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# Tweaking financial instruments: bills obligatory in sixteenth-century Antwerp

JEROEN PUTTEVILS
*University of Antwerp*

This article discusses the use of private promissory notes in the sixteenth-century commercial metropolis of Antwerp. Students of financial history tend to look for first instances of financial techniques and institutions such as bills of exchange, share trading, sovereign debt and banks. However, financial innovation can also be found in the piecemeal adaptation of an older, existing technique, institution or instrument as the result of changes in the market and of demands exerted by particular groups within that economy. The outcome of this process is determined by the structure of the economy in question, its institutional arrangements and the willingness of authorities to adapt the rules.

**Keywords:** Antwerp, bills obligatory, financial innovation, sixteenth century

**JEL classification:** N23, N83

In his study *Finance and the Good Society*, Robert J. Shiller points out that the democratization of financial innovation 'proceeds at a snail's pace, often over centuries. Progress in finance can seem excruciatingly slow'. This slowness in financial development is due to the 'demand for conventionality and familiarity and an overreliance on tradition, both of which continue to inhibit financial innovation' (Shiller 2012, pp. 106 and 194).

Financial innovation can be defined as the 'act of creating and then popularising new financial instruments as well as new financial technologies, institutions and markets'. Financial innovation is sometimes divided into product – new products, securities or pooled investment products – and process innovation – ways to distribute securities, process and price transactions (Tufano 2003, pp. 2-3). The literature on financial innovation attempts to understand how imperfections (such as incomplete markets, information asymmetries or high transaction, search and marketing costs)

J. Puttevils, Centre for Urban History, University of Antwerp and Research Foundation Flanders, Prinsstraat 13 D-322, 2000 Antwerp, Belgium; email: jeroen.puttevils@uantwerpen.be. The author would like to thank those present at the University of Pennsylvania's Economic History Forum (29 April 2013), the Finance and History Meeting (7 June 2013, The Hague), the European Historical Economics Society Conference (6-7 September 2013, London), Bruno Blondé, Dave de ruysscher, Oscar Gelderblom, Wouter Ryckbosch, Thomas Max Safley, Peter Stabel and two anonymous reviewers for their insightful comments on previous versions of this paper. The text was proofread by John R. J. Eyck. The research for this paper was funded by the Research Foundation Flanders.

stimulate financial innovation, though these deficiencies may prevent participants in the economy from efficiently obtaining the functions they need from the financial system (Merton 1992; Goetzmann and Rouwenhorst 2005, pp. 4–9). Financial innovation tries to provide solutions to these imperfections and responds to changes in the economic environment; indeed, the innovation itself reveals changes in that environment (Tufano 2003, pp. 5–7).

This article draws on the history of bills obligatory in sixteenth-century Antwerp to show that financial innovation does not need to be sudden or revolutionary but can happen through piecemeal, gradual (but not necessarily slow) adaptation and improvement – or 'tweaking', as it is called in the title of this article – of existing instruments and practices. Recent research has similarly shown that the Dutch East India Company, which many have dubbed the first modern corporation, took shape rather gradually, as the result of a process of piecemeal engineering executed by its directors (Gelderblom, de Jong and Jonker 2013). In the case of bills obligatory, gradual innovation was shaped by the economic environment – in the sense of the economic structure and its dynamics, the institutional structure of the economy and the regulatory agencies – as well as the (sometimes different) demands of those using the financial instrument or technique in question. The article at hand maps this innovation by analysing laws and customs, discussions among legislators, and a large data set of bills obligatory drawn from Antwerp secretaries' and notaries' acts and from merchant account ledgers. It not only studies the process of innovation but also considers the implications for users of the financial instrument, the options and strategic choices enabled by financial innovation, and the influence and opinions the users themselves had on the process of financial innovation. In so doing, this article builds further on the earlier literature by De Smedt, Brulez, Van der Wee and Munro and presents a large and new data set on bills obligatory (Brulez 1959; O. de Smedt 1940–1; Munro 2000, 2003; Van der Wee 1993).

In sixteenth-century commercial cities like Antwerp, merchants had a wide range of methods to execute payments and to finance their businesses: goods could be paid for in cash, by a promissory note or a bill of exchange, by mutual or multilateral account ledger clearing and through a giro transfer via a bank. Long-term financing of commercial enterprise was structured by partnerships, deposits, annuities and the reinvestment of profits (Gelderblom 2003, 2010; Gelderblom and Jonker 2004; Neal 1994). Historians have mainly focused on long-term financing through loans and annuities, on the one hand, and on one particular payment and short-term credit instrument, the bill of exchange, on the other hand (Hoffman, Postel-Vinay and Rosenthal 2000; Santarosa 2015). Different European trading cities offered merchants different solutions for their payments and finance as a result of different traditions, institutional trajectories, and the scale and scope of the cities' markets (Gelderblom 2003).

The present investigation intends to broaden the debate on financial instruments and singles out the relatively simple bill obligatory or IOU in sixteenth-century Antwerp. The bill obligatory was anything but new or revolutionary by the sixteenth

century. Economic and legal historians have pointed out novel and modern uses of bills obligatory such as discounting and endorsement. Yet not much attention has been paid to the actual use of the instruments and frequency of the new techniques in handling them, or to their impact on the daily operations of merchants (Van der Wee 1993). Bills obligatory frequently show up in recent reconstructions of early modern portfolios – based either on inventories or taxed assets (Deneweth 2011; Ogilvie, Küpker and Maegraith 2012; Oldland 2010). This article will argue that the bill obligatory in sixteenth-century Antwerp developed into a convenient, multi-functional and versatile financial instrument. Its contents, clauses and use were subject to the preferences of its users, who could construct the bill to suit their individual needs within the limits of the laws and customs governing the bill and its use. As such, the bill obligatory became a one-size-fits-all solution for different transactions, remaining popular in Antwerp until at least the eighteenth century (Willems 2009, pp. 108–12).

The first section defines what constituted a bill obligatory and briefly presents the sources used in this article. The development towards the transferability and negotiability of bills obligatory and how these affected the use of bills is the subject of Section II; by juxtaposing the evidence from account ledgers and other documents with the legal texts, the speed and shape of financial innovation is uncovered. Section III provides evidence for how the transfer of a bond was proven and how there were critical reactions against the IOU payment system. In the next section the role of intermediaries in the IOU payment system and the evolution of that system into a fully developed financial instrument are described. Section V turns from laws to contract enforcement; it demonstrates that the central government, too, played an important role in providing a legal structure and contract enforcement framework for the IOU payment system. Subsequently, the actual bonds themselves are examined. These quantitative analyses show that the bond was a versatile financial instrument that could be tailored to the needs of the contracting parties.

## I

Before proceeding, a clear definition of what is understood as a so-called IOU is needed, given the more specific terminology used in English language and law for different forms of such contracts (Holden 1955; Kerridge 1988; Postan 1974; Rogers 1995). The Antwerp sources use the terms *obligatie, obligasi, obligacie, obligation, schuldbekentenisse, schuldbrief* and *hantschrift* to denote what today is understood to have been a contract between a debtor and a creditor, in which the debtor promised to pay the creditor a specified sum of money on a specified date. The sum had to be paid in local currency; in this sense, the bill obligatory differed from a bill of exchange. The obligation was a credit instrument granting deferred payment and, when transferable, it became a means of payment, thus obtaining the status of currency. It could be registered by an authority, such as the city's aldermen or a notary, or it could be a private instrument, signed only by the debtor. In England, only higher-value bonds were

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registered (Munro 2000, p. 243). In sixteenth-century Antwerp sources there was no separate terminology used to designate transferable and/or registered IOUs (De ruysscher 2009, pp. 236-47). Therefore, this article treats IOUs, bonds, promissory notes, obligations and bills obligatory as synonyms and distinguishes between transferable and non-transferable debt where necessary. It will deal with private IOUs only, although it should be noted that city and provincial governments and the central government in the Low Countries also issued obligations (Van der Wee 1963b, pp. 354-5; Zuijderduijn 2010). The 1567 trial proceedings concerning a bond between Coenraerdt Schetz and Jan Spierinck provide a full-text copy of a typical bond:

> I, Jan Spierinck, confess and declare by my own hand toowe the honourable lord Coenraerdt Schetz the sum of four hundred pounds Flemish groat and this on the account of the equal sum I have received from himto my satisfaction. I promise to fully pay the afore-mentioned lord CoenraerdtSchetz or the bearer hereof on the fourth day of the coming month of Augustwithout any delay, committing my person and all my possessions now and in thefuture. In the year 1565 11 June[1]

Five different types of Antwerp sources have been examined in search of bills obligatory (subject to the availability of the extant sources) (see appendix). The data set of bills obligatory that will be used to demonstrate the process of financial innovation and the preferences and options of the users not only includes bonds written within the mercantile community; IOUs by non-merchants are found as well in the certification records, aldermen's registers, civil rulings, notarial acts and the lists of lost bonds. Law texts, proposals and notes by government administrators, and court cases provide additional details on the evolution of the IOU payment system and the financial innovation it engendered.

## II

Innovations, new practices and unrealised ideas on bills obligatory took place within four fields: the transfer and negotiation of bills, guarantees, registration of bills and their enforcement. As a result, the bill obligatory evolved into a widely used, negotiable and transferable financial instrument from the late fifteenth and early sixteenth century onward (de Roover 1953; De ruysscher, 2011; Puttevils, 2015b; Van der Wee, 1993). The first instances of tweaks in the design of and the new legal rules concerning the bill obligatory are summarised in Table 1, drawing on previous (archival) research.

Antwerp's economic golden age took off as a fair-based market, much like the thirteenth-century fairs in Champagne and Flanders where bills obligatory or fair letters (*marktbrieven*) were frequently used and registered by public authorities (Wyffels and des Marez 1991). From the beginning of the Antwerp fairs in the fourteenth and fifteenth centuries such instruments were present, drawn up by buyers and sellers for

[1] City Archive Antwerp, henceforth CAA, Processen, 7 no. 12144, Copye obligacie.

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Table 1. *Chronology of financial innovations in bills obligatory*

| Year | Innovation | Type |
|---|---|---|
| 13th century | Bearer clause in bills obligatory at the Ypres fairs | First (documented) instance |
| 1489 | Deposit-banking and payment services by money-changers/cashiers is prohibited | Princely law |
| +/- 1490 | Majority of bills obligatory mentioned in the Antwerp Certification books has a bearer clause | First (documented) instance |
| 1497 | Ban on payment services by money-changers/cashiers is revoked | Princely law |
| 1507 | Bond bearer did not need a power of attorney from the original creditor any more to sue the original debtor for payment | Declaration on commercial custom in Antwerp confirmed by the city government |
| 1521 | Payment dates for bills obligatory which were due at the Brabant fairs are proclaimed by the emperor | First (documented) instance |
| 1532 | Assignment of bills obligatory ('*bewysinghe*') to a third party had become familiar practice; assignor remains liable for payment | First (documented) instance |
| 1536 | Discounting of bill obligatory | First (documented) instance |
| 1537 | Bond bearer did not need a power of attorney from the original creditor any more to sue the original debtor for payment | Princely law |
| 1538 | Assignor writes name on the bond itself as '*borge principael*' or principal surety; the receiving creditor could even sue the *borge* before the original debtor (legalised in municipal law in 1570) | First (documented) instance |
| 1541 | Assignment liability legalised (request for legalisation in 1537) | Princely law |
| 1541 | Payment periods were established on fixed calendar days (instead of movable holy days and fair periods) | Princely law |
| 1542 | Strict distinction made between transport (definitive payment) of a letter obligatory and transfer by assignment | First (documented) instance |
| 1546 | First lost bill obligatory is posted | First (documented) instance |
| 1555 | Partial payments are written on the back of the bond | First (documented) instance |

*Continued*

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Table 1. *Continued*

| Year | Innovation | Type |
|---|---|---|
| 1559 | Bills obligatory are used to raise money without commodities as collateral | First (documented) instance |
| 1560 | Mutual clearing of bills obligatory (‘*rescontre*’) | First (documented) instance |
| 1565 | Formal proof is required to demonstrate that the transfer of a bill was definitive and did not happen through the practice of assignment | Declaration on commercial custom in Antwerp confirmed by the city government |
| 1565 | Condemnation of assignment by the nation of Lucca | First (documented) instance |
| 1567 | Document which proves transfer through assignment ‘*billet van assignatie*’ | First (documented) instance |
| 1570 | 7 articles on bonds published in municipal customary law | Municipal law |
| 1608 | 17 articles on bonds published in municipal customary law | Municipal law |

*Sources:* Aerts 2011; De ruysscher 2009, 2011; O. de Smedt 1940–1; Munro 2000; Puttevils 2015b, pp. 109–35; Van der Wee 1993.

payment at the next fair in Antwerp or Bergen-op-Zoom (roughly every three months) (Doehaerd 1962–3; Van der Wee 1963b, p. 338). Hence, bills obligatory were a fundamental part of the Antwerp fair system and would continue to function as such even after its transition into a permanent market.

Bills obligatory could circulate because of the possibility of including a (mixed) bearer clause: ‘payable to X (name of the creditor) or to bearer’ (De ruysscher 2011, p. 505). The bearer clause already existed in thirteenth-century Flanders; in these early documents the bearer clause merely indicates that an agent of the creditor would collect the debt (Munro 2000, p. 133; Van der Wee 1993, p. 151). The Antwerp certification books and aldermen’s registers show that the bearer clause had already become an established practice at the Antwerp fairs by the 1490s. In fact, by this time there were more bonds with a bearer clause than without. Interestingly, in the period 1479–1514, bonds with a bearer clause had a higher average (and median) value than bills without such a clause.[2] The higher nominal value may have increased the need to make the bond transferable. Merchants

[2] Bond with bearer clause: mean £80.441 gr. Fl. or 155,454.3 grams of silver, median £53 gr. Fl. or 7,408.8 grams of silver (N = 95), bonds without clause: mean £59.079 gr. Fl. or 18,707.28 grams of silver, median £24.625 gr. Fl. or 7,408.8 grams of silver (N = 74).

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needed to be able to transfer the larger sums in case of liquidity problems, but transferring bonds also entailed sizeable risks for the new creditor. In 1507 the Antwerp municipal government ruled by a '*turbe*' – a declaration by jurists and lawyers on legal and commercial practice – that a bearer had full legal powers without having to prove his ownership of the bill, rendering the bill more secure for a third party who would receive such a bill.[3] By doing so, Antwerp followed the precedents on the legal powers of bond bearers created in England (the *Burton* vs *Davy* case on a bill of exchange in 1436) and in Lübeck (1499 and 1502) (Munro 2000, pp. 144–51; North 2013, pp. 163–4). The central government issued an ordinance in 1537, thereby establishing what had already been accepted in Antwerp much earlier (Laurent, Lameere and Simont 1893–1922).

This chronology clearly indicates institutions moving at different speeds: the local government starkly outpaced the central authorities. The ordinances of the central government allowed for bearer rights in the entire territory of the Low Countries, but the bearer clause in bonds did not become standard practice outside the commercial gateways of the Low Countries: in Liège, for instance, the bearer clause was used very infrequently and the circulation of bonds remained limited. The customary laws of the cities of Aalst, Brussels, Leuven and Mechelen did not recognise the rights of a bond bearer (de Roover 1953, p. 94; Lejeune 1939, p. 65). This variation indicates the different needs of commercial cities like Antwerp as well as the faster pace of financial innovation in centres of long-distance commerce. The commitment of the Antwerp municipal government in providing legal rules in line with the demands of the mercantile community is corroborated by the subsequent editions of the municipal customary laws (the *Costuymen*) in 1572, 1582 and 1608: the number of articles on bonds increased, namely, from seven to 17 (Van der Wee 1993, p. 161).

Besides the juridical powers and legal rights of the bond bearer, the liability of the transferring creditor was at stake. The transfer of a bond by a creditor to a new creditor could be executed through the legal concepts of '*transport*' (conveyance in English), or '*cession*', and through assignment, or '*bewysinghe*'. The older concept of transport definitively transferred all legal rights from the old creditor to the new one; the transfer dismissed the former from all claims by the latter.[4] Conveyance was needed for the new creditor to obtain all legal rights to pursue a debtor and was usually accompanied by a power of attorney (Van der Wee 1993, pp. 151–2). Transports were often registered by notaries or by the aldermen; oral testimony on the conveyance was also considered as legal evidence (Van der Wee 1993, pp. 155–6).

In case of an assignment, the ceding creditor retained liability if the debtor did not pay (De ruysscher 2009, pp. 242–4). In the 1582 edition of the *Costuymen* – again: the customary law – this principle was made explicit in the ruling 'assignment is not a

[3] CAA, Vierschaar, V no. 68, 13r, 7 June 1507.

[4] Antwerp customary laws, 1582, Impressae, title LXIV, article 12. Published in de Longé (1870), available at www.kuleuven-kulak.be/facult/rechten/Monballyu/Rechtlagelanden/Brabantsrecht/antwerpen/impressa2.html

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payment'.[5] The ceding creditor was relieved of this liability only when the debtor had fully satisfied the new creditor. This assignment originated in the late medieval practice of a payment order (De ruysscher 2009, pp. 233, 236, 242–4; Van der Wee 1993, pp. 152–3). The debtor was only acquitted of the new creditor's claim when he could prove that he had already paid his due. The practice of transferring bonds through assignment quickly became popular in the first half of the sixteenth century (Brulez 1958, pp. 183–4, 189; Van der Wee 1993, pp. 153, 155). In 1539 the financier Erasmus Schetz wrote to the Antwerp municipal government representative in Brussels insisting that 'the central government would receive God's blessing when it would legalise and regulate the practice of assignment and would equate paying by assignment with paying in cash' (O. de Smedt 1940–1, pp. 25–6; Van der Wee 1993, p. 153). The central government did so, convinced by Schetz's request, in an ordinance in October 1541 (Laurent *et al.* 1893–1922, IV, pp. 329–31).

Every time an IOU was passed on, the security for the eventual creditor increased. This liability chain, enforced by municipal law, turned the obligation into legal tender. The 1608 *Costuymen* explicitly regulated these assignment chains and documented that a bond could be passed on to 'four or five persons and more'; all ceding persons remained liable and linked to the original debtor of the bond (de Longé 1870, IV, pp. 380).[6] The bills could change hands several times before their maturity. The sources – especially the merchant account ledgers – abound with evidence of this high degree of circulation. Yet it is hard to measure exactly and systematically how many times a bond was passed on, since only the original creditor and debtor are named in the bond itself. According to Frans de Pape's account ledger, 69 of his bonds were paid out to his original creditor; in 52 cases the beneficiary was not the original creditor and hence de Pape's bond was transferred or assigned. Unregistered debts (for which de Pape did not write out any IOU) were much less likely to be paid out to a third party than debts paid for by a bond.

## III

Sixteenth-century Antwerp witnessed a strong development of its market and an equally strong increase in population. The mercantile population grew from a few hundred merchants (and a larger but seasonal crowd who visited the fairs) to more than 1,500 by the middle of the sixteenth century (Gelderblom 2013, p. 33). In this climate of growing anonymity – and as a result of the increasing transferability of bills obligatory – longer and longer chains of interdependence were created. Consequently, creditors could not know every party involved in the bond and gauge the credit risk to which they were exposed. Additional legal and personal guarantees were necessary to secure the bill.

[5] Antwerp customary laws, 1582, title LXIV, article 2.
[6] Antwerp customary laws, 1608, Compilatae, part 4, title XV, article 14.

The series of transferring creditors could be recorded either on the bond itself, on a separate document or in a particular register administered by a public authority. Interestingly, only one of these became an established practice in Antwerp – and only fairly late, for that matter (namely, recording the transferring creditor on the bond itself) (Brulez 1959, p. 402; Van der Wee 1993, p. 158). An official and specific registry could have been used to record bond transfers. In 1622 Malynes makes mention in his *Consuetudo, vel lex mercatoria* of the existence of an official IOU transfer registry system in Rouen and Lisbon (Malynes 1622, p. 100). No such system existed in Antwerp, though. On the one hand, registering a transfer would have increased transaction costs, thereby impeding the flexibility offered by trading bonds. On the other hand, this registration would have increased the security of the final creditor who, in the Antwerp scenario, could only either hope that the debtor would pay or appeal to the person from whom he had received the bond. Merchants always had the option to have their bond or its transfer recorded by public authorities such as the city clerk or a notary (see infra). This fits in with the commercial laissez-faire policy of the Antwerp municipal government: it provided a basic legal framework, offered services to those who required them but did not make registration compulsory (Gelderblom 2013). The flexibility of the Antwerp assignment system did not go unnoticed: Tommaso Contarini described the assignment system in his proposal to the Venetian senate for establishing a public bank. According to Contarini, the Antwerp market was successful due to abundance of trust and the scarcity of fraud, which obviated the need for public records (Lattes 1869, pp. 122–3).

Yet not all merchants were equally convinced of the advantages to the bond assignment system; especially foreign traders active in sixteenth-century Antwerp had different attitudes towards assignment and *transport*. Italian and Spanish traders were often suspicious of IOU assignments (Van der Wee 1963b, p. 343). The notarised *transports* in 1540 almost exclusively concern French and Spanish merchants. Local merchants were using notaries as intensively as these merchant groups but registered fewer *transports*. Hence, French and Spanish merchants seem to have preferred definitive *transport* over assignment.[7] When the Antwerp magistracy, in an attempt to benefit its own secretaries, tried to curtail the practices of notaries in the city in 1565, the 'nation' (or merchant guild) of Lucca argued in favour of the notaries, whose services they used to record powers of attorney and *transports* (Goris 1925, pp. 111, 339; Oosterbosch 1995). The 'nation' explicitly condemned assignment, or, as they called it '*transportz privez de main a main*': they claimed it caused collusion and fraud involving substantial sums, which had ruined several merchants. The English practice of assigning bills within the community of Merchant Adventurers differed from Antwerp customs, too. When a member of the Merchant Adventurers transferred a bond to a colleague, he was acquitted fully and could not be held liable any more (O. de Smedt 1950, II, pp. 583). By 1555, though, the Antwerp city government no longer tolerated the difference between English and Antwerp customs.

[7] For example, CAA, Notarial archives, notary Adriaan Zeger 's-Hertoghen, N no. 2071, 74v.

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Besides the guarantees of the creditor who passed a bill on through assignment, goods could be used as collateral and third parties could stand surety to secure the bond. In most cases, the IOU was based on a commodity transaction and the constitutive goods acted directly as a collateral; they could be returned or arrested when the bond was not paid. In the first half of the sixteenth century, IOUs were still intimately connected with the commodities trade. This is evidenced by the implicit contingency clause that the IOU was valid only when the goods were delivered to the buyer and when the goods' quality was satisfactory. The collateral of a bond was a general one; it involved the pledging of person and goods, now and in the future. This could raise potential problems, since liquidation of a bad debt could be problematic with such general collateral (Gelderblom 2010, p. 167). Merchants sometimes supplied additional and specific security measures: deeds to real estate and annuities could be offered, and bonds could act as security for new letters obligatory.

The timeline in Table 1 shows that between the 1490s and 1565 several piecemeal adaptations were made to the simple instrument of the bill obligatory in order to make it transferable, negotiable and enforceable in a court of law. Imperfections such as insufficient rights for bond bearers and the unclear liability of assignors were solved by financial innovation, first in practice, then in municipal and finally in princely law. To do so, Antwerp drew on and learned from European precedents. Financial innovation itself thus can be said to react to changing economic circumstances which generate imperfections; in the case of Antwerp these changes involved the growth of the market, the increase in the number of market participants (both merchants and non-merchants) and the transition from a periodic, fair market to a year-round, permanent market. As a result of innovation, the bond remained important and retained its various functions (moving funds across time and space; addressing moral hazard and asymmetric information problems; and facilitating the sale or purchase of goods and services through a payment system as described in the functional scheme in (Merton 1992)). At the same time, the very occurrence of financial innovation itself reveals changes in the Antwerp market. The changes made in the design of the bond were mainly process innovations; the nature of the bond, a simple loan, did not really change (no product innovation). The conventionality and tradition of the bill obligatory did not really hinder innovation, and neither was financial innovation slow. By 1582 – although probably well before then already, given the presence of many non-mercantile bonds in prior sources and years – the bond had become a democratised innovation: the Antwerp *Costuymen* explicitly stated that everyone, not only merchants, could make use of the instrument.[8] The innovations in the design of the bill obligatory caused important spill-over effects for the bill of exchange.

[8] Antwerp customary laws, 1582, Impressae, title LI, article 13.

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## IV

The previous section described how the IOU payment system was tweaked over time into a flexible and decentralised system relying on chains of interdependence. This system had the potential for *rescontre* – a periodic meeting, often embedded in a fair – where all merchants cleared mutual debts and organised clearing chains so that only the net amounts of money needed to be settled (Boerner and Hatfield 2014). However, no signs of organised *rescontre* sessions involving large groups of merchants could be found for sixteenth-century Antwerp. There is only evidence for the mutual clearing of merchant-to-merchant debts (Van der Wee 1993, p. 151).

IOU creditors could not only turn to acquaintances or business colleagues in the payment system; there were also intermediaries such as money-changers, cashiers and brokers. In fourteenth-century Bruges, Antwerp's commercial predecessor, money-changers accepted deposits, executed giro-payments on behalf of their clients (cashiering), co-operated with other money-changers and extended credit through fractional reserves; they had become bankers (Aerts 2011, pp. 94-5; de Roover 1948; Murray 2006). Letters obligatory were also very much present in the Bruges probate inventories of the middle of the fifteenth century (Stabel 2008); money-changers/bankers could thus co-exist with the IOU payment system. The Brabant fairs were another arena where these money-changers/bankers were active (Van der Wee 1963b, pp. 355-7). Even so, economic crisis and monetary disorder led the Burgundian dukes to prohibit the execution of payments and acceptance of deposits by money-changers (most strongly in 1489). Still, the ban was revoked in 1497 and gradually money-changers offered cashier services again, although they did not engage in extensive credit extension (Aerts 2011; Munro 1991, p. 66; 2003, pp. 549, 562; Van der Wee 1977, pp. 323-4; 1993, pp. 150-1). The few extant indications of money-changers/cashiers in sixteenth-century Antwerp do show active cashiers working either independently or as employees. The Low Countries did not witness the creation of a public bank prior to the beginning of the seventeenth century, so such an institution could not centralise payments, either. Lacking a central institution for payments such as the southern-style banks or the Bank of Amsterdam, financial instruments thus circulated privately in sixteenth-century Antwerp. This private circulation was reinforced by government interventions that set the rules.

Bill-holders could also turn to third parties to negotiate or discount their bonds, i.e. selling a bond before maturity at a price (premium) lower than the bond's nominal value. Such discounting of debts originated in the medieval practice of creditors who, when in need of cash, requested an earlier payment from their debtor in exchange for a rebate (Kohn 1999, p. 27; Van der Wee 1963b, p. 349). The earliest reference of discounting a bill obligatory in Antwerp is dated 1536 and can be found in the papers of the English merchant Thomas Kitson (Van der Wee 1955). Merchants such as Daniel de Bruyne or Jan Spierinck turned to discounting when

they needed ready cash.[9] For wealthy merchants, discounting could become a lucrative activity. Jan Gamel even organised a partnership to buy bills obligatory from third parties. Because most bonds were short-term debt (with no significant risk of the death or insolvency of the debtor in the long run) and because they could be assigned to a third party (recouping the full value of the bond), it is probable that discounting was not a common choice for merchants (Brulez 1959, pp. 403-4; Van der Wee 1963b, p. 351; 1993, p. 163). Yet they always had the option, when in need of cash, to discount the bond.

In late sixteenth-century Amsterdam the letter obligatory developed as a means to finance enterprise and became detached from actual commercial transactions in commodities (Gelderblom 2003, pp. 627-30; Gelderblom and Jonker 2004, pp. 647-8, 663). Hence, the bill evolved into a full-fledged financial instrument. In fact, early signs of this detaching of bonds from commodity transactions are already visible in Antwerp: a 1559 ordinance refers to '*lettres d'obligations, tant de finances, changes que marchandises*'. IOUs could thus be used for both commodity transactions and for pure finance (Laurent *et al.* 1893-1922, pp. v, 30). Bills obligatory were crucial to (re)starting mercantile companies: during the military offensive of 1576 called the 'Spanish Fury', Christophe Plantin had to pay a large ransom and afterwards needed to repair his printing enterprise. Hence, Plantin turned to bills obligatory from his former partners Charles, Daniel and Frans van Bombergen to finance the continuation of his firm. In October 1582, none of £1,600 Fl. gr. was repaid to the Van Bombergens and a new, complex IOU contract was drawn up: Plantin was to repay the Van Bombergens or third parties to whom parts of the debt were assigned in instalments of six months. All capital was paid back by September 1588.[10]

## V

The path of development of the bill obligatory as a financial instrument was the result of a dynamic and continuous tweaking process and subject to negotiation between urban and princely legislators and the users of the IOU payment system. In sixteenth-century Antwerp, merchants pushed for the legal recognition of their commercial practices and enforcement of their contracts. The Antwerp municipal government was quick to respond, pressured by inter-city competition for the gains of trade, often at the request of the mercantile community (Gelderblom 2013). Sixteenth-century Antwerp lawmakers combined and integrated learned Roman law, city customs and mercantile practices from foreign traders into a coherent body of municipal law (De ruysscher 2009, 2011). In seventeenth-century England, while the Common Law Courts did not recognise the transfer through assignment of bills obligatory (since these served both commercial and non-commercial purposes,

[9] CAA, Chamber of Insolvency, IB no. 788, Journal Daniel de Bruyne, 29. The discount rate is unknown. CAA, Processen, 7 no. 12144, inventory of Jan Spierinck.

[10] MPM, Manuscripts, Arch 98 fo. 463.

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Table 2. *Rulings by the Antwerp aldermen and the Council of Brabant*

| | Civil rulings by aldermen | | | Council of Brabant |
|---|---|---|---|---|
| Year | 1504 | 1505 | 1544 | 1544 |
| Number of cases | 94 | 92 | 583 | 47 |
| Cases on bills obligatory | 12 | 5 | 50 | 4 |
| % of total rulings | 12.77 | 5.43 | 8.75 | 8.51 |
| Number of observations on duration | / | 2 | 24 | / |
| Average duration in days | / | 2,028.5 | 533 | / |

*Sources:* CAA, Vierschaar, Rulings books, V 1233 and V 1238-1240; RAB, Council of Brabant, Rulings books, 589.

mercantile custom could not be invoked), the Promissory Notes Act ultimately established the legality of transfer of said notes in 1704. London merchants, however, who had witnessed the practice of intense bill circulation in Antwerp and Amsterdam, had been using and transferring bonds for a while, albeit without legal protection (Holden 1955; Rogers 1995).

The Antwerp municipal government provided the legal structure and contract enforcement in which the IOU payment system could flourish. Section II above has already documented how the city acknowledged the rights of a bond bearer (thirty years earlier than the central government) and how a set of rules for bond use materialised into the city's customary laws. Both the city and the princely courts (Council of Brabant) judged in court cases concerning bonds. Table 2 shows the number of legal cases on bonds handled by both courts in a number of sample years.

These numbers may seem low at first sight, given the wide variety of cases dealt with by these courts, but bond disputes constituted an important aspect of their jurisdiction. The number of disputed bond cases grew quickly as a result of both the burgeoning market and increased litigation over credit transactions, which has also been documented for England (Kerridge 1988, p. 72). The only available proxy to verify the courts' efficiency in handling such cases is the duration of the case (the difference in days between the final ruling and a clear starting date). This duration is not always calculable for every case; only the 1544 sample of the aldermen's court rulings offers enough data. It took a year and a half on average for the court to reach a decision in 1544 in these obligation cases. Unfortunately, the lack of comparative data makes it impossible to judge whether Antwerp's court was quick or slow for its time. Even so, one and a half years for a case on a bond, a fairly simple issue, does seem quite long. The plaintiffs in the legal cases of 1544 were mostly the original creditors suing their debtors (74 percent); a quarter of the cases concerned a bond that was passed on. Judges could not rely on an official registry of the bonds, but

there was more than just the bond itself, which could serve as evidence. Judges or arbiters inspected account ledgers and correspondence and in the process they accepted private documents as legal proof (Gelderblom 2013). By doing so, both formally registered and informal contracts could be enforced when necessary.

The municipal government went one step further in securing the IOU payment system: starting in 1546, it announced and cancelled lost bills obligatory, an early modern Card Stop. All these descriptions were given in city announcements registered in the *Gebodboeken*, records that also contained all the other public proclamations and municipal orders.[11] The obligations announced as lost were often declared missing by debtors who feared that they would be addressed by an unknown bearer, especially when the bill had already been paid. Because bonds were highly liquid assets, they were an easy target for thieves and mutineers: for example, during the sack of Antwerp in 1576, a horde of more than 5,000 mutinous Spanish and German soldiers descended on Antwerp and plundered the city. After the pillagers had left, a series of announcements by the Antwerp government posted and cancelled IOUs stolen during the pillage.

Not only the municipal government listened to the needs of IOU users, the princely government, too, sought to remedy flaws in the design of the IOU payment system at the request of the users. The exact periodization of the fair payments became a matter of contention several times throughout the sixteenth century. In the 1521 ordinance the emperor declared that the presentation days of bills obligatory with a fair as maturity date would commence on the twenty-seventh day of the freedom of the fair and would last through the thirtieth. Payments had to take place from the thirty-first day to the thirty-seventh (Laurent *et al.* 1893–1922, pp. iv, 329–31).

Because several of the fairs (Easter and Pentecost) were structured around movable holy days, the exact dates of the fairs and their payment periods differed from year to year. This was remedied in October 1541: the four payment periods were to last ten days and started on 31 October, 31 January, 1 May and 1 August (Laurent *et al.* 1893–1922, pp. iv, 329–31). These fixed dates brought an end to the shifting fair periods linked to changing holy days. From then on, payment periods were at three-month intervals. The development of fixed payment periods mirrors the growing permanence of the Antwerp market throughout the year (O. de Smedt 1940–1, pp. 22–31; 1950, pp. 574–81). Clearly, financial innovation and the tweaking of the IOU instrument was the result of negotiations between users, city and princely courts and governments. Table 1 shows, then, that practice and custom mostly preceded legislation. Nowadays, the reverse is often true: practices change and innovation happens as a response to regulation (and taxes) (Tufano 2003, p. 320). Sixteenth-century legislation, in the end, made the financial instrument safer and more reliable.

[11] CAA, Gebodboeken, Pk nos. 913–29 (1439–1794), published in Van Setter (1864). Antwerp customary laws, 1582, Impressae, title XXXIII, article 5 and title LIII, article 10.

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## VI

This section considers the actual bonds, their values, payment terms and duration, and the various ways they could be registered if the user deemed it necessary. Bond values (always given in money of account, such as pounds Flemish groat or guilders) and information on the identities of the debtors and creditors could be collected for 1,276 bonds, which were drawn from the rather heterogeneous collection of sources. To adjust for currency differences and for sixteenth-century inflation, which account for IOUs having (slightly) higher nominal values as the century proceeded, nominal values were recalculated and deflated to their value in (grams of) silver.[12]

Table 3 demonstrates that there was remarkable variety in bond values, pointing to a diversified market for such instruments; while these bills obligatory may seem similar in their wording, they clearly served different needs. The values of bills obligatory registered in different sources could differ significantly.[13] Bills registered by the aldermen had substantially lower values. That is, formal registration of a bill could even be made for low denominations, which indicates a relatively efficient urban bureaucratic apparatus. Bills posted as lost mostly – and unexpectedly – had a relatively high value. Bills in merchant inventories, too, had a higher value on average, especially the valuable bonds of the financier Jan Gamel. The bills obligatory mentioned in the account ledgers of Frans de Pape and Herman Janssens derived from commodity transactions; Christophe Plantin was owed small amounts of money by his workers and was indebted, through bills obligatory, for substantial sums to his financiers. For the period 1540–4, we have the largest number of bills for three source categories: civil court rulings, bonds from Frans de Pape's account ledgers and bonds in the notarial deeds. Bonds disputed in a civil court case or registered by a notary were more valuable than those written in an account ledger (disputing and registering these bonds makes sense given their higher value).[14] Clearly, different bills obligatory served different needs and were subject to different degrees of contractual security.

[12] In this case, using the silver values of a d. gr. Fl. from (Verlinden 1959, pp. ii, xxxvi-xxxix) and Robert C. Allen's Antwerp wage data: www.iisg.nl/hpw/data.php#europe. One could also deflate the nominal bond values by using rye prices. The results of all subsequent analyses are similar for both deflators (silver prices and rye prices (per litre)). The table with bond prices in litres of rye can be found in the data appendix.

[13] Based on the seven source series containing bonds. None of the source series had normally distributed bond values. Sampling was not done randomly (all available bonds were extracted from the available sources, and in source series spanning longer periods specific years were selected (the notarial acts, for example)). The independent-samples K-W (ANOVA) test is significant at the 1% level ($p < 0{,}0001$).

[14] The independent-samples Kruskal-Wallis test reported insignificant (at the 5% level) differences in bond value (measured in pounds Flemish groat, grams of silver and rye prices, although in this case most of the bonds stem from the same years, so no deflation is required) (62 bond values in the civil rulings, 75 in the de Pape journal and 74 in the notarial acts). Three two-sample Kolmogorov-Smirnov tests on the three source type pairs reveal statistically significant differences between the civil rulings and de Pape's account ledgers (rulings had a higher bond value than the

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Table 3. *Antwerp bills obligatory sample 1479–1587, values in grams of silver*

| Source | Period | Number of bonds | Mean | Median | Std dev. |
|---|---|---|---|---|---|
| Aldermen's register acts | 1479-1514 | 339 | 6,335 | 2,551 | 12,547 |
| Certificates | 1479-1514 | 44 | 12,517 | 6,133 | 15,653 |
| Civil court rulings | 1495-1544 | 87 | 13,168 | 4,195 | 27,864 |
| Lost bonds | 1546-87 | 304 | 18,462 | 9,491 | 863,835 |
| Merchant account ledgers | | | | | |
| – Frans de Pape | 1539-47 | 120 | 6,225 | 5,645 | 3,474 |
| – Herman Janssens | 1551-70 | 54 | 5,618 | 3,070 | 7,995 |
| – Christophe Plantin | 1559-89 | 26 | 13,108 | 1,649 | 23,204 |
| – Daniel de Bruyne | 1561-8 | 55 | 18,254 | 7,776 | 31,490 |
| – Jaspar Van Bell | 1563-66 | 29 | 8,562 | 4,050 | 12,001 |
| – Moriel | 1567 | 16 | 3,017 | 3,270 | 2,030 |
| Merchant inventories | | | | | |
| – Jan Spierinck | 1565 | 35 | 12,858 | 2,502 | 39,608 |
| – Jan Gamel | 1572 | 59 | 32,551 | 10,109 | 65,017 |
| Notarial acts | 1540 | 108 | 13,603 | 6,067 | 25,193 |
| Total | | 1,276 | 12,615 | 5,184 | 36,018 |

*Source:* see data appendix.

The best and most substantive information on how and when bills obligatory were used comes from the rudimentary account ledger of Frans de Pape, a trader in English and Flemish textiles (1539-47). The ledger records all of de Pape's purchases (N = 274) at the Brabant fairs and how he would pay for them (in cash, with an IOU or in goods).[15]

Figure 1 shows that de Pape mostly paid his larger debts (starting at £30 Fl. gr.) with an IOU. This proves that bonds were used to secure larger debts. De Pape's foreign creditors, mostly English Merchant Adventurers, preferred to receive a bond from de Pape rather than an unregistered debt; his domestic creditors were less discriminatory (perhaps they knew de Pape better).[16] Notably, this preference for bonds by the foreign creditors was not due to a higher value of the debts owed to them.[17]

de Pape bonds (p = 0,003)) and between the bonds in the notarial deeds and those in the account ledgers (notarial acts had a higher bond value than the de Pape bonds (p = 0,014)).

[15] 120 purchases were paid for by a bond, 154 were settled in another way.

[16] Foreign creditors: 73 bonds & 46 unregistered debts; domestic creditors: 44 bonds and 99 unregistered debts.

[17] Average bond owed to a foreign creditor = £55.2 Fl. gr. opposed to average bond value owed to a domestic creditor = £53.3 Fl. gr. A logistical regression with a dummy variable for creditor identity (0 = native; 1 = foreigner) and the value of the debt in £ Fl. gr. as independent variables and a dummy

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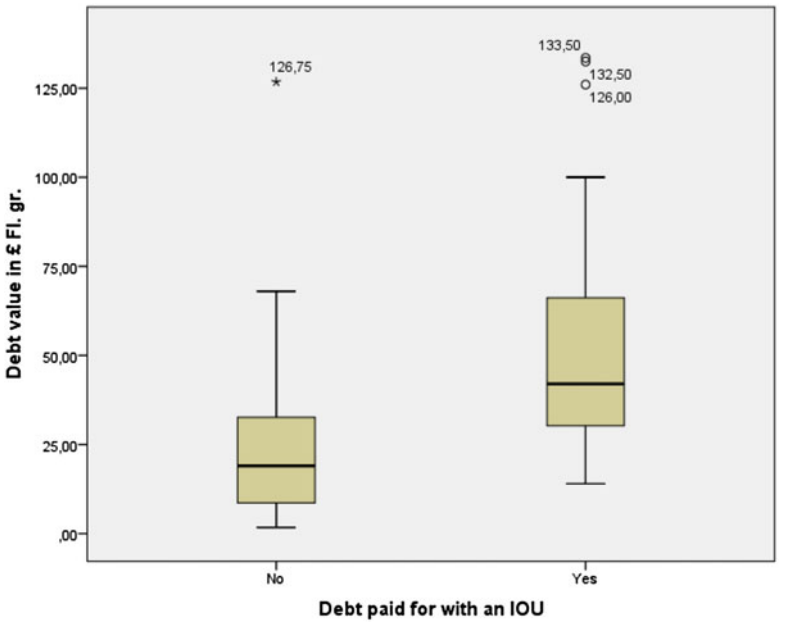


Figure 1. *De Pape's bond and non-bond payments*
*Source:* CAA, Chamber of Insolvency, IB no. 776, Jaarmarktboek Frans de Pape.[18]

Because de Pape meticulously recorded the payment dates (both the ones written in the bond and the actual payment dates), it is possible to investigate the relation between the timing of the debt, whether it was embedded in a bond or not, and its value. The mean expected duration of debts paid for with a bond was 27 days longer on average than non-bond debts. No relation could be observed between both the expected and the real duration of the payment and the value of the debt, and between the duration of delays and the value of the debt.[19] The number of payments executed was positively correlated with the value of the debt.[20] De Pape did not need more time for larger debts but he did adopt different payment policies for

variable for whether the bond was paid via a bond or not (0 = no bond; 1 = bond) using 261 cases reports a 0.321 Nagelkerke R square. Both independent variables are significant at the 1% level (respective regression coefficients are 1.208 and 0.036 and the odds ratios are 3.347 and 1.037).

[18] Independent Samples T Test reports a significant (at 1% level) difference of means (equal variances not assumed) in value between bond and non-bond debts.

[19] All measured in days. Pearson correlations: bond value (in ℒ Fl. gr.) x expected payment duration = -0.049 (N=14); bond value (in ℒ Fl. gr.) x real payment duration = 0.128 (N=14); bond value (in ℒ Fl. gr.) x payment delay = 0.376 (N=13). The relation between the specified duration of the debt in the bond and its value (in grams of silver) is equally weak for the entire sample of bonds (Pearson correlation = -0.041; N = 331).

[20] Pearson correlation between number of actual payments and the value of the bond (in ℒ Fl. gr.) = 0.64 (significant at the 0.01 level, N = 17).

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them: more individual payments were executed on higher-value bonds. For 334 bonds in the entire data set the expected duration is known: 88.6 per cent of the bonds had to be repaid within a year, 70.7 per cent within six months.[21] Hence, IOUs were used mostly to structure short-term debt.

Not all creditors and debtors were punctual in the payment of their bonds: in 1585 a widow discovered a small silk bag containing an IOU owed to her late husband which was six weeks in arrears.[22] For 95 bonds from the mercantile account ledgers of de Pape, Moriel, Plantin and Van Bell, the difference between the stipulated payment deadline and the actual last payment could be calculated:[23] 16.8 per cent of the bonds were paid before the specified deadline, 29.5 per cent with less than one month delay; 80 per cent within two months after the original deadline. On average, bonds were paid within 41 days after the deadline.[24] Gerard Malynes wrote in his *Consuetudo, vel lex mercatoria*, 'if within one month after, it is accounted very good payment' (Malynes 1622, p. chapter XII). Explicit terms were more advantageous than such open-ended contracts because a merchant was always aware of upcoming bond payments; however, open-ended loans, often extended by family members, could be withdrawn at quick notice (Gelderblom 2010, pp. 166–7; Kole and Van Bochove 2014, p. 50).

Perhaps surprisingly, the de Pape account ledger does not offer any indication of interest rates paid on the debts; the purchase price almost always matches the amount paid afterwards. Interest rates on bonds were mostly hidden in the value of the bond or covered up as a fee for not paying immediately in cash. The central government set the legal maximum interest at 12 per cent; all interest rates above this ceiling were considered usurious (Laurent *et al.* 1893–1922, IV, 4 October 1540). In 1582 Antwerp law prescribed that creditors were free to set the interest rates on bonds, provided they were not usurious.[25] In a few cases implicit interest rates on bonds could be found. For example, Franchois van Lare had borrowed £100 gr. Fl. from Daniel de Bruyne in January 1561, and had to pay £106 gr. Fl. back six months later (12 per cent per annum). The account ledgers of Van Bell, Moriel and Plantin provide explicit interest rates between 6 per cent and 16.6 per cent (the latter rate well above the legal ceiling).[26] This variation goes to show that interest rates depended on the person and the required term. The *Costuymen* from 1582 stipulated that the rate for bonds specifying the

[21] 6 months (N = 63), 3 months (N = 50) and 4 months (N = 48) were the most frequent terms.

[22] CAA, Gebodboeken, Pk no. 916, 1585, 464r.

[23] Number of days: actual final payment prior to expected final payment is a negative number, actual payment after expected payment is a positive number.

[24] N = 95. Minimum = - 65 days; max. = 340 days. Mean = 41,190 days. Median = 33 days. Std. deviation = 61.824 days. Coefficient of variation = 1.501 which indicates high variability. There is only a very weak and insignificant Pearson correlation between the value of the debt (grams of silver) and the delay of final payment (N = 95, Pearson correlation = 0.054 (p = 0.602).

[25] Antwerp customary laws, 1582, Impressae, title LI, article 13.

[26] 19 observations. Mean interest rate = 7.76%, median interest rate = 6.25%.

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maturity date was 6.25 per cent.[27] Falling interest rates may have had a psychological effect on investments throughout the sixteenth century: smaller merchants used short-term bonds to finance their enterprise (Van der Wee 1967, pp. 230–2).

## VII

The bill obligatory underwent piecemeal tweaking and process innovation in the city of Antwerp during the first part of the sixteenth century. This age-old, traditional and conventional instrument acquired new features and became an efficient modus operandi for executing three functions key to the financial system: moving funds across time; addressing moral hazard and asymmetric information problems; and facilitating the sale or purchase of goods and services (Merton 1992). The innovative process of the bill obligatory should be seen, then, in light of the genesis of these inclusive, efficient and transparent institutions that first came about in sixteenth-century Antwerp (Gelderblom 2013; Ogilvie 2011; Puttevils 2015a, 2015b). Antwerp's starting conditions made the difference for the trajectory of innovation: the city's commercial growth started off, namely, within the context of fairs hosting a fairly large group of traders, where the bill obligatory had already been in use for centuries, and where money-changers executed payment services but did not provide extensive credit. Later, the feverish commercial growth of Antwerp caused imperfections for the use of the bill obligatory: because the volume of trade and the group of traders grew, a process of anonymisation set in and the chains of interdependence of those who were transferring bonds grew longer. These growing pains were resolved by an active municipal government, which set the rules for the transfer of bonds, often at the request of bill users and by looking at precedents in other commercial cities. To be sure, the municipal government was incentivised to do so, given inter-city competition as well as the ability of traders to move to another place when circumstances were not deemed beneficial for their trading operations. For its part, Antwerp had the financial resources and the legal power to modify the rules, which then yielded the continuous adaptation of institutional arrangements and process innovations (Gelderblom 2013). As the sixteenth century progressed, the municipal government also strived for uniform rules and no longer tolerated the divergent practices of particular merchant groups active in the city (the English Merchant Adventurers, for example). The municipal government, however, could not and in fact did not act as a *cavalier seul*: its new rules for bonds were ratified by the central government, and the central government established rules for payment dates. As such, the legislation on bonds was the result of negotiation between bond users, the city and the central government – a multilateral process similarly observed in the legislation on Antwerp marine insurance as well (De ruysscher and Puttevils 2015). Moreover, these rules and practices that had crystallised in sixteenth-century Antwerp were copied and adapted further in Amsterdam and London in subsequent years.

[27] Antwerp customary laws, 1582, Impressae, title LI, article 13.

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Thus, the Antwerp municipal government, in close cooperation with the central government, provided a framework of rules that allowed the efficient use of bonds. Not only merchants but also other entrepreneurs and citizens relied on this financial instrument. The legislators, however, did not overextend their authority by creating a too rigid framework; rather, the city pursued a laissez-faire commercial policy by providing a minimal framework, leaving ample options open for the bond users. The bill obligatory had become a multifunctional and versatile instrument which the users could tailor to their own needs choosing from a menu of available options: to draw up a bond or not, for instance, depending on the value of the debt and the relationship between debtor and creditor; to have the bond registered by the city secretary or a notary or not (a note in the account ledger was deemed sufficient and increasingly became legal proof); to transfer the bond (through assignment or transport) or not; to make use of intermediaries such as money-changers, other money-dealers or brokers or not; to discount the bond (when one needed quick cash) or not; and, finally, to use the bond only for commodity transactions or to realise its purely financial potential. The micro-analysis of de Pape's and other traders' accounts has shown how merchants used bonds in day-to-day transactions. Merchants like de Pape issued several dozen promissory notes each year. Yet bonds were but one of several instruments which merchants could use to fund their enterprise; accordingly, future research would be well served by looking deeper into mercantile documents to determine why merchants used one or the other financial instrument or technique, in addition to why authorities came to develop particular institutional arrangements governing trade.

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## Data appendix

Five different types of Antwerp sources have been examined in search of bills obligatory.

1. Antwerp certification books and aldermen's registers (1490-1514): the Antwerp magistracy produced certificates (written declarations) on behalf of private persons, often local and foreign merchants, concerning various commercial and/or juridical issues. I used Renée Doehaerd's publication of the certification books (1488-1513). She summarised all certificates with references to 'international trade', and I have selected all '*lettres obligatoires*', which provided 189 cases between 1479 and 1514 (Doehaerd 1962-3, pp. 17-18). Doehaerd's selection criteria are: (1) all certificates making reference to foreigners doing business in Antwerp (from abroad); (2) all certificates making reference to Low Countries merchants active abroad; (3) documents making reference to distribution and consumption of foreign goods in the Low Countries; and (4) documents making reference to distribution and consumption of Low Countries products abroad. Some '*mandats et procurations*' contain quantitative information on debts, but Doehaerd's abbreviated notes specify whether the debt is in fact a bill obligatory. The Antwerp aldermen's registers are preserved in their entirety from 1394 to 1797. All transactions concerning immovable goods had to be registered in these ledgers. A large variety of other contracts could also be registered by the aldermen's clerks. The sheer size of these ledgers (roughly between 2,000 and 4,000 deeds per year) renders this source problematic for an individual historian. Fortunately, Doehaerd also recorded all aldermen's deeds concerning international trade. Moreover, I have used a database constructed by Tim Bisschops and his students, in which they digitised written summaries of the aldermen's registers for several years in the period 1490-3. I would like to express my gratitude to Tim Bisschops for letting me use his data. All bonds have been drawn from the Doehaerd and Bisschops records; these have been double-checked to eliminate double entries.
2. Civil rulings pronounced by the Antwerp aldermen in cases of litigation (1504-1505 and 1544): in 1488 the bench of aldermen adopted a written procedure for registering its rulings in civil cases (De ruysscher 2009, pp. 22-7, 101). Litigants could request a copy of the ruling, which was then

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Table A1. *Antwerp bills obligatory sample 1479–1587, values in litres of rye (Antwerp prices)*

| Source | Period | Number of bonds | Mean | Median | Std dev. |
|---|---|---|---|---|---|
| Aldermen's register acts | 1479-1514 | 339 | 33,217 | 8,720 | 70,856 |
| Certificates | 1479-1514 | 44 | 73,050 | 43,530 | 74,899 |
| Civil court rulings | 1495-1544 | 87 | 59,007 | 16,711 | 128,545 |
| Lost bonds | 1546-87 | 304 | 50,117 | 22,443 | 226,018 |
| Merchant account ledgers | | | | | |
| – Frans de Pape | 1539-47 | 120 | 23,159 | 22,909 | 12,645 |
| – Herman Janssens | 1551-70 | 54 | 19,869 | 8,677 | 29,631 |
| – Christophe Plantin | 1559-89 | 26 | 34,355 | 4,819 | 70,796 |
| – Daniel de Bruyne | 1561-8 | 55 | 57,852 | 22,751 | 100,292 |
| – Jaspar Van Bell | 1563-6 | 29 | 29,753 | 13,874 | 37,027 |
| – Moriel | 1567 | 16 | 9,889 | 10,714 | 6,653 |
| Merchant inventories | | | | | |
| – Jan Spierinck | 1565 | 35 | 41,627 | 9,860 | 144,197 |
| – Jan Gamel | 1572 | 59 | 68,308 | 20,385 | 119,452 |
| Notarial acts | 1540 | 108 | 56,016 | 25,008 | 103,741 |
| Total | | 1,276 | 43,254 | 17,094 | 135,604 |

*Source:* see data appendix; rye prices from (Van der Wee 1963a).

reproduced in a *vonnisboek*. Not all of these ledgers have been preserved. Hence, I have chosen three sample years: 1504 (94 rulings), 1505 (92 rulings) and 1544 (583 rulings). In 1504, 12 per cent of all pronounced rulings concerned bills obligatory; 5.4 per cent did so in 1505 and 9 per cent in 1544.[28]

3. Notarial acts by Zeger Adriaan 's Hertoghen and Willem Stryt (1540): merchants frequently used the services of notaries to register their obligations and operations concerning these obligations (transports, procurations, receipts). I have selected 1540 as a sample year; the deeds of two notaries have been preserved for that year. A total of 74 acts (9.8 per cent) of all the notarial acts recorded by Adriaen Zeger 's Hertoghen and Willem Stryt in 1540 mentioned a bond.[29]
4. Post-mortem inventory of Jan Gamel (1572): according to the inventory of a textile trader and financier, his estate was owed more than £20,000 gr. Fl. in bonds, and half of his wealth consisted of such obligations. Registered on 11 August 1572 by the notary Henrick van Uffele (De Smedt 1970).
5. Bankrupt merchant's inventory of Jan Spierinck (1565): in 1565 the merchant Jan Spierinck was sued by his creditor Coenraerd Schetz over a £400 gr. Fl. obligation and imprisoned. Spierinck wished to prove that he was not insolvent and thus could not be detained as a bankrupt. He argued that he was 'not so godless that he wanted to deny his debt' and had an inventory drawn up to prove that he was still creditworthy.[30]
6. Account ledgers of Frans de Pape (1539-47): cloth trader Frans de Pape bought most of his merchandise from English or Antwerp merchants. He organised his account ledger around the four fairs, noting from whom he had bought the textiles, providing specific details (description and

[28] CAA, Vierschaar, Rulings books, V 1233, 1504-05 and V 1238-40, 1544.
[29] CAA, Notarial Archives, N 2078 and N 3568.
[30] CAA, Processen, 7 no. 12144, dupliek.

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price) and the credit terms (usually payable at the next fair or the following). He also noted the bonds he had drawn up ('*hantscrift*').[31]

7. Account ledgers of Herman Janssens (1551-70): Herman Janssens co-operated with his sister Anna and several of his brothers in the trade with England, Portugal, Spain and the Canary Islands. His journal in which he recorded costs and yields of his enterprises documents his operations between 1551 and 1570.[32]
8. Notes and accounts of printer and bookseller Christophe Plantin (1559-89): Christophe Plantin moved to Antwerp in 1549 and started his own printing company in 1555. In two volumes of Plantin's accounts, several bonds can be found.[33]
9. Account ledgers of Daniel de Bruyne (1561-8): Daniel de Bruyne was a jeweller and was also active in real estate speculation, maritime insurance and organising lotteries. His double-entry journal has been preserved because it was confiscated when de Bruyne and his patron, Christoffel Pruynen were implicated in a large-scale government fraud case. De Bruyne noted 55 bonds in this journal.[34]
10. Account ledgers of Jaspar Van Bell (1563-6): the 's-Hertogenbosch merchant Jaspar van Bell sold locally bleached linen, pins and knives to Antwerp merchants and in Spain (Formsma and Pirenne 1962).
11. Account ledgers of Jehan and Mathieu Moriel 1567: The two nephews traded in textiles and grain and had agents in Lyon and Danzig (Van Den Brulle 2010).
12. Notices given for lost obligations (1546-87).[35]

[31] CAA, Chamber of Insolvency, IB no. 776, Jaarmarktboek Frans de Pape.
[32] MPM, Manuscripts, Arch. 681, Journal Herman Janssens, 1550-70.
[33] MPM, Manuscripts, Arch. 98 and 116.
[34] CAA, Chamber of Insolvency, IB no. 788, Journal Daniel de Bruyne.
[35] CAA, Gebodboeken, Pk nos. 913-29 (1439-1794). Published in Van Setter (1864).