A CONDITIONAL MIRACLE.
THE MARKET FORCES THAT SHAPED HOLLAND'S PUBLIC DEBT MANAGEMENT, 1514-1713

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Abstract

The low issuing rates on public debt in early modern Holland have been taken as evidence that the political and fiscal reforms achieved during the second half of the 16th century raised the government's credit with investors to a degree unparalleled elsewhere. However, the decline of interest rates trailed events by more than half a century, so other factors must have driven that. We examine how market forces shaped Holland's issuing policy. Strong economic growth created a thriving private capital market and a class of wealth owners who played the private and public markets fully as calculating investors do, considering options, weighing alternatives, and trying to get the best price. Though the exploitation of this market for public finance purposes is generally seen as a remarkable example of statecraft, it is clear that the authorities embraced the market most reluctantly, as they kept looking for alternatives and attempted to roll back market forces as soon as circumstances permitted.

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INTRODUCTION[1]

The main reason for studying early modern public finance lies in its presumed function as foundation for modern economic growth. Proposed first by Peter Dickson in 1967, this idea emphasizes the importance of the switch from haphazard and expensive short-term borrowing by monarchs to a consolidated long-term debt under parliamentary control, more secure, traded on liquid secondary markets, and thus cheaper.[2] Following Dickson, North and Weingast wrote a celebrated article highlighting the institutional aspect of this switch, the constitutional reforms following the Glorious Revolution (1688-9) which gave better protection to property rights. This they considered instrumental in bringing about the lower interest rates which stimulated British economic growth and subsequent ascendancy.[3] The North and Weingast argument has had tremendous appeal to economic historians who have since explored the causal nexus between political regime change,

[1] The authors would like to thank Jeremy Atack, Dan Bogart, Wantje Fritschy, Marjolein 't Hart, Larry Neal, Peter Koudijs, Jean-Laurent Rosenthal, and participants in seminars at Utrecht University, London School of Economics, Freie Universität Berlin, the Paris School of Economics, Rutgers University, Oxford University, and Yale University for helpful comments and suggestions. Heleen Kole, Kirsten Hulsker, Jaco Zuijderzuijn, and Ralf Bovers provided first-rate assistance; in addition we have drawn many details from Ralf Bovers' MA thesis (2009). Abbreviations: NA= National Archives, The Hague; ACA= Stadsarchief Amsterdam; SH = E.C.M. Huysman et al., ed., *Particuliere notulen van de vergaderingen der Staten van Holland 1620-1640 door N. Stellingwerff en S. Schot,* Rijksgeschiedkundige Publicatiën, 7 volumes; RSH = National Archives, *Generaale Index op Resoluties Staten van Holland* (microfilm). NSV = N. Japikse, ed. *Notulen gehouden ter Staten-Vergadering van Holland (1671-1675) door Cornelis Hop, pensionaris van Amsterdam en Nicolaas Vivien, pensionaris van Dordrecht* (Amsterdam: Johannes Müller 1903).

[2] Dickson, *Financial revolution.*

[3] North and Weingast, "Constitutions".

financial development, and economic performance in other parts of pre-industrial Europe and in the modern world.[4]

However, at the same time serious doubts have been raised about the constitutional commitment explanation. The fiscal reforms which enabled the British crown to increase its borrowing after 1690 dated from the 1640s.[5] Nor did interest rates really behave the way they should have done according to the explanation. Land rents failed to decline following the Glorious Revolution; commercial interest rates did not fall; and the risk premium on sovereign debt remained high well into the 18th century.[6] For Europe as a whole, Larry Epstein pointed out that public interest rates declined everywhere between 1500 and 1800, regardless of parliamentary control on government borrowing and spending.[7] These observations have led some historians to examine the complex process of constitutional change a little closer by looking at the specific role of merchants, the nobility, and urban magistrates in decision making under different political regimes.[8] Others have drawn attention to long-term changes in the level of fiscal centralization to explain the ultimate convergence of public interest rates in Europe.[9] Returning to the British evidence, Larry Neal and others have pointed out that the state's improved credit during the 18th century may have been grounded in political and fiscal changes, but it also required the development of a liquid market for governments bonds to attract a large and varied crowd of investors, a condition only met after the consolidation of England's debt in the 1740s.[10]

Rather than focusing on constitutional commitment alone, we thus need to widen the scope by considering the interaction between political institutions, fiscal policy, investors, and public debt management. This is what we want to do by looking at the case of Holland, the principal province of the Dutch Republic, which during the first half of

[4] For the causal nexus between financial development and economic growth: Sylla, "Financial systems", and Sylla, "Financial systems". For cross-country comparisons in preindustrial Europe: Epstein, *Freedom and Growth*; Stasavage, "Cities", and Dincecco, "Political regimes", the latter with references to numerous country studies.
[5] O'Brien, "Fiscal exceptionalism"; Braddick, "Nerves"; Brewer, *Sinews*, 88-134.
[6] Clark, "Political foundations"; Quinn, "Glorious Revolution's Effect"; Sussman and Yafeh, "Institutional Reforms".
[7] Epstein, *Freedom and Growth*, 16-25.
[8] Stasavage, *Public debt*; Idem, "Partisan politics"; Prak and Van Zanden, "Towards"
[9] Dincecco, "Fiscal Centralization", with references to the older literature.
[10] Neal, "How it all began"; Carlos et al. "Origins"; Murphy, "Origins"; Epstein, *Freedom and Growth*, 16-25, but compare Sussman and Yafeh, 'Institutional Reforms' 920-921, for a critical review of the evidence.

the 17th century emerged as Western Europe's most prosperous country and one of its major political powers. Holland became the marvel of Europe with a public debt soaring to unprecedented heights and issuing rates amongst the lowest in Europe.[11] The province may be considered a classic example of the constitutional commitment model because during the 16th century it developed a political regime in which taxation, public borrowing, and military expenditure were decided upon by the provincial Estates, which in turn were controlled by delegates from the major towns.[12] True enough, during the war of independence against the kings of Spain (1568-1648) the Republic's executive power was delegated to the Orange stadholders, but the Estates of Holland controlled 60 per cent of the military budget. This allowed the urban delegates to align the state's military endeavors with the commercial and financial interests of its domestic creditors.[13]

But as in Britain the link between Holland's financial revolution in the 16th century and its subsequent economic spurt appears tenuous at best. In 1598 the provincial debt amounted to three million guilders, or six guilders per capita, a financial burden similar to the total debt issued by local authorities in 1514. At eight per cent Dutch interest rates at the turn of the 17th century were similar to those paid by the kings of France and Britain, and significantly higher than prevailing rates in Genoa or Spain. The strongest growth of Holland's debt occurred between 1621 and 1648 and it was not until the second half of the century that the issuing rate dropped to the lowest available in Europe. Furthermore, the composition of Holland's debt differs considerably from common conceptions of public finance. Until 1630 life annuities and *losrenten* (redeemable annuities) were Holland's main debt instruments. The *losrenten* were very similar to the Consols that boosted the British bond market during the 1740s, but they failed to do so in Holland. Moreover, from selling primarily annuities Holland turned increasingly to the issue of short-term obligations or bonds. By 1700 these bonds made up 70 per cent of the public debt. This led to a remarkable situation in which bondholders clearly bought to hold, yet retained the right to liquidate their holdings at the end of their

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[11] On interest rates: Homer and Sylla, *History*, 129, citing Josiah Child; Temple, *Observations*, 209-246; Smith, *Wealth of Nations*, vol. I, chapter 9, section 10. On Holland's debt: Dormans, *Tekort*; 't Hart, "Merits"; Liesker and Fritschy, *Gewestelijke financiën*.

[12] Tracy, "Financial Revolution"; Fritschy, "Financial Revolution".Compare, however, Zuijderduijn, *Medieval Capital Markets* who traces the long pedigree of the financial and fiscal changes of the 1540s.

[13] 't Hart, *Making of a bourgeois state*; Idem "Mutual advantages"; Prak and Van Zanden, "Towards".

twelve-month term. Repeated attempts by the provincial authorities to convert these bonds into perpetual annuities failed, and Holland's debt retained its short-term character until the end of the 18th century.

Holland thus deviated considerably from the constitutional path sketched by North and Weingast, but in an entirely different direction from Britain, raising further doubts about their model. The Dutch case suggests that political and fiscal changes were necessary but not sufficient to create a large, consolidated public debt issued at declining interest rates. The interaction between Holland's issuing authorities and investors analyzed in this paper shows that the province owed its success to continuous changes in fiscal and financial institutions, including the bond market, and to a precocious economic development with the attendant surge in tax revenues and accumulated wealth.[14] The growth of the Dutch economy was a vital ingredient because it created a thriving private capital market and a class of wealth owners who played the private and public markets fully as calculating investors do, considering options, weighing alternatives, and trying to exact the best price. Though the exploitation of this market for public finance purposes is generally seen as a remarkable example of statecraft, it is clear that the authorities embraced the market most reluctantly, as they kept looking for alternatives and attempted to roll back market forces as soon as circumstances permitted.

The article first shows how the Revolt against Spain interrupted the fiscal centralization and the emergence of a provincial debt pioneered during the Habsburg period. Holland was thrown back on the credit of the six major towns. Once the Spanish threat had receded the province could gradually restore its credit, though even then it had to rely on a mix of wealth levies and forced loans supplemented by increasing amounts of short-term bonds. In the first half of the seventeenth century a receptive primary market for these bonds emerged which enabled Holland to raise huge sums without having to resort to levies or forced loans. This market derived its strength from fast rising wealth and not from a liquid secondary market. Because investors had the option of redemption

[14] Between 1590 and 1650 revenues from land taxes, excises, and wealth levies increased with 2.3 per cent per year on average: Fritschy, "Financial revolution"; Liesker and Fritschy, *Gewestelijke financiën*; On the accumulation of private wealth is documented in De Vries and Van der Woude, *First Modern Econom*y, 116-117. See also: Klein, *Trippen*; Gelderblom, *Zuid-Nederlandse kooplieden*; Gelderblom and Jonker, "Completing"; Zandvliet, *De 250 rijksten*. Jan Luiten van Zanden estimated that wealth per capita in Holland had risen from 300 guilders in 1600 to 650 guilders fifty years later: Van Zanden, "Economic growth".

on demand it was not until the national emergency of 1672 that a secondary market burst into the open because bond holders could no longer get repayment from the tax receivers. This secondary market inaugurated a new phase in the interaction between Holland's government and its investors. High bond prices enabled the province to introduce a withholding tax on interest payments. Though initially accepted by the market, the tax effectively raised the price for new issues, forcing Holland to devise ever more intricate means to attract buyers during the War of the Spanish Succession.

REVOLUTION POSTPONED, 1514-1588

As James D. Tracy has convincingly shown, the key feature of Holland's finance in the sixteenth century was the very gradual process in which the province acquired sufficient credit to approach investors directly and in its own name. Initially the Estates of Holland could only raise money through the mediation of its six major towns.[15] These cities' borrowing record stretched back to the late Middle Ages, when they began selling term and life annuities, as often as not to fund emergency expenditure or public works such as the construction of fortifications.[16] Despite occasional mishaps they enjoyed sufficient creditworthiness to build up impressive debts totalling 2 million Holland pounds in 1514, or an estimated 8 per cent of Holland GDP.[17]

However, during the sixteenth century Holland very gradually acquired sufficient credit to approach investors directly and in its own name, rather than through the six major towns. The process really began in 1482, when the six cities sold 7.7 per cent redeemable annuities for the province on their collective credit.[18] Under Charles V this became regular practice and until the mid-1530s the cities raised a total of nearly 540,000 Holland pounds in redeemable annuities, now at the rate of 6.25 per cent.[19] The first issue

[15] Tracy, *Financial Revolution*, 124-125.
[16] Van der Heijden, *Geldschieters*, 100-145; Zuijderduijn, *Medieval Capital Markets*, 139-182; Cf. also various contributions in: Boone et al., *Urban Public Debt*.
[17] De Vries and Van der Woude, *First Modern Economy*, 93.
[18] Tracy, *Financial Revolution*, 57-60. In the end Amsterdam opted out and issued its share in its own name so as to avoid the risk of being caught in financial problems caused by any of the others.
[19] Tracy, *Financial Revolution*, 60-64; Tracy, "Taxation System", 94. Amsterdam again opted out of the collective and issued renten in its own name.

of provincial debt proper, totalling 158,000 pounds of redeemable annuities at the same rate, occurred during the 1540s. This debt was funded by various new taxes which the imperial government assigned to the province, but even so credit remained brittle.[20] Around a third of the total issue was sold in neighboring provinces of the Habsburg Empire because many Holland investors distrusted Habsburg policy and would not buy willingly.[21] Voluntary buyers were found only in Amsterdam. Elsewhere local authorities had to take annuities in proportion to their share in the tax burden, who in turn forced the paper on either their office holders or on their wealthy citizens. Ledgers listed the wealth holders targeted for buying.[22] Such lists had a long pedigree and they were to have a bright future as part of the groundwork for Holland's financial revolution.[23]

The 1540s switch to a provincial debt funded on taxes levied by the Estates proved successful in two important respects. By widening the tax base the new taxes generated sufficient income for servicing the debts, which were redeemed with uncommon speed. This then boosted investor confidence, opening access to wealth hitherto locked up. As a result the debt market widened considerably. Despite wartime market conditions the Estates managed to issue just over 1.2 million guilders of annuities during the years 1552-1559, of which 920,000 guilders in redeemable annuities, mostly at 8.3 per cent, and the remainder in life annuities with a buy-back option at 16.7 per cent.[24] Combined with the newly found investor confidence, these high interest rates reduced the need for forced purchases to small amounts. Though nearly half of the total debt issued was still sold outside the province, the pattern of sales inside Holland shows a marked widening of the investing public compared to the relatively narrow group subjected to forced purchases. Moreover, investors proved loyal enough to accept conversions from life annuities into redeemable annuities and from the high issuing rates to the customary 6.25 per cent interest which started in 1556.[25] Or perhaps they simply complied for lack of an exit option. Annuities holders could not demand repayment and selling annuities appears to have been difficult. Local transfer ledgers and the debt ledgers of the Estates

[20] Tracy, *Financial Revolution*, 86-91.
[21] Tracy, *Financial Revolution*, 117.
[22] Tracy, *Financial Revolution*, 110-124, 131-132.
[23] Tracy, *Financial Revolution*, 87-91.
[24] Tracy, *Financial Revolution*, 92-94.
[25] Tracy, *Financial Revolution*, 96-97, 132-138, leaving the exact amount of forced purchases a little unclear.

show only occasional transfers, as often as not following the liquidation of an estate. Prices were considered unimportant; the Gouda transfer ledger shows only one instance, perhaps because the price of 86.3 per cent of par was thought exceptional.[26]

Despite the success of the 1550s issues the amounts raised by the province proved insufficient, forcing the Estates to find money by selling bonds or *obligaties*, borrowing 150,000 guilders from Amsterdam merchants, and asking Amsterdam and Dordrecht to appease creditors of Charles V with a total of 120,000 guilders in bonds.[27] Though we do not know the wording of these bonds, they appear to have been typical stopgaps, promissory notes issued on the credit of a corporate body or an official in its service pledging particular future revenues to redeem a specified debt.[28] Being basically unfunded, they carried a higher interest rate than redeemable annuities. Moreover, bond holders had the right to demand repayment, which annuities holders did not. Because of the high interest rates the Amsterdam merchants showed no hurry to get their money back and the Estates attempted a conversion into annuities only in 1569.[29]

The Dutch Revolt then cut violently across the evolution of a free primary market. With war raging across the province tax revenues dropped sharply while military expenses soared, throwing Holland into a deep financial crisis. Interest payments had to be suspended from 1572 and the Estates set aside its customary funding principles, negotiating credit from army commanders and suppliers at very high interest rates. Confiscated émigré and church property served to satisfy the most demanding creditors.[30] To lessen the pressure, the Estates effected a fundamental change to the fiscal system. In 1574 Holland's towns ceded control over two thirds of the local beer and wine excises to the province, while being allowed to use the revenues from them to pay garrisons billeted within the city walls. Initially conceived as an emergency measure, this administrative change transformed the patchwork of local excises into a uniform tax system of common means (*gemeene middelen*) across the whole province, providing Holland with a secure

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[26] The Verleyboeken of Gouda, starting in 1548, reveal two transfers of Holland's losrenten in the 1550s: Gouda Archives, Inv. 393, fol. 24r en 380v. For transfers recorded in the province's ledgers, Tracy, *Financial Revolution*, 90n.
[27] In 1569 the Estates consider redemption of bonds through the issue of annuities: Dormans, *Tekort,* 18; Houtzager, *Hollands lijf- en losrenteleningen*, 118. Tracy, *Financial Revolution*, 17n.
[28] Tracy, *Financial Revolution*, 206.
[29] Houtzager, *Hollands lijf- en losrenteleningen*, 118-119.
[30] Tracy, "Emigré and Ecclesiastical Property".

funding base. Once the emergency had passed the Estates refused to give up its control over the excises and return it to the cities, thus sealing what Fritschy has rightly called a tax revolution which necessarily complemented the earlier shift upwards of borrowing power.[31]

That said, the reorganized revenues still fell short of military expenditure. To bridge the gap the province continued to rely on forced loans, wealth levies, and short-term loans at high interest rates from merchants and army suppliers.[32] Forced loans, first contemplated in 1581 and eventually levied in 1585, were distributed *pro rata* over the Holland's towns and villages, which used their own credit to have their citizens take them.[33] In the same year a loan from the English crown collateralized on two cities and a fortress helped to make ends meet.[34] Holland assumed responsibility for interest arrears only gradually from 1586 so the province remained unable to approach investors directly. Instead it relied on the cities' ability to raise money from its citizens. Thus during the years 1584-1604 Amsterdam placed about one million guilders in loans for the province and other major cities such as Delft probably did likewise.[35]

LEARNING TO MANAGE THE MARKET, 1588-1621

In 1588 the political and military prospects of Holland changed dramatically. An Anglo-Dutch fleet defeated the Great Armada and the advances of the Spanish army under the Duke of Parma ground to a halt. Over the next decade Dutch troops mounted several successful campaigns to recapture the eastern provinces, by and large securing the Republic's frontiers. The removal of military operations from Holland's borders gave the province the opportunity to reorganize its finances. Rising tax receipts allowed a slow restoration of Holland's credit, enabling the Estates to cut issuing rates from 12 per cent in 1590 to 8.3 per cent in 1597. Though still above its own previous low, and high compared to some states, this was the same price Holland had paid during the late 1550s

[31] Fritschy, "Financial Revolution".
[32] Fritschy, "Financial Revolution" 74-76, Liesker and Fritschy, *Gewestelijke financiën* 160-161, 362-365.
[33] Van Dillen, *Kohier 1585*; Fritschy, "Financial Revolution Revisited" 75-76.
[34] 't Hart, *Making of a Bourgeois State*; Fritschy, "Financial Revolution".
[35] 't Hart and Van den Burg, "Renteniers" 205.

and on a par with Geneva, so the rate probably reflects the market premium for small, fledgling Protestant regimes in general.[36] The Estates also converted bonds issued in the 1580s into annuities which, though equally managed and guaranteed by local magistrates, were issued in the name of the *gemeene land*, i.e. the province, unlike the bonds they replaced.[37]

By 1594 Holland's credit had recovered sufficiently for it to resume sales of annuities in its own name and terminate the expensive stopgaps. The network of seventeen tax receivers all over the province sold the annuities and paid interest and redemptions from their tax receipts. This gave the Estates a very precise instrument to work local markets while at the same time anchoring trust in the public debt by having community officials administer it.[38] What followed was a marked growth of Holland's debt, from 1.7 million guilders in 1594 to 14.4 million in 1609. Free loans predominated overall, yielding almost 10 million guilders out of the 13 million raised in this period; forced loans supplied the rest. The timing and composition of the debt issues shows the Estates carefully working different market segments to obtain the sums required. During 1594-1598 they raised voluntary loans totaling 850,000 guilders in annuities plus nearly 640,000 guilders in bonds. The pattern then changed, however. Between 1599 and 1603 Holland borrowed 900,000 guilders through voluntary sales of annuities, 3,2 million in forced loans, plus 2.4 million in bonds. The latter were intended to anticipate returns from the forced loans but a large part was rolled-over afterwards.[39] Between 1604 and 1609 Holland primarily sold life- and redeemable annuities but occasionally obligations were added to the mix. When in 1609 the Truce with Spain took effect Holland's debt had reached 14.4 million guilders, of which more than a third, 5.2 million guilders, was in bonds.[40]

Declining interest rates also point to a quick recovery from recent financial difficulties. The rate for redeemable annuities dropped from 8.3 per cent in 1597 to seven in 1605 and 6.25 in 1608, only slightly trailing the private interest rate paid by Amsterdam merchants and the Dutch East India Company (VOC) for short-term loans

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[36] Epstein, *Freedom* 21.
[37] Tracy, *Founding*, 263.
[38] 't Hart, "Mutual Advantages" 116-119.
[39] Liesker and Fritschy, *Gewestelijk financiën*, 160; See Appendix A.
[40] Dormans, *Tekort* 45; Liesker and Fritschy, *Gewestelijk financiën*, 180.

(Figure 1).[41] The Estates carefully monitored market circumstances and several times tried to reduce interest payments even further with a withholding tax that cut interest payments on redeemable annuities with 0.5 per cent in 1596, and 1 per cent in 1601, 1604 and 1607.[42] Until 1604 the interest paid on obligations was somewhat higher than on annuities with maximum rates set at nine per cent. This differential derived from bonds being sold by the receivers on their personal credit rather than the province's. The rating difference gradually disappeared, however. From 1597 buyers could ask for a guarantee by the Estates; in 1605 the Estates reduced the commission paid to the receivers for selling bonds from one to 0.5 per cent, and in 1607 the government formally equalized the issuing rate of redeemable annuities and obligations.[43] The 6.25 per cent interest – last obtained in 1556 – paid on both instruments from 1611 indicated Holland's return to the middle band of European interest rates, above Genoa, Venice, Castile, and France, but below Naples, Rome, Bologna, and fellow protestant Britain and Geneva.[44]

[Figure 1 about here]

The recovery of Holland's credit resulted from the growth of the Dutch economy. Between 1590 and 1609 fiscal revenues doubled and the business community started earning serious money.[45] The average annual increase of the wealth of Amsterdam merchants, for instance, may have been as high as 12.5 per cent in this period.[46] The expanding economy thus boosted the supply of capital, but potential public debt buyers had plenty of alternative investment opportunities. Both the booming European trade and the first intercontinental expeditions yielded much higher returns.[47] Hence for the market to accept the large government loans during 1599-1603 investors needed prodding by forced issues for about half of the total. These loans were based on a census of the entire

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[41] Gelderblom and Jonker, *Completing a Financial Revolution*.
[42] Houtzager, *Hollands Lijf- en losrenteleningen*, 124-129; Liesker and Fritschy, *Gewestelijk financiën*, 363-364.
[43] NA RSH, 19 December 1597, fol. 664 (guarantee); 't Hart, "Mutual Advantages" 118; Fritschy, "Financial Revolution" 64.
[44] Houtzager, *Hollands lijf- en losrenteleningen*, 132-133; Epstein, *Freedom*, 20-23.
[45] Liesker and Fritschy *Gewestelijk financiën*,160; Fritschy, "Financial Revolution", 83-84.
[46] Gelderblom, *Zuid-Nederlandse kooplieden*,144, 163.
[47] Gaastra, *Geschiedenis*, 22; Gelderblom and Jonker, "Completing".

population. Specially appointed commissioners assessed wealth and income of every household in detail, after which inhabitants possessing 2,000 guilders or more had to accept a loan for 0.5 per cent of their wealth in 8.33 per cent redeemable annuities or 14.3 per cent life annuities.[48] To ease acceptance the loans were exempt from the withholding tax, but the receivers still needed the additional pressure of suspending interest payments on debts outstanding to have the investors targeted take up their portion of the forced loans.[49]

Census-based levies like this were not uncommon. Both provincial and local authorities had resorted to them repeatedly, first during the 1540s and again during the 1570s and 1580s emergency.[50] This time, however, the Estates clearly intended to create a regular fiscal resource. Revised and updated in 1599 and 1602, the census ledgers enabled the receivers who administered them to submit investors holding out for better conditions. They offered those liable for direct taxation the option between a rinse (voluntary loan) and a shave (forced loan), with the potential third option, a haircut (levy), remaining unused until the 1620s. Thus the censuses helped receivers to harness the market and for that reason successive internal memos praised them as the foundation of Holland's finances.[51] But at the same time, as static appraisals, the ledgers were quickly obsolete and expensive to update; and despite the Estates' detailed enumeration of what should be assessed, they were also poorly suited to capture the fast growing liquid wealth sunk in every kind of commercial enterprise by Holland's merchants.

To target the riches which the forced loans hardly touched, Holland raised substantial amounts in bonds between 1588 and 1609. With a typical maturity of six to twelve months, bonds offered investors the advantages of a slightly higher interest rate plus greater control over their money than annuities. Redemption of annuities was at the

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[48] NA 3.01.29, Inv. nr 797; *Memorie* 1755, fol. 20r-20v; transcribed and annotated by Wantje Fritschy, the memo may be consulted at http://www.inghist.nl/Onderzoek/Projecten/GewestelijkeFinancien/memorie. Cf. however RSH 23 October and 2 December 1599, putting the threshold at 2,000 guilders and not the 3,000 guilders stated in the *Memorie*.

[49] RSH 30 May 1602, quoted in Houtzager, *Hollands lijf- en losrenteleningen*, 125; References to loans in 'vrij geld', i.e. not subject to tax, suggest that the annuities sold in the forced loans of 1599, 1600, 1602 and 1603 were not subject to the withholding tax: Houtzager, *Hollands lijf- en losrenteleningen* 52, 124. To speed up collection of the forced loans in 1599-1603 the cities advanced the amount assessed locally to the province, usually by borrowing that sum themselves on collateral of the expected revenue (*Memorie* 1755, 21r)

[50] Tracy, *Founding*, 250-253.

[51] *Memorie* 1755, fol. 20v; cf. Liesker and Fritschy, *Gewestelijke financiën*, 160-161, 362-365.

authorities' discretion, and since transfer of ownership passed through an official register they could charge a fee plus a 3.3 per cent duty for transferring annuities.[52] With bonds the boot was on the other foot. Bondholders could demand repayment at the end of term and effect transfers without formalities or extra cost, because bonds were in effect bearer paper, transferable by endorsement. Receivers in Amsterdam and Delft also issued bonds *in blanco*, i.e. without a name, to allow the easy transfer between investors.[53] Merchants with their constantly shifting liquidity needs therefore preferred bonds over annuities. For their part, the Estates constantly urged receivers to sell bonds only if no takers could be found for annuities, probably because with bonds Holland put itself theoretically at the mercy of its creditors, who could cause a public finance crisis at any moment by demanding their money back.[54] Presumably the receivers countered that danger by staggering issues as much as possible, thereby also spreading their interest payments equally over the year to match the flow of revenues coming in.

Though the bonds and annuities sold between 1588 and 1609 were puny by later standards, the issuing policy and the forces shaping it were by and large the same. The Estates tailored amounts to be raised, the instruments, and their price to perceived market conditions in various segments. By letting the receivers apply carrots or sticks to mediate the preference mismatch between the province and its creditors, the Estates could raise loans as quickly, as cheaply, and as close to its funding needs as market circumstances allowed. Moreover, by setting maximum loan issuing rates, the Estates gave officials an incentive for bargaining with potential investors over options and prices leaving actual rates at the receivers' discretion and the difference for them to pocket.[55]

As soon as circumstances allowed the Estates took steps to reduce interest burdens by restructuring the debt. In 1609 the province seized upon the financial leeway created

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[52] In 1593 the Estates of Holland decided to levy a tax on transfers of annuities (2.5 per cent) and bequests (5 per cent). In 1598 the succession tax was lowered to 2.5 per cent and the transfer tax raised to 3.3 per cent: Liesker and Fritschy, *Gewestelijke financiën*, 380-381.

[53] From 1650, and quite possibly much earlier, all bonds were technically bearer bonds, since they carried a standard clause assigning ownership to a named person 'or bearer': Hecht, *Beitrag* 118-120; Tracy, *Financial Revolution* 206; Dormans, *Tekort*, 143; See also ACA 367 A/154 for a transfer on 12 September 1688 of one of Holland's obligations with the standard clause. Pamphlet Knuttel No. 3348 (1621) quotes the text of VOC bonds with the complete bearer clause. For the full text of Holland's bonds in the eighteenth century: NA 3.01.29, Inv. Nr. 257, fol 1184 (1732), and Inv. Nr 935, fol. 1193 (1752).

[54] Dormans, *Tekort*, 24, 58-60.

[55] See, for instance, RSH 27 January 1593, 2 December 1603.

by the end of the hostilities with Spain to convert all bonds and annuities into 6.25 per cent redeemable annuities. Investors bridled at the interest rate cut; the Estates sweetened the pill by lifting the transfer tax on annuities thus obtained, and still had to repeat the original order to the receivers twice, in February and May 1611.[56] Finally the conversion succeeded. By 1618 the debt issued by the province's northern part consisted entirely of term- and life annuities and this was probably the case in the soutern part as well. Relieved from the war's pressure on money, Holland's receivers could persuade unwilling investors by offering life annuities or else cajole them with a credible threat of reimbursement.[57] In similar circumstances the attempted conversion of the Estates-General's bond debt failed because the Union lacked the means for sweeteners or threats.[58]

THE FREE MARKET'S STRETCH, 1621-1648

The policy room which still existed during the 1610s disappeared during the second phase of the Eighty Years' War which, despite being considerably shorter, proved to be far more expensive than the first. Between 1621 and the Peace of Westphalia in 1648 Holland's debt rose more than fivefold to 125.5 million, not counting a floating debt of 7.2 million in *soldijordonnanties* and advances by the cities on taxes due.[59] Letting the debt rise so quickly required a firm confidence in the country's fiscal resilience and stretch, which the economic boom clearly inspired. The Estates succeeded in raising the amounts required by tweaking financial policy in two respects: they used wealth levies rather than forced loans to supplement voluntary purchases of annuities, and from the late 1620s they increasingly relied on bonds rather than annuities, turning them into the single

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[56] RSH 26 September 1609, 23 February 1611, 5 May 1611, as cited in Houtzager, *Hollands lijf- en losrenteleningen*, 132-133.
[57] NA 3.01.29, Inv. Nr. 852, a memo detailing the final outcome of the conversion in the Noorderkwartier; Bovers, "Government-Market Interaction", 39.
[58] It has previously been thought that the 1609 conversion failed: cf. for instance Fritschy, "Financial Revolution", 77-78; Dormans, *Tekort*, 46-47. However, these authors took the conversion amounts reported in the 1618 memo (NA 3.01.29, Inv. Nr. 852) as giving the totals for the province as a whole, whereas the document pertains to the Noorderkwartier only. See Appendix A.
[59] Dormans, *Tekort*, 47-48; see also SH I, no. 2789 (1623), SH III no. 3106, SH IV, no. 649 (1625, 1627, 1628), SH V, no. 428 (1630).

most important debt component. By the end of the war with Spain in 1648 obligations amounted to 73 million guilders, or 60 per cent of Holland's debt (Figure 2).

[Figure 2 about here]

The reason to start using wealth levies on a regular basis appears to have been twofold. First, despite the introduction of new taxes military expenditure rose very much faster than revenues, so any measure slowing the growth of interest charges was welcome.[60] Second, the Estates feared pushing issuing rates upward by floating too much debt. The relative merits of alternative solutions were first debated in 1622, when a proposed forced loan was dropped in favor of a wealth levy for the same amount.[61] The following year Delft resisted a new free loan with the argument that local investors would demand higher interest rates and suggested using alternatives such as wealth taxes or forced loans.[62] The yield from wealth levies began to drop, however, because the 1602 ledgers had become outdated so taxpayers could no longer be targeted adequately.[63]The ensuing debate shows the Estates unable to decide on the lesser evil, the growing interest burden, wealth levies, or forced loans.[64]

When in 1625 the Estates finally did issue a forced loan of 0.5 per cent on wealth assessed, they drafted a careful compromise between conflicting interests. The annuities issued in return carried 3 per cent interest during the first six years, rising to the going rate of 6.25 per cent after that; they were also free from the 3.3 per cent transfer duty during the first three years. At the same time the Estates gave instructions to make the wealth tax more effective by updating the 1602 ledgers, so the loan was clearly intended as a one-off.[65] And thus it remained. Though the Estates debated the option of a forced loan again in 1626, 1627, 1628, 1630, and in 1633-1635, each time they decided to levy a wealth tax instead, sometimes sweetened by letting the taxpayers have annuities for their

[60] SH I, no. 2656; SH II, no. 722; SH III, no. 758; SH IV, no's 17, 646, 993.
[61] SH I, no.'s 2571, 2880.
[62] SH II, no. 456.
[63] SH II, no. 1906.
[64] SH I, no. 2571, 2656, 2880.
[65] SH II, no.'s 1903, 1906, 1921.

contribution if they paid before a set date.[66] By 1635 the tax yield had started to decline again, but the urban delegates to the Estates refused to have the 1625 ledgers updated, thus ensuring a light touch.[67] Taxing wealth remained unpopular, a last resort to make ends meet. Until 1650 levies occurred on average once every three years, the one in 1646 using finally updated ledgers.[68]

By the mid-1630s the Estates could afford this policy change because the market absorbed new and large bond issues with astounding ease, allaying fears for an upward pressure on interest rates and liberating the authorities from their dilemma between levies or forced loans. The province also found that, with bonds as its prime debt instrument, it could tap sufficient wealth to drop the levies and forced loans. The administrative groundwork for this policy change was done in 1628, when the province substituted its own credit for that of the receivers. Henceforth new bond issues were formally accepted by the Estates and backed by a certificate of indemnity given to the receiver which pledged all provincial revenues for servicing the debt.[69] This tightening up of the administrative procedure made little difference for bond buyers, since receivers had given such a guarantee on demand since 1597, but it did signal the Estates' imminent policy change.

Letting the debt rise as quickly as it did by issuing bonds meant building up a perpetual debt with short-term instruments, because the redemption horizon receded ever further. Before the Truce the debt to tax ratio had barely touched three, that is to say, the entire debt could have been redeemed with three years' revenues, but the rate now shot up to reach 12 by 1650 (Figure 3). This quasi consolidation took place gradually, unnoticed, and without any change to status or price of the bonds, creating a remarkable anomaly in the history of public finance: a very large, growing, and stable debt financed

[66] SH III, no.'s 3196, 3243, 3655, 3757, IV no.'s 316, 1050, 1179, 1271, 1691, V, no. 536, VI no.'s 17, 76, 494, 6696, 1303, 1362, VII no.'s D99, D130, E14, F84, G128. In 1626 taxpayers in Leiden complained about missing out on the annuities: SH V, no. 1002.

[67] SH VII, no. G232.

[68] The frequency of wealth levies dropped from almost annual during the 1620s to intermittent during the 1630s and 1640s, eight times in twenty years with sometimes large gaps in between. The total assessment dropped from 2.8 per cent between 1621 and 1631 to 2.5 per cent between 1632 and 1648. Liesker and Fritschy, *Gewestelijke financiën*, 223, 365-366, 369; ledgers updated in 1644, *Memorie* 1755 fol. 25v-26r.

[69] NA 3.01.05 Gecommitteerde Raden No. 3287, secret minutes, 14 February 1628, 21 June 1634; 8 November 1640; 2 March 1643; 13 March 1654. For the exact wording a reimbursement deed from a later period (1750), see NA 3.01.29, No. 866.

largely with short-term instruments at low and falling issuing rates. In 1634 declining market rates led to plans for a conversion of redeemable annuities and bonds from 6.25 per cent to 5. This happened in 1640 and put Holland's rates amongst the lowest for the mid-17th century.[70]

[Figure 3 about here]

How do we explain this anomaly? By 1630 Holland combined a strong credit record with a booming economy. Accumulated wealth rose very fast during these peak years of the Dutch Golden Age, far outpacing the rise in public debt. Moreover, the net debt increase between 1621 and 1648 more or less equalled the interest paid out during that period. Net annual transfers from investors to the province seldom exceeded one million guilders and were balanced by transfers in the opposite direction (Figure 4). The ballooning debt could thus be financed entirely by investors ploughing back interests paid which, given the rapid wealth increase, created a sellers' primary market.[71]

[Figure 4 about here]

Investors were keen to buy, and hold, the province's bonds as a secure store of wealth. Very few bondholders ever wanted to liquidate their holdings. In 1621, 1622, and 1623, for instance, redemptions amounted to only 56,000, 84,000 and 148,000 guilders.[72] By 1635 the prolongation of bonds had become so common that provincial receivers were forced to give up the small fee for roll-overs.[73] When preparing the 1640 conversion the Estates considered 800,000 guilders enough to cover expected redemptions on an estimated total debt of 94 million.[74] The bonds were also quite liquid because redeemable

[70] Epstein, *Freedom*, 20-23.
[71] Compare De Vries and Van der Woude , *First Modern Economy*, 120-121, for a similar exercise pertaining to the Dutch Republic as a whole.
[72] Liesker and Fritschy, *Gewestelijke financiën*, 513, 517, 521.
[73] SH VI no.'s 1191, 1303, 1358, 1360, 1424, 1429; VII no.'s B 65, 129, D 177, H 210, 24, I 403. the VOC had abolished the roll-over fee on its bonds in 1626: Van Dam, *Beschryvinge* I, 439.
[74] Tracy, *Financial Revolution*, 209-210; Dormans, *Tekort* 65.

at par and at short notice which, together with the investors' preference to hold, explains the otherwise puzzling absence of an active secondary market.[75]

Thus investors had little to gain from a formal consolidation and a lot to lose, as the fate of redeemable annuities showed. With the transfer formalities and cost Holland effectively locked its annuities into a relatively small market segment. Data from Gouda demonstrate this phenomenon to good effect (Figure 5). The annuities transfers recorded by the city secretary show very little activity until the 1650s. In 16 years between 1613 and 1650 nothing was transferred at all; in 12 more years, only one or two annuities changed hands. The nine remaining years saw three or four transfers, exceptionally five or seven, for amounts in the hundreds of guilders rather than in the thousands. Moreover prices, if recorded, were invariably at par. The annuities clearly catered for a specific market segment, i.e. investors with a long time horizon who could afford to hold the paper long enough to compensate the penalty on transfers. Once this segment had absorbed about 50 million guilders, i.e. the amount reached in the early 1640s, investors would take no more. The specific character of this segment also anchored prices firmly at par until the 1672 emergency forced part of the investors to sell their paper.

[Figure 5 about here]

If Dutch investors could only lose from consolidation, the Estates did not stand to gain either. Issuing rates could hardly be lower and, after some 30 years of experience, they must have known that the likelihood of creditors rushing to cash in and causing a credit collapse was minimal.[76] Consequently we must see Holland's anomaly as an chance equilibrium of interests achieved by the fortuitous conjunction of rapid economic growth and wealth accumulation with fast rising expenditure to defend that prosperity. The equilibrium was maintained by a dual-action safety valve provided by the receivers, who on the one hand gave investors an exit option, and on the other acted to buffer roll-over crises.

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[75] Neal, "How it all began", 123; Gelderblom and Jonker, "Completing", 642-643.

[76] One such crisis may have occurred in 1631, since the Estates discussed complaints that receivers sometimes refused to reimburse creditors. No run on the receivers' offices has been recorded, however, and the complaints may just as well have been related to the reimbursement of annuities from the last forced loan of 1625 (SH V, 1340).

TRAPPED IN EQUILIBRIUM, 1648-1672

With the end of the long war against Spain in 1648 old financial worries immediately resurfaced. Holland's interest burden stood at a crushing 7 million guilders a year, fully 60 per cent of revenue.[77] The debt-tax ratio of twelve made any prospects of redemption unrealistic; the overwhelmingly short-term character of the debt sat uneasy with the Estates and more so after an incident in 1653. When the first Anglo-Dutch war (1652-54) appeared to go against the Republic bondholders giving notice squeezed several receivers, notably the one in The Hague. The bottlenecks were solved by transferring funds between offices and by having receivers work hard on their creditors to leave their money untouched with promises of prompt payment.[78] Though the roll-over crisis thus did not pose a serious threat and passed quickly, the experience helped to inspire consolidation efforts.

The worries translated into three financial policy priorities during the 1650s and 1660s: conversion, redemption, and consolidation. The Estates tackled the first two issues in tandem. During 1651 and 1652 two successive committees explored the available options for reducing the interest burden through cutting the debt. In August 1652 Johan de Witt, on his way to Holland's most powerful office of grand pensionary, presented conclusions. The interest on redeemable annuities and bonds would be reduced from 5 to 4 per cent for at least one year, with the savings going into a redemption fund. This proposal caused such an uproar amongst the urban delegates that the delegates from the nobility asked for the subject to be shelved for two to three years. The ongoing war with Britain prevented debt reduction anyway, but to avoid a further increase the Estates reintroduced the 0.5 per cent wealth tax, revising the ledgers in 1654 to boost the yield, and raised the land tax by 50 per cent.[79]

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[77] Dormans, *Tekort*, 47.
[78] Houtzager, *Hollands lijf- en losrenteleningen*, 159; NA 3.01.05 Gecommitteerde Raden No. 3287, secret minutes 3 October 1653.
[79] Houtzager, *Hollands lijf- en losrenteleningen*, 155-157; Liesker and Fritschy, *Gewestelijke financiën*, 365-366.

The war with England taught some harsh realities: Holland's financial position could not be sustained without further sacrifices from the bondholders. Wealth levies became a regular tax, being raised in all but nine years until 1722. There was room for an interest rate cut, too, because the wealth which had earlier absorbed the fast growing debt pushed interest rates down now that debt creation had stopped (Figure 4). Between 1650 and 1653 net annual transfers to investors amounted to seven million guilders, money which, with the Dutch economic spurt slowing down, could not easily find remunerative employment elsewhere. Consequently private interest rates started to fall: to 4.5 per cent by 1655, and less than 4 per cent five years later.

[Figure 6 about here]

The downward pressure on interest rates combined with the war lessons to muster the political will for a bondholders' sacrifice. In August 1655 the Estates, overcoming strong opposition from some cities, adopted a more radical version of the 1652 proposal and converted all annuities and bonds to 4 per cent, reducing annual tax transfers to investors from 6.9 to 5.7 million guilders. The savings fed a redemption fund with which Holland's debt would be extinguished in just over 40 years.[80] Foreigners would be repaid first, then bond holders who had given notice in 1653, followed by investors living outside Holland, and in the last resort inhabitants proper.[81] The profoundly unpopular redemption would thus hit the delegates and their constituents somewhat later. Investors need not have worried. To achieve its target the province would have had to redeem over 3 million guilders a year. In effect total debt declined by just that amount in the 15 years between 1655 and 1670, partly due to the fact that in 1664, with the clouds gathering for the Second Anglo-Dutch War (1665-1667) the savings were diverted from the redemption fund to war spending.[82]

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[80] Houtzager, *Hollands lijf- en losrenteleningen*, 76-81; Dormans, *Tekort* 53, 55, 85, 88, 91, 105-106; Liesker and Fritschy, *Gewestelijke financiën*, 365-366.

[81] Houtzager, *Hollands lijf- en losrenteleningen*, 80-81, 167. Evidence for the actual application of the rule are the instructions the *Gecommitteerde Raden* gave to the Receiver General in The Hague in 1655: NA 3.01.05 Gecommitteerde Raden, No. 3287, secret minutes, 22 June 1655. In 1662 the Estates repeated their instruction to repay outsiders first: resolution 27 September 1662, quoted in Houtzager, *Hollands lijf- en losrenteleningen*, 172-173.

[82] Houtzager, *Hollands lijf- en losrenteleningen*, 83.

After conversion and redemption the Estates turned their attention to consolidation. During 1657 and 1658 they repeatedly discussed the wholesale repackaging of bonds into annuities. The advantages were considered to be higher transfer tax revenues, a greater administrative transparency, and for investors the certainty that they would not face redemption before a set date.[83] No decision was taken, presumably because delegates realized that, with nothing to attract bondholders, consolidation stood no chance at all. As a second best the Estates reintroduced its old policy of selling redeemable and life annuities rather than bonds.[84] This met with marginal success. By 1670 bond debt had declined with 5 million guilders and the amount of term and life annuities risen correspondingly.

The dearth of new debt issues did lead to a fundamental change the relationship between the government and its creditors, however, as it pushed demand for bonds to the point of creating a secondary market. This did not happen on purpose or as a consequence of diverging investors' expectations, but as a consequence of the friction between aggregate supply and demand, just as the secondary market in VOC shares originated in rising expectations after the company's subscription books had already closed.[85] Until 1650 new issues had more or less kept pace with the rise in wealth and the receivers had provided a ready exit, so nobody needed a secondary market. When the halting of new issues upset the balance, excess demand created such a market. In March 1655 an internal report for the Estates had argued that interest rates could be cut because bonds traded at 105-107 per cent of par, the first instance we have of bond prices and of the authorities using these in support of financial policy.[86]

It is difficult to determine when this market sprang up, or how active it was. The Gouda annuities transfers, admittedly circumstantial evidence for a secondary bond market, show a marked increase during the 1650s, the number of transactions reaching

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[83] Houtzager, *Hollands lijf- en losrenteleningen*, 169-170; the conversion would be effected simply by substituting the holder's name for the words 'to bearer'.
[84] Houtzager, *Hollands lijf- en losrenteleningen* 82-85; Dormans, *Tekort* 60-62. See for the exclusion of bonds from new issues, the resolutions of the Estates of Holland of 19 September 1659, 3 October, 1659 29 May 1660, and 11 December 1660, cited in: Houtzager, *Hollands lijf- en losrenteleningen* 170-172. Compare also an instruction from 1665 to minimize sales of bonds Holland's resolutions from 5 February 1665 and 13 March 1665, cited in: Houtzager, *Hollands lijf- en losrenteleningen* 175.
[85] Gelderblom and Jonker, "Completing".
[86] Houtzager, *Hollands lijf- en losrenteleningen*, 163-164.

double figures for amounts totalling 6,000-20,000 guilders (Figure 5). After 1655 prices dipped under par on a few occasions: 98 per cent, 96 per cent, 93 even, which, given the higher price for bonds at the time, presumably suggests investors moving from annuities into bonds. At the same time, however, there is no evidence for active trade in obligations. Bonds could admittedly be transferred privately without leaving a paper trail in public registers, but one would expect a lively trade to have attracted the administration's attention, of which we have found no traces. On the other hand, demand must have been considerable as investors received 6 million guilders per year in interest payments while public loans consistently yielded higher returns than private loans. By 1660 Amsterdam's trustees for orphans (*weesmeesters*) lent at 3.5-4 per cent, while the city's leading merchants could borrow at 3-3.5 per cent.[87] Even the VOC lowered the interest on its bonds from 4 per cent to 3.5 between 1662 and 1665. The Estates tried to follow in 1664, issuing a loan at 3 per cent on the express condition that this created no precedent for an overall interest rate cut, but the market would accept loans only at 4 per cent, and subsequent loans were once again floated at 4 per cent.[88]

With Holland's bonds paying these relatively high rates, few investors will have been inclined to sell.[89] Yet under any circumstances some creditors will need to liquidate their holdings, and with 130 million guilders debt outstanding the emergence of an active secondary market would seem a logical response. One explanation for its absence would be that the authorities succeeded in keeping a tight rein by intermediating between sellers and buyers, redeeming bonds and then resell them. An incidental reference in the accounts of an Amsterdam merchant reveals how they might have done so. In 1666 and 1668 the *Gecommitteerde Raden* sold Louys Trip bonds which previously belonged to other investors.[90] Bondholders acquiesced in this captive market because they had an alternative means to convert obligations into cash. In 1672 three Amsterdam brokers declared before a notary that from about 1660 onwards it was common to borrow on the

[87] ACA 5060, Inv. Nrs. 50, 51.
[88] RSH 16 May 1664, 24 May 1664, 6 February 1665; *Memorie* 1755, fol. 28v-29r.
[89] In 1662 the Estates repeated their instruction to target outsiders for the repayment of bonds. The resolution of the Estates of Holland of 27 September 1662 is cited in Houtzager, *Hollands lijf- en losrenteleningen*, 172-173.
[90] ACA 5060 Inv. Nr. 50, 24 March 1666, 21 November 1668.

collateral of Holland's obligations.[91] The government probably did not like this and in March 1661 the Estates of Holland decreed that bonds in the receivers' offices could not be attached, a measure which should have made bonds less attractive as loan collateral.[92] The lombarding of bonds continued, however. In May 1668, for instance, Louys Trip loaned 20,000 guilders at 3.5 per cent to Pieter de Groot, who pledged 22,600 guilders worth of obligations issued by Holland's receiver in Amsterdam as collateral.[93] In the absence of an active secondary market, borrowing on the security of bonds allowed investors strapped for cash to temporarily liquidate their otherwise very secure store of wealth.

Thus, during the 1650s and 1660s the Republic stood at the peak of its economic and political power, but already Holland had become trapped in a public finance system of its own making. By now the Estates entirely depended on the market to realize its policy priorities; consequently the interest rate conversion succeeded, the redemption made as much headway as the international political situation allowed, and the consolidation failed. Overall, the attempts to turn the clock back were a success in that the Estates managed to reduce debt slightly despite two conflicts with Britain, but at the same time it had become clear that public spending and debt had reached clear limits. Larger conflicts than the essentially localized ones with Britain would require higher contributions from wealth owners through forced loans or levies. As for the emerging secondary market, the Estates did use higher bond prices to justify decisions, but they disliked and distrusted the free market, as their strenuous consolidation efforts show. For their part the bondholders were trapped, too, in their own wealth. Every interest payment added more money to the already large pool of surplus savings, pushing down interest rates. We see here the origins of Holland as Europe's lender of first resort, offering such low interest rates that, from the late 1650s, foreign monarchs rushed in.[94]

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[91] Jacob Cardoso, Hendrick de Schepper and Jacob Hellesloot, brokers, declared that 10 to 12 years earlier money was Typically loaned at 4 per cent (for loans contracted before the city's aldermen or commissionairs of the orphans), and sometimes less, but loans below 3 per cent could only be had with obligations Holland or VOC shares as collateral. ACA, *Notarial archives* Inv. Nr. 2238 (notary Lock), 22 January 1672, folio 205 (courtesy Peter Koudijs and Lodewijk Petram).
[92] RSH 9, 18, and 22 March 1661.
[93] SA 5060, Inv. Nr. 50.
[94] See for instance, *Geneva*: RSH 27 March 1657; *Denmark*: 19 October 1657, 18 May 1658, 2 and 3 October 1659, 20 February 1660, 23 September 1666, 26 November 1666; *Britain*: 24 May 1660.

For both Holland and its creditors the three-pronged attack by Britain, France and two German princes in 1672 posed a problem of an entirely different order altogether. From 1670 Holland began preparing for an imminent conflict with France, raising troops, taxes, and loans.[95] In October 1671 the Estates introduced a small roll-over charge on bonds.[96] Two months later they boosted the financial reserves with 7 million guilders' worth of loans issued on the free market, adding another 2 million in February 1672.[97] At the end of February the Estates agreed to channel another 2 million guilders into this reserve. Five weeks later, on April 2nd, the *Gecommitteerde Raden* warned against further borrowing for fear of ruining credit, so the Estates chose to levy a one percent wealth tax instead.[98] Then war broke out in earnest, the coalition forged by Louis XIV attacking the Republic from all sides.

Needing funds instantly without time to wait for the market to take up bonds voluntarily, Holland resorted to forced loans, using the wealth tax ledgers last updated in 1654. When the yield proved too low, the Estates brought real estate from the land tax registers and public bonds sold before 1672 into the assessment.[99] Between 1672 and 1675 Holland raised 10 million guilders in free loans plus nearly 25 million guilders in forced loans, 7 per cent of the estimated wealth in real estate and public securities.[100] Getting hold of any money at all proved difficult because the invasion sent everybody scrambling for cash, triggering a sharp liquidity squeeze.[101] After some deliberation about

[95] *Memorie* 1755 30r-30v.
[96] *Memorie* 1755 30v.
[97] NSV 4-5 (7 January 1672), 15-17 (19-23 January 1672); NSV 40 (26 February 1672).
[98] NSV 55-56 (2 April 1672).
[99] With the greatest difficulty the Estates in 1674 also agreed upon a modest ten per cent increase of all assessments in the wealth tax ledgers: Liesker and Fritschy, *Gewestelijke financiën*, 367-368.
[100] NA 3.01.29, Inv. Nr. 802; Dormans, *Tekort* 70, puts the total value of forced loans at 24.7 million in the years 1672-1675, 95 per cent of which was raised through wealth taxes totalling 5.5 per cent of estimated wealth. According to Liesker and Fritschy (Gewestelijke *financiën*, 366,368) the wealth taxes used to this purpose between 1672 and 1675 amounted to 7 per cent of total wealth: 1672: 2 per cent; 1673: 1 per cent; 1674: 3 per cent; 1675, 1 per cent.
[101] Panhuysen, *Rampjaar 1672*, 293. Private minutes of the Estates meetings show the disappearance of credit: Hop, *Notulen*, 55, 70 ff.

the potential damage to public credit the Estates allowed receivers to accept bullion and gold and silver objects as payments for the forced loans, because insisting on cash would increase pressure from investors on the receivers for redemption.[102] This happened anyway; by June the receivers were in trouble. With tax receipts coming in very slowly, a naval blockade halting overseas trade, and enemy armies pushing ever deeper into Dutch territory, a growing number of bondholders gave notice. On 2 June provincial officials intervened and set the term of notice at three months for annuities and one month for bonds.[103] This failed to stop the run so on June 13 the Estates declared a moratorium on redemptions, though not on interest payments.[104] Even so all receivers fell in arrears.[105] In 1675 interest payments on the forced loans of 1672 were still in arrears and the Estates were equally concerned about the servicing of the 1674 forced loans, leading them to consider ignoring the 1672 arrears outright.[106] Holland also paid interest due in bonds rather than money and persuaded the VOC to pay dividends in public bonds rather than cash.[107]

The war thus threw Holland in its deepest financial crisis since the late 16th century and forced the Estates to take drastic measures. They proposed to renew the existing wealth tax ledgers and widen the assessment to include, among other things, the financial assets of tax payers, which would really represent an interest cut for Holland's creditors. It required intense negotiations to overcome the resistance of some urban delegates and introduce a blanket 16.6 per cent increase of the estimated wealth of those who possessing property of more than 3,000 guilders, new ledgers being drawn up in 1674. The Estates also decided to levy two wealth taxes of 0.5 per cent each specifically applied to financial assets, thus effectively reducing nominal interest rates on Holland bonds to 3 per cent in 1673. The impact of this latter measure was softened somewhat by

[102] NSV 92-93 (30 May 1672), 95 (2 June 1672), 198 (8 July 1672); NSV 216-217 (14-15 July).
[103] NSV 94 (2 June 1672). The three months' notice for redeemable annuities is puzzling because, in principle, creditors could not demand repayment on annuities. Perhaps it had become the receivers' habit after the failed restructuring of 1657 to respond to demands for redemption from holders of annuities as well.
[104] NSV 108 (13 June 1672).
[105] NSV 318 (18 November 1672), 322 (24 November 1672).
[106] RSH 11 december 1674, 19 January 1675, 21 January 1675, 26 Maart 1675, 24 May 1675; In July 1675 the Estates decided that those who had paid the forced loan of 1674 too late would not get interest in 1675: RSH 24 May 1675, 13 July 1675.
[107] Van Dam, *Beschrijvinge*, I, 441-443.

introducing a dual taxation rule. Sums due in the financial assets levy could be subtracted from sums due in personal wealth tax.[108] This benefitted big investors to the detriment of small ones, people below the tax threshold with a term or life annuity as a pension provision. The sharp drop in Gouda prices from 1673 followed by marked fluctuations and increasingly high annual turnovers shows that this caused a rush to sell redeemable annuities, which led to the annuities segment breaking open to merge with the main bond market (Figures 5 and 7).

[Figure 7 about here]

From these data we can also see that investors discounted the securities tax in prices, leading private and public rates to diverge. At the start of the war, private interest rates in Amsterdam shot up, but once the immediate danger had disappeared, they declined again (Figure 6). A small portfolio of 67 loans extended by one Amsterdam merchant banker on collateral of VOC shares between 1673 and 1683 shows a sharply declining interest rate, the lowest one dropping from 3.5 per cent in 1677 to as little as 2.5 per cent in 1683.[109]

Public rates followed a quite different trajectory. During the summer of 1672 they also peaked as Holland's creditors threw their bonds on the market. The few prices we have for the summer of 1672 suggest that, for a brief period, prices may have plummeted to as low as 30 per cent before recovering to the 70-85 range during the second half of the year.[110] Initially investors held on to redeemable annuities, but during 1673 that segment merged with the bond market. Prices dropped to an average of 75 per cent and started a slow recovery only at the end of the 1670s, shadowing bond prices at a slightly lower level to compensate the 3.3 per cent transfer tax. Low securities prices directly translated

[108] NSV 325-334 (25-26 November 1672), 340-349 (7-9 December 1672), 353-363 (14-21 December 1672). Cf. also Liesker and Fritschy, *Gewestelijke* financiën, 366-370.
[109] ACA 235 (Deutz), Inv. Nr. 288, 291-295 (Courtesy Lodewijk Petram).
[110] Grossmann, *Amsterdamer Börse* 111-112; Compare a request by Portuguese merchants not to be forced into the public execution of their stocks and bonds in case of their business failure, a clear sign of a price drop in these financial assets: NSV 266 (12 August 1672).

into higher borrowing costs. In 1673 the cities had to borrow their usual advance on the forced loans at 6 per cent per year.[111] The market situation then eased somewhat, but with bond prices below 80 Holland had to offer at least 5 per cent if it wanted to issue free loans. This the Estates did not want to do, so they continued issuing forced loans at 4 per cent. That proved difficult enough; in 1674 the receivers had to be warned not to sell under par, which they obviously did.[112]As late as 1678 the Rotterdam receiver could raise money only by offering 5 per cent.[113] By now the secondary market had held the whip hand. During the mid-1650 bond prices performed no more than a signaling function for delegates to the Estates, helping them to decide whether or not to lower interest rates; from the 1670s, however, the Estates had to follow the market rate, whether they wanted or not.

THE DOUBLE-EDGED SCALPEL, 1678-1713

In 1678 the Peace of Nimwegen ended the war with France, enabling Holland to restore its finances. With a debt-to-tax rate of 14 the situation was worse than before De Witt's reform efforts of the 1650s and 1660s (Figure 3). The Estates responded with drastic measures. In 1680 they raised the rate of both the excises and the real estate tax and also imposed a 0.5 per cent wealth levy, the interest on public bonds being taxed at source by the receivers.[114] A similar withholding tax on interest payments had been used between 1596 and 1607 but subsequent attempts to apply it had met with strong opposition. In 1634, for instance, the urban delegates in the Estates turned down a proposal for a withholding tax of 2.5 per cent on the interest from bonds and 5 per cent on income from other loans with the argument that the necessary opening of private administrations would cause credit to collapse.[115] In 1655 the Estates briefly considered a withholding tax only to abandon it in favor of a wholesale interest rate reduction. In December 1671, only

[111] RSH 20 April 1673.
[112] RSH 17 Augustus 1674.
[113] City Archives Rotterdam, ORA, 1a, Inv. Nr. 3687, fol. 131-134. The 5 per cent bonds were converted to 4 per cents in 1680 (Ibid. fol 140-142).
[114] Fritschy, "Efficiency", 64-74.
[115] SH VI, Nrs. 1471, 1472.

months before Louis XIV's invasion, Johan de Witt had great difficulty in persuading the Estates of the need for an incidental 5 per cent levy on interest payments and obtained approval only on promising not to use this expedient again for the next seven years.[116]

The withholding tax levied in 1680 was not continued either, presumably because of its immediate impact on credit. After a steady recovery during the late 1670s Gouda annuities prices halted in 1681, drifted for a year or two as if testing the Estates' intentions, then resumed their rise (Figure 7). Clearly investors wanted compensation for their substantial sacrifices during the war before being amenable to an interest rate cut. In the absence of debt new issues wealth transfers through interest payments to investors ran at some seven million guilders a year, pushing Gouda annuities prices back to par (Figure 5). At the same time the fiscal reforms succeeded in generating the surplus needed for about 2.6 million guilders of redemptions during the 1680s, reducing the debt-to-tax ratio from almost fourteen to almost twelve (Figure 3).

The Estates returned to the withholding tax in 1687 to lower the debt-to-tax rate even further. Holland introduced a 0.5 per cent withholding tax on public debt interest payments, which was doubled to one per cent in 1688; again the dual taxation rule cushioned big investors. Compared to the blunt knife of the ledger-based wealth levies with their built-in obsolescence, the withholding tax was a scalpel, easier to impose, more efficient, and cheaper to raise. At the same time the adoption of this tax signalled that the Estates considered bonds a fair proxy for overall wealth, i.e. ownership was spread sufficiently wide over the population for the tax to result in an equitable assessment. The moment proved well chosen; Gouda prices hardly moved, so the market accepted the interest rate cut (Figure 5). The extra revenues helped to push the debt-to-tax rate to 8.5 by 1690, its lowest level for more than forty years.

The withholding tax was also instrumental in funding the quarter century of almost continuous warfare which followed William of Orange's acceptance of the English crown in 1688. During this period Holland's debt nearly doubled from 160 million guilders in 1690 to almost 300 million at the Peace of Utrecht in 1713, pushing the debt-to-tax ratio to more than fourteen. To fund the wars the Estates resorted to their customary round of substantial tax raises, including the real estate tax, the excises, and a

[116] Houtzager, *Hollands lijf- en losrenteleningen*, 192-196.

doubling of the withholding tax on interest payments to two per cent. Consequently from 1690 investors suffered an annual haircut of a similar magnitude to the forced loans of the 1670s. According to some explanations Holland bondholders bore this stoically, accepting that the need to counter the French threat to trade required sacrifices. Investors did not have much option, however. Home alternatives such as buying real estate suffered a similar tax pressure on yields and foreign alternatives like British securities were slow to materialize.[117]

Moreover, the Gouda data do not show stoicism, but a continuous tug-of-war between the authorities and investors over the price of public debt (Figure 8). The market accepted the initial reductions of 1687-1690, but prices then dropped sharply to 80 per cent of par in 1695. The Estates responded by halving the withholding tax to 1 per cent following the end of the Nine Years' War in 1698 and annuities prices veered back to par. The reimposition of a two per cent levy at the start of the War of the Spanish Succession in 1702 clearly disappointed investors and prices fell gradually until 75 per cent in 1712, giving a three per cent yield. By that time even a 0.5 per cent tax cut failed to restore prices.

[Figure 8 about here]

This price drop shows Holland caught in a vicious circle of its own making. Its scalpel cut both ways; to raise the very large volume of debt needed, the Estates had to offer incentives which drove down the price of old debt to the same degree and then necessitated new incentives. For example, at first Holland sold new issues at a tax-exempt four per cent for the duration of the war. This period had to be extended to 10 years after the war for later issues.[118] When the market for four per cent bonds appeared

[117] Murphy, *Origins*, 39-65; Carter, "Dutch foreign investment".
[118] For loans between 1690 and 1698: NA 3.01.29, Inv. Nrs. 855 and 856; RSH 16 March 1690; 1 August 1693; 1 February 1694; 6 February 1694; 9 jul 1694; 26 jul 1695; 26 oct 1695; 18 nov 1695; 17 dec 1695; 18 aug 1696; 8 feb 1697; 19 jun 1697; 2 aug 1697; 21 apr 1698: For loans issued after 1700: NA 3.01.29, Inv. Nr 863. RSH 28 January 1701; 5 February 1701; 10 March 1701; 1 April 1701; 20 July 1701; 8 April 1702; 20 May 1702; 23 September 1702; 6 April 1703; 28 September 1703; 14 December 1703; 26 January 1704; 15 March 1704; 10 May 1704; 25 October 1704; 27 March 1705; 19 September 1705; 13 February 1706; 4 September 1706; 22 January 1707; 26 March 1707; 12 January 1707; 11 June 1707; 24 January 1708; 26 January 1708; 25 February 1708; 24 March 1708; 21 July 1708; 29 September 1708; 12 January

exhausted, the Estates adopted a successful British public debt innovation, lottery loans, issuing lottery bonds totalling 34 million guilders in 1711, 1712 and 1713.[119] During 1710 and 1711 Holland also issued twenty-year bonds at nine per cent, of which four per cent interest and five per cent amortization.[120] The entire volume issued during 1690-1712 consisted of loans with one kind of incentives or another (Figure 2). In 1709 sluggish home demand led the Estates even to take a 1.5 million loan at 4 per cent from the Swiss canton of Bern.[121]

These circumstances put a premium on the receivers' skills in coaxing local markets. A careful juggling with carrots and sticks could help narrow the yield gap between old and new loans by persuading investors to hang on to old bonds in return for privileged offers of new, higher yielding bonds. In doing this the receivers were helped by two factors. First, the primary market remained opaque to investors, the Estates publishing no financial information whatever. Only the receivers knew how much money was to be raised or still needed to be subscribed, so they could play investors against each other. Second, despite negative transfers during the early 1700s (Figure 4), the mismatch between investment opportunities and surplus savings continued. Though old bonds sold under par on the secondary market, there was no rush to redeem them at par with the receivers. Clearly investors valued keeping what they had as much as raising the overall yield of their portfolios.

These factors combined to give the receivers considerable leverage over their customers. New issues were not simply sold on a first come, first served basis, but judiciously fed to investors according to their status with the receiver. Favourites could always buy new, untaxed issues, perhaps even be allowed to swap old, taxed bonds for new ones. Less privileged investors would have to bargain for new bonds, guarded threats of reimbursement serving to coax them into accepting whatever it pleased the receiver to offer them. In 1706 the French diplomat Adrianus Helvétius reported admiringly from The Hague on the skilful harnessing of investors by the general receiver

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1709; 19 April 1709; 25 June 1709; 17 June 1709; 21 January 1710; 19 July 1710; 24 October 1710; 20 June 1711; 23 January 1710; 20 February 1711; 19 March 1712; 24 February 1714; 1 September 1714

119 Dormans, *Tekort*, 77. NA 3.01.29, Inv. Nr. 863, fol. 19; cf. Fokker, *Geschiedenis*, 127.

120 NA 3.01.29, Inv. Nr. 861.

121 S. Altdorfer-Ong, "Canton of Berne" 12; idem, "State Investment", 449-450.

of the United Provinces, Cornelis de Jonge van Ellemeet.[122] According to Helvétius, he used threats of reimbursement so effectively that 'sometimes he is overwhelmed with requests and pleas to keep the money; even then, he pretends to grant this favor only to people whom he holds in high esteem'. To drum up interest for new loans, Van Ellemeet staged a show, having prominent people come to him to subscribe. He then 'refuses the large sums which they present to him, claiming that the issue has been fully subscribed and that they are too late'.[123] With manipulations such as these Van Ellemeet and his colleagues succeeded in keeping estimated average interest payments on bonds very close to the yield of redeemable annuities as reconstructed with the Gouda and Leiden price data (Figure 9).[124] Only after 1706 did the gap between annuities yields and the average interest on bonds start to widen, bonds becoming relatively expensive for the authorities because investors raised their demand for premiums.

[Figure 9 about here]

Thus by the Peace of Utrecht in 1713 Holland's bond debt, homogeneous in 1687, had become a patchwork of different issues ranging from old debt subject to the withholding tax, new debt with tax exemptions of varying length or with amortization payments, to lottery bonds with widely differing chances. Rather than preventing the rise of a secondary market, as Larry Neal surmised, this was actually the consequence of pressure from the secondary market which showed quite exactly what investors were prepared to pay. To all concerned it was now clear that the Dutch Republic had moved to the side of the European stage, not because money was in short supply or because its public debt management failed, but for a want of fiscal means to retain a more central position.

[122] Helvetius, "Mémoire", 230-231. On Van Ellemeet see De Muinck, *Regentenhuishouding*.
[123] Helvetius, "Mémoire", 230-231.
[124] Holland's finance office recorded the value of new issues of tax-exempt bonds: NA 3.01.29, Inv. Nr. 856.

CONCLUSION

At first sight the evolution of Holland's public debt appears a curious anomaly in every respect. First, there was no North-Weingast moment of fundamental institutional or constitutional change. The Estates' credible commitment evolved gradually, grafted on that of the cities and sustained, as and when needed, by fiscal reforms to make revenue meet increased debt service levels. Second, no direct link existed between credible commitment and declining interest rates, because these were caused by rising wealth, which grew fast enough to cancel out the effects of a ballooning debt. Third, rising wealth clearly outweighed other explanations for interest rate differentials, i.e. fiscal and financial institutions, including liquid bond markets. Fourth, the debt's predominantly short-term character defies ordinary logic, which emphasizes the desirability of consolidation. This was in neither the debtor's nor the creditor's interest, since it was wealth that drove down interest rates and shaped investors' preferences, not the advantages of one form of debt over another. Fifth, a secondary market for public debt appeared very late in the day, long after the start of such a market for private securities. The option of liquidity on call at the receivers' office sufficed for investors so an open market only sprang up when bond supply and demand no longer matched.

Yet on reflection Holland's case really shows up the missing link in the classic analyses of public debt, i.e. rising wealth. Local circumstances will give commitment and institutions different shapes, one not necessarily superior to another. The informal commitment mechanisms of Venice or Genoa performed as well as Britain's written Bill of Rights, Holland's receivers provided sufficient liquidity to render a secondary market redundant, short-term bonds may act as long-term paper, for the same price. However, for debt to grow and interest rates to fall, credible commitment and the adoption of suitable fiscal and financial institutions are necessary, but not sufficient. Unless the commitment and institutions happened to coincide with rising wealth, unless they enabled the authorities to tap that wealth efficiently, they achieved little or nothing. That is to say, all Early Modern public debt success stories, from Venice via Genoa and the Republic to Britain, ultimately depended on a preceding phase of economic growth and wealth accumulation.

Moreover, the success of these cases tended to weaken the need for commitment and institutional change elsewhere through capital exports. Genoese loans sustained the Spanish crown in the 16th and 17th centuries, Amsterdam ones absolute regimes in Denmark, Austria, and Russia in the 18th century, British ones various South American regimes in the 19th century, all loans bridging the often wide interest rate gap due to the difference in commitment and in institutions between lender and borrower. Thus one key driver of the declining interest rates noted by Epstein would appear to have been growing wealth, spread through arbitrage between wealthy centers and a poorer periphery. Aspects of credible commitment diffused in this way as well, the Danish and Russian monarchs learning the importance of a prompt debt service from their Dutch bankers, for instance. If the Spanish and Austrian crowns proved slower to pick up that lesson, this shows that money will flow to where it is wanted, but its lessons do not necessarily follow.

Appendix A. The Size and Composition of Holland's Debt, 1590-1720

Our reconstruction of the size and composition of Holland's debt at the end of each year between 1590 and 1720 (reported in Figure 2) differs from earlier calculations by Dormans (*Het tekort*) and Liesker and Fritschy (*Gewestelijke Financiën*). This appendix details the amendments and changes we made to their estimates.

We estimate Holland's debt at the end of 1591 at 1.5 million guilders, the amount for which Holland's towns since 1588 had issued annuities to replace bonds outstanding.[125] For the years from 1591 to 1607 the resolutions of the Estates of Holland concerning the sales of life annuities, redeemable annuities and obligations provide the basis for our estimates.[126] We assume that all loans were placed according to these instructions. This seemingly strong assumption is warranted by both the reported value of Holland's interest payments in 1604 and the conversion of these bonds recorded by the *Noorderkwartier* in 1618 (see below). One exception is the year 1594 in which annuities worth 250,048 guilders were sold to replace a similar amount in bonds issued by the tax receivers; we deduct this amount from the estimated value of bonds outstanding in 1594.[127]

The Estates of Holland preferred annuities but between 1591 and 1607 they also approved bond issues worth 5.2 million guilders. These were obligations for one year but they were rolled over upon expiry.[128] The Estates also used forced sales of life- and redeemable annuities in 1599 and 1600, and again in 1602 and 1603. A report from 1618 set the total revenues for these four years for the northern part of Holland (*Noorderkwartier*) at 660,611 guilders. Based on this area's share in fiscal revenue (20.5%) we can estimate the total issue of forced loans at 3.2 million guilders for the entire province.[129] To arrive at annual estimates we have attributed equal shares to 1599, 1600, 1602 and 1603.

In 1609 the Estates ordered the conversion of all obligations into annuities, and the 1618 report for the *Noorderkwartier* confirmed the conversion of 1,131,119 guilders worth of bonds.[130] This amount is very close to what the area's official share (20.5%) in the 5.2 million guilders obligation debt of 1609 would have been: 1,069,546 guilders. We therefore assume the receivers in the *Zuiderkwartier* complied with the

[125] Tracy, "Keeping", 143; Idem, *Founding*, 182, 261; Bovers, "Government-Market Interaction", 31-37.

[126] RSH 26 January 1591; 18 and 29 June 1591; 27 August and 10 September 1591, 16 November 1592; 31 May and 5 June 1593; 23 June and 3 July 1594; 25 July 1594; 7 September 1595; 24 January 1596; 19 March 1596; 25 April 1596; 11 May 1596; 1 July 1596; 14 July and 27 July 1596; 27 December 1596; 5 February 1597; 19 May 1597; 1 and 23 December 1597; 23 December 1598; 23 March 1599; 5 April 1599; 12 and 23 October 1599; 16 March 1600; 6 June 1600; 7 June 1600; 28 August and 15 September 1601; 11 September 1601; 12 February and 16 March 1602; 13 and 15 August 1602; 3 and 6 September 1602; 4 and 21 December 1621; 18 February and 20 March 1603; 21 March 1603; 28 July 1603; 11 August 1603; 3 September 1603; 28 November 1603; 1 December 1603; 2 December 1603; 15 June 1604; 4 August 1604; 23 August 1604; 12 October 1604; 1 March 1605; 8 March 1605; 15 March 1605; 5 May 1605; 19 August 1605; 13 September 1605; 27 September 1605; 30 November 1605; 11 February 1606; 17 May 1606; 29 May 1606; 10 June 1606; 12 June 1606; 27 June and 8 July 1606; 30 June 1606; 24 August 1606; 12 September 1606; 27 October 1606; 18 November 1606; 23 April 1607; 1 May 1607; 3 May 1607; 17 July 1607; 4 September 1607; 13 October 1607; No amounts were mentioned in the resolutions for 1608: 25 February 1608; 11 June 1608; 28 June 1608. We estimate the total value of loans in this year as similar to 1607.

[127] NA 3.01.14 no's 139; RSH, 25 July 1594; Tracy, "Keeping", 149.

[128] Cf. the resolutions of the Estates of Holland ordering the prolongation of obligations: 12 and 23 November 1591; 30 December 1592 and 24 January 1593; 27 January 1593; 10 November 1593; 14 and 23 December 1593; 1 November 1594; 2 and 21 December 1596; 23 December 1598; 22 and 31 December 1600; 25 November and 20 December 1601; 4 and 21 December 1602; 2 December 1603; 12 October 1604; 30 November and 28 December 1605; 21 November 1605 and 5 December 1606; 4 September 1607; 4 December 1607.

[129] NA 3.01.29, Inv. Nr. 852; Bovers, "Government-Market Interaction", 36; On the share of the Noorderquartier in debt issues: Liesker and Fritschy, *Gewestelijke financiën*, 22-23.

[130] NA 3.01.29, Inv. Nr. 852; Liesker and Fritschy (*Gewestelijke Financiën*, 187) took the report to describe the debt of Holland, but it refers to the northern quarter only. See Bovers, "Government-Market Interaction", 39n.

Estates' resolution as well and converted all their bonds in 1609. In the *Noorderkwartier* 90 per cent of the bonds were converted into redeemable annuities, against ten percent life annuities.[131] We assume this ratio was the same in the southern part of the province and we distribute the 5.2 million guilders worth of obligations in 1609 between the two types of annuities in 1610. In following years the receivers in the *Noorderkwartier* repaid 34.4 per cent of the redeemable annuities. We assume the receivers in the rest of Holland redeemed a similar percentage. We estimate these redemptions were distributed equally over time between 1610 and 1618.

The report from 1618 also allows estimates of the relative share of life annuities and redeemable annuities in Holland's debt between 1591 and 1609.[132] The 495,300 guilders worth of annuities issued up until 1598 in the *Noorderkwartier* consisted of 45.3 per cent life annuities and 54.7 per cent redeemable annuities; the 660,612 guilders of forced loans of 1599-1603 consisted of 58.9 per cent life annuities and 41.1 per cent redeemable annuities; and the 490,804 guilders worth of annuities issued between 1601 and 1608 consisted of 69.1 per cent life annuities and 30.9 per cent redeemable annuities. We can estimate the composition of Holland's debt by applying these ratios to the various issues of annuities between 1591 and 1607, while at the same time adjusting the value of life annuities outstanding to their average annual extinction rate between 1591 and 1609 (1.25 per cent). The accuracy of this procedure is confirmed by a government report from 8 March 1604 stating that Holland paid about one million guilders in interest on its loans.[133] Our estimates for 1603 – obligations worth 3,448,802 guilders at 8.5 per cent; life annuities worth 3,506,533 guilders at 14.3 per cent and redeemable annuities worth 2,976,223 guilders at 8.33 per cent – would yield interest payments of 1,005,347 guilders.[134]

In 1609 the Estates General asked each of the provinces to contribute to the redemption of 4,356,101 guilders worth of bonds issued by the Union and to take over a debt of 1,303,245 guilders resulting from miscellaneous military expenses.[135] If Holland contributed according to its share in the Union's budget (58 per cent), the province will have issued some 3.3 million guilders of new debt to pay the Estates General. A report from 1616 stated that the receiver-general of Holland paid 309,201 guilders interest on *renten* sold between 1610 and 1614 to redeem loans which initially had not yet been charged to the province.[136] We assume this statement relates to the operations for the Union and we estimate that by 1614 Holland had fulfilled its obligations. Consequently we can estimate the share of life annuities (at 14.3 per cent) and redeemable annuities (at 6.25 per cent) at 40 and 60 per cent of the replacement loans, respectively.

In 1616 the *Noorderkwartier* issued 300,000 guilders worth of life annuities to pay for its share in a 2.8 million guilders loan of the Estates General to retrieve the cities of Flushing and Brielle from the English crown.[137] Based on the northern quarter's share in the provincial budget (20.5 per cent) we estimate Holland's total issue of annuities at 1.5 million guilders in 1616 but we assume that the *Zuiderkwartier* issued 40 per cent life annuities and 60 per cent redeemable annuities. In 1617 the *Noorderkwartier* sold obligations for 73,800 guilders to fund a 360,000 guilders loan Holland extended to the king of Sweden. The resolutions of the Estates of Holland reveal several other issues of obligations between 1610 and 1620 mostly in support of foreign allies.[138] These loans were small and mostly for short periods, but not all of them were redeemed and we estimate the obligation debt rose to 573,000 guilders in 1620. In 1617 and again in 1618 the *Noorderkwartier* also sold life annuities worth 41,000 guilders as part of two 200,000

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[131] NA 3.01.29, Inv. Nr. 852; Bovers, "Government-Market Interaction", 39n.
[132] NA 3.01.29, Inv. Nr. 852.
[133] *Memorie* 1755, 17-18.
[134] Interest rates from Dormans, *Het tekort*, 26.
[135] In earlier work we followed Houtzager's claim that Holland's obligation debt stood at 4,356,101 guilders in November 1609 (Houtzager, *Holland's lijf- en losrenteleningen*, 132, 135,136, 142; Gelderblom and Jonker, "Completing", 666). However, the resolution of the Estates of Holland on which Houtzager based his claim clearly refers to the debt of the Union – not the province of Holland: NA 3.01.04.01 Inv. Nr. 373, fol. 345. For the resolution on the debt 1,303,245 guilders: Idem, fol. 344v.
[136] Tracy, "Keeping", 143.
[137] NA 3.01.29, Inv. Nr. 852.
[138] RSH 25 June 1610, 8 September 1612, 23 August 1607; 21 February – 24 March 1612, 9-20 December 1614, 24 November – 22 December 1616; 4 May 1617; 25 July 1617; 27 October 1617; 10 and 15 November 1617; 9 December 1617; 31 August 1618; 18 and 22 October 1618; 6 and 30 November 1618; 10 December 1618; 30 August 1619; 21 and 26 August 1620 10 December 1618; 20 December 1619; 14 and 21 March 1620; 21 July 1620; 21 August 1620; 13 May 1620; 8 and 15 August 1620.

guilders loans to pay for French troops. We estimate that the *Zuiderkwartier* exclusively sold life annuities as well in these two instances, but we assume that in a new, 400,000 guilders issue of annuities in 1620 redeemable annuities made up one quarter.

Taking into account a 1 per cent annual extinction rate of life annuities between 1610 and 1620 we estimate the size of Holland's debt at the end of 1620 at 18.2 million guilders, with redeemable annuities (at 6.25 per cent) totaling 9.6 million guilders, life annuities (at 11.1 per cent) 8.0 million guilders, and obligations (at 6.25 per cent) 570,000 guilders. The estimated interest due on these loans was 1,522,294 guilders. In actual fact a report of Holland's finance office (1634) stated that in 1620 Holland paid 1,550,621 guilders interest.

The *Opreeckeninge*, an internal report describing the size and composition of Holland's debt in 1632, 1647, 1652, and 1667, set Holland's debt at 55.9 million guilders by the end of 1632.[139] In combination with our estimate for 1620 this would imply an increase of 37.5 million guilders – 3 million guilders less than the new loans reported for this period in the 1634 report: 34.4 million guilders.[140] We do not have a satisfactory explanation for this difference; we can only surmise that several loans which had initially been issued by individual cities, or the central government, were at a later stage added to Holland's total.[141] We follow the 1634 report to reconstruct the annual debt increase between 1620 and 1632, dividing the excess 3 million guilders over these years according to relative size of the known loans issued in the various years. Given the Estates' strong preference for annuities in this period, and the fact that it was only in 1629 that the Estates of Holland discussed the issue of obligations instead of annuities, we assume that between 1620 and 1628 all new debt issues consisted entirely of life- and redeemable annuities.[142]

The *Opreeckeninge* also shows the debt increased with 70 million guilders between 1632 and 1647. To reconstruct the growth pattern we can use a document from 1694 which reports the annual value of loans issued between 1599 and 1694.[143] We discard the actual amounts of new loans reported in 1694 because they do not add up to the amounts given in the 1634 report and the *Opreeckeninge* of 1667, but we use the implied distribution of loans over the years 1632-1647 to approximate the annual growth of the debt.

For the years from 1647 to 1720 we follow Dormans' estimates with only minor adjustments.[144] We estimate that consolidation of 6 million guilders worth of war debts was achieved in 1648 and 1649. The relative shares of life annuities, redeemable annuities, and obligations between 1632 and 1652 are interpolated from Dormans' estimates of their share in the first and last year of this period.[145] We follow Liesker and Fritschy's estimates of the redemption of 4.4 million guilders' worth of bonds between 1655 and 1660 (assuming life- and redeemable annuities were issued in equal amounts to replace them) as well as their estimate for the issue of new obligations worth 3 million guilders between 1664 and 1666. Data for 1668 and 1669 are lacking and therefore we interpolate the size and composition of Holland's debt from the figures for 1667 and 1670. The value of tax-exempt loans between 1691 and 1720 is calculated from detailed reports drafted by Holland's finance officers.[146]

The table below documents the total debt outstanding between 1591 and 1720 and the relative shares of life annuities (A), tax-exempt life annuities (B); redeemable annuities (C); obligations (D); tax exempt obligations (E), and lottery loans (F), in the total debt.

[139] Dormans, *Tekort*, 47.
[140] Dormans, *Tekort*, 45-46.
[141] See for instance the 800,000 guilders worth of bonds issued by the towns of Holland in anticipation of the revenue from the forced loan of 1625: SH III nr. 1907 (26 March 1625).
[142] SH I, nr. 2571; SH II, 12, 18, 19, 60, 70; SH III, nr. 1199. In April 1629 Holland's receivers were given permission to issue obligations to repay cities who wanted the money back they had loaned in 1625 to anticipate the forced sales of annuities. On the same day they were instructed to sell obligations for one million guilders with land tax revenues as collateral (SH IV, Nr. 682, 7 April 1629).
[143] Liesker and Fritschy, *Gewestelijke financiën*, 120-122
[144] Dormans *Tekort*, 65-66, 80-81, 110-111.
[145] Dormans, *Tekort*, 58.
[146] NA 3.01.29, Inv. Nrs. 855, 856, 862.

Year	Total	A	C	D
1591	1,685,000	40.3%	48.7%	11.0%
1592	1,776,506	37.6%	46.4%	16.0%
1593	1,833,167	36.2%	44.7%	19.1%
1594	1,954,873	39.5%	48.7%	11.8%
1595	2,045,209	39.7%	49.0%	11.2%
1596	2,349,051	36.3%	44.8%	18.9%
1597	2,961,390	31.7%	39.0%	29.3%
1598	3,149,664	32.5%	40.0%	27.5%
1599	4,278,884	34.6%	37.1%	28.3%
1600	5,495,375	35.2%	34.9%	29.9%
1601	6,171,207	35.4%	33.1%	31.5%
1602	7,693,886	34.2%	30.8%	35.0%
1603	9,688,866	35.2%	29.5%	35.3%
1604	10,426,199	34.6%	28.4%	36.9%
1605	10,926,041	33.3%	27.4%	39.3%
1606	12,094,085	32.0%	25.8%	42.3%
1607	13,300,742	34.8%	26.2%	39.0%
1608	14,417,854	37.4%	26.7%	36.0%
1609	14,417,854	37.4%	26.7%	36.0%
1610	15,033,902	41.0%	58.0%	1.0%
1611	15,388,283	41.4%	58.0%	0.6%
1612	15,790,655	41.6%	57.8%	0.6%
1613	16,191,038	41.8%	57.6%	0.6%
1614	16,589,451	41.9%	57.5%	0.6%
1615	16,329,431	42.2%	57.2%	0.6%
1616	17,620,106	43.2%	56.0%	0.9%
1617	17,893,625	43.2%	54.1%	2.7%
1618	17,751,905	44.2%	53.4%	2.3%
1619	17,817,394	43.6%	53.2%	3.1%
1620	18,152,668	44.0%	52.8%	3.2%
1621	19,159,907	41.9%	55.1%	3.0%
1622	20,631,345	39.1%	58.2%	2.8%
1623	23,150,262	35.1%	62.4%	2.5%
1624	25,077,751	32.6%	65.1%	2.3%
1625	27,915,465	29.5%	68.4%	2.1%
1626	33,753,033	24.9%	73.4%	1.7%
1627	35,113,506	24.0%	74.3%	1.6%
1628	38,291,278	22.2%	76.3%	1.5%
1629	42,126,300	20.5%	75.8%	3.7%
1630	45,824,564	19.0%	71.0%	10.0%
1631	49,656,548	17.7%	66.9%	15.3%
1632	55,901,803	16.1%	64.9%	19.0%
1633	61,420,877	14.7%	60.0%	25.4%
1634	66,490,924	13.6%	56.1%	30.3%
1635	70,360,171	12.9%	53.6%	33.5%
1636	75,697,063	12.0%	50.5%	37.5%
1637	80,334,235	11.4%	48.1%	40.5%
1638	85,438,044	10.7%	45.8%	43.4%
1639	91,447,843	10.1%	43.4%	46.5%
1640	96,004,215	9.6%	41.8%	48.5%
1641	101,474,529	9.2%	40.1%	50.8%
1642	107,011,555	8.7%	38.5%	52.8%
1643	110,595,278	8.5%	37.6%	54.0%
1644	113,493,464	8.3%	36.9%	54.9%
1645	117,747,184	8.0%	35.9%	56.1%
1646	120,148,785	7.8%	35.4%	56.8%
1647	125,495,939	7.5%	34.3%	58.2%
1648	128,943,185	7.5%	33.3%	59.1%
1649	131,343,185	7.5%	32.7%	59.7%
1650	131,343,185	7.5%	32.7%	59.7%
1651	131,343,185	7.5%	32.7%	59.7%
1652	131,435,779	7.8%	32.7%	59.5%
1653	131,471,641	7.7%	32.7%	59.5%
1654	131,507,504	7.9%	33.0%	59.4%
1655	131,543,366	7.9%	33.0%	58.5%

Year	Total	A	B	C	D	E	F
1656	131,579,229	7.8%		33.0%	57.6%		
1657	131,615,091	7.7%		33.0%	56.7%		
1658	131,650,954	7.7%		33.0%	55.8%		
1659	131,686,816	7.9%		33.3%	55.7%		
1660	131,722,679	8.5%		34.0%	55.7%		
1661	131,758,541	8.5%		34.1%	55.7%		
1662	131,794,404	8.4%		34.1%	55.7%		
1663	131,830,266	8.3%		34.1%	55.6%		
1664	131,866,129	8.5%		34.0%	55.9%		
1665	131,901,991	8.8%		34.0%	56.3%		
1666	131,937,854	9.3%		34.0%	56.8%		
1667	131,973,716	9.5%		34.0%	56.8%		
1668	130,781,477	9.0%		34.0%	57.2%		
1669	129,589,239	8.5%		33.9%	57.7%		
1670	128,397,000	8.0%		33.9%	58.1%		
1671	128,761,000	7.8%		33.4%	58.8%		
1672	128,501,000	8.8%		34.8%	56.4%		
1673	131,006,000	8.4%		34.0%	57.6%		
1674	139,075,000	7.9%		33.2%	58.9%		
1675	153,525,000	7.2%		29.5%	63.4%		
1676	158,525,000	6.9%		28.6%	64.5%		
1677	161,406,000	6.7%		27.9%	65.4%		
1678	161,633,000	6.5%		27.9%	65.6%		
1679	161,883,000	6.3%		27.8%	65.9%		
1680	161,533,000	6.1%		27.9%	66.1%		
1681	161,285,000	5.8%		28.0%	66.2%		
1682	160,910,000	5.6%		28.0%	66.3%		
1683	160,414,000	5.4%		28.1%	66.5%		
1684	160,242,000	5.3%		28.1%	66.5%		
1685	159,966,000	5.2%		28.2%	66.6%		
1686	159,792,000	5.1%		28.2%	66.7%		
1687	159,421,000	5.0%		28.3%	66.7%		
1688	159,229,000	4.9%		28.3%	66.8%		
1689	159,196,000	4.8%		28.3%	66.9%		
1690	159,471,000	4.9%		28.3%	66.8%		
1691	163,022,000	4.1%	1.1%	27.6%	65.5%	1.7%	
1692	166,694,000	4.5%	1.1%	26.9%	64.4%	3.1%	
1693	170,347,000	4.7%	1.2%	26.2%	63.7%	4.2%	
1694	173,925,000	5.1%	1.1%	25.6%	63.4%	4.8%	
1695	177,606,000	4.1%	2.4%	25.0%	59.6%	8.8%	
1696	181,189,000	4.0%	2.9%	24.5%	58.2%	10.5%	
1697	184,775,000	3.6%	3.5%	23.9%	55.9%	13.0%	
1698	189,462,000	4.4%	3.4%	23.3%	55.9%	13.0%	
1699	191,479,000	8.3%		23.1%	68.5%		
1700	193,319,000	8.8%		23.0%	68.2%		
1701	200,165,000	7.6%	1.4%	22.2%	67.7%	1.1%	
1702	207,016,000	7.8%	1.4%	21.5%	65.0%	4.3%	
1703	213,873,000	6.8%	2.6%	20.8%	63.4%	6.4%	
1704	220,734,000	6.5%	3.1%	20.1%	60.6%	9.7%	
1705	227,601,000	6.1%	3.6%	19.5%	58.8%	12.0%	
1706	234,472,000	5.8%	4.1%	18.9%	57.1%	14.0%	
1707	241,348,000	5.2%	4.9%	18.3%	54.6%	16.9%	
1708	248,229,000	4.7%	5.5%	17.8%	52.3%	19.6%	
1709	256,476,000	4.4%	6.0%	17.2%	50.7%	21.7%	
1710	265,684,000	4.1%	6.3%	16.6%	48.8%	24.2%	
1711	282,536,000	4.0%	6.4%	16.1%	46.1%	23.9%	3.5%
1712	295,164,000	3.8%	6.3%	16.1%	43.9%	23.2%	6.8%
1713	309,989,000	4.3%	6.0%	16.0%	40.9%	22.5%	10.3%
1714	310,865,000	3.7%	6.2%	15.9%	62.0%	1.9%	10.2%
1715	310,455,000	3.6%	6.2%	16.0%	62.1%	1.9%	10.3%
1716	310,847,000	3.6%	6.3%	15.9%	62.0%	1.9%	10.2%
1717	310,985,000	3.4%	6.4%	15.9%	62.1%	1.9%	10.2%
1718	310,228,000	3.3%	6.4%	16.0%	63.4%	0.7%	10.3%
1719	309,588,000	3.0%	6.4%	16.0%	63.5%	0.7%	10.3%
1720	307,526,000	6.0%	3.3%	16.0%	63.9%	0.8%	10.0%

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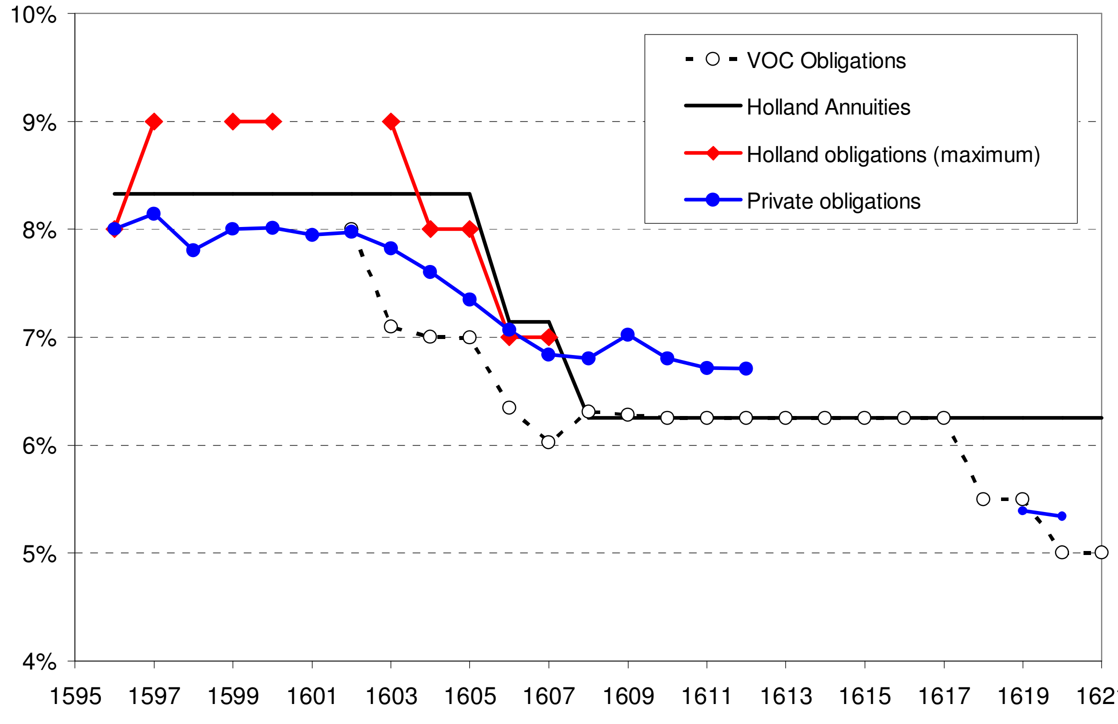
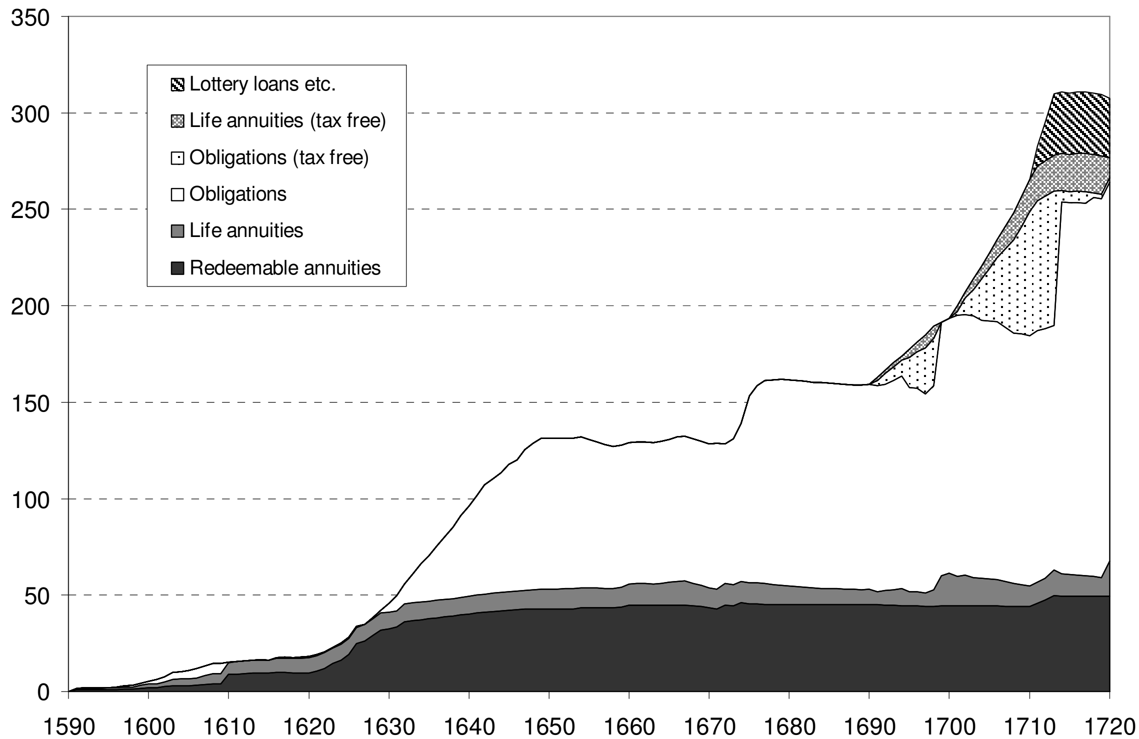
Figure 1. Interest paid on VOC Bonds, Private Bonds and Holland's redeemable annuities in Amsterdam, 1595-1621



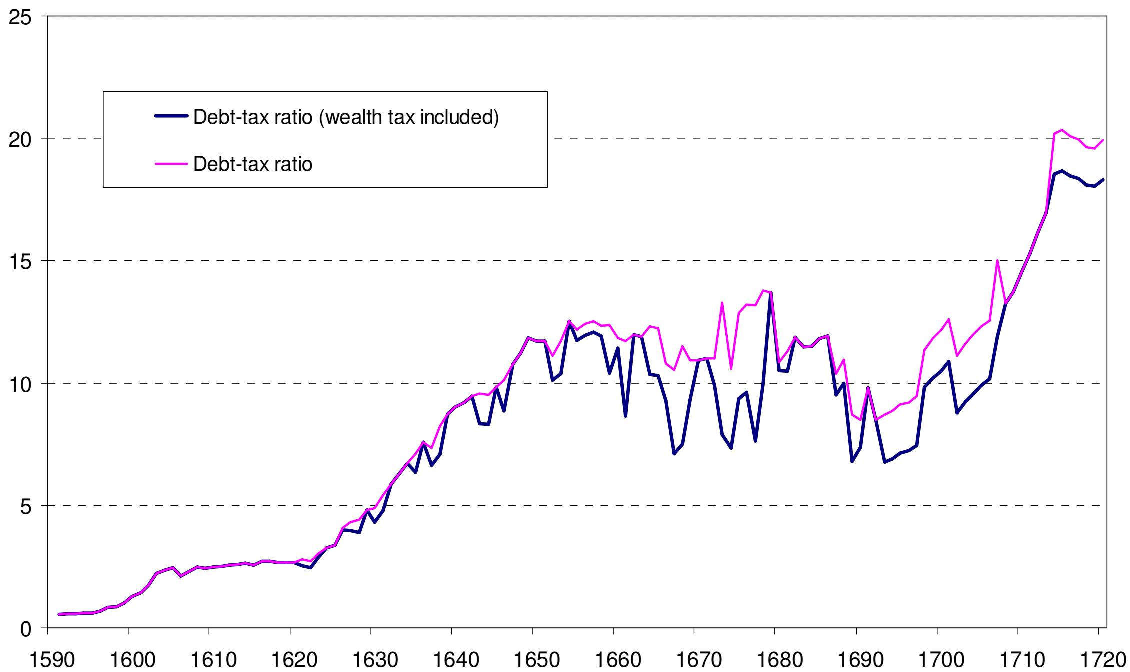
Sources: Private bonds: Gelderblom and Jonker, "Completing", Appendix; VOC Bonds 1602-1608: NA 1.04.02 Inv. Nr. 7142; VOC Bonds 1602-1620: Van Dam, *Beschryvinge*; Holland's redeemable annuities: Liesker and Fritschy, *Gewestelijke financiën*.

Figure 2. The Estimated Size and Composition of Holland's Debt between 1590 and 1720 (in million guilders).



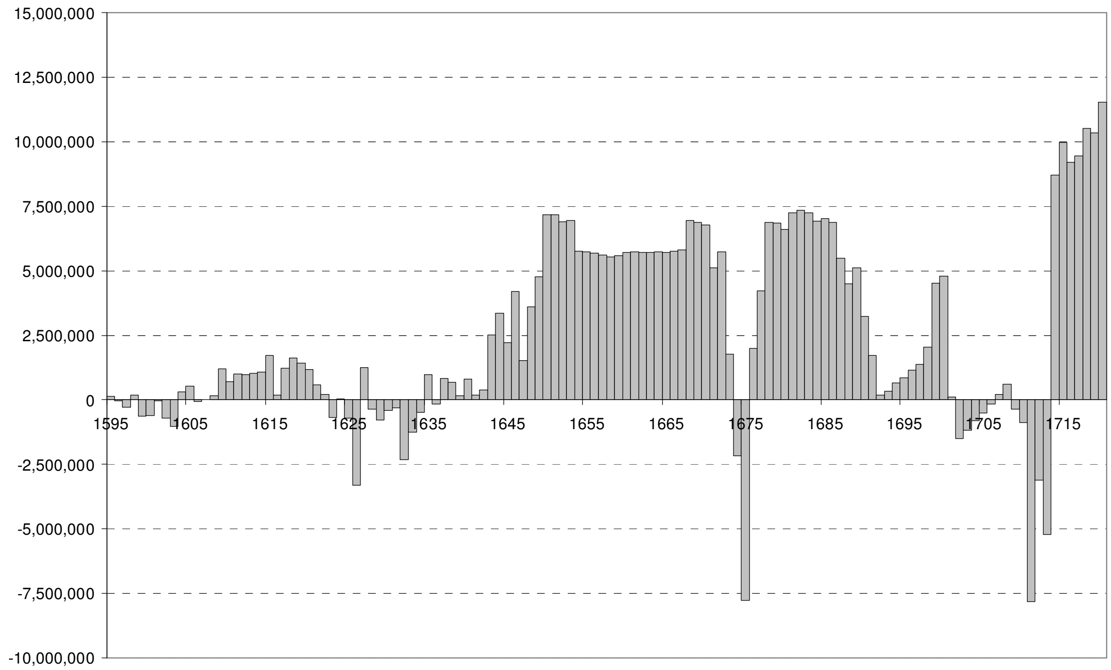
Source: Appendix A.

Figure 3, The ratio of debt to tax revenues in Holland, 1600-1720



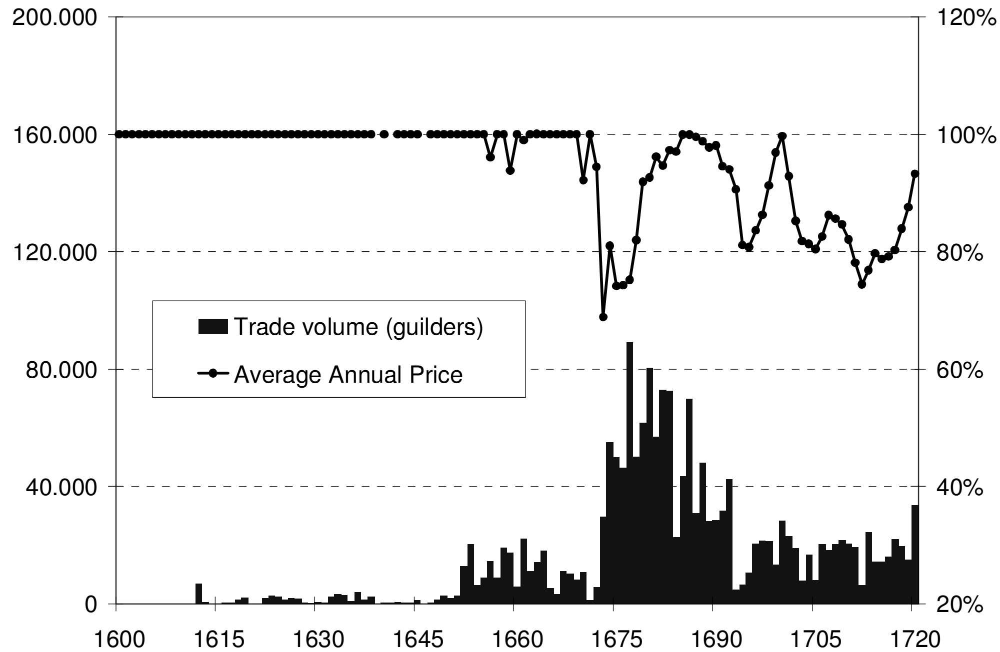
Sources: Appendix A; Liesker and Fritschy, *Gewestelijke financiën*.

Figure 4. Estimated annual net transfer of wealth from the province of Holland to its creditors, 1600-1720.



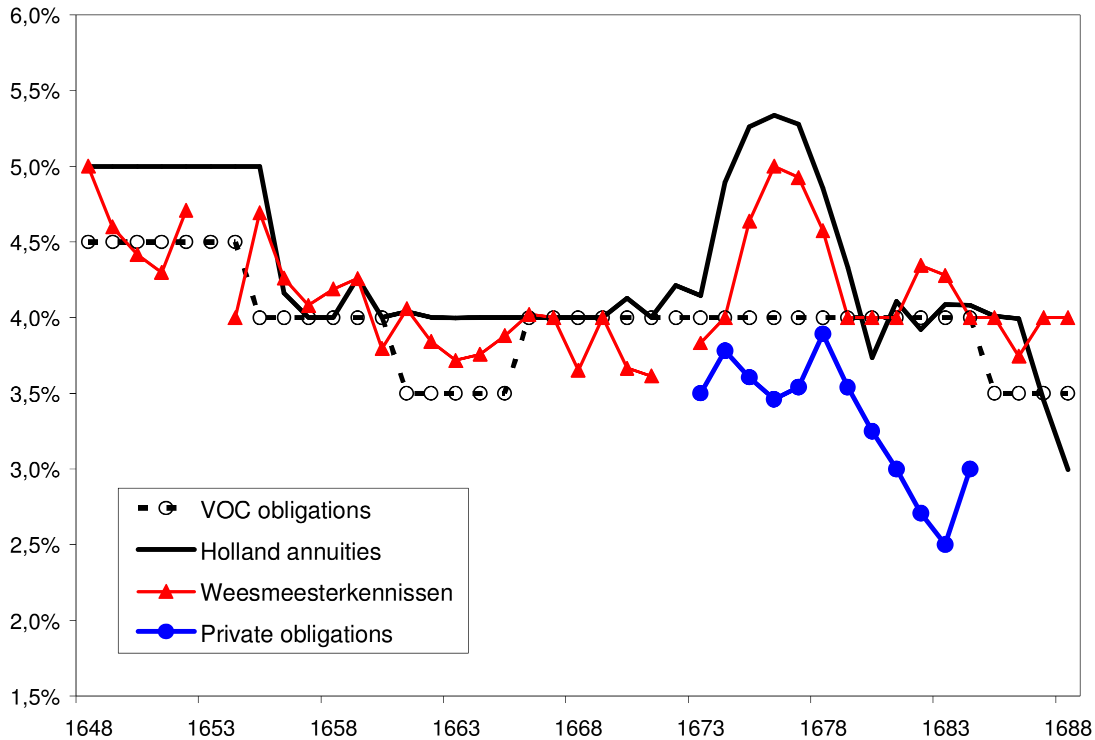
Sources: Appendix A; Liesker and Fritschy, *Gewestelijke financiën*.

Figure 5. Transfers and prices of Holland's losrenten *recorded by Gouda's town secretaries, 1600-1720*



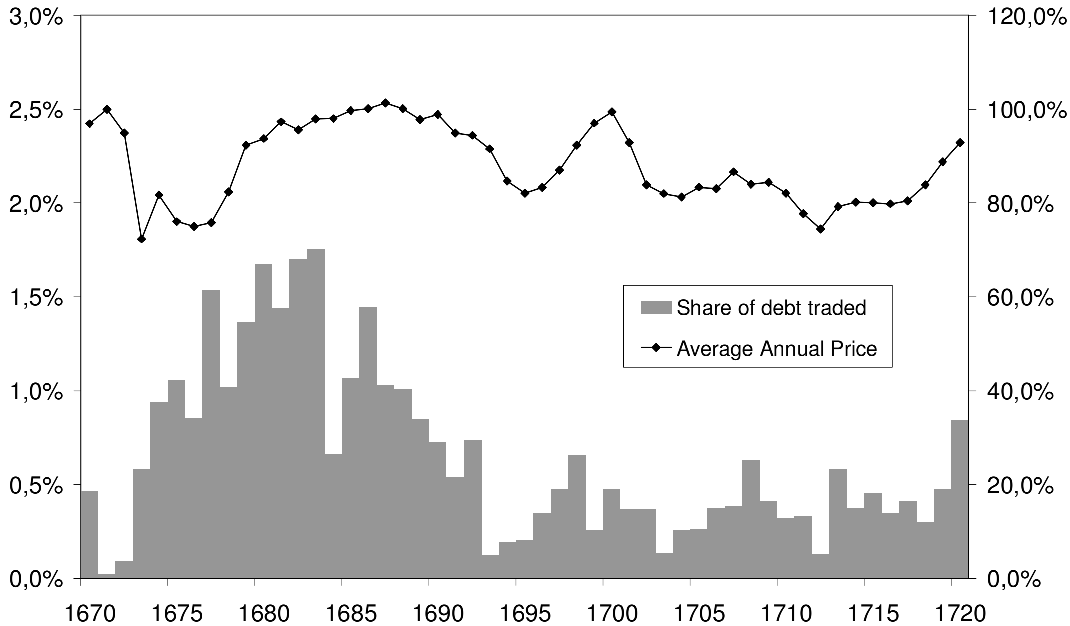
Source: Gouda Archives, Oud-Rechterlijk Archief, Inv. Nrs. 482-493.

Figure 6. Private and public interest rates in Amsterdam, 1648-1688



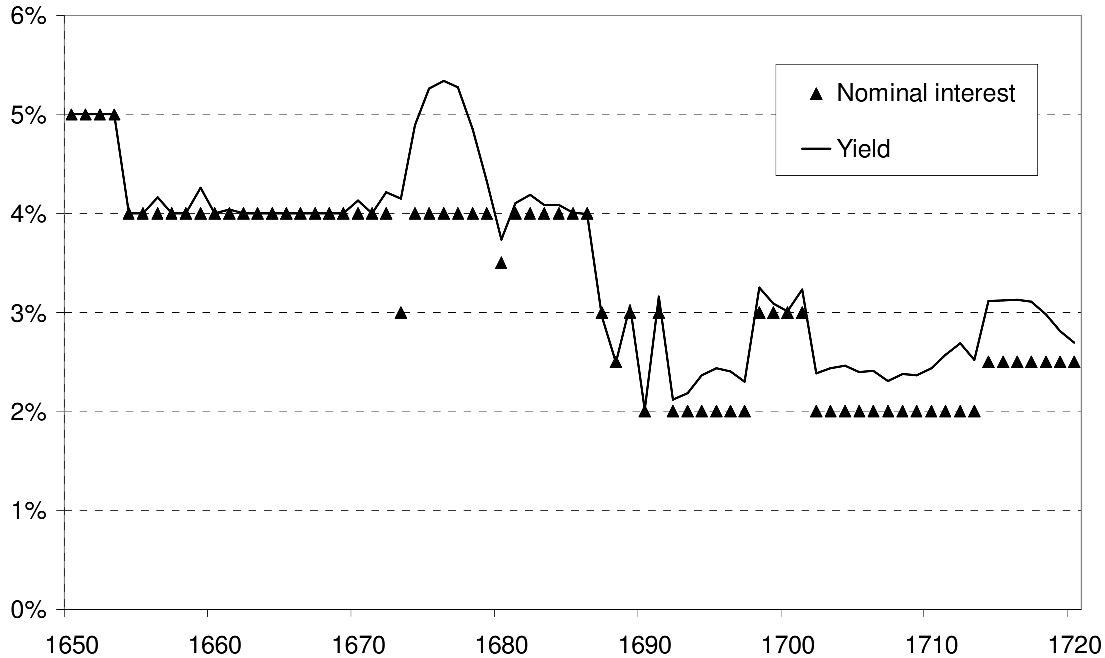
Sources: Van Dam, *Beschryvinge*; ACA 5060, Inv. Nrs. 50, 51, 162; ACA 235, Inv. Nr. 288, 291-295; Archives, Oud-Rechterlijk Archief, Inv. Nrs. 482-493

Figure 7. The annual average price of Holland's losrenten in Gouda and Leyden and the value of losrenten sold as a percentage of the total debt outstanding in the two towns.



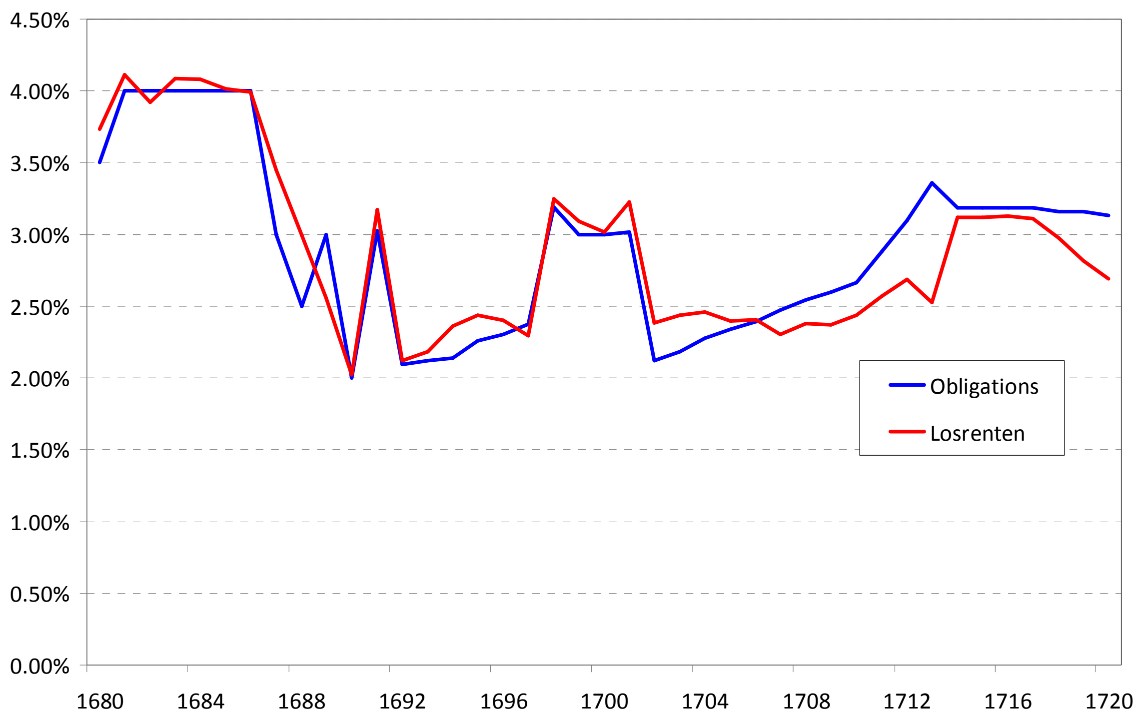
Sources: Gouda City Archives, Oud-Rechterlijk Archief, Inv. Nrs. 482-493; Leyden City Archives ORA 71-73.

Figure 8. The nominal interest rate and the yield on Holland's losrenten, 1650-1720



Sources: Liesker and Fritschy, *Gewestelijke financiën*, 368-371; Tax incidence 1687-1698 based on NA 3.01.29, Inv. Nr. 802, "Memorie van de Extraordinaris Consenten in Holland"; Gouda City Archives, Oud-Rechterlijk Archief, Inv. Nrs. 482-493; Leyden City Archives ORA 71-73.

Figure 9. Annual yield on losrenten and average annual interest payment on bonds, 1680-1720



Source: Appendix A; Liesker and Fritschy, *Gewestelijke financiën*; Gouda City Archives, Oud-Rechterlijk Archief, Inv. Nrs. 482-493; Leyden City Archives ORA 71-73.