
*Public Finance and Economic
Growth: The Case of Holland in the
Seventeenth Century*

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The debate over the institutions that link economic growth to public finance tends to disregard the need for savings to finance growing public debt. In seventeenth-century Holland the structure, size, and issuing rates of the debt were determined by investors' preferences, wealth accumulation, and changing private investment opportunities. The growth of savings enabled the creation of a huge debt largely with short-term bills. Issuing rates dropped because savings outstripped private investment alternatives. In Holland, and probably elsewhere as well, credible commitment and efficient fiscal institutions were necessary, but not sufficient to create liquid secondary markets and low costs of capital.

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.¹ Following Dickson, Douglass C. North and Barry R. Weingast wrote a celebrated article highlighting the institutional

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¹ Dickson, *Financial Revolution*.

aspect of this switch, the constitutional reforms following the Glorious Revolution (1688/89) which raised property rights protection. They argued that the reforms enabled a decline in interest rates which stimulated British economic growth and subsequent ascendancy.² Their article inspired a vigorous debate on the causal nexus between political regime change and economic performance, but, curiously enough for a finance debate, nobody appears to have wondered where the money for rising investments in public and private securities came from.³ To our mind, investors will lend freely to the state only if the latter is credibly committed to its obligations *and* if the investors have money to spare for the purpose. The hallmark financial revolutions, from Italy via the Dutch Republic to Britain, the United States, and Japan, happened in expanding economies because here the tax base and the supply of loanable funds grew hand in hand.⁴ In order to tap into these resources, governments had to signal their commitment to secure property rights, but investors always weighed the benefits of lending money to the state against likely returns from other opportunities.

To explore the relationship between economic growth and public debt management in early modern Europe, we analyze public finance in Holland, the biggest and richest province of the Dutch Republic during its long seventeenth century (1579–1713). By the latter date, Holland had built up a huge debt at issuing rates among the lowest in Europe. Curiously enough, this debt was composed of many different loans rarely secured on specific revenue flows. We argue that this peculiar debt structure resulted from investors' preferences, themselves driven by voluminous savings and declining private investment opportunities. Those preferences were articulated in two connected bargaining processes driving the evolution of Holland's public debt. The first negotiation involved the political question of whether or not to wage war; it played out in the Estates of Holland among the 18 cities represented there. Over time, the cities moved from supporting offensive warfare to retreat from interstate competition. The financial requirements resulting from the Estates' military agenda drove the second bargaining process about funding military expenses by raising tax and/or by issuing loans. We show that this was a dynamic process, its outcome initially

² North and Weingast, "Constitutions."

³ See Sylla, "Financial Systems." Reservations about the English evidence in O'Brien, "Fiscal Exceptionalism"; Braddick, *Nerves*; Brewer, *Sinews*, pp. 88–134; Clark, "Political Foundations"; Quinn, "Glorious Revolution's Effect"; Sussman and Yafeh, "Institutional Reforms"; Stasavage, *Public Debt* and "Partisan Politics"; Carlos, Neal, and Wandschneider, "Origins"; and Murphy, *Origins*. For cross-country comparisons in preindustrial Europe: Epstein, *Freedom and Growth*; Neal, "How It All Began"; Stasavage, "Cities"; and Dincecco, "Political Regimes."

⁴ Sylla, "Financial Systems."

determined by the country's economic growth boosting both fiscal resources and the scope for public borrowing. When economic growth slowed after 1650, Holland's issuing policy changed because investments in the public debt were now more attractive than private projects.

Others before us have suggested that Holland's widening tax base and growing savings determined the size and issuing rates of the provincial debt.⁵ However, with our new estimates of the size and composition of loans between 1590 and 1720, we document more precisely the interaction between the government and its creditors over the terms of debt issues. Exploring differences between public and private interest rates, we gauge investors' preferences and document the late emergence of a secondary market for government bills. Finally, we use surviving accounts of negotiations within the Estates of Holland to show how these investors' preferences influenced the Estates' decisions about the funding of warfare in general, and their choice for certain kinds of loans in particular.

We start by outlining the main features of Holland's public debt system in the sixteenth century. We then relate how the revolt against Spain interrupted the reforms pioneered during the Habsburg period. Once the Spanish threat had receded, Holland gradually restored its credit. Even so the province still had to rely on a mix of wealth levies and forced loans, supplemented by increasing amounts of short-term bills, because the abundance of lucrative business openings after 1590 raised the opportunity cost of funding the state. During the Dutch economy's slowdown in the second half of the seventeenth century, issuing rates of public debt dropped to record low levels, not because of better property rights, but because the available savings dwarfed demand for capital from private opportunities and from the state.

THE ORIGINS OF THE PUBLIC FINANCE FRAMEWORK

The secret of Holland's seventeenth-century fiscal system lay in its mediated structure. Urban public finance facilities dating back to the Middle Ages were made to serve provincial needs through careful grafting which, because the cities held power in the Estates, helped to inspire confidence that financial demands remained reasonable, the money well spent, and payments met promptly.⁶ The literature interprets this arrangement as a static equilibrium resulting from taxpayers doubling as debt holders and political decision makers,

⁵ De Vries and Van der Woude, *First Modern*, pp. 116–17; Fritschy, “Financial Revolution”; Hoffman and Norberg, “Introduction”; and Veenendaal, “Fiscal Crises.”

⁶ Cf. Zuijderduijn, “Medieval,” and Idem, “Emergence,” on fifteenth-century conditions.

and motivated by considerations of citizenship.⁷ However, we emphasize that the arrangement was really dynamic, a continuous bargaining process between local and central levels, between taxpayers, investors, and political representatives, and between urban and provincial officials, over fiscal policy.

The grafting started in 1482, when the six biggest cities jointly floated a loan on their account, but on behalf of the province.⁸ The provincial loans issued during the 1540s were also controlled by the local tax receivers, members of the central administration but part of the local elite.⁹ They doubled as debt managers, selling annuities and paying interest and redemptions from their tax receipts. At this stage, voluntary buyers were found only in Amsterdam; elsewhere office holders or wealthy citizens were forced to buy in proportion to their census contribution.¹⁰

For the loans issued during the 1550s, Holland could do without forced purchases.¹¹ The issues consisted of a mix of life annuities, more expensive but self-extinguishing, and *losrenten*, annuities redeemable at the debtor's wish. Redeemable annuities appear to have served a specific segment, investors seeking a secure store of wealth for long-term holding; transfers were rare.¹² To supplement the annuities loans the Estates occasionally raised money by selling *obligaties* or promissory notes issued on the credit of a corporation or one of its officials pledging particular revenues to redeem a specified debt.¹³ Being basically unfunded, they carried a higher interest rate than annuities.

During the 1560s Philip II tried to centralize and increase taxation. The effort, combined with rising religious tensions and an economic slump, sparked the Dutch Revolt. The military emergency pushed Holland into a serious fiscal crisis.¹⁴ Interest payments were suspended from 1572 and forced the Estates to borrow from army commanders and suppliers at very high interest rates. Confiscated *émigré* and

⁷ t Hart, *Making* and "Mutual"; and Prak and Van Zanden, "Towards" and "Tax."

⁸ Tracy, *Financial*, pp. 57–60.

⁹ *Ibid.*, pp. 86–91.

¹⁰ Tracy, *Financial*, pp. 87–91, 110–24, 131–32; Van Dillen, *Kohier 1585*; and Fritschy, "Financial," pp. 75–76.

¹¹ Tracy, *Financial*, pp. 96–97, 132–38.

¹² The Gouda Verleyboeken, starting in 1548, list two transfers of Holland's *losrenten* in the 1550s: Gouda Archives, Inv. 393, fol. 24r en 380v. For incidental transfers recorded in provincial ledgers, see Tracy, *Financial Revolution*, 90n.

¹³ In 1569 the Estates considered a conversion of bills into annuities: Dormans, *Tekort*, p. 18; Houtzager, *Hollands*, p. 118; and Tracy, *Financial*, 17n, p. 206.

¹⁴ Cf. Hoffman and Norberg, "Introduction"; and Veenendaal, "Fiscal Crises"; cf. however Dormans, *Tekort*, pp. 147–48, for the Union's suspension of payments in 1715.

church property compensated the most demanding creditors.¹⁵ The emergency also shifted the balance between cities and province. To ease the pressure, the Estates seized control over local excises from the cities in 1574. 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, a tax revolution which necessarily complemented the earlier shift upwards of borrowing power.¹⁶ The rebel provinces which signed the Union of Utrecht (1579) accepted to introduce a similar system.

However, the new fiscal regime's full potential remained as yet unrealized because mobilizing private savings proved difficult. A forced loan was contemplated in 1581 but not carried through. In 1585 Holland's towns and villages had to borrow on their own credit to anticipate the revenues of a wealth tax.¹⁷ A loan from the English Crown helped to make ends meet.¹⁸ The province also continued to rely on expensive stopgaps such as short-term loans at punitive rates from merchants and army suppliers.¹⁹ Loans raised by the cities supplied the rest. During the years 1584–1604 Amsterdam borrowed about 1 million guilders for the province, and Delft probably did likewise.²⁰

LEARNING TO MANAGE THE MARKET, 1588–1621

During 1588 Holland's prospects changed dramatically. The Great Armada was defeated and the Spanish army's advance stalled, enabling the republic to secure its frontiers during the subsequent decade. After the immediate danger had subsided, Holland reorganized its public finance. Rising tax receipts gradually restored Holland's credit, enabling the Estates to cut issuing rates from 12 percent in 1590 to 8.3 percent in 1597. Though still above its own previous low, and high compared to some states, this was the same rate Holland had paid during the late 1550s and on a par with Geneva, so it probably reflects the market price for small, fledgling Protestant regimes.²¹ The Estates

¹⁵ Tracy, "Emigré."

¹⁶ Fritschy, "Financial Revolution'."

¹⁷ NA 3.01.29, Inv. No.797; *Memorie* 1755, fol. 18r; Fritschy published the memo at <http://www.inghist.nl/Onderzoek/Projecten/GewestelijkeFinancien/memorie>. See Van Dillen, *Kohier 1585*; and Fritschy, "Financial Revolution'," pp. 75–76.

¹⁸ 't Hart, *Making*; and Fritschy, "Financial Revolution'."

¹⁹ Fritschy, "Financial Revolution'," pp. 74–76; and Liesker and Fritschy, *Gewestelijke*, pp. 160–61, 362–65.

²⁰ 't Hart and Van den Burg, "Renteniers," p. 205.

²¹ Epstein, *Freedom*, p. 21.

also converted bills issued during the 1580s into annuities issued in the name of the *gemeene land*, i.e., the province.²²

By 1594 Holland resumed sales of annuities through its 18 local tax receivers.²³ These officials had considerable leeway.²⁴ Provincial officers preferred to issue redeemable annuities or life annuities, but they allowed receivers to sell *obligaties* or bills if needed. This article was formally short-term, up to twelve months, akin to treasury bills in Anglo-Saxon parlance but, being habitually rolled over, tended to become long-term, as will become clear below. During 1594–1598 the receivers raised 850,000 guilders in annuities plus nearly 640,000 guilders in bills, but booming private business then raised the stakes, so Holland switched to forced loans supplemented by bills.²⁵ 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 bills.²⁶ Between 1604 and 1609 Holland primarily sold life and redeemable annuities, with bills occasionally mixed in. When the 1609 Truce with Spain took effect, Holland's debt had reached 14.4 million guilders, of which 5.2 million guilders in bills.²⁷

The public credit recovery was highlighted by declining interest rates. The issuing rate for redeemable annuities dropped from 8.3 percent in 1597 to 7 in 1605 and to 6.25 in 1608, only slightly trailing the rates paid by Amsterdam merchants and the Dutch East India Company (VOC) for short-term loans (Figure 1).²⁸ The Estates succeeded cutting interest costs further several times with a withholding tax on redeemable annuities of 0.5 percent in 1596, and 1 percent in 1601, 1604, and 1607.²⁹ With maximum rates of 9 percent, bills paid slightly more than annuities (Figure 1), a consequence of the bills being sold on the receivers' personal credit.³⁰ The rating difference gradually disappeared, however. From 1597 buyers could ask the Estates to guarantee the bills; in 1605 the Estates reduced the receivers' commission for selling bills from 1 to 0.5

²² Tracy, *Founding*, p. 263.

²³ Liesker and Fritschy, *Gewestelijke*, pp. 33–34.

²⁴ 't Hart, "Mutual," pp. 116–19; on Britain, see Brewer, *Sinews*, pp. 91–95, 127–29.

²⁵ Gelderblom and Jonker, "Completing."

²⁶ Liesker and Fritschy, *Gewestelijke*, p. 160; see the Appendix.

²⁷ Dormans, *Tekort*, p. 45; and Liesker and Fritschy, *Gewestelijke*, p. 180.

²⁸ Gelderblom and Jonker, "Completing."

²⁹ Houtzager, *Hollands*, pp. 124–29; and Liesker and Fritschy, *Gewestelijke*, pp. 363–64.

³⁰ In 1597 the Estates instructed Gouda's receiver to sell obligations for 8,000 guilders at 9 percent, and Amsterdam's receiver to sell 15,000 guilders at 8 percent, which he could raise to 9 if no money could not be obtained otherwise: NA RSH, 19 May 1597; similar instructions on 23 March 1599 and 28 July, 11 August, and 1 December 1603.

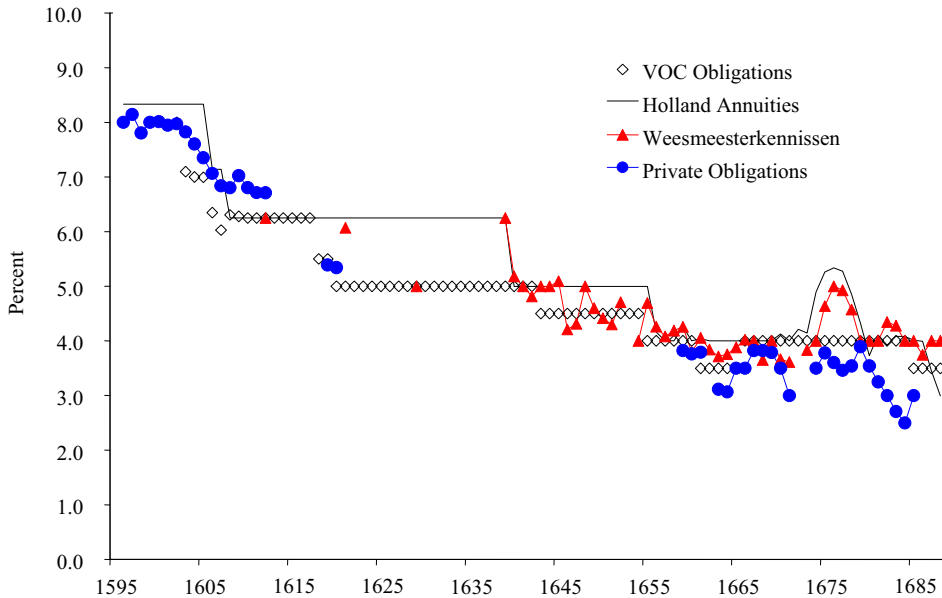


FIGURE 1
INTEREST PAID ON VOC BONDS, PRIVATE BONDS IN AMSTERDAM, AND
HOLLAND'S REDEEMABLE ANNUITIES, 1595–1688

Sources: Private bonds: Gelderblom and Jonker, “Completing,” appendix, ACA 5060, Inv. Nrs. 50, 51, 162; ACA 235, Inv. Nr. 288, 291–295; ACA Oud-Rechterlijk Archief, Inv. Nrs. 482–493; VOC Bonds 1602–1608: NA 1.04.02 Inv. Nr. 7142, 1608–1688: Van Dam, *Beschryvinge*; and Holland’s redeemable annuities: Liesker and Fritschy, *Gewestelijke*.

percent, and from 1607 redeemable annuities and bills had identical issuing rates.³¹ From 1608 these stood at 6.25 percent, a rate last obtained in 1556, putting Holland in the European middle band, above Genoa, Venice, Castile, and France, but below Naples, Rome, Bologna, and fellow Protestant Britain and Geneva.³²

Economic growth boosted the recovery of Holland’s credit. Between 1590 and 1609 fiscal revenues doubled.³³ Moreover, the expanding economy boosted the supply of savings; the average annual increase of the wealth of Amsterdam merchants, for instance, may have been as high as 12.5 percent in this period.³⁴ Potential public debt buyers had plenty of alternative investment opportunities, however. Both the booming European trade and the first intercontinental expeditions yielded

³¹ NA RSH, 19 December 1597, fol. 664 (guarantee); ’t Hart, “Mutual,” p. 118; and Fritschy, “Financial Revolution,” p. 64.

³² Houtzager, *Hollands*, pp. 132–33; and Epstein, *Freedom*, pp. 20–23.

³³ Liesker and Fritschy, *Gewestelijke*, p. 160; and Fritschy, “Financial Revolution,” pp. 83–84.

³⁴ Gelderblom, *Zuid-Nederlandse*, pp. 144, 163.

much higher returns.³⁵ Hence to accept the large loans of 1599–1603, investors needed prodding by forced issues for about half of the total. As before, such loans were based on a census of the entire population. Commissioners assessed every household in detail, after which those possessing 2,000 guilders or more had to accept a loan for 0.5 percent of their wealth in redeemable or life annuities.³⁶ To sweeten the pill, the loans were exempt from the withholding tax, but the receivers still needed the threat of suspending interest payments on existing loans for investors to swallow their allotted portion.³⁷

Both provincial and local authorities had resorted to such census-based levies before, first during the 1540s and again during the 1570s and 1580s emergency.³⁸ 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 to subdue investors holding out for better conditions, offering them 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. The ledgers harnessed the market so well that officials hailed them as the foundation of Holland's finances.³⁹ However, as static appraisals of real assets, the ledgers were quickly obsolete, expensive to update, and unable to capture the fast growing liquid wealth from commerce.

To tap this commercial wealth, Holland raised substantial amounts in bills between 1588 and 1609. With a maturity of up to 12 months, bills offered investors the advantages of a slightly higher interest rate plus greater control over their money than annuities. Redemption of annuities was at the authorities' discretion. Transfer of ownership passed through an official register, for which a fee plus a 3.3 percent duty for transferring annuities was charged.⁴⁰ With bills, the boot was on the other foot. Billholders could demand repayment at the end of term and effect transfers without formalities or extra cost, because bills were, in effect bearer paper, transferable by endorsement, really liquid

³⁵ Gaastra, *Geschiedenis*, p. 22; and Gelderblom and Jonker, "Completing."

³⁶ *Memorie* 1755, fol. 20r–20v. 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*.

³⁷ RSH 30 May 1602, quoted in Houtzager, *Hollands*, p. 125. References to loans in "vrij geld," i.e., not subject to tax, suggest that the annuities forcedly sold in 1599, 1600, 1602, and 1603 were exempt of withholding tax: Houtzager, *Hollands*, pp. 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).

³⁸ Tracy, *Founding*, pp. 250–53.

³⁹ *Memorie* 1755, fol. 20v; and cf. Liesker and Fritschy, *Gewestelijke*, pp. 160–61, 362–65.

⁴⁰ Liesker and Fritschy, *Gewestelijke*, pp. 380–81.

equivalents of time deposits.⁴¹ As such they were ideally suited to merchants with their constantly shifting liquidity needs, so the receivers in Amsterdam, Rotterdam, or Delft found it easier to sell bills than annuities. For their part, the Estates constantly urged receivers to sell bills only if no takers could be found for annuities, probably because they realized that its creditors could cause a public finance crisis at any moment by demanding their money back.⁴² Presumably, the receivers countered that danger by staggering interest payments to match the flow of revenues coming in.

The loans raised between 1588 and 1609 were puny by later standards but the forces shaping issuing policy were the same. The Estates tailored amounts to be raised, the instruments, and their price to perceived market conditions. By letting the receivers 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 local markets allowed. Moreover, by setting maximum loan issuing rates, the Estates gave officials an incentive for bargaining with investors.⁴³ The 1609 Truce with Spain altered the stakes of both parties. Funding pressure eased and debt issues remained comparatively small, creating room for the province to convert all bills and redeemable annuities into 6.25 percent redeemable annuities. The conversion proceeded slowly because investors bridled at the interest rate cut.⁴⁴ It nevertheless succeeded because investors disliked the alternative, repayment, and because the Estates exempted the new annuities from transfer tax, a typical mix of threats and incentives made possible by the temporary financial breather.⁴⁵ In similar circumstances, the attempted conversion of the Estates General's debt failed for a lack of money.

⁴¹ From at least 1650 bills were made out to a named person "or bearer": Hecht, *Beitrag*, pp. 118–20; Tracy, *Financial*, p. 206; and Dormans, *Tekort*, p. 143. See ACA 367 A/154 for an example. VOC bonds were to bearer as early as 1621: Pamphlet Knuttel No. 3348. Texts of Holland's bills in Noordhollands Archief Haarlem, No. 3, Inv. No. 897 (1672), NA 3.01.29, Inv. No. 257, fol 1184 (1732), and Inv. No. 935, fol. 1193 (1752).

⁴² Dormans, *Tekort*, pp. 24, 58–60.

⁴³ See RSH 27 January 1593, 2 December 1603.

⁴⁴ RSH 26 September 1609, 23 February 1611, and 5 May 1611 in Houtzager, *Hollands*, pp. 132–33.

⁴⁵ NA 3.01.29, Inv. No. 852, a 1618 memo about the Noorderkwartier conversion; Bovers, "Government-Market Interaction," p. 39. According to Fritschy, "'Financial Revolution,'" pp. 77–78; and Dormans, *Tekort*, pp. 46–47, the conversion failed, but they take the amounts reported in the 1618 memo as provincial instead of just the Noorderkwartier figures. See the Appendix.

THE FREE MARKET'S STRETCH, 1621–1648

What policy choice the Estates of Holland may have had in the 1610s disappeared during the much shorter but massively more expensive second phase of the Eighty Years' War. Between 1621 and the Peace of Westphalia in 1648, Holland's debt rose more than fivefold to 125.5 million guilders, not counting a floating debt of 7.2 million.⁴⁶ Letting the debt rise so quickly required a firm confidence in the country's fiscal resilience, which the economic boom clearly inspired. As before, the Estates preferred issuing annuities, but tweaked 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 bills rather than annuities. By 1648 bills amounted to 73 million guilders, or 60 percent of Holland's debt (Figure 2).

Presumably, there were three reasons for using wealth levies rather than forced loans. First, despite new taxes military expenditure outpaced revenues, so any measure slowing the growth of interest charges was welcome.⁴⁷ Second, forced loans enabled taxpayers who needed liquidity to sell their paper, but rising wealth had lessened their need to do so. Third, the Estates feared pushing issuing rates upward by floating too much debt. The alternatives were first debated in 1622, when a proposed forced loan was dropped in favor of a wealth levy.⁴⁸ The following year Delft objected to a free loan because local investors would demand higher interest rates, suggesting wealth taxes or forced loans instead.⁴⁹ The yield from wealth levies began to drop, however, because the 1602 ledgers were too old, shifting the burden away from merchants with their liquid wealth to property owners in less dynamic sectors.⁵⁰ The ensuing debate shows the Estates unable to find the lesser evil among the growing interest burden, wealth levies, and forced loans.⁵¹ When in 1625 the Estates finally did issue a forced loan of 0.5 percent on wealth assessed, they drafted a careful compromise between conflicting interests. The annuities issued in return carried 3 percent interest during the first six years, rising to the going rate of 6.25 percent after that; they were also free from the 3.3 percent transfer duty during the first three years. To

⁴⁶ Dormans, *Tekort*, pp. 47–48; and cf. SH I, No. 2789 (1623), SH III No. 3106, SH IV, No. 649 (1625, 1627, 1628), and SH V, No. 428 (1630).

⁴⁷ SH I, No. 2656; SH II, No. 722; SH III, No. 758; and SH IV, Nos. 17, 646, and 993.

⁴⁸ SH I, Nos. 2571, 2880.

⁴⁹ SH II, No. 456.

⁵⁰ SH II, No. 1906.

⁵¹ SH I, Nos. 2571, 2656, 2880.

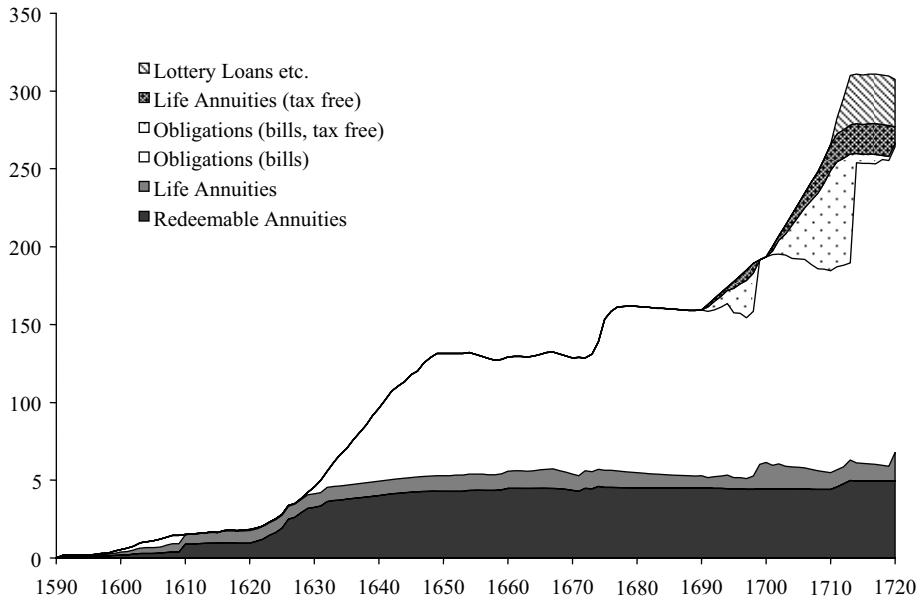


FIGURE 2
THE ESTIMATED SIZE AND COMPOSITION OF HOLLAND'S DEBT, 1590–1720
(million guilders)

Source: See the Appendix.

ensure a fair balance between wealth owners, the Estates also had the 1602 ledgers updated, so the loan was clearly intended as a one-off.⁵² So 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 made more attractive by letting the taxpayers have annuities for their contribution if they paid before a set date.⁵³ By 1635 the tax yield had started to decline again, but now the Estates ensured a light touch for mercantile wealth by not updating the 1625 ledgers.⁵⁴ Taxing wealth remained a last resort, occurring on average once every three years until 1650.⁵⁵

⁵² SH II, Nos. 1903, 1906, 1921.

⁵³ SH III, Nos. 3196, 3243, 3655, 3757, IV Nos. 316, 1050, 1179, 1271, 1691, V, No. 536, VI Nos. 17, 76, 494, 6696, 1303, 1362, VII Nos. D99, D130, E14, F84, G128. In 1626 Leiden taxpayers complained about not getting annuities: SH V, No. 1002.

⁵⁴ SH VII, No. G232.

⁵⁵ The frequency of wealth levies dropped from almost annual during the 1620s to intermittent during the 1630s and 1640s. The assessment declined from 2.8 percent during 1621–1631 to 2.5 percent during 1632–1648. See Liesker and Fritschy, *Gewestelijke*, pp. 223, 365–66, and 369; and the 1644 update in *Memorie 1755*, fol. 25v–26r.

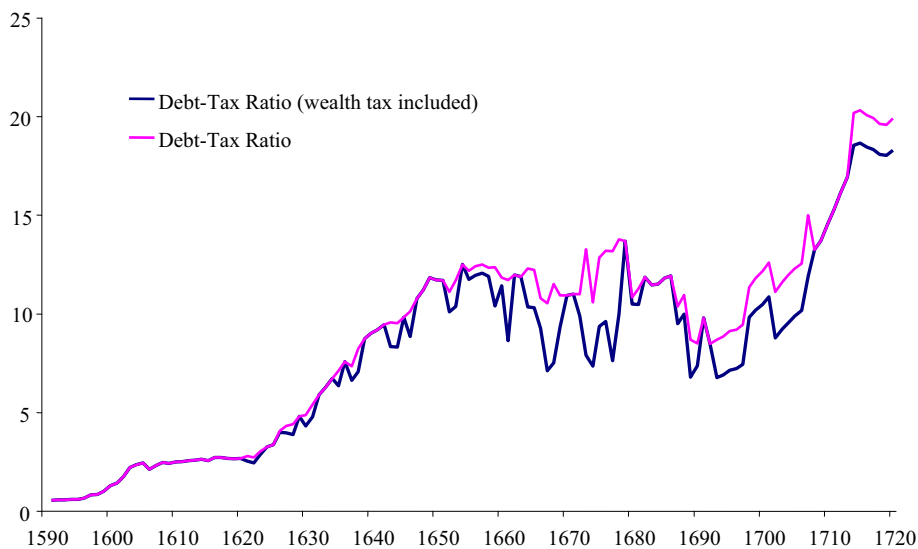


FIGURE 3
THE RATIO OF DEBT TO TAX REVENUES IN HOLLAND, 1600–1720

Sources: See the Appendix; and Liesker and Fritschy, *Gewestelijke*.

By the mid-1630s the Estates could afford the policy change from forced loans to wealth levies and bills because the market absorbed bill issues with remarkable ease. The administrative groundwork for the transition was done in 1628, when the province substituted its own credit for that of the receivers. Henceforth, new bill issues were backed by a certificate of indemnity for the receiver pledging all provincial revenues for servicing the debt.⁵⁶ The administrative tightening up made little difference for bill buyers, since receivers had provided such a guarantee on demand since 1597, but it did signal the Estates' commitment to the new issuing policy. Using bills on such a scale meant building up a perpetual debt with short-term instruments. Before the Truce of 1609 the debt-tax ratio had barely touched three, that is to say, the debt could have been redeemed with three years' revenues. Now the rate shot up to 12 by 1650 (Figure 3), rendering debt retirement unlikely given the frequency of European wars. Consequently, the bills turned from short-term paper into de facto perpetuals. This quasi-consolidation took place gradually and without any change to status or price of the bills, creating a remarkable anomaly in the history of public finance: a rapidly growing

⁵⁶ NA 3.01.05 No. 3287, secret minutes, 14 February 1628; 21 June 1634; 8 November 1640; 2 March 1643; and 13 March 1654. A reimbursement deed from 1750 in NA 3.01.29, No. 866.

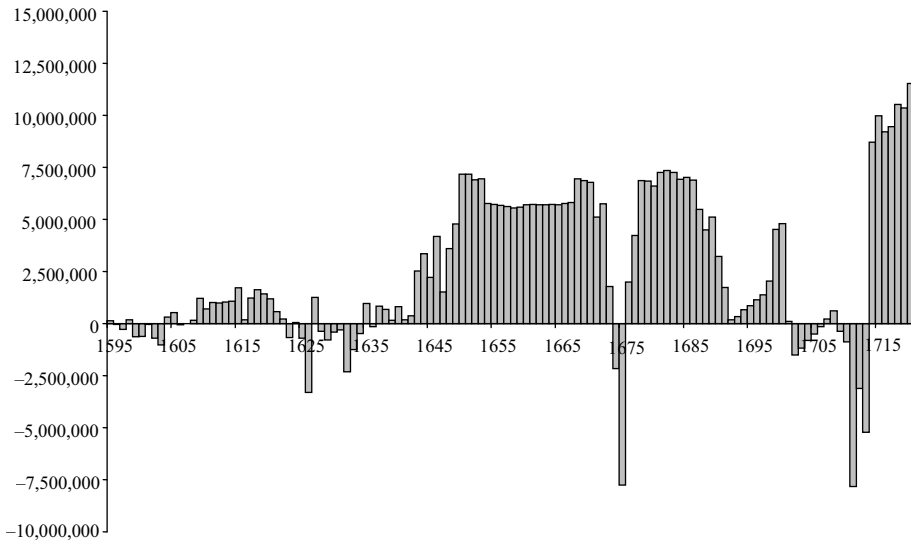


FIGURE 4
ESTIMATED NET ANNUAL TRANSFERS FROM THE PROVINCE OF HOLLAND TO
ITS CREDITORS, 1600–1720
(interest paid out minus new debt issues)

Sources: See the Appendix; and Liesker and Fritschy, *Gewestelijke*.

debt financed largely with short-term instruments at issuing rates that were amongst the lowest in Europe.

How to explain this anomaly? By 1630 Holland combined a strong credit record with a booming economy and savings outpaced the rise in public debt. Historians agree that the period up to the 1650s was the most dynamic phase of the republic's economic growth.⁵⁷ Moreover, the net debt increase between 1621 and 1648 more or less equaled the interest paid out during that period, with net annual transfers from investors to the province seldom exceeding 1 million guilders (Figure 4). The ballooning debt could thus be financed entirely by reinvesting interests paid out.⁵⁸ Investors obliged because the bills were always redeemable at par and at short notice but as their savings accrued, few

⁵⁷ Between 1590 and 1650 tax revenues increased at an average annual rate of 2.3 percent: Fritschy, "Financial Revolution" and Liesker and Fritschy, *Gewestelijke*. Private wealth accumulation documented in De Vries and Van der Woude, *First Modern*, pp. 116–17; Prak, *Dutch Republic*, pp. 122–34; Klein, *Trippen*; Gelderblom, *Zuid-Nederlandse*; Gelderblom and Jonker, "Completing"; and Zandvliet, *De 250 rijksten*. Van Zanden, "Economic Growth," estimates that wealth per capita in Holland rose from 300 guilders in 1600 to 650 guilders 50 years later. See also Soltow and Van Zanden, *Income*.

⁵⁸ Compare De Vries and Van der Woude, *First Modern*, pp. 120–21.

billholders exercised the option. In 1621, 1622, and 1623 redemptions amounted to only 56,000, 84,000, and 148,000 guilders.⁵⁹ By 1635 the roll-over of bills was so common that the provincial receivers lost their small fee for it.⁶⁰ Declining market rates in the 1630s led to plans for a conversion of redeemable annuities and bills from 6.25 percent to 5. When preparing this conversion in 1640, the Estates deemed 800,000 guilders enough to cover expected redemptions on an estimated total debt of 94 million.⁶¹

Investors had little to gain from a formal consolidation and a lot to lose (in particular the liquidity from the option to redeem at the tax receivers' offices), as the fate of redeemable annuities showed. With a transfer tax and related formalities, Holland effectively locked its annuities into a relatively small segment. Data from Gouda demonstrate this phenomenon to good effect (Figure 5). The annuities transfers recorded by the city secretary show little activity until the 1650s. In 16 years between 1613 and 1650 there were no transfers; 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, the few recorded prices were invariably at par. The annuities clearly catered for a specific market segment, i.e., investors holding the paper long enough to cancel the penalty on transfers. This segment absorbed no more than the 50 million guilders reached by the early 1640s, anchoring prices at par until the 1672 emergency forced a fire sale.

If investors could only lose from consolidation, the Estates did not stand to gain. Their debt management depended entirely on continuously rolling over short-term paper at interest rates that could hardly be lower and by now they probably knew that the likelihood of a roll-over crisis was minimal.⁶² Consequently, we must see Holland's anomaly as an equilibrium of interests achieved on one side by rapid economic growth and wealth accumulation and on the other by the soaring expenditures needed to defend that prosperity. The equilibrium depended on the receivers' dual-action safety valve, which gave investors an exit option while buffering roll-over crises.

⁵⁹ Liesker and Fritschy, *Gewestelijke*, pp. 513, 517, and 521.

⁶⁰ SH VI Nos. 1191, 1303, 1358, 1360, 1424, and 1429; VII Nos. B 65, 129, D 177, H 210, 24, and I 403. The VOC abolished its roll-over fee in 1626: Van Dam, *Beschryvinge* I, p. 439.

⁶¹ Tracy, *Financial*, pp. 209–10; and Dormans, *Tekort*, p. 65.

⁶² One such crisis may have occurred in 1631, the Estates discussing complaints about receivers refusing reimbursements. No run on receivers has been recorded, however, and the complaints may have been related to reimbursements of the last forced loan of 1625 (SH V, 1340).

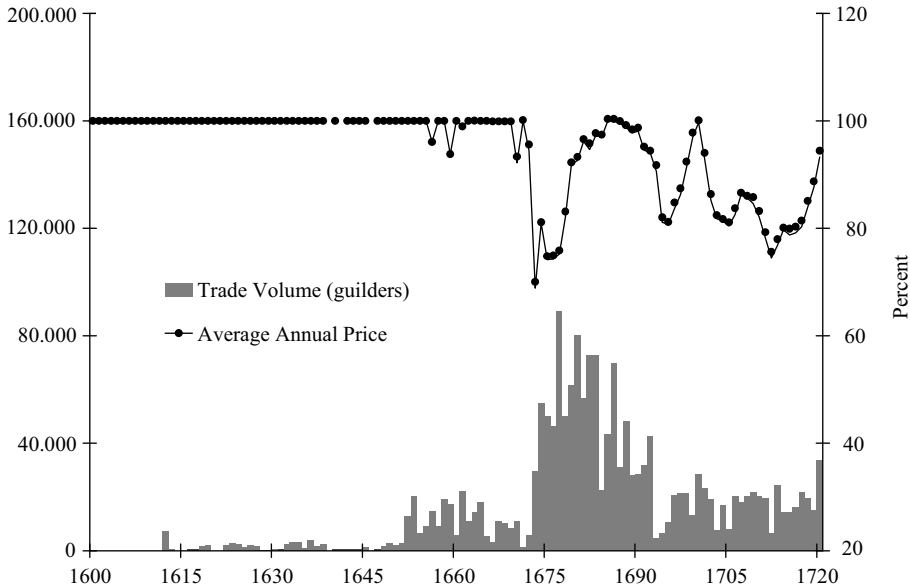


FIGURE 5
TRANSFERS AND PRICES OF HOLLAND'S REDEEMABLE ANNUITIES RECORDED
BY GOUDA'S TOWN SECRETARIES, 1600–1720

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

TRAPPED IN EQUILIBRIUM, 1648–1672

The 1648 peace with Spain did not bring an end to fiscal concerns. Indeed, at 7 million guilders annually, interest payments absorbed 60 percent of revenue.⁶³ Moreover, the debt's short-term character sat uneasy after an incident in 1653. When the first Anglo-Dutch War (1652–1654) appeared to go against the republic, billholders giving notice squeezed several receivers, notably the one in The Hague. The bottlenecks were solved by transferring funds between offices and by having receivers persuade creditors to leave their money untouched.⁶⁴

Though the roll-over crisis did not pose a serious threat and passed quickly, the experience added impetus to formulating three financial policy priorities during the 1650s and 1660s: conversion, redemption, and consolidation. The Estates tackled the first two issues in tandem and started exploring the 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 radical plans.

⁶³ Dormans, *Tekort*, p. 47.

⁶⁴ Houtzager, *Hollands*, p. 159; and NA 3.01.05 No. 3287, secret minutes, 3 October 1653.

The interest on redeemable annuities and bills would be reduced from 5 to 4 percent for at least one year, with the savings going into a redemption fund. This proposal caused such uproar that the subject had to be shelved. The ongoing war with Britain prevented debt reduction anyway, but to avoid a further increase the Estates raised the land tax by 50 percent and reintroduced a 0.5 percent wealth tax, revising the ledgers in 1654 to boost the yield.⁶⁵

The war with England taught some harsh realities: Holland's financial position required further billholders' sacrifices. Wealth levies became a regular tax, raised in all but nine years until 1722. There was room for an interest rate cut, too, because the savings which had earlier absorbed the fast growing debt pushed interest rates down now that debt creation had stopped. Between 1650 and 1653 net annual transfers from Holland to investors amounted to 7 million guilders, subsequently dropping to around 6 million (Figure 4), money which, with the Dutch economic spurt slowing down, could not easily find alternative employment. Consequently private interest rates started to fall: to 4.5 percent by 1655, and less than 4 percent five years later (Figure 1). By 1660 Amsterdam's orphans' trustees (*weesmeesters*) lent at 3.5 to 4 percent, while the city's leading merchants borrowed at 3 to 3.5 percent.⁶⁶ The VOC lowered its bond rates from 4 to 3.5 percent between 1662 and 1665.⁶⁷

Falling interest rates combined with the war lessons to muster the political will for a billholders' sacrifice. In March 1655 bills were said to trade at 105–107 percent of par, the first instance we have of bill prices.⁶⁸ The Estates used these high prices to force through an interest rate reduction to 4 percent in August, earmarking the saved expense for a redemption fund that would extinguish the debt in 40 years.⁶⁹ Foreigners would be repaid first, then holders who had given notice in 1653, followed by investors living outside Holland, and in the last resort inhabitants proper.⁷⁰ The profoundly unpopular redemption would thus hit the delegates and their constituents somewhat later but investors need not have worried. To achieve its goal of repaying the debt in 40 years,

⁶⁵ Houtzager, *Hollands*, pp. 155–57; and Liesker and Fritschy, *Gewestelijke*, pp. 365–66.

⁶⁶ ACA 5060, Inv. Nos. 50, 51.

⁶⁷ Even Holland tried a 3 percent loan in 1664 only to find that, with a war imminent, it could not float below 4 percent: RSH 16 and 24 May 1664, and 6 February 1665; *Memorie* 1755, fol. 28v–29r.

⁶⁸ Houtzager, *Hollands*, pp. 163–64.

⁶⁹ Houtzager, *Hollands*, pp. 76–81; Dormans, *Tekort*, pp. 53, 55, 85, 88, 91, and 105–06; and Liesker and Fritschy, *Gewestelijke*, pp. 365–66.

⁷⁰ Houtzager, *Hollands*, pp. 80–81, 167. See the 1655 instructions from *Gecommitteerde Raden* to their receiver general: NA 3.01.05 No. 3287, secret minutes, 22 June 1655. In September 1662 the Estates repeated their instruction to repay outsiders first: Houtzager, *Hollands*, pp. 172–73.

the province should have redeemed over 3 million guilders annually. The debt, however, declined by just that amount between 1655 and 1670, partly due to the fact that in 1664, with the clouds gathering for the Second Anglo-Dutch War (1665–1667) redemption funds were diverted into war spending.⁷¹

After conversion and redemption, the Estates turned their attention to consolidation. During 1657 and 1658 they repeatedly discussed the wholesale repackaging of bills into annuities.⁷² No decision was taken, presumably because delegates realized that, with nothing to attract investors and little to gain for the government, consolidation made no sense. Nor was it viable. In Gouda, the number of annuities transferred rose markedly during the 1650s and 1660s, reaching double figures for amounts totaling 6,000 to 20,000 guilders annually (Figure 5). After 1655 prices dipped under par on a few occasions: 98 percent, 96 percent, 93 even, rendering a conversion at par impossible. As a second best, the Estates reintroduced its old policy of selling annuities rather than bills, with marginal success.⁷³

Thus Holland, though at the peak of its power, was trapped in a public finance system of its own making. By the 1650s the Estates depended on the market to realize its policies; consequently, the interest rate conversion succeeded, the redemption made as much headway as the international situation allowed, and the consolidation failed. Though the Estates managed to reduce debt, public finance had reached clear limits. Larger conflicts than those with Britain would require higher contributions from wealth owners. In effect, the high-level equilibrium between Holland and its creditors was really a trap for both, the sheer size of the debt tying both parties to each other hand and foot.⁷⁴ Moreover, the Estates did not embrace the emerging secondary market as a means to lower interest costs, but actively disliked it, as their strenuous consolidation efforts show. For their part, the billholders were trapped, too, in their own savings. Interest payments boosted 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.⁷⁵

⁷¹ Ibid., p. 83.

⁷² Ibid., pp. 169–70.

⁷³ Ibid., pp. 82–85; and Dormans, *Tekort*, pp. 60–62. Bills to be excluded from new issues resolved by the Estates on 19 September 1659, 3 October 1659, 29 May 1660, and 11 December 1660: Houtzager, *Hollands*, pp. 170–72. Cf. similar resolutions on 5 February 1665 and 13 March 1665: Ibid., p. 175.

⁷⁴ Cf. Elvin, "High-Level Equilibrium," for a different use of the term high-level equilibrium.

⁷⁵ 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, and 26 November 1666; and *Britain*: 24 May 1660.

COMING TO TERMS WITH THE MARKET, 1672–1678

The three-pronged attack by Britain, France, and two German princes in 1672 created entirely new financial parameters. Holland had begun preparing for an imminent conflict with France as early as 1670, raising troops, taxes, and loans.⁷⁶ In October 1671 the Estates introduced a small roll-over charge on bills.⁷⁷ Over the next four months, they boosted reserves with 9 million guilders worth of loans.⁷⁸ By early April the *Gecommitteerde Raden* warned against further borrowing for fear of ruining credit, so the Estates chose to levy a 1 percent wealth tax instead.⁷⁹ Then war broke out in earnest. Needing funds instantly, Holland resorted to forced loans. Revenues were disappointing and the Estates widened the assessment terms.⁸⁰ Between 1672 and 1675 Holland raised 10 million guilders in free loans plus nearly 25 million guilders in forced loans, 7 percent of the estimated wealth in real estate and public securities.⁸¹ Getting hold of any money at all proved difficult because the invasion triggered a scramble for cash.⁸² After some deliberation, the Estates allowed receivers to accept bullion and gold and silver objects in payment, hoping to avoid investors pressing for cash through redemption.⁸³ This happened anyway; by June the receivers were in trouble from billholders giving notice. On 2 June provincial officials intervened and raised the terms for giving notice.⁸⁴ This failed to stop the run, so on June 13 the Estates declared a moratorium on redemptions, though not on interest payments.⁸⁵ Even so all receivers fell in arrears.⁸⁶ In 1675 interest payments on the forced loans of 1672 were still overdue, the Estates were also concerned about servicing the 1674 forced loans. As a result, they briefly entertained the notion of cancelling the 1672 arrears

⁷⁶ *Memorie* 1755, 30r–30v.

⁷⁷ *Memorie* 1755, 30v.

⁷⁸ NSV 4–5 (7 January 1672), 15–17 (19–23 January 1672), and 40 (26 February 1672).

⁷⁹ NSV 55–56 (2 April 1672).

⁸⁰ The Estates also grudgingly accepted a 10 percent increase of wealth tax assessments in 1674: Liesker and Fritschy, *Gewestelijke*, pp. 367–68.

⁸¹ NA 3.01.29, Inv. No. 802; Dormans, *Tekort*, p. 70, puts the total value of forced loans at 24.7 million in the years 1672–1675, 95 percent of which was raised through wealth taxes totalling 5.5 percent of estimated wealth. Liesker and Fritschy, *Gewestelijke*, pp. 366, 368, give the yield of the wealth taxes as a percentage of total wealth: 1672: 2 percent; 1673: 1 percent; 1674: 3 percent; and 1675, 1 percent.

⁸² Panhuysen, *Rampjaar 1672*, p. 293; and Hop, *Notulen*, p. 55, 70 ff.

⁸³ NSV 92–93 (30 May 1672), 95 (2 June 1672), 198 (8 July 1672), and 216–217 (14–15 July 1672).

⁸⁴ NSV 94 (2 June 1672).

⁸⁵ NSV 108 (13 June 1672).

⁸⁶ NSV 318 (18 November 1672) and 322 (24 November 1672).

outright.⁸⁷ Holland also paid interest due in bills rather than money and persuaded the VOC to pay dividends in public bills rather than cash.⁸⁸

The war thus threw Holland in its deepest financial crisis since the late sixteenth century. The Estates proposed drastic measures such as renewing the existing wealth tax ledgers and widening the assessment to include all financial assets. After intense negotiations they adopted a blanket 16.6 percent increase of the estimated wealth for tax payers worth more than 3,000 guilders using updated ledgers. The Estates also decided to levy two wealth taxes of 0.5 percent each specifically applied to financial assets, thus effectively reducing nominal interest rates on Holland bills to 3 percent in 1673. The impact of this latter measure was softened somewhat by introducing a dual taxation rule. Sums due in the financial assets levy could be subtracted from sums due in personal wealth tax.⁸⁹ This benefitted big investors to the detriment of small ones, people below the tax threshold with a redeemable 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 (Figures 5 and 6). The liquidity squeeze thus breathed life into the rudimentary local secondary markets that had begun in the 1650s and 1660s.

Why did a secondary market not emerge earlier? After all, with 130 million guilders of debt there will always be investors who need some liquidity. The receivers probably served this market, redeeming bills for later resale.⁹⁰ In 1666 and 1668 the Amsterdam merchant Louys Trip purchased such bills.⁹¹ Billholders could also obtain liquidity by offering their securities as loan collateral (lombarding).⁹² The 1672 squeeze upset the balance between supply and demand, though the Gouda data do not tell us how active that market was. All the same it

⁸⁷ RSH 11 December 1674, 19 January 1675, 21 January 1675, 26 March 1675, and 24 May 1675. The Estates scrapped the 1675 interest payments for late payers of the 1674 forced loan: RSH 24 May 1675 and 13 July 1675.

⁸⁸ Van Dam, *Beschrijvinge*, I, pp. 441–43.

⁸⁹ NSV 325–334 (25–26 November 1672), 340–349 (7–9 December 1672), and 353–363 (14–21 December 1672). Cf. Liesker and Fritschy, *Gewestelijke*, pp. 366–70.

⁹⁰ The instruction to target outsiders for the repayment was repeated on 27 September 1662: Houtzager, *Hollands*, pp. 172–73.

⁹¹ ACA 5060 Inv. No. 50, 24 March 1666 and 21 November 1668.

⁹² An affidavit from three brokers dates the phenomenon to as early as 1660 in ACA Notarial archives Inv. No. 2238 (notary Lock), 22 January 1672, folio 205 (courtesy Peter Koudijs and Lodewijk Petram). In March 1661 the Estates banned the lombarding of bills held in the receivers' offices: RSH 9, 18, and 22 March 1661. Lombarding probably started earlier; Ruben Schalk found a 1644 example in Enkhuizen: R. Schalk, "Financing the Dutch Golden Age," pp. 47–48. In May 1668 Louys Trip loaned 20,000 guilders at 3.5 percent to Pieter de Groot on collateral of 22,600 guilders of bills: SA 5060, Inv. No. 50.

bears emphasis that the secondary market did not emerge 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 had originated in sustained demand after the closure of the company's subscription books.⁹³

The Gouda data also show 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 1). 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 percent in 1677 to as little as 2.5 percent in 1683.⁹⁴ Public rates followed a quite different trajectory. During the summer of 1672 the yield on Holland's securities also peaked as sellers could find no buyers. The available bill data for 1672 suggest that prices plummeted to 30 percent, recovering to the 70–85 range during the second half of the year, then dropping again to 50–55 in late December before returning to 76 early in 1673.⁹⁵ Low securities prices directly translated into higher borrowing costs. In 1673 the cities had to borrow their usual advance on the forced loans at 6 percent per year.⁹⁶ The market situation then eased somewhat, but with bill prices below 80 Holland had to offer at least 5 percent for free loans. Considering this too high, the Estates continued issuing forced loans at 4 percent. That proved difficult and in 1674 receivers were once again warned not to sell bills below par, which they obviously were doing.⁹⁷ As late as 1678 the Rotterdam receiver could raise money only by offering 5 percent.⁹⁸ By now players in the secondary market held the whip hand. During the mid-1650s bill prices had 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 to or not.

THE DOUBLE-EDGED SCALPEL, 1678–1713

The 1678 Peace of Nijmegen enabled Holland to restore its finances. With a debt-to-tax rate of fourteen, the situation was worse than before De

⁹³ Gelderblom and Jonker, "Completing."

⁹⁴ ACA 235 (Deutz), Inv. No. 288 and 291–295 (courtesy Lodewijk Petram).

⁹⁵ Grossmann, *Amsterdamer Börse*, pp. 15, 21, 33, 35, 41–42, and 43.

⁹⁶ RSH 20 April 1673.

⁹⁷ RSH 17 Augustus 1674.

⁹⁸ City Archives Rotterdam, ORA, 1a, Inv. No. 3687, fol. 131–134 and 140–142, indicating a conversion of the 5 percents to 4 in 1680.

Witt's efforts of the 1650s and 1660s (Figure 3). The circumstances of the 1650s returned, but with a difference. The province could not redeem large sums, so instead it raised the rate of both the excises and the real estate tax. The extra revenues helped to push the debt-to-tax rate to 8.5 by 1690, its lowest level for more than 40 years (Figure 3). Holland also reduced expenses by forcing an interest rate cut in the form of a withholding tax. In 1680 the Estates imposed a 0.5 percent wealth levy. Public securities were taxed at 0.5 percent of the face value, deducted from interest payments by the receivers.⁹⁹ A similar withholding tax on interest payments had been used between 1596 and 1607, but opposition had prevented subsequent attempts to levy it. In 1634, for instance, the Estates had rejected a proposal for taxing interest payments on bills and on other loans because credit would collapse if private administrations were opened for inspection.¹⁰⁰ The Estates considered a withholding tax in 1655, but abandoned it in favor of an interest rate cut. In December 1671, only months before Louis XIV's invasion, De Witt had great difficulty in persuading the Estates to enact a temporary 5 percent levy on interest payments.¹⁰¹

The 1680 withholding tax was also discontinued, presumably because of its immediate impact on credit. After a steady recovery during the late 1670s, Gouda and Leiden annuities prices halted in 1681, drifted for a year or two as if testing the Estates' intentions, then resumed their rise back to par (Figure 6). Clearly investors wanted compensation for their sacrifices during the war before being amenable to an interest rate cut. With the swell of interest payments not absorbed by new debt issues running at some 7 million guilders a year, that moment would come more or less automatically (Figure 4). Modest redemptions helped to prepare the ground; fiscal reforms succeeded in generating the surplus needed for about 2.6 million guilders of redemptions during the 1680s.¹⁰² In 1687 the Estates reintroduced the 0.5 percent withholding tax on public debt interest payments. The rate was doubled to 1 percent the following year; 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 apply. Moreover, the Estates could use the withholding tax rate to test the market's readiness for new issues, lowering or raising the interest differential between existing bills and new

⁹⁹ Fritschy, "Efficiency," pp. 64–74.

¹⁰⁰ SH VI, Nos. 1471 and 1472.

¹⁰¹ Houtzager, *Hollands*, pp. 192–96.

¹⁰² See Fritschy, "Efficiency."

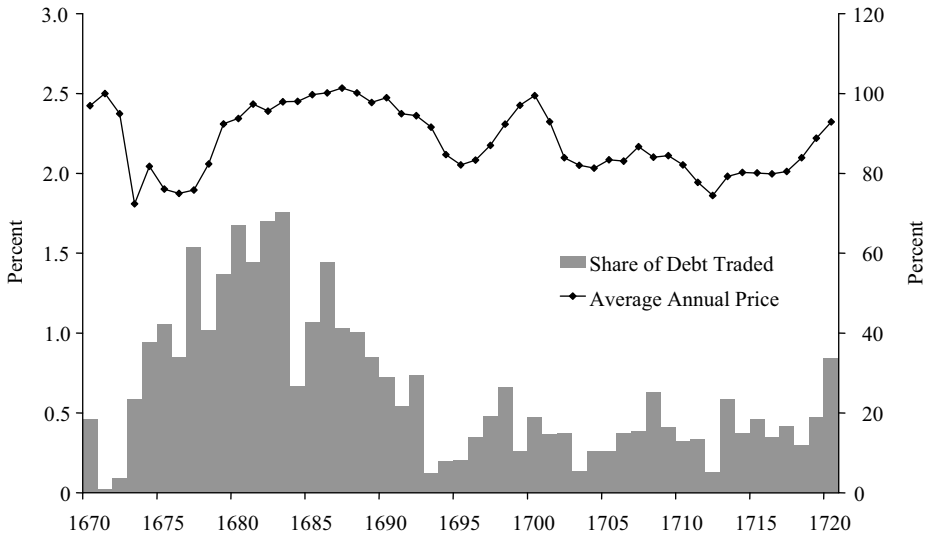


FIGURE 6
THE ANNUAL AVERAGE PRICE OF HOLLAND'S *LOSRENTEN* IN GOUDA AND LEIDEN AND THE VALUE OF *LOSRENTEN* SOLD AS A PERCENTAGE OF THE TOTAL DEBT OUTSTANDING THERE, 1670–1720

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

issues as required. The adoption of this tax also signaled that the Estates considered bills a fair proxy for overall wealth, i.e., ownership was spread sufficiently wide over wealth owners for the tax to result in an equitable assessment. The moment proved well chosen; Gouda-Leiden prices hardly moved, so the market accepted the interest rate cut (Figure 6).

The withholding tax was also instrumental in funding the quarter century of almost continuous warfare which followed William of Orange's ascension of the English throne in 1689. 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 back to over 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 doubling of the withholding tax on interest payments to 2 percent. Consequently, from 1690 investors

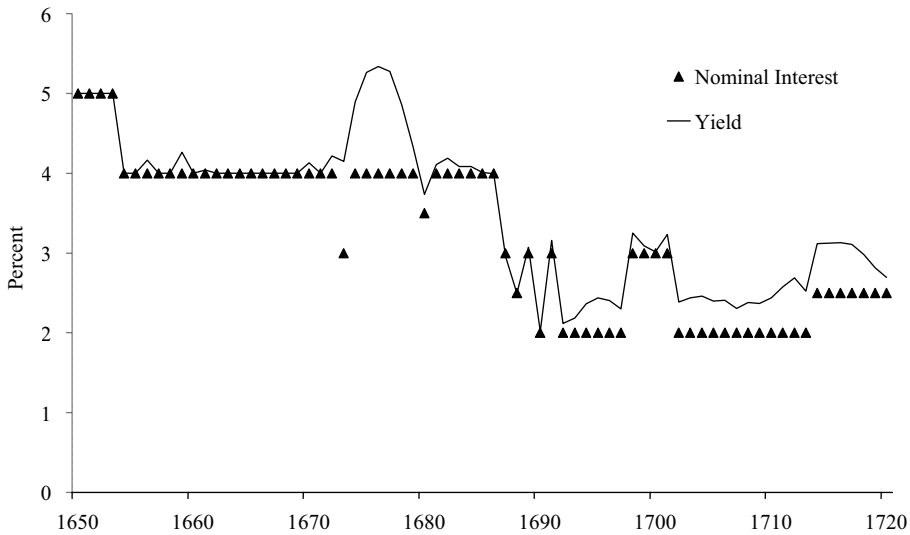


FIGURE 7
THE NOMINAL INTEREST RATE AND THE YIELD ON HOLLAND'S *LOSRENTEN*,
1650–1720

Sources: Liesker and Fritschy, *Gewestelijke financiën*, pp. 368–71; 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; and Leyden City Archives ORA 71–73.

suffered an annual haircut of a similar magnitude to the forced loans of the 1670s. Billholders are said to have borne this stoically because countering the French threat required sacrifices, but they did not have much of an option. Home alternatives such as buying real estate suffered a similar tax pressure on yields and foreign alternatives like British securities were slow to materialize.¹⁰³

Moreover, the annuity prices from Gouda and Leiden show an immediate impact of taxation on the price of public debt (Figure 7). The market accepted the initial reductions of 1687–1690, but prices then dropped to 80 percent in 1695. The Estates responded by halving the withholding tax to 1 percent following the end of the Nine Years' War in 1698, causing annuities prices to veer back. The reimposition of a 2 percent levy at the start of the War of the Spanish Succession in 1702 clearly disappointed investors and prices fell gradually to reach 75 percent in 1712, giving a 3 percent yield. By that time, even a 0.5 percent tax cut failed to restore prices.

¹⁰³ Murphy, *Origins*, pp. 39–65; Carter, “Dutch”; and Fritschy, “Poor.”

The price drop shows Holland caught in a vicious circle of its own making. Its scalpel cut both ways; to raise the very large loans 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 4 percent for the duration of the war. This period had to be extended to ten years after the war for later issues.¹⁰⁴ When the market for 4 percent bills appeared exhausted, the Estates adopted a successful British public debt innovation, lottery loans, issuing lottery bills totaling 34 million guilders in 1711, 1712, and 1713.¹⁰⁵ During 1710 and 1711 Holland also issued twenty-year bills at 9 percent, of which 4 percent interest and 5 percent amortization.¹⁰⁶ The entire volume issued during 1690–1712 consisted of loans incentivized in one way or another (Figure 2). In 1709 sluggish home demand even led the Estates to take a 1.5 million 4 percent loan from the Swiss canton of Bern.¹⁰⁷

Under these circumstances, the receivers needed all their skills to coax local markets into accepting new issues while holding on to old, lower-yielding bills. They probably did this by pretending to make exclusive offers to selected customers, which they could because the primary market remained opaque. The Estates published no financial information whatsoever; 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. Moreover, despite negative transfers during the early 1700s (Figure 4), the mismatch between investment opportunities and surplus savings continued. Though old bills sold under par on the secondary market, there was no rush to redeem them at par with the receivers because investors feared being excluded from new issues at higher rates that could raise the overall yield of their portfolios. This gave the receivers considerable leverage. New loans were probably fed to investors according to their status with the receiver, favorites being able to buy new, untaxed

¹⁰⁴ For loans between 1690 and 1698: NA 3.01.29, Inv. Nos. 855 and 856; RSH 16 March 1690; 1 August 1693; 1 and 6 February, 9 July 1694; 26 July 1695; 26 October, 18 November, 17 December 1695; 18 August 1696; 8 February, 19 June, and 2 August 1697; and 21 April 1698. For loans issued after 1700: NA 3.01.29, Inv. No. 863. RSH 28 January, 5 February, 10 March, 1 April, 20 July 1701; 8 April, 20 May, and 23 September 1702; 6 April, 28 September, and 14 December 1703; 26 January, 15 March, 10 May, 25 October 1704; 27 March and 19 September 1705; 13 February, 4 September 1706; 12 and 22 January, 26 March, and 11 June 1707; 24 and 26 January, 25 February, 24 March, 21 July, and 29 September 1708; 12 January, 19 April, and 17 and 25 June 1709; 21 and 23 January, 19 July, and 24 October 1710; 20 February and 20 June 1711; 19 March 1712; 24 February and 1 September 1714.

¹⁰⁵ Dormans, *Tekort*, p. 77. NA 3.01.29, Inv. No. 863, fol. 19; Fokker, *Geschiedenis*, p. 127. See Hoekstra, "Necessity is the Mother of Invention."

¹⁰⁶ NA 3.01.29, Inv. No. 861.

¹⁰⁷ Altdorfer-Ong, "Canton," p. 12 and "State," pp. 449–50.

issues, perhaps even be allowed to swap old, taxed bills for new. Less privileged investors would have needed to bargain, 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 skills with which the Receiver-General Receiver of the United Provinces, Cornelis de Jonge van Ellemeet, exploited his market to get new issues subscribed.¹⁰⁸

Consequently, by the Peace of Utrecht in 1713 Holland's bill debt, homogeneous in 1687, had become a patchwork of different issues. Rather than preventing the rise of a secondary market, as Larry Neal surmised, this was actually the consequence of pressure from the secondary market.¹⁰⁹ At this moment in time, Britain struggled for a secondary market to absorb its short-term debt overhang and ended up creating liquidity by way of securitization, with the 1720 boom and bust as a direct consequence.¹¹⁰ By contrast, Holland had no such need and thus avoided the worst of the 1720 excesses.¹¹¹ The key difference between the two countries would seem to have resided in Holland's fiscal decentralization, the system of feeding debt directly to local markets in proportion to their tax yield, rather than issuing everything from the center.¹¹² In this way, investors could be targeted, tax receipts matched with interest payments, debt issues tailored to available savings, and trust maintained by leaving local people in charge. Britain's public finance trajectory was a particular one, determined by its particular circumstances, and not by any general law of public finance development. This particularity explains why public finance best practices could not easily be transplanted, why the "Dutch Finance" imported by William III into Britain did not really work there, and why so few European countries adopted British fiscal practices even during the nineteenth century.¹¹³ In public finance, each country needed to develop its own wheel, no doubt inspired by foreign examples, but always adapted to local circulation.

¹⁰⁸ Helvetius, "Mémoire," pp. 230–31; and De Muinck, *Regentehuishouding*. Holland's finance office recorded new issues of tax-exempt bills: NA 3.01.29, Inv. No. 856.

¹⁰⁹ Neal, "How It All Began," p. 122.

¹¹⁰ Dickson, *Financial Revolution*; and Quinn, "Securitization."

¹¹¹ Gelderblom and Jonker, "Mirroring."

¹¹² Liesker and Fritschy, *Gewestelijke*; and Prak and Van Zanden, "Towards" and "Tax."

¹¹³ Cardoso and Lains, *Paying*.

CONCLUSION

At first sight, the evolution of Holland's public debt appears a curious anomaly. There was no distinctive North-Weingast moment of fundamental constitutional change. The Estates' credible commitment to debt service 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. The predominantly short-term character of Holland's debt in the seventeenth century defies ordinary logic, which emphasizes the desirability of consolidation to create a liquid market for government debt and attain lower interest rates. In Holland, a secondary market for public debt appeared very late in the day, long after the start of such a market for private securities such as VOC shares. Until the French invasion of 1672, the liquidity on call at the tax receivers' offices combined with the lombarding of public bills sufficed for investors, and a fully fledged market only sprang up following a general liquidity squeeze. Finally, from 1687 the composition of Holland's debt changed dramatically from the traditional mix of bills and annuities into a patchwork of issues with different terms and conditions, each individual one tailored to the market conditions and managed by the withholding tax.

Yet on reflection, Holland's case reveals that the long-running debate about the causes of the modernization of public finance in early modern Europe has overlooked a vital ingredient: private savings. For debt to grow and interest rates to fall, credible commitment and efficient fiscal institutions were necessary, but not sufficient. Unless such institutions coincided with growing riches, unless they enabled the authorities to tap private wealth efficiently and timely, they achieved little or nothing. Economic growth and rising wealth generate the tax flows needed for debt service; the importance of good fiscal institutions lies in the need for capturing these revenues in a timely and proper manner. Then as now, fiscal institutions needed constant readjustment to changed circumstances, and the evolution of public borrowing was always a dynamic process of bargaining over the application of growing savings for state purposes, the course of which depended on local circumstances. Unless we start looking at early modern public finance from the perspective of such processes, we will not fully understand how they evolved. In Holland's case, the accumulation of private wealth widened the Estates' options, at the price of giving in to investors' preferences, which changed as wealth increased and private alternatives declined. Thus a growing debt at falling interest rates was

not due to any institutional changes, but to a combination of abundant savings with a weakening economy.

The importance of a savings surplus for public finance is underlined to best effect by changes in the size, composition, and price of Holland's debt. Rising savings changed investors' preferences from long-term to short-term, forcing the government to respond. The province's initial debt instruments, annuities, combined full governmental control over repayments with investors' demand for a secure store of wealth. This demand was fairly static, tied as it was to a limited number of uses, but as economies grew and savings accumulated, investors in public securities wanted liquidity so they could switch their resources as and when required. Holland's solution of short-term bills with a return option was unusual only in being remarkably successful. This finding highlights another aspect neglected in the credible commitment debate: there existed no direct link between credible commitment, secondary bill markets, liquidity, and low costs of capital. In Holland, a liquid market seems to have appeared some 70 years after the emergence of the Amsterdam market for VOC shares. Liquid markets for public debt were clearly more difficult to create than we like to think, so we need to reconsider what it takes.

Finally, surplus savings also explains why, as Larry Epstein has demonstrated, issuing rates for public debt fell across the European board, in countries with limited government and absolutist rule alike. The economic success of the Italian city states, Holland, and Britain tended to weaken the need for commitment and institutional change elsewhere, because once growing wealth had pushed down home interest rates, investors started looking abroad for higher returns. Genoese loans sustained the Spanish Crown in the sixteenth and seventeenth centuries, Amsterdam debt absolute regimes in Denmark, Austria, and Russia in the eighteenth century, British bonds various South American regimes in the nineteenth 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 savings, 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 underlines that money will flow to where it is wanted, but its lessons do not necessarily follow.

Appendix: 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 E. H. H. Dormans (*Tekort*) and Ruud Liesker and Wantje Fritschy (*Gewestelijke*). This appendix details the amendments and changes we made to their estimates.

Appendix Table 1A details the size and composition of Holland's debt between 1591 and 1646. We estimate Holland's debt at the end of 1591 at 1.5 million guilders, the amount for which Holland's towns, since 1588, issued annuities to replace bills outstanding.¹¹⁴ For the years 1591–1607 we took the Estates resolutions concerning sales of life annuities, redeemable annuities, and bills as basis for our estimates and assumed that all loans were placed in accordance with those instructions.¹¹⁵ This seemingly strong assumption is warranted by both the reported value of Holland's interest payments in 1604 and the conversion of these bills recorded by the *Noorderkwartier* in 1618 (see below). One exception is 1594, when annuities worth 250,048 guilders were sold to replace a similar amount in bills issued by the tax receivers; we deduct this amount from the estimated value of bills outstanding in 1594.¹¹⁶

Though preferring annuities, the Estates also approved bill issues worth 5.2 million guilders between 1591 and 1607, with a term of one year but rolled over upon expiry.¹¹⁷ The Estates also used forced sales of life- and redeemable annuities in 1599, 1600, 1602, and 1603. A 1618 report put 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 percent), we estimate the total of forced loans for Holland

¹¹⁴ Tracy, "Keeping," p. 143 and *Founding*, pp. 182, 261; and Bovers, "Government-Market Interaction," pp. 31–37.

¹¹⁵ 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 and 25 July 1594; 7 September 1595; 24 January, 19 March, 25 April, 11 May, 1, 14 and 27 July, and 27 December 1596; 5 February, 19 May, and 1 and 23 December 1597; 23 December 1598; 23 March, 5 April, and 12 and 23 October 1599; 16 March and 6 and 7 June 1600; 28 August and 11 and 15 September 1601; 12 February, 16 March, 13 and 15 August, 3 and 6 September, and 4 and 21 December 1602; 18 February, 20 and 21 March, 28 July, 11 August, 3 September, 28 November, and 1 and 2 December 1603; 15 June, 4 and 23 August, and 12 October 1604; 1, 8 and 15 March, 5 May, 19 August, 13 and 27 September, and 30 November 1605; 11 February, 17 and 29 May, 10, 12, 27 and 30 June, 8 July 1606, 24 August, 12 September, 27 October, and 18 November 1606; 23 April, 1 and 3 May, 17 July, 4 September, and 13 October 1607. No amounts were mentioned in the resolutions for 25 February and 11 and 28 June 1608. We estimate the total value of loans in this year as similar to 1607.

¹¹⁶ NA 3.01.14 No. 139; RSH, 25 July 1594; and Tracy, "Keeping," p. 149.

¹¹⁷ Cf. the Estates' resolutions ordering the prolongation of obligations: 12 and 23 November 1591; 30 December 1592; 24 and 27 January, 10 November, and 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; 5 December 1606; and 4 September and 4 December 1607.

APPENDIX TABLE 1A
THE SIZE AND COMPOSITION OF HOLLAND'S DEBT (1591–1646)

Year	Total	A (%)	B (%)	C (%)
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

APPENDIX TABLE 1A — continued

Year	Total	A (%)	B (%)	C (%)
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

Notes: The table documents the total debt outstanding between 1591 and 1720 and the relative shares of life annuities (A); redeemable annuities (B); and (C) bills.

at 3.2 million guilders.¹¹⁸ 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 bills into annuities; the 1618 *Noorderkwartier* report confirmed the conversion of 1,131,119 guilders worth of bills.¹¹⁹ This amount is very close to the area's 20.5 percent share in the 5.2 million guilders bill debt of 1609, i.e., 1,069,546 guilders. We therefore assume the receivers in the *Zuiderkwartier* to have successfully converted all their bills in 1609 as well. In the *Noorderkwartier*, 90 percent of bills were converted into redeemable annuities and 10 percent into life annuities.¹²⁰ We assume this ratio was the same for the *Zuiderkwartier* and we distribute the 5.2 million guilders worth of bills in 1609 between the two types of annuities in 1610. Subsequently, the *Noorderkwartier* receivers repaid 34.4 percent of the redeemable annuities; we assume the *Zuiderkwartier* receivers to have done the same and we take these redemptions to have been distributed equally over time between 1610 and 1618.

The 1618 report also allows estimates of the relative share of life annuities and redeemable annuities between 1591 and 1609.¹²¹ The 495,300 guilders of annuities issued until 1598 in the *Noorderkwartier* consisted of 45.3 percent life annuities and 54.7 percent redeemable annuities; the 660,612 guilders of forced loans of 1599–1603 consisted of 58.9 percent life annuities and 41.1 percent redeemable annuities; and the 490,804 guilders of annuities issued between 1601 and 1608 consisted of 69.1 percent life annuities and 30.9 percent redeemable annuities. We estimate the composition of Holland's debt by applying these ratios to the various issues of annuities between 1591

¹¹⁸ NA 3.01.29, Inv. No. 852; and Bovers, "Government-Market Interaction," p. 36; On the share of the Noorderkwartier in debt issues: Liesker and Fritschy, *Gewestelijke*, pp. 22–23.

¹¹⁹ NA 3.01.29, Inv. No. 852; Liesker and Fritschy (*Gewestelijke*, p. 187) took the report to describe Holland's debt, but it refers to the northern quarter only. See Bovers, "Government-Market Interaction," p. 39n.

¹²⁰ NA 3.01.29, Inv. No. 852; and Bovers, "Government-Market Interaction," p. 39n.

¹²¹ NA 3.01.29, Inv. No. 852.

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 percent). The accuracy of this procedure is confirmed by a government report from 8 March 1604 stating that Holland paid about 1 million guilders in interest.¹²² Our estimates for 1603—bills worth 3,448,802 guilders at 8.5 percent; life annuities worth 3,506,533 guilders at 14.3 percent and redeemable annuities worth 2,976,223 guilders at 8.33 percent—yields interest payments of 1,005,347 guilders.¹²³

In 1609 the estates general asked all provinces to contribute to the redemption of 4,356,101 guilders worth of bills issued by the Union and to take over a debt of 1,303,245 guilders.¹²⁴ If Holland contributed according to its share in the Union's budget (58 percent), it should have issued about 3.3 million guilders of debt to pay for that. According to a 1616 report, the receiver general of Holland paid 309,201 guilders interest on *renten* sold between 1610 and 1614 to redeem loans which not previously charged to the province.¹²⁵ We assume this statement relates to the operations for the Union and estimate that, by 1614, Holland had fulfilled its obligations. Consequently, we estimate the share of life annuities (at 14.3 percent) and redeemable annuities (at 6.25 percent) at 40 and 60 percent of the replacement loans, respectively.

In 1616 the *Noorderkwartier* issued 300,000 guilders of life annuities as its share in a 2.8 million guilders loan of the estates general to redeem the cities of Flushing and Brielle from the English Crown.¹²⁶ Based on the *Noorderkwartier's* 20.5 percent share, we estimate Holland's total issue of annuities at 1.5 million guilders in 1616, but we assume that the *Zuiderkwartier* issued 40 percent life annuities and 60 percent redeemable annuities. In 1617 the *Noorderkwartier* sold 73,800 guilders of bills to fund a 360,000 guilders loan from Holland to Sweden. The Estates' resolutions reveal several other bill issues between 1610 and 1620, mostly in support of allies.¹²⁷ These loans were small and mostly short-term, but not all of them were redeemed and we estimate the bill debt rose to 573,000 guilders in 1620. In 1617 and 1618 the *Noorderkwartier* also sold life annuities worth 41,000 guilders as part of two 200,000 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 percent 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 6.25 percent redeemable annuities totaling 9.6 million guilders, 11.1 percent life annuities of 8.0 million guilders, and 6.25 percent bills of 570,000 guilders.

¹²² *Memorie* 1755, pp. 17–18.

¹²³ Interest rates from Dormans, *Tekort*, p. 26.

¹²⁴ In earlier work, we followed Houtzager's claim that Holland's obligation debt stood at 4,356,101 guilders in November 1609 (Houtzager, *Hollands*, pp. 132, 135, 136, and 142; and Gelderblom and Jonker, "Completing," p. 666). However, the Estates resolution 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. No. 373, fol. 345. For the resolution on the debt 1,303,245 guilders: Idem, fol. 344v.

¹²⁵ Tracy, "Keeping," p. 143.

¹²⁶ NA 3.01.29, Inv. No. 852.

¹²⁷ RSH 23 August 1607, 25 June 1610; 21 February–24 March 1612, and 8 September 1612; 9–20 December 1614; 24 November–22 December 1616; 4 May, 25 July, 27 October, 10 and 15 November, and 9 December 1617; 31 August, 18 and 22 October, 6 and 30 November, and 10 December 1618; 30 August and 20 December 1619; 14 and 21 March, 13 May, 21 July, and 8, 15, 20, 21, and 26 August 1620.

The estimated interest due on these loans was 1,522,294 guilders, a 1634 report of Holland's finance office putting the total interest paid in 1620 at 1,550,621 guilders.

The *Opreckeninge*, an internal report describing the size and composition of Holland's debt in 1632, 1647, 1652, and 1667, put the total at 55.9 million guilders by the end of 1632.¹²⁸ In combination with our estimate for 1620, this would imply an increase of 37.5 million guilders, i.e., 3 million less than the 34.4 million of new loans in the 1634 report.¹²⁹ We cannot explain this difference satisfactorily and surmise that loans initially issued by individual cities, or by the Union, were later added to Holland's total.¹³⁰ We follow the 1634 report to reconstruct the annual debt increase between 1620 and 1632, spreading the excess 3 million guilders over these years according to relative size of the known issues. Given the Estates' strong preference for annuities, and the fact that they only discussed the issue of bills instead of annuities in 1629, we assume that between 1620 and 1628 all new issues consisted entirely of life and redeemable annuities.¹³¹

The *Opreckeninge* 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 1694.¹³² 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 *Opreckeninge* of 1667, but we use the implied distribution of loans over the years 1632–1647 to approximate the annual growth of the debt.

Appendix Table 1B details the size and composition of Holland's debt between 1647 and 1720. For the years from 1647 to 1720, we follow Dormans' estimates with only minor adjustments.¹³³ We estimate that 6 million guilders of war debts were consolidated during 1648–1649. The relative shares of life annuities, redeemable annuities, and bills between 1632 and 1652 are interpolated from Dormans' estimates of their share in the first and last year of this period.¹³⁴ We follow Liesker and Fritschy's estimates of the redemption of 4.4 million guilders' worth of bills 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 bills 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 office.¹³⁵

¹²⁸ Dormans, *Tekort*, p. 47.

¹²⁹ Dormans, *Tekort*, pp. 45–46.

¹³⁰ See, for instance, the 800,000 guilders worth of bills issued by Holland towns as an advance on the forced loan of 1625: SH III No. 1907 (26 March 1625).

¹³¹ SH I, No. 2571; SH II, 12, 18, 19, 60, and 70; and SH III, No. 1199. In April 1629 Holland's receivers were authorized to issue bills to repay cities for money advanced in 1625 on the forced sales of annuities. The same day they were instructed to sell obligations for 1 million guilders on collateral of land tax revenues (SH IV, No. 682, 7 April 1629).

¹³² Liesker and Fritschy, *Gewestelijke*, pp. 120–22.

¹³³ Dormans *Tekort*, pp. 65–66, 80–81, and 110–111.

¹³⁴ *Ibid.*, p. 58.

¹³⁵ NA 3.01.29, Inv. Nrs. 855, 856, and 862.

APPENDIX TABLE 1B
THE SIZE AND COMPOSITION OF HOLLAND'S DEBT (1647-1720)

Year	Total	A (%)	B (%)	C (%)	D (%)	E (%)	F (%)
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			
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	27.6	65.5	1.1	1.7	
1692	166,694,000	4.5	26.9	64.4	1.1	3.1	
1693	170,347,000	4.7	26.2	63.7	1.2	4.2	
1694	173,925,000	5.1	25.6	63.4	1.1	4.8	
1695	177,606,000	4.1	25.0	59.6	2.4	8.8	

APPENDIX TABLE 1B — continued

Year	Total	A (%)	B (%)	C (%)	D (%)	E (%)	F (%)
1696	181,189,000	4.0	24.5	58.2	2.9	10.5	
1697	184,775,000	3.6	23.9	55.9	3.5	13.0	
1698	189,462,000	4.4	23.3	55.9	3.4	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	22.2	67.7	1.4	1.1	
1702	207,016,000	7.8	21.5	65.0	1.4	4.3	
1703	213,873,000	6.8	20.8	63.4	2.6	6.4	
1704	220,734,000	6.5	20.1	60.6	3.1	9.7	
1705	227,601,000	6.1	19.5	58.8	3.6	12.0	
1706	234,472,000	5.8	18.9	57.1	4.1	14.0	
1707	241,348,000	5.2	18.3	54.6	4.9	16.9	
1708	248,229,000	4.7	17.8	52.3	5.5	19.6	
1709	256,476,000	4.4	17.2	50.7	6.0	21.7	
1710	265,684,000	4.1	16.6	48.8	6.3	24.2	
1711	282,536,000	4.0	16.1	46.1	6.4	23.9	3.5
1712	295,164,000	3.8	16.1	43.9	6.3	23.2	6.8
1713	309,989,000	4.3	16.0	40.9	6.0	22.5	10.3
1714	310,865,000	3.7	15.9	62.0	6.2	1.9	10.2
1715	310,455,000	3.6	16.0	62.1	6.2	1.9	10.3
1716	310,847,000	3.6	15.9	62.0	6.3	1.9	10.2
1717	310,985,000	3.4	15.9	62.1	6.4	1.9	10.2
1718	310,228,000	3.3	16.0	63.4	6.4	0.7	10.3
1719	309,588,000	3.0	16.0	63.5	6.4	0.7	10.3
1720	307,526,000	6.0	16.0	63.9	3.3	0.8	10.0

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

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