the city of Antwerp were connected to the 1835 Cadaster of the city providing us with information on the estimated value of the residence of the contracting parties residing in the city, as well as (for a subsample of loans) of the urban real estate pledged as collateral.

The second dataset contains bank-level information. We gathered all available balance sheets for the Belgian banks as well as information on their discounting activities and banknote issuance.<sup>10</sup> This information is gathered from annual reports, archival sources, the work by Mardini & Schuler (2014) and between April 1848 and December 1850, the *Moniteur Belge*,

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<sup>9</sup> In the future, names of Dutch municipalities will be coded into 1850 Amsterdam codes (Van der Meer and Boonstra, 2011).

<sup>10</sup> The banks include: Société Générale de Belgique, Banque de Flandre, Banque de Belgique, Banque de l'Industrie. Balance sheets were found in the *Moniteur Belge*, bank archives, archives of the Ministry of Finance and the Ministry of Foreign Affairs.

which, following the law of 20 March 1848, published this information for the main Belgian banks on a bi-weekly basis (Luyten, 1986).

Table 1: Overview of Sources

Name	Number Of Observations	Observation Level	Period
<b>Notarial Credit Contracts</b>	1,029 in 1833-1837	Loan Level	1 Jan 1833-31 Dec 1837
	1,436 in 1846-1850		1 Jan 1846- 31 Dec 1850
<b>Bank Balance Sheets</b>			
Société Générale	210	Quarterly	Sept. 1848 – Dec.1850
Banque de Belgique	128	Yearly	1842, 1843, 1845, 1847
Banque De Flandre	605	Monthly	May/Aug/Dec 1848 - Dec. 1850
Banque De L'industrie	81	Semester	Dec 1847 – June 1848 (insolvency)
Union De Credit	80	Yearly	Sept 1848 - Sept 1851
Banque Le Grelle	To be completed		
<b>Discount Volumes</b>	2,081 (4 Main Banks <sup>11</sup> )	Day	11 April 1848 – 14 Dec 1850
<b>Banknotes In Circulation</b>	73	Biweekly	3 Jan 1848 – 25 Dec 1850

We do not have information on private bankers (with the exception of Banque Joseph J. Le Grelle, to be compiled). However, as private bankers had limited capital bases and relied on the larger banks to rediscount bills, we assume that the restriction in bill discounting was passed through from the large commercial banks through the private bankers, rather than compensated by them (Mardini and Schuler, 2014).

#### 4.1 Notarial loans

The notarial loan sample includes 2,465 loan contracts, of which 1,029 were notarized in the between 1833 and 1837 and 1,436 in the between 1846 and 1850. The sample includes all loan contracts registered by 63 unique notaries, of which 37 were active in the first period and 41 in the second period. Of those, four notaries were active in Antwerp city in the first period, and six in the second period.

The ANCRED sample represents 28 percent of the notaries active in the province of Antwerp between 1833-1837 and 38 percent between 1846-1850. Differentiating per area, the sample

<sup>11</sup> Discount activities were published for the Société Générale de Belgique, Banque de Flandre, Banque de Belgique, and the Comptoir Centrale de Bruxelles.

includes 29 percent of the notaries working in the city of Antwerp in the first period and 32 percent in the second period (29 and 40 percent, respectively, for the rural areas (rest of the province)). For these notaries, we collected all loan contracts registered in the given periods.

From 1833 to 1837, the notaries included in the ANCREC sample registered loans amount to 5.9 million (current) BEF. For the second period in the analysis, the total was 6.3 million (current) BEF, at an average of 1.3 million BEF per year. This amounts to about one tenth of the average annual discounts provided by the Société Générale in Antwerp between 1846 and 1850 (excluding 1848, for which no data are available). Assuming that the ANCREC notaries are a representative sample of all notaries in the province, annual notarial lending could correspond to about 28 percent of the Société Générale discounts in Antwerp<sup>12</sup>.

Table 2 summarizes the main descriptive statistics for both periods and the entire sample. Loan size was smaller in the second period than in the first one, while average loan maturity was shorter in the second period (the median remained unchanged), and the median interest rate increased. A higher share of loans was registered by notaries active outside of the city of Antwerp (in rural areas), which went hand in hand with lower percentages of loans where lenders or borrowers resided in a city of over 5,000 inhabitants.

Around one fifth of contracts in 1846-1850 specified a change in the applied interest rate in case some condition took place: in most cases, this was a favorable interest when the borrower paid the loan on time<sup>13</sup>. [Data on conditional rates and payment and repayment conditions for the 1833-1837 period are incomplete at this stage.] The average (median) difference compared to the main rate agreed in the contract amounted to 84 (100) basis points. Loans with a conditional rate were significantly larger in size and had longer maturities and higher interest rates than those without.

For the 1846-1850 period, 58 percent of loans included a repayment form condition, requiring the loan reimbursement to be made with a specific means of payments. In almost all of these loans (99.6 percent) the loan was to be repaid back in metal coins, explicitly excluding banknotes or other financial assets as means of payment. This condition was considerably less usual and stringent for the way in which the loan had to be initially provided to the borrower

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<sup>12</sup> This comparison does not take into account the large differences in maturities between the two types of credit: a few months for bank discounts, compared to an average of around 10 years for notarized loans.

<sup>13</sup> For the 1846-1850 period, we record only one case of penalizing rate, i.e., a higher interest rate in case of late reimbursement.

(a condition was present in only 44 percent of the contracts, and in 11 percent of cases banknotes were accepted).

Table 2: Summary statistics of notarial loans

Loan size in thousands BEF; interest rate and conditional rates in percentage points; maturity in years. “Rest of the province” equals 0 when the loan has been notarized in the city of Antwerp, 0 otherwise. “City lender” and “City borrower” equal 0 when the lender or borrower, respectively, are located in a municipality with less than 5,000 inhabitants, 1 otherwise. “Payment conditions” and “Repayment conditions” equal 0 if the loan must be provided or reimbursed, respectively, in banknotes; 1 if it must be provided or reimbursed in a mix of banknotes and coins; 2 if only coins are accepted.

	mean	sd.	min	q1	median	q3	max	N
<b>Period 1: 1833-1837</b>								
<b>Loan size (BEF thousands)</b>	5.70	-14.21	0.04	1.00	2.12	5.00	211.64	1,029
<b>Loan interest rate (pp)</b>	4.53	-0.62	0.00	4.00	4.50	5.00	10.40	952
<b>Conditional interest rate (pp)</b>	na	na	na	na	na	na	na	na
<b>Maturity (years)</b>	11.21	-6.51	0.12	10.00	10.00	10.00	60.00	910
<b>Rest of province</b>	0.53	-0.5	0	0	1	1	1	1,029
<b>City lender</b>	0.57	-0.5	0	0	1	1	1	951
<b>City borrower</b>	0.43	-0.5	0	0	0	1	1	995
<b>Payment conditions</b>	na	na	na	na	na	na	na	na
<b>Repayment conditions</b>	na	na	na	na	na	na	na	na
<b>Period 2: 1846-1850</b>								
<b>Loan size (BEF thousands)</b>	4.41	-14.2	0.09	0.8	1.8	4	350	1,436
<b>Loan interest rate (pp)</b>	4.51	-0.62	0	4	5	5	6	1,393
<b>Conditional interest rate (pp)</b>	4.14	-0.28	3	4	4	4.5	5	278
<b>Maturity (years)</b>	10.06	-4.51	0.25	10	10	10	50	1,302
<b>Rest of province</b>	0.72	-0.45	0	0	1	1	1	1,436
<b>City lender</b>	0.37	-0.48	0	0	0	1	1	1,090
<b>City borrower</b>	0.25	-0.43	0	0	0	0	1	1,118
<b>Payment conditions</b>	1.85	-0.46	0	2	2	2	2	643
<b>Repayment conditions</b>	1.99	-0.12	0	2	2	2	2	833

Source: ANCREED database.

Compared to data for France (as described by HPVR), notarized loans in Antwerp were, on average, larger in size and had longer maturities (10 to 11 years in our sample vs 4 to 5 years in France around 1840). Interest rates showed slightly more variation in Antwerp than in France, where, in 1865, 98 percent of the loans (weighted by loan size) were contracted at five percent, the legal interest rate at the time.

#### 4.1.1 Urban and rural loan contracts

Loans registered in the city of Antwerp were significantly different from those registered in the rest of the province (rural areas) in several aspects. Table 3 shows the average and standard deviation of the main loan characteristics by place of registration.

Most notably, city loans were considerably larger, with a median and average three to four times as large compared to those of loans outside of the city. On average, interest rates were higher and maturities shorter. Conditional rates were more frequent for city loans than in rural areas (38 vs 13 percent). Repayment requirements appeared also more often in city loans (71 vs 52 percent).

Table 3: Summary statistics of notarial loans, according to place of registration

	Location of notary			Test
	Antwerp	rest of province	Total	
Sample frequency (percent)	N=891 (36.1%)	N=1,574 (63.9%)	N=2,465 (100.0%)	
Loan size (BEF th.)	9.77 (22.44)	2.22 (3.35)	4.95 (14.22)	<0.001
Loan interest rate (pp)	4.67 (0.47)	4.42 (0.67)	4.52 (0.62)	<0.001
Conditional interest rate (pp)*	4.17 (0.27)	4.10 (0.29)	4.14 (0.28)	0.042
Maturity (years)	9.58 (4.23)	11.13 (6.01)	10.54 (5.45)	<0.001
City lender				
No	63 (10.5%)	1,034 (71.8%)	1,097 (53.7%)	<0.001
Yes	537 (89.5%)	407 (28.2%)	944 (46.3%)	
City borrower				
No	124 (19.7%)	1,285 (86.5%)	1,409 (66.7%)	<0.001
Yes	504 (80.3%)	200 (13.5%)	704 (33.3%)	
Payment conditions*				
Banknotes	21 (7.3%)	6 (1.7%)	27 (4.2%)	<0.001
Banknotes and coins	27 (9.4%)	15 (4.2%)	42 (6.5%)	
Coins	239 (83.3%)	335 (94.1%)	574 (89.3%)	
Repayment conditions*				
Banknotes	0 (0.0%)	3 (0.6%)	3 (0.4%)	0.200
Coins	294 (100.0%)	536 (99.4%)	830 (99.6%)	

linear regression test performed for Loan size, Loan interest rate, Conditional rate, Maturity.

Pearson's chi-squared test for City lender, City borrower, Payment conditions, Repayment conditions.

Only second period data for Conditional interest rate, Payment conditions, Repayment conditions.

Source: ANCREED database.

For 80 percent of the Antwerp city loans, borrowers and lenders resided in cities (i.e. municipalities with over 5,000 inhabitants), although almost one third of loans in the rest of the province also included at least one lender from a city.

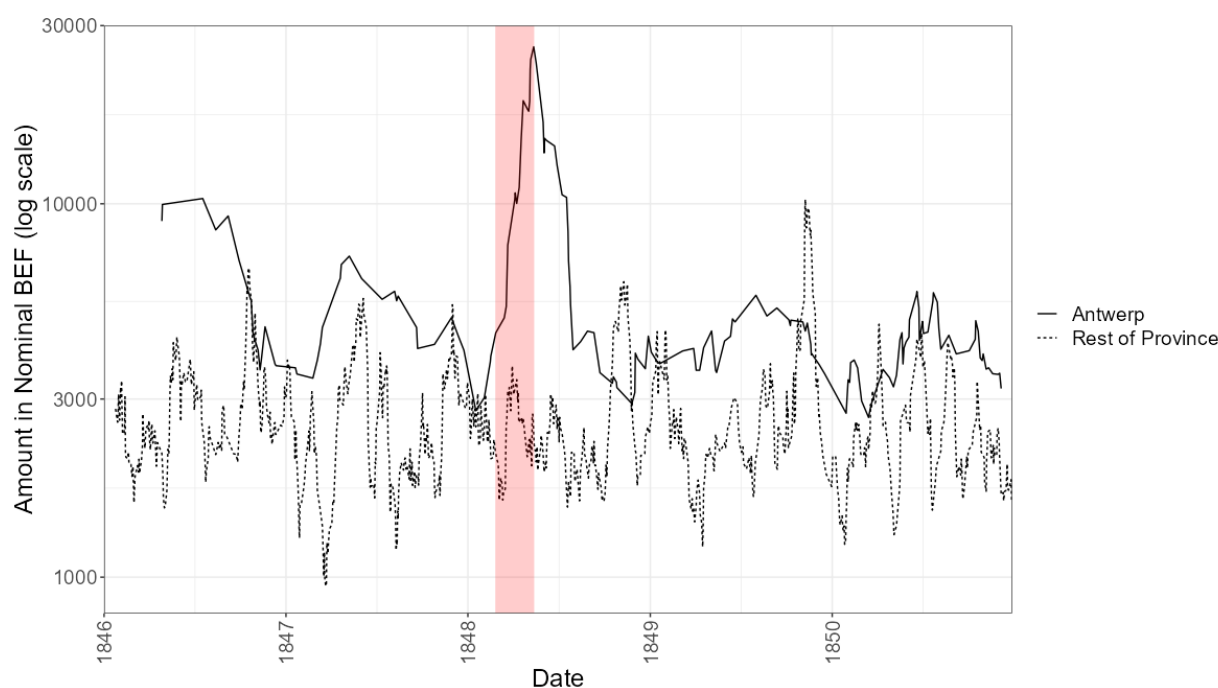
Antwerp city notaries were much busier, registering more than twice the number of loans compared to their rural colleagues (68 vs 29 per notary, respectively, on average per year).



## 5. Banks and Notaries: Aggregate Level

The absence of bill discounting and bank lending should have severely disrupted economic activity, unless firms and individuals could obtain liquidity from other sources. As in the case of France, Antwerp banks and notaries provided complementary products (Peeters and van Kooten, 2024), with banks focusing on short-term lending through discounting, while notarial lending consisted rather of long-term mortgage credit.<sup>14</sup> Antwerp had a vibrant notarial credit market in the nineteenth century which provided around 3.6 million Belgian francs annually in new mortgage loans in 1846 and 1847. Accessing this market may have allowed firms and individuals to try to overcome the bank liquidity squeeze in 1848 by mortgaging (part of) their real estate property. Figure 5 illustrates such a scenario and shows that the amount lent in the notarial market drastically increased when banks experienced distress.

Figure 5: Two week moving average of total notarial lending in Antwerp and rest of the province, 1846-1850.



Source: ANCREC database. Shaded area represents the crisis period from February 25 1848 until 15 May 1848.

Table 4 shows the results from linear regression analyses of the amounts borrowed in notarial markets. The loan amounts have been aggregated at the monthly level, distinguishing between loans notarized in Antwerp city and those notarized in the rest of the province ( $L_t$ , expressed

<sup>14</sup> It is unclear if notarial markets operated in the same way as in France and whether notaries were active intermediaries (Gelderblom et al., 2018; Peeters and van Kooten, 2024). Banks could also provide long-term funding, but they did so usually by acquiring companies' shares (Ugolini, 2021).

in the natural logarithm of the amount in BEF). The regressions are then run separately for the two geographical areas. The main variable of interest is the dummy “crisis” ( $D_t$ ), which takes a value of 1 in the crisis months (February to May 1848), and of 0 otherwise. Some specifications include macroeconomic variables ( $M_t$ ): these include the changes in bank stock prices (weighted by market capitalization), the level of the yield in government bonds (as estimated from the price of a perpetual sovereign bond) and the level of a commercial discount rate, all available at the Study Center for Companies and Exchanges (SCOB) of the University of Antwerp. We also include year fixed effects ( $Y$ ) in some specifications.

Equation 1: aggregate monthly notarial lending

$$L_t = \alpha + \beta D_t + \gamma M_t + \gamma Y + \varepsilon_t$$

The analyses confirm the increase in notarial lending during the crisis in the city of Antwerp, but no change, either positive or negative, outside of it.

The results are robust across specifications; with and without time effects, with a dependent variable in nominal amounts (thousands BEF; not shown); considering the full sample or only the 1846-1850 period (not shown); and including other macro data (changes in bank stock prices and long- and short-term interest rates in capital markets).

The size of the crisis coefficient for the city specifications increases when include additional controls. Moreover, in all cases, monthly amounts borrowed at least doubled in the crisis months.

Table 4: Regression results for monthly notarial loan amounts

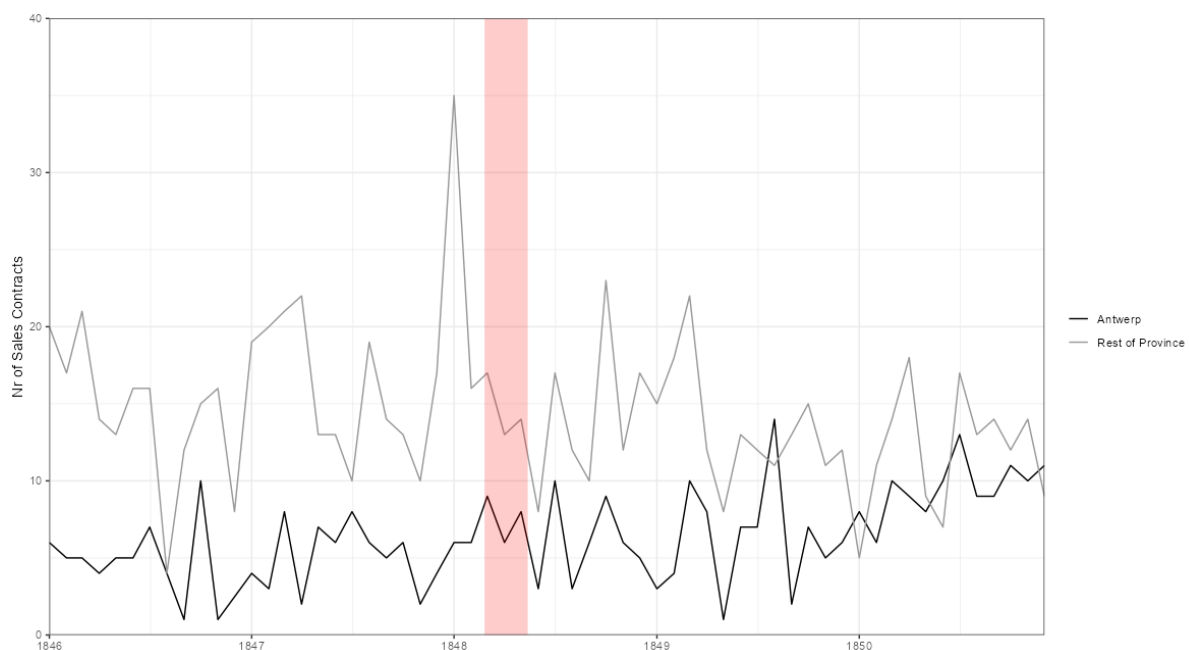
	1		2		3		4		5		6	
	Antwerp city		Rest of province		Antwerp city		Rest of province		Antwerp city		Rest of province	
	Ln(amount)		Ln(amount)		Ln(amount)		Ln(amount)		Ln(amount)		Ln(amount)	
Crisis	0.963	**	0.596		1.304	**	-0.003		1.478	**	-0.022	
	(0.447)		(0.379)		(0.526)		(0.331)		(0.711)		(0.448)	
$\Delta$ bank stock prices									0.407		0.490	
									(2.007)		(1.248)	
Short-term rate									-0.276		0.082	
									(0.253)		(0.160)	
Long-term rate									0.117		0.055	
									(0.235)		(0.147)	
Intercept	10.784	***	10.009	***	10.858	***	8.845	***	10.901	***	7.701	***
	(0.082)		(0.069)		(0.248)		(0.156)		(2.582)		(1.597)	
Year FE	No		No		Yes		Yes		Yes		Yes	
Number of observations	119		120		119		120		119		120	
Adjusted R-squared	0.03		0.01		0.07		0.48		0.06		0.47	

\*\*\* p<.01, \*\* p<.05, \* p<.1

This rapid rise in mortgage lending could be caused by reasons unrelated to higher demand from firms and entrepreneurs suddenly excluded from bank discounting facilities. It could have originated, for instance, from an increased appetite for real estate by depositors and investors that withdrew their money from banks and stock and bond markets. Alternatively, those investors could have placed their funds in the notarial credit market by lending to other individuals or firms wanting to acquire real estate. This would mean a positive supply shock allowing more people to borrow or people to borrow more.

Both scenarios would likely be reflected in an increase of the number of sales contracts as an additional group of buyers entered the market. Figure 6, on the contrary, shows that the number of contracts remained stable throughout the period. In the countryside, it even slightly decreased after an unexplained peak before the crisis. Therefore, this explanation appears unlikely.

Figure 6: Total monthly number of real estate sales contracts notarized by location of the notary, 1846-1850.



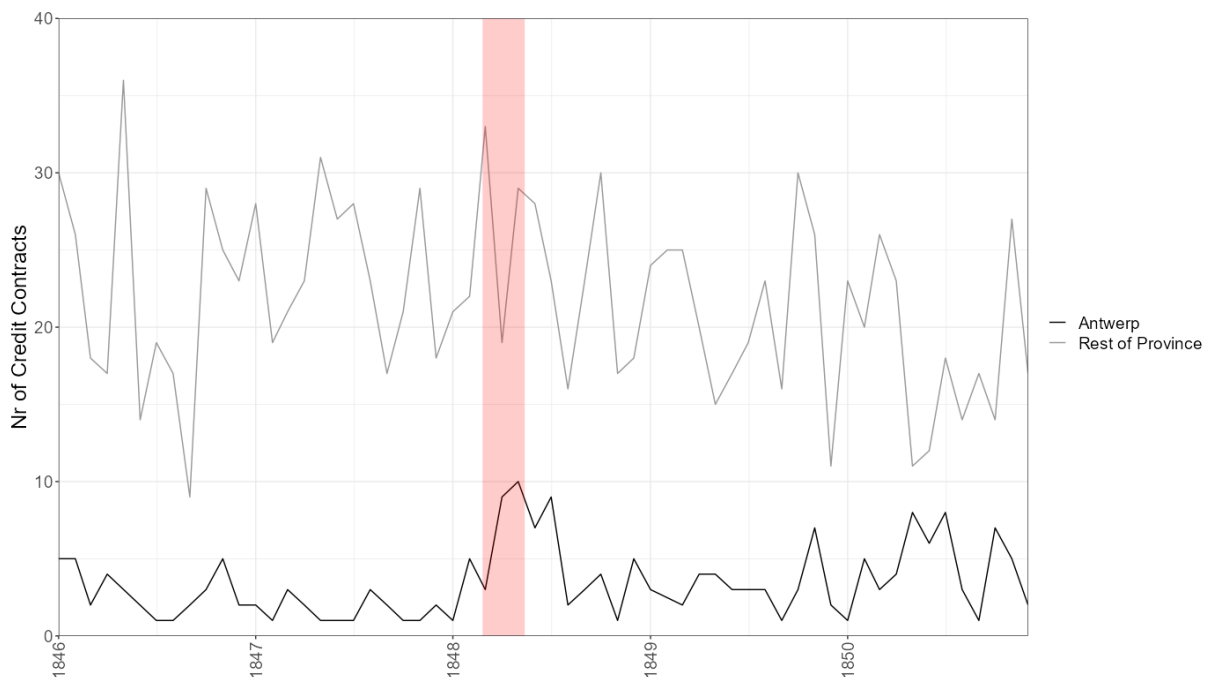
Source: NOTANT database, contains information on 8 notaries in the city of Antwerp and 30 notaries in the rest of the province. Shaded area represents the crisis period from February 25 1848 until 15 May 1848.

It appears that the increase in notarial lending was driven by people mortgaging existing property to obtain capital (Figure 7), notably in the city of Antwerp. While the number of credit contracts increased compared to levels prior to the crisis, regressions using the number of loans as a dependent variable do not show a clear impact of the crisis: the coefficients of the crisis

dummy remain statistically insignificant in most specifications. The increase in amounts lent would seem to be driven by larger individual loans, rather than by a rise in the number of contracts.

The analysis on the aggregate amounts suggest that the notarial credit market expanded during the banking crisis, and that this was not driven by a flight to real estate markets as alternative investments. This supports our first hypothesis, namely that notarized credit substituted (at least partially) for bank lending during the crisis. This substitution, however, seems to have taken place only in the city of Antwerp, also providing support to our second hypothesis.

Figure 7: Total monthly number of credit contracts notarized by location of the notary, 1846-1850.



Source: NOTANT database, contains information on 8 notaries in the city of Antwerp and 30 notaries in the rest of the province. Shaded area represents the crisis period from February 25 1848 until 15 May 1848.

## 6. Loan Level Analysis

To shed light on what drove the increase in notarized lending during the crisis, we analyze the data at the loan-level. This allows us to gauge changes on the loan's terms and conditions, such as interest rate, maturity, or repayment requirements. A tightening of one or several of these can be interpreted as the presence of credit constraints and/or an increase in risk awareness.

Tables 5 to 8 show the results of the analysis of the impact of the crisis on different loan term and conditions.<sup>15</sup> In case of liquidity constraints or higher risk perceptions, we would expect individual loans to have a smaller size, shorter maturity, higher interest rates, or more stringent repayment conditions. Equation 2 shows the regression model used for loan size, where  $L_{it}$  represents the natural logarithm of the size (in BEF) of loan  $i$  which has been provided at time  $t$ ;  $D_t$  is the crisis dummy (equal to 1 from 25 February to 15 May 1848, zero otherwise);  $R_i$  indicates where the loan was registered (equals 0 is registered in Antwerp city, 1 otherwise). Several specifications also include the interaction between the loan registration place and the crisis variable ( $D_t * R_i$ ). The rest of variables contain loan controls ( $C_i$ ) and year and notary fixed effects.

Equation 2: individual loan analysis

$$L_{it} = \alpha + \beta_1 D_t + \beta_2 R_i + \beta_3 (D_t * R_i) + \gamma_i C_i + \gamma_t Y_t + \gamma_j N_j + \varepsilon_{it}$$

Table 5 estimates the impact of the crisis on the size of individual loans. Nominal loan amounts are transformed into logarithm form (natural logarithm). Interest rates and the change in bank stock prices are expressed in percentage points and maturity is measured in years. We also include some variables on the share of women among the loan parties (gender composition), and differentiate between the share among lenders and borrowers. These are expressed in percentages. The rest of variables are dummies, taking values 0 and 1. Specifications shown in columns 3 to 5 include notary and year fixed effects.

Consistent with the analysis of aggregate amounts, the estimations show that loans became larger during the crisis, but only if they were notarized in the city of Antwerp. In specification 5, furthermore, we distinguish between the location of lenders and borrowers, which we interact with the crisis variable. This suggests that the location of the borrower mattered: loans provided to borrowers living in a city (Antwerp in most cases, but also other towns with a population above 5,000) are considerably larger (over 300%) than loans provided to non-city borrowers in normal times. The location of the lender does not imply a change in loan size during the crisis, although loans with either a city borrower or lender are in general larger in normal times. In specifications 1 to 3, this is reflected in the negative coefficient for the variable “Rest of province”.

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<sup>15</sup> For consistency purposes, results shown refer to regressions on the sample of loans for which none of the variables used in the latest specification is missing (1,677 loans). Results of specifications with fewer variables using the largest available sample yield similar results, both in magnitude and significance.

Given the stronger presence of banks in the cities, it makes sense that borrowers in urban areas would have been more affected by bank credit constraints and, therefore, increased their demand for notarial loans. This result suggests that city borrowers were, however, able to access liquidity from the notarial market when bank lending supply dropped. On the contrary, most specifications show a reduction in the size of loans notarized in the rest of the province, although the coefficient is not statistically significant in all regressions. This indicates a fall in notarial credit activity outside the city following the banking crisis.

Table 5: Individual loan size regressions

	1	2	3	4	5
	Ln(size)	Ln(size)	Ln(size)	Ln(size)	Ln(size)
Crisis	0.13 (0.158)	1.22 *** (0.247)	1.16 *** (0.242)	1.13 *** (0.250)	0.37 (0.690)
Rest of province		-1.12 *** (0.053)	-1.20 *** (0.061)	-0.36 (0.683)	0.11 (0.674)
Rest of province# Crisis		-1.56 *** (0.297)	-1.41 *** (0.292)	-1.35 *** (0.288)	-0.44 (0.687)
Maturity			0.04 *** (0.005)	0.05 *** (0.005)	0.05 *** (0.005)
Interest rate			0.06 (0.041)	0.08 * (0.044)	0.04 (0.044)
Payment conditions			-0.06 (0.075)	-0.13 (0.086)	-0.12 (0.084)
Repayment conditions			-0.06 (0.069)	-0.01 (0.089)	-0.02 (0.087)
Crisis # City lender 0 # 1					0.44 *** (0.065)
1 # 1					-0.00 (0.339)
Crisis # City borrower 0 # 1					0.18 ** (0.077)
1 # 1					1.48 ** (0.712)
Intercept	7.65 *** (0.029)	8.41 *** (0.044)	7.68 *** (0.213)	7.40 *** (0.282)	7.10 *** (0.280)
Gender composition	No	No	Yes	Yes	Yes
Notary FE	No	No	No	Yes	Yes
Year FE	No	No	No	Yes	Yes
Number of observations	1677	1677	1677	1677	1677
Adjusted R-squared	-0.00	0.24	0.28	0.33	0.36

\*\*\* p<.01, \*\* p<.05, \* p<.1

In markets with unregulated interest rates, changes in supply and demand for credit can be reflected on rates as well as on volumes. Positive supply shocks in credit markets would result in a decrease in interest rates combined with an increase in the total amount lent (Quinn, 2001). However, interest rates on notarial loans show little dispersion, both in the cross-section and across time, including during the crisis. The loan-level regressions (Table 6) confirm this stability and, in particular, the lack of reaction of interest rates to the crisis.

Notarial loan interest rates are however negatively correlated to the loan size, and lower when the share of women among lenders is higher. They are higher when either the borrower or the lender resides in a city.

Table 6: Interest rate regressions

	1	2	3	4	5
	Interest rate	Interest rate	Interest rate	Interest rate	Interest rate
Crisis	0.09	0.28 *	0.21	0.04	0.32
	(0.084)	(0.147)	(0.147)	(0.142)	(0.395)
Rest of province		-0.25 ***	-0.25 ***	-0.66 *	-0.49
		(0.032)	(0.040)	(0.386)	(0.386)
Rest of province # Crisis		-0.28	-0.18	-0.11	-0.35
		(0.177)	(0.178)	(0.164)	(0.394)
Ln(size)			0.02	0.03 *	0.01
			(0.015)	(0.014)	(0.014)
Maturity			-0.01 **	-0.01 ***	-0.01 **
			(0.003)	(0.003)	(0.003)
Payment conditions			0.02	0.07	0.07
			(0.045)	(0.048)	(0.048)
Repayment conditions			-0.13 ***	-0.03	-0.03
			(0.042)	(0.050)	(0.050)
Crisis # City lender					0.11 ***
0 # 1					(0.037)
1 # 1					-0.02
					(0.194)
Crisis # City borrower					0.12 ***
0 # 1					(0.044)
1 # 1					-0.07
					(0.408)
Intercept	4.50 ***	4.67 ***	4.62 ***	4.59 ***	4.51 ***
	(0.015)	(0.026)	(0.129)	(0.152)	(0.153)
Gender composition	No	No	Yes	Yes	Yes
Notary FE	No	No	No	Yes	Yes
Year FE	No	No	No	Yes	Yes
Number of observations	1677	1677	1677	1677	1677
Adjusted R-squared	0.00	0.04	0.07	0.25	0.25

\*\*\* p<.01, \*\* p<.05, \* p<.1

The steadiness of interest rates may indicate that supply was enough to meet the increased demand during the crisis, and that risks were not considered to be significantly different from before the crisis. Perhaps this had to do with the fact that real estate was offered as collateral, which was considered a very safe asset. However, it can also reflect market practice or regulation<sup>16</sup> rather than an assessment of credit risk or changes in liquidity (Hoffman et al., 2000; Peeters and van Kooten, 2024; Têcheur, 1957). As HPVR showed for France, changes in credit supply may have been reflected in adjustments to other conditions of the loan, including size and maturity, instead of to its price (Hoffman et al., 2019). In such a case, other loan terms and conditions could have tightened during the crisis. We thus turn to study the impact of the crisis on loan maturities and repayment conditions. We assume that a credit

<sup>16</sup> Between 1807 and 1830, rates on loans could not exceed 5 percent (6 percent for commercial loans) in Belgium.

tightening could be reflected in shorter maturities (to minimize credit and liquidity risk), and/or an increase in the inclusion of repayment conditions, as a reimbursement in coins could indicate better borrower worthiness (or distrust of the banking sector).

Table 7: Loan maturity regressions

	maturity	maturity	maturity	maturity	maturity
Crisis	-0.70 (0.666)	0.10 (1.189)	-1.05 (1.172)	0.33 (1.187)	-0.29 (3.303)
Rest of province		1.23 *** (0.256)	2.21 *** (0.319)	0.44 (3.221)	-0.20 (3.226)
Rest of province # Crisis		-1.18 (1.431)	0.55 (1.413)	0.10 (1.365)	-0.35 (3.291)
Ln(size)			0.99 *** (0.115)	1.11 *** (0.114)	1.14 *** (0.116)
Interest rate			-0.50 ** (0.194)	-0.57 *** (0.208)	-0.52 ** (0.209)
Payment conditions			0.05 (0.359)	0.46 (0.403)	0.50 (0.403)
Repayment conditions			-0.39 (0.331)	-0.10 (0.417)	-0.13 (0.417)
Crisis # City lender 0 # 1					-0.17 (0.313)
1 # 1					4.35 *** (1.622)
Crisis # City borrower 0 # 1					-0.76 ** (0.368)
1 # 1					-4.61 (3.412)
Intercept	10.31 *** (0.121)	9.48 *** (0.210)	3.01 ** (1.364)	2.95 * (1.588)	3.15 ** (1.588)
Gender composition	No	No	Yes	Yes	Yes
Notary FE	No	No	No	Yes	Yes
Year FE	No	No	No	Yes	Yes
Number of observations	1677	1677	1677	1677	1677
Adjusted R-squared	0.00	0.01	0.06	0.17	0.17

\*\*\* p<.01, \*\* p<.05, \* p<.1

Loan maturity, expressed in years, also remained unchanged during the crisis (Table 7). Several loan characteristics seem to explain (or be related to) its maturity (such as size, interest rate, or the share of women participating in the loan), but the crisis variable is statistically insignificant in most specifications. Nonetheless, lenders located in cities did provide longer-maturity loans during the crisis, by over four years. This seems to point at the absence of a tightening in this dimension and, for city lenders, possibly even an easing.

Almost 60 percent of the loans in our sample notarized during the second period (1846-1850) included a requirement on the type of money that could be used to reimburse the loan. For roughly all of them, metal coin or bullion was the only form accepted, while banknotes or similar financial assets were categorically rejected in the contract.



Table 8 shows the results of several logit regressions where the presence of such a condition (with value 0 if not present and 1 if it is) is the dependent variable. None of the specifications indicate any impact of the crisis variable, either alone or interacted with other variables. When controlling for notary and year, most of the loan characteristics seems to become insignificant, and the coefficient on “rest of province” reverses sign: loans notarized outside of the city of Antwerp would be more likely to include a repayment condition of this type. This may be related to the distance from banks where banknotes could be redeemed, although it could also indicate higher levels of distrust vis-à-vis banknotes in smaller towns.

Loan contracts that included a payment condition (i.e. type of money used to provide the loan) are also more likely to include a repayment requirement, possibly indicating distrust (by both lender and borrower) of banknotes, or the longer distance to a bank. Finally, borrowers from cities needed to agree more often to the inclusion of repayment requirements, though this did not change during the crisis.

Table 8: Logit regressions on repayment form conditions

	1	2	3	4	5
	Repayment conditions	Repayment conditions	Repayment conditions	Repayment conditions	Repayment conditions
Crisis	0.09 (0.278)	0.09 (0.546)	0.70 (0.690)	0.70 (0.861)	-25.14 (1,898.077)
Rest of province		0.73 *** (0.215)	1.22 *** (0.292)	2.27 *** (0.720)	2.85 *** (0.811)
Rest of province # Crisis		0.20 (0.642)	-0.24 (0.794)	-0.45 (1.051)	25.08 (1,898.077)
Ln(size)			-0.10 (0.083)	0.02 (0.121)	0.02 (0.124)
Maturity			0.03 * (0.020)	0.03 (0.030)	0.03 (0.031)
Interest rate			-0.19 (0.126) (0.357)	0.02 (0.227) (0.549)	0.03 (0.234) (0.553)
Payment conditions			2.84 *** (0.202)	1.51 *** (0.284)	1.52 *** (0.286)
Crisis # City lender 0 # 1					-0.34 (0.310)
1 # 1					13.65 (804.402)
Crisis # City borrower 0 # 1					0.97 ** (0.459)
1 # 1					12.91 (1,719.196)
Intercept	-0.06 (0.069)	-0.69 *** (0.201)	-0.98 (0.887)	-1.46 (1.422)	-2.02 (1.479)
Gender composition	No	No	Yes	Yes	Yes
Notary FE	No	No	No	Yes	Yes
Year FE	No	No	No	Yes	Yes
Number of observations	895	895	895	664	664

\*\*\* p<.01, \*\* p<.05, \* p<.1

NOTE: Regressions for loans registered in the second period only (1846-1850) due to incomplete information about payment and repayment conditions for loans registered in the first period (1833-1837).

## **7. Robustness Checks and Additional Evidence**

Several robustness tests have been performed to assess the consistency of these results. Analyses using the size of loans in thousands BEF instead of their logarithm yield similar conclusions, both for the aggregate (monthly) and loan-level analyses.

Adding lagged values of monthly lending or macroeconomic variables in the monthly-level regressions did not affect the size or significance of the coefficient on the crisis variable. Focusing on the second period only instead of on the entire sample (both for the aggregate and loan-level analyses) did not change the main results, either. Results were also robust to alternative crisis definitions (measured by bank deposit outflows or spanning a shorter period of time), and to replacing the interest rate variable by one that took into account the conditional rate.

## **8. Conclusions**

Recent research highlights the role of non-bank lending in industrializing economies. Drawing from a unique, newly collected database of notarized loans in Antwerp, we are able to assess the relevance of such type of credit, in particular during a banking crisis. As banks tightened lending in 1848, we find that borrowers were able to find liquidity in notarial loan markets, although with differences across geographic areas. During the crisis months, there was an increase in new lending provided through notaries in the city of Antwerp, compensating, at least partly, the drop in bank lending. However, this effect was not present in the rest of the province.

Borrowers from bigger municipalities, who before the crisis usually faced tougher terms and conditions, were able to obtain larger loans during the crisis. Furthermore, there is no evidence of tightening in terms and conditions in notarial markets: interest rates and the frequency of repayment conditions remained unchanged, while city lenders provided loans with longer maturities. The combination of those factors suggests that the notarial credit market experienced both a positive supply and demand shock during the months of banking distress.

Overall, our results suggest that notarized lending supported the economy during a bank run. The effects we find are driven by urban areas where banks were more active. As such, in this paper we provide new evidence that notarized lending was an important alternative for bank lending during a bank crisis caused by an exogenous shock.

Further research can look at structural or cyclical differences between rural and urban areas, and at the role of the socio-economic situation of lenders and borrowers, to try to shed light on these heterogeneous developments. Finally, to improve our understanding of the process of financial transformations and the expansion of banking in the 19<sup>th</sup> century, further research on later periods is needed to confirm if the substitution effect continued as bank lending became relatively more important to firms and households.

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