Loans for Salaried Employees: The Case of the Dutch East India Company, 1602-1795

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Abstract

Capital markets became more important to society once it was possible to borrow against future revenues. States had long used this possibility, but it is generally believed that salary loans for private people were only used from the late-nineteenth century onwards. During the seventeenth and eighteenth centuries, however, salary loans were already in wide use in Holland's maritime sector. Even though the rules applying to these salary loans helped solve moral hazard problems, they were still risky investments because of the high on-board mortality rates. This paper shows how specialized financiers were able to adjust purchase prices of loan contracts according to the prevailing mortality regime. This was a major accomplishment since actuarial science was still underdeveloped at that time. It enabled these financiers to run sustainable businesses and to mobilize the credit networks necessary to fund their operations. Their complex transactions give an unprecedented insight into how developed Holland's financial market actually was.

INTRODUCTION[1]

The ability to borrow against future revenue was a powerful impetus to making capital markets more important to society. Although it had been long common for states to fund loans on future tax or toll revenues[2], salary loans for private people are believed to have been used from the late nineteenth century onwards only. This was facilitated by the rise of wage labor, the standardization of wage rates and the regular salary payments that took place around that time.[3] The emergence of salary loans was important because it allowed people that could not pledge or post (sufficient) collateral to borrow on the basis of their skills and ability to work.

In some regions, however, high levels of wage labor were attained long before the late nineteenth century. In Holland, for example, wage labor already became important during the Middle Ages.[4] During the seventeenth and eighteenth centuries the preconditions for the use of salary loans were in place in the maritime sector in particular. The rise of large employers like the East India Company (VOC), the West India Company (WIC), the Navy and organizations managing plantations in Surinam and Guyana made this possible. A situation thus existed in which people that would elsewhere not have had access to salary loans in fact used them on a large scale.[5] The archives of the VOC, the largest maritime employer[6], show for instance that around 532,000 of its employees signed a salary loan during the period 1700-1794.[7]

This paper will focus on the salary loans of VOC employees because of the richness of its archives. These loans differed from their nineteenth-century counterparts in two notable ways. Lenders could not solve moral hazard problems – and maximize the recovery rates of their outstanding loans – by regularly intimidating borrowers.[8] Intimidation was a much less effective instrument because the borrower was in or on his way to Asia. This paper will show how the VOC helped solve moral hazard problems by instituting a detailed

[1] We thank Mikolaj Malinowski for research assistance and seminar participants at Utrecht University for comments.
[2] See, for example, Riley 1980; Van Bochove 2011.
[3] Easterly 2008, 2009.
[4] Van Zanden 1993; Van Bavel 2006.
[5] Van Alphen 1988. The companies in Surinam and Guyana were the Surinam Society and the Colony Berbice. See SAA, 5060, 170; NA, 1.05.03; NA, 1.05.05.
[6] Bruijn, Gaastra and Schöffer 1987; Gaastra 2003.
[7] *VOC Sea Voyagers*.
[8] Easterly 2008, 2009.

regulatory framework regarding salary loans. The high on-job mortality rates, however, made this a necessary but not a sufficient condition for their wide use. This paper documents how specialized financiers were able to adjust purchase prices of loan contracts according to the prevailing mortality regime. This was a major accomplishment since actuarial science was still underdeveloped at that time.[9] It enabled these financiers to run sustainable businesses and to mobilize the credit networks necessary to fund their operations. Because of their unique actuarial skills and the qualitative asset transformation that followed from this, these financiers provided an important impetus for the large-scale use of salary loans. The case of the VOC salary loans thus gives an unprecedented insight into how developed Holland's financial market – one of the leading markets in pre-industrial Europe – actually was.[10]

This paper will first discuss the loan contracts themselves and the various purposes that made their use attractive to employees. Subsequently it will describe the regulatory framework imposed by the VOC that removed the moral hazard problems for lenders. The financiers and the techniques they used to price the loan contracts will be examined next, followed by an investigation of the credit networks that funded them. It will then also be shown under which circumstances this system could become unstable. The final section will summarize and conclude.

Figures 1 and 2 about here

TRANSPORT-LETTERS

The East India Company had designed three ways through which employees could anticipate on their future income. Upon signing each employee received an advance of two months' wages (*handgeld*). Through a month-letter (*maandbrief*) the employee could authorize a family member to collect three months' wages from his salary account each year. Additionally, the transport-letter (*transportbrief*) enabled him to contract a debt to bearer that could be redeemed with the income in his salary account. The maximum amount of a transport-letter was regulated by rank and the most common denomination was therefore

[9] Teugels and Sundt 2004. For the Netherlands, see Van Gerwen and Van Leeuwen 1998 on insurance and De Vries and Van der Woude 1997, 115, 118 for the failed attempt of Holland's grand pensionary Johan de Witt to impose a more rational system of life annuities.

[10] De Vries and Van der Woude 1997, 81-158; 't Hart, Jonker and Van Zanden 1997.

150 guilders or about 13 to 17 months' wages.[11] An employee could use month-letter and transport-letter at the same time.

Transport-letters did not carry a coupon. If lenders wished to incorporate interest this had to be done by writing down a principal sum that was larger than the amount the borrower had actually received. Fixing this discount was a fairly complex task because transport-letters were usually not redeemed at once but rather through multiple payments. Depending on the amount of salary received in Asia, fines and expenses on medical treatment this could take several years and a number of payments.[12] In case an employee died, payments continued until his salary account ran dry and then ceased.[13]

Due to the high mortality rates on board, especially up to the Cape of Good Hope (see Figure 1), and in Asia[14] many transport-letters were never redeemed in full. In many instances the bearer of a transport-letter thus only received a fraction of the amount specified in the loan contract. The sample collected in Figure 2 shows that during years with low mortality this fraction – the recovery rate – fluctuated between 80% and 90%, but it could also be much lower. As lenders were unable to single out individuals that were more likely to die than others they had to diversify their portfolios and had to apply a substantial discount to all their loans.[15] For those that survived the journey to Asia this meant that implicit interest rates were rather high. They not only paid interest on their own loan, but also compensated their lender for losses on his other loans as well.

Transport-letters were nevertheless used on a large scale. Figure 3 shows the face value of the new transport-letters signed by employees of the VOC in Amsterdam. The amount increased in the first sample years, reached a peak of 550,000 guilders of new debt in 1750 and then gradually declined again. As 50% of the VOC's labor supply was recruited in Amsterdam, overall use was around twice as high. Their wide use suggests that transport-letters fulfilled an important function. In fact, depending on the personal situation of employees, the transport-letter could be used for various purposes. The literature has

[11] Van Bochove et al. 2011.
[12] Board and lodging were provided by the VOC.
[13] Van Bochove et al. 2011.
[14] Van der Brug 1994.
[15] We will show below that specialized financiers did in fact distinguish between *groups* of employees, e.g. sailors and soldiers.

traditionally focused on its use by the Company's foreign employees.[16] Attracted by the economic opportunities that presented themselves in Holland they came to Amsterdam in search for work and higher wages.[17] Arriving in Amsterdam empty handed many foreigners found themselves without the reputation or collateral necessary to raise the money needed for their daily needs. Innkeepers offered these people a place to stay in return for a promise to join the VOC.[18] As employees of the Company they could assume a debt through the transport-letter and by giving it to their innkeeper they could compensate him for the costs he had incurred. It has commonly been believed that innkeepers treated their guest harshly in an attempt to maximize their return on investment. They supposedly put their guests under house arrest and provided only the bare necessities of life to them.

The following section will discuss whether all innkeepers indeed deserve such a bad reputation. Perhaps future employees had more leeway with using their transport-letter than was previously thought. It will also test whether the board and lodging interpretation is consistent with what is known about the Company's labor supply. During the decades immediately after its establishment in 1602 local labor markets were usually able to satisfy the demand for sailors and soldiers. As the demand for labor grew further, workers increasingly came from further away; first from the regions around the provinces of Holland and Zeeland but later also from abroad. As a result only 5% of those destined to Asia in 1607 were foreigners, but this increased to 32% in 1635, 25% in 1694 and 46% in 1780.[19] An increase of the share of non-locals that used transport-letters would therefore be expected.

Despite the growing importance of foreign workers, the VOC hired many locals still and it should not be lost out of sight that these also had their financial needs. First, the recent literature has shown that many more of these men were married than was previously thought.[20] The long voyage to Asia and the high mortality rates thus confronted many households with serious problems in their revenue streams.[21] Second, the more

[16] Bruijn and Lucassen 1980 presents the classic interpretation, which was heavily influenced by contemporary travel journals. Van Alphen 1988, 1991 substantially nuanced the classic interpretation but still took a somewhat negative position.

[17] Kuijpers 2005; Van Lottum 2007; Van Bochove 2008, 56-89.

[18] The practice was not restricted to the VOC, but was also common in the WIC, Navy, the Colony Berbice and the Surinam Society (see above). These large companies shared their huge need for laborers, kept highly detailed salary administrations and paid standardized wages.

[19] Ketting 2002; Van Lottum 2007, 214.

[20] Van den Heuvel 2004; Van den Heuvel 2005; Van der Heijden and Van den Heuvel 2007; De Wit 2008.

[21] For sailors on traditional routes the interruption in revenue streams was more modest for voyages in (northern) Europe were relatively short. Van Royen, Bruijn and Lucassen 1997.

experienced local sailors joined the VOC less frequently as they preferred the higher wages and shorter voyages on the intra-European routes. The Company's employees thus increasingly came from the lower strata of society.[22] Disruptions in household income were obviously even more serious to these people.

Locals may therefore have used transport-letters for two reasons. The first reason people signed and sold transport-letters was fairly straightforward: to insure the risk of dying en route to Asia. The second reason was to create a lump sum upfront. In present-day developing countries the ability to generate lump sums makes an important welfare-enhancing contribution to the daily lives of the poor. It allows them to invest in small companies or to send their children to school.[23] The following section will present qualitative evidence on the use of transport-letters by local employees. Again, it will also compare the available data to what is known about the local labor supply. Based on the above characteristics the share of locals using transport-letters should have been low initially. The employees that enlisted with the Company then probably had access to some financial fallback options consisting of family, friends, shop credit and pawnshops. As the share of poor, local employees rose, the relative share of locals using transport-letters will have increased. As in present-day developing countries these people did not have access to alternative credit instruments and used transport-letters almost regardless of costs.[24] Overall, locals presumably used transport-letters less frequently than non-locals.

Figures 3 and 4 about here

THE USE OF TRANSPORT-LETTERS BY VOC EMPLOYEES

The database *VOC Sea Voyagers* makes it possible to test the hypotheses concerning the use of transport-letters as formulated above. Unfortunately, information about all c.960,000 employees that left for Asia during the period 1602-1794 has not survived. Data for the years 1602-1632 are not available at all and for the period 1633-1794 sources were sometimes lacking too. The database nevertheless contains information about c.740,000

[22] ***.

[23] Collins et al. 2009.

[24] This did not mean that the costs of salary loans were excessive (see below).

employees and is almost complete for the eighteenth century.[25] Between 1680 and 1794 – the period for which the data are most complete – almost 361,000 employees boarded a VOC vessel for the chamber Amsterdam. In c.85,000 instances people mentioned Amsterdam as their place of origin and c.276,000 mentioned another place. Figure 4 shows the shares of employees within the groups of locals and non-locals that signed a transport-letter.[26] The long-term developments and differences between these groups are consistent with the hypotheses formulated earlier.

Indeed many non-locals must have used their transport-letter to pay their innkeeper for board and lodging. Whether they were always exploited by this innkeeper remains to be seen, however. The bad reputation that innkeepers had across Europe certainly implies that exploitation did occur.[27] It also suggests, however, that many immigrants must have been cautious not to fall into the hands of such innkeepers. Foreigners were often referred to reliable innkeepers by friends and family members, for instance.[28]

The case of Georg Naporra, who joined the VOC as a sailor in 1752, demonstrates how financial transactions between guest and innkeeper could also take place. In his autobiography Naporra described his innkeeper, Jan Dirksen, as an 'honest burgher' that treated his guests well and allowed them to go wherever they wanted. Like other immigrants Naporra had to sign a transport-letter to be able to pay for board and lodging. However, he was not forced to hand over the transport-letter to Dirksen but could dispose of it himself. The available sources show that, although Naporra listed Dirksen as his lender, he sold his 150-guilder transport-letter himself to one Herman Heyle for 86 guilders. Naporra subsequently used the proceeds to pay Dirksen in cash and kept the remainder. The remaining amount must have been significant for Naporra arrived in Amsterdam on 6 June and embarked on *De Drie Papegaaien* on 22 July. He had stayed with Dirksen for most of this period at the rate of 0.35 guilders per week, leaving 83 guilders for other purposes.[29]

[25] *VOC Sea Voyagers*; Van Velzen 2006, 30.

[26] To make certain that Figure 4 did not overestimate local use – i.e. because recently arrived migrants stated they were from Amsterdam – a similar analysis was also performed for the VOC chambers of Delft and Enkhuizen. These towns were much less important destinations for immigrants, but more or less identical results were nevertheless found.

[27] Van Gelder 1997, 141.

[28] Van Gelder 1997, 134-135.

[29] Naporra had promised Dirksen, however, to hand over one month's salary (9 guilders) when hired by the Company. The actual costs for board and lodging were thus somewhat higher, but Naporra did not have to use his transport-letter to pay for this. Van Gelder 2003, 139, 148-155, 178-188. When innkeepers did accept the transport-letter they frequently sold them to financiers because they could not afford to hold on to them until

Naporra may have used this money to purchase some travel gear. Immigrants also sent money to their family members back home.[30]

Not all immigrants were as fortunate as Georg Naporra, however. The travel journal of Danish VOC soldier Jens Mortensen Sveigaard (1670) shows, for instance, that he stayed at an inn for 111 days at the rate of five guilders per week. Sveigaard thus owed his hostess 79.28 guilders for board and lodging. As she had also put together his travel gear (26.73 guilders) Sveigaard had accumulated a debt of 106 guilders. His 150-guilder transport-letter apparently did not suffice to cover these expenses and Sveigaard therefore also signed a notarized obligation for thirty guilders.[31] It should not be lost out of sight, though, that the long waiting time of Sveigaard probably was untypical. During the eighteenth century VOC ships sailed out throughout the year[32] and one could also enlist with one of the other maritime employers.

Rather than paying for board and lodging, household revenues were the main concern for locals. To make the transport-letter a worthwhile insurance instrument it obviously had to pay more than the expected income an employee would earn during the eight-month voyage to Asia. The available prices suggest that employees received a bit more than eight month salaries when they signed a transport-letter (see below). As many on-board deaths occurred before the Cape of Good Hope – a voyage that took around 4.5 months – the salary loan might double income earned during that period.[33]

Similar objectives could theoretically have been achieved through other instruments as well. No evidence of this was found, however, and there are good explanations for this. Mutual insurance, for example, depended on cooperation and was therefore primarily used in close-knit communities.[34] Life insurance could have been an alternative, but all

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payments were finally made. They had expenses of their own and had to pay their suppliers. By selling the transport-letter to a specialized financier they could restructure the payments schedule.

[30] See Lucker 2004 for the case of Jacob Dirksen from Norway who worked for the Middelburg Merchant Company between 1727 and 1754. Van Gelder 2003, 184 estimates the costs for travel gear at 30 guilders.

[31] Gøbel 2005, 33-37. Note that this implies that the transport-letter was worth 76 guilders. It seems, however, that Sveigaard only received 0.63 guilders of his 18 guilder advance in cash himself. If the remainder went to his hostess the transport-letter was in fact valued at 58.63 guilders.

[32] Bruijn, Gaastra and Schöffer 1987, 63.

[33] Bruijn, Gaastra and Schöffer 1987, 67, 74, 163. Without insurance, those left behind would simply inherit the salary the employee had earned until his death. Since the VOC pledged the ship and its cargo as collateral for wage arrears, wages would not be paid at all when the ship sank. See Van Bochove et al. 2011. Bruijn, Gaastra and Schöffer 1987, 75 shows that c.2% of the ships departing from the Republic were wrecked during the eighteenth century.

[34] Boon 1996, 76-79.

contemporary (non-maritime) initiatives failed because of the lack of good actuaries.[35] Early modern societies had more experience with life annuities, but these were not practical here because they required the lender to present proof of life. Moreover, the borrower had to pay interest until his death. The transport-letter was therefore a much more practical instrument for general use.

For many of Amsterdam's poor salary loans will have been the only means by which they could create lump sums. Pawnshop credit maybe alleviated some of the vagaries of life, but the proportionality of loan amount and collateral kept the poor from borrowing relatively large sums. Many families may not even have possessed assets or will have been unable to do without them.[36] The amounts that these people could generate by selling the transport-letter (see below) must have been of great importance in the makeshift economy.[37]

Various sources illustrate the two-fold use of the transport-letter by locals. Around one-sixth of the local employees that signed a transport-letter also signed a month-letter, for example. As the month-letter was only payable to close family this shows that a substantial group of locals was concerned about their financial position.[38] The transport-letters themselves, as summarized in the ledgers of the VOC, also show that such concerns existed. In 1740 eight employees on board the *Amsterdam* explicitly stated that the "lender" was their wife, mother or father. For a few dozen others it could be established that their names were identical or at least strongly resembled each other.[39] Establishing the use of transport-letters by analyzing personal relationships thus remains a difficult task.

In addition to these personal links some transfer deeds provide evidence of how transport-letters could be used. On 1 September 1758, for instance, Adam Hogenberg (sailor, 11 guilders per month) "received" 150 guilders from Trijntje Hogenberg. On the same day, however, Trijntje sold the transport-letter to Rutgerus Bouwens for 93 guilders.

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[35] Van Gerwen and Van Leeuwen 1998.

[36] Maassen 1994; McCants 2007.

[37] Cf. Van Nederveen Meerkerk 2007; Van den Heuvel 2007; Van Dekken 2009 on female labor in early modern Holland.

[38] *VOC Sea Voyagers*. This figure underestimates the number of married sailors, however, because it generally includes only those month-letters that were signed upon entering into the labor contract. The VOC also allowed employees' wives to get a month-letter afterwards, but such letters are often not included in the database.

[39] NA, 1.04.02, 6106. Collecting evidence from names was complicated by differences in writing and because women could use their own surnames. In many instances a fake name – Jan Jansz or John Doe – was also used.

Quite similarly Willem van Es (soldier, 9 guilders per month) acknowledged a "debt" of 150 guilders to Dirk van Es on 29 October 1759. Dirk sold the transport-letter on the exact same day to the widow of Jan van Velsen for 69 guilders.[40] The identical surnames of "lender" and "borrower" suggest that both parties were related. The fact that these transport-letters were sold immediately after signing implies that the name of the "lender" had merely been recorded pro forma. Credit had not actually been provided, but the intent was to create a document that could immediately be sold to create a lump sum.

Reviewing the above it has become clear that salary loans fulfilled various functions. They were used to pay for board and lodging, to insure against the risk of dying and to create lump sums. Employees often used them for a combination of these functions. The ability to use these high-risk transport-letters depended, however, on financiers willing to buy them.

THE REGULATORY FRAMEWORK[41]

The rules applying to transport-letters solved the moral hazard problems confronting lenders centuries later. Since the VOC regulated maximum indebtedness by rank lenders could be sure that employees did not become over-indebted. The VOC's elaborate administration made certain that these debt ceilings were indeed not exceeded. As a consequence loan amount and ability to redeem were always in proportion. In addition to this lenders did not depend on a borrower's willingness to redeem because they could collect payments directly from the Company. As regards collecting these payments the VOC maintained a clear order of claims on the salary account too. The Company itself came first if it had fines or costs of medical treatment to claim. Next, the employee himself could receive part of his salary in Asia. As long as the transport-letter had not been redeemed in full this was one month's wage, but this increased to six months' wages once the debt had been fully redeemed. What remained was communicated to the Republic and was payable there. The holder of the month-letter came first and the Company made sure that sufficient money remained in the account to make this payment.[42] The bearer of the transport-letter

[40] SAA, 5060, 170. Adam came from Oude-Tonge, but Trijntje lived in Amsterdam. Willem and Dirk van Es came from the town of Gouda.
[41] This section is largely based on Van Velzen 2006; Van Bochove et al. 2011.
[42] See, for example, ***.

was the last in line with a claim on the salary account and received whatever was remaining.[43]

The employee's salary account thus played a central role in the payments from and to the Company. The salary account of every individual employee was carefully kept in a ledger (*scheepssoldijboek*) on board the ship with which he departed to Asia. Entries for the salary advanced, the gear received from the Company and the transport-letter were already made in the Republic. This method of bookkeeping created a deficit in the employee's balance sheet. During the voyage the book was further debited with, for example, purchases of goods from the estates of deceased colleagues. Salary could not be cashed during the voyage and was only credited upon arrival in Asia. There clerks diligently copied each ledger for use in Batavia and sent the original back to the Republic.

At the moment employees arrived in Asia most still had negative balances, but these gradually decreased over the years as more salary was credited to their accounts. Summaries of these mutations were sent to the Republic annually to keep both copies identical. This elaborate copying allowed the VOC's cashiers in the Republic to make payments from salary accounts with a positive balance. Once an account had run dry, however, holders of month-letters and transport-letters had to await the arrival of the next update before new payments could be made. As long as employees stayed alive these payments would usually follow because employees were not allowed to leave Asia as long as their accounts were in deficit. For practical reasons the Company could not always keep to this principle, however, but in such instances it made sure that sufficient money stayed in the account to redeem the transport-letter.[44] Upon arrival in the Republic no debt would therefore be remaining.

These elaborate regulations show a firm commitment of the Company to protect the interests of the bearers of transport-letters. This must have strengthened the willingness to invest in them. Nevertheless, transport-letters remained far from risk-free instruments. Repayment could take quite a long time because many others held priority and mortality

[43] It should be noted that this system did not take the presence of month-letters into account. As a consequence employees could already start collecting six months' wages in Asia whereas the transport-letter had in fact not been redeemed in full. Once an employee could collect six months' wages instead of merely one the amounts that could be paid in the Republic decreased. Van Bochove et al. 2011 shows that there also existed private debts that attached the salary account as collateral. These bond holders did not receive automatic payment from the Company but required a legal procedure to confiscate the salary.

[44] See, for example, NA, 1.04.02, 14054 f.7.

and desertion further increased risks. The following section will analyze how specialized financiers assessed these risks and determined the prices that could be paid for transport-letters.

Figure 5 about here

PRICING RISK

The complexity of the instrument made that financiers had to take a number of variables into account when pricing transport-letters. The case of Georg Naporra may be used to analyze which variables these were. Naporra signed his 150-guilder transport-letter on 14 July 1752 and presumably sold it immediately to Herman Heyle. On 16 October 1754 – more than two years after he had purchased the transport-letter – Heyle was able to collect 76 guilders form Naporra's salary account. A second payment of 42 guilders followed on 5 November 1755 and the third and final payment of 32 guilders was collected on 12 December 1756.[45] Heyle did not leave the VOC office with 150 guilders, however, because he had to pay 5% transaction costs to the cashier of the VOC when collecting payments.[46] Heyle thus went home with 72.20, 39.90 and 30.40 guilders respectively. He could therefore never have paid Georg Naporra more than 142.50 guilders for his transport-letter.

Of course, financiers like Heyle also had to take the opportunity costs of capital into account. Data about Amsterdam's private credit market suggest that during the eighteenth century an interest rate between 2.5% and 4% was quite common.[47] At 2.5% interest – a favorable scenario for Naporra – the present value of the above series of future payments would have been 132.32 guilders. Naporra did not receive this amount but rather 46.32 guilders less. This difference may seem large, but financiers also had to take various operating costs into account. Many incurred borrowing costs themselves, for example, as they financed their business with external capital (see below).[48] Using the favorable rate of 2.5% interest gives a present value of 122.91 guilders; still 36.91 guilders more than Naporra actually received.

[45] Van Gelder 2003, 178-187; NA, 1.04.02, 6295 f.138. Naporra thus in effect paid 20.8% interest.
[46] ***.
[47] Van Bochove and Kole 2011.
[48] Additionally, labor inputs and other transactions costs had to be compensated for too. These are difficult to quantify, however, and will not be taken into account explicitly here. For a similar debate about present-day micro credit, see ***.

It should be realized that Georg Naporra presented an ideal scenario for a financier because he redeemed the full 150 guilders relatively quickly. Moments and size of payments were never certain, however, and many loans were not redeemed in full because of the high mortality rates. Figure 5 uses historical data to model what financiers should have paid for transport-letters. It uses the proportion of the transport-letter's face value that could be collected as the independent variable. This exploits the fact that a relationship existed between mortality and recovery rates. Distinction is made between a positive and a negative scenario. Both scenarios assume that the first payment was made after 2.25 years, the average for employees on board the *Amsterdam* (1740).[49] Since redeeming a bond mostly took around four to five years, additional payments are modeled after three, four and – if necessary – five years from sailing out.[50] The positive scenario uses an interest rate of 2.5% and assumes that the transport-letter was redeemed in three payments. The negative scenario, on the other hand, is based on 4% and four payments.

Figure 5 shows that when mortality rates were low and recovery rates high (e.g. 85%) a financier could afford to pay 91.90 to 104.08 guilders for a 150-guilder transport-letter. This shows that even under a modest mortality regime financiers could only purchase transport-letters at substantial discounts. When recovery rates declined to 50%, however, discounts further increased and prices ranged between 54.06 and 61.22 guilders only. Unfortunately it is unknown which recovery rates were common when Georg Naporra sailed out. The 86 guilders that he received for his transport-letter suggest that a rate of around 70% to 80% was used. Georg thus compensated Heyle for all those other employees that only partially redeemed their loans.

Large discounts had nothing to do with exploitation of VOC employees, but rather with running sound business operations. Whether discounts were excessive is hard to verify. Only scattered evidence is available to determine to which extent financiers purchased transport-letters at prices predicted by the above model. Prices for the town of Hoorn (1781-1785) show that transport-letters belonging to soldiers and sailors then traded at 60 and 75 guilders respectively.[51] Although this was a period of high mortality rates, especially

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[49] This estimate was based on the departure date of the ship. It does not take into account that financiers purchased transport-letters up to several months before a ship actually sailed out. Observations ranged between a minimum of 1.75 years and a maximum of 5.5 years.

[50] Cf. Van Alphen 1988, 44. For simplicity's sake it was assumed that all payments were of equal size.

[51] Van Alphen 1988, 42; Dillo 1992, 278.

among soldiers, it is hard to determine whether these large discounts were accurate. These prices do show, however, that it was understood that soldiers and sailors represented different risks and that these should be priced differently.

A number of sale contracts in the Amsterdam archive give additional evidence.[52] The 150-guilder transport-letters of two cabin boys (*jongen*; 8 guilders per month) show an ability to adjust prices. On 18 November 1756 one letter changed hands for 78 guilders, whereas on 6 April 1761 an identical instrument raised only 68 guilders.[53] Three other transfers suggest that financiers also adjusted their prices based on the borrower's capacity to raise revenues. On 29 October 1759 the 150-guilder transport-letter of a soldier (9 guilders per month) sold for 69 guilders. A transport-letter of the same face value but belonging to a gunner (*busschieter*; 11 guilders per month) raised 93 guilders on 1 September 1758. The 200-guilder transport-letter of another gunner with a similar wage only fetched an additional 21 guilders on 16 August 1757. The Hoorn data corroborate this finding for a group of employees that signed a 300-guilder transport-letter: those with higher wages received a better price.[54]

Table 1 about here

The above data give evidence of a fairly developed system in which financiers adjusted discounts according to changes in mortality rates and differences in earning capacities. The available prices seem to be of the order of magnitude as predicted by the model. Obviously, it was crucial for financiers that they got their discounts right (and diversified their portfolios). Paying too much was not sustainable and would eventually lead to insolvency, whereas those that paid too little would suffer from the better prices offered by competitors. In an age without statistical software packages the task was daunting, but it could be accomplished.[55]

Experience in dealing with buying transport-letters may have enabled financiers to identify profitable strategies. The case of the Carstens family demonstrates how this

[52] SAA, 5060, 170.
[53] Whether the physical condition of employees was taken into account is impossible to verify.
[54] Based on Van Alphen 1988, 42.
[55] Murphy 2009 showed, for example, that traders in London could price option contracts almost three centuries before a formal model was developed for this.

worked. This family business was established during the late seventeenth century by Anthonie Carstens sr. and Jannetje Jans. It was most likely this Jannetje Jans to whom employees of the Surinam Society recognized debts in 1696. As these debts were held by someone else, Jannetje must still have operated as an innkeeper.[56] She stayed in that business and established an inn with her new husband – Gerrit Closman – after the death of Anthonie sr. (1695). It was Closman that eventually combined the inn with holding on to transport-letters. From 1707 he did this together with Christoffel Melis and in 1713 Closman gave up the inn to fully specialize in buying transport-letters. After Melis' death (1719) Jan – the son of Anthonie sr. and Jannetje – joined his stepfather. Jan's son, Anthonie jr., joined the family business in 1725 at the age of eighteen. Although Closman retired as transport-buyer in 1727 and Jan died in 1763, Antonie jr. stayed in the business until he eventually failed in 1777 (see below).[57]

The main strategy the Carstens family employed for determining discounts was presumably the formation of a large portfolio.[58] A large portfolio, after all, gives a better approximation of the true mortality rate than a small portfolio would. Table 1 illustrates how the three most important financiers in 1740 formed large and diversified portfolios. They did not restrict their investments to this particular ship either, but also invested in the other ships that sailed out for the chamber Amsterdam that year. Financiers like Jan Carstens, Abraham van Roijen and Reinier de Wolff repeated such investments year after year and amassed large portfolios of transport-letters.

For one Amsterdam financier, Jan Simonsz, this portfolio is also known. At the time of his death in 1708 Simonsz possessed 1,701 transport-letters.[59] Simonsz owned transport-letters from Amsterdam (956), but also had sizeable investments in Hoorn (203), Enkhuizen (242) and Zeeland (300). Evidence from Delft illustrates the process through which Amsterdam financiers managed to acquire a position in these other VOC chambers. The Delft chamber offers a unique insight for it required non-locals that cashed a transport-letter to submit to local law.[60] The possibility to distinguish between locals and non-locals was used to determine that only 30.7% of the 1,335,260 guilders cashed during the period

[56] NA, 1.05.03, 541 f.1. See Van Hoboken 1954 for this other person, Harmen Warsinck.
[57] Van Alphen 1988, 80-82.
[58] Possibly financiers also used correspondents at the Cape of Good Hope. Cf. Moree 1998, 58-74; Moree 2003, ***.
[59] Van Alphen 1988, 61.
[60] ***.

1721-1756 was collected by locals. Interestingly, however, the distribution between locals and non-locals was not fixed throughout this period. People from Delft dominated initially but were gradually overtaken by outsiders (see Figure 6).[61]

The single most important financier was Anthonie Carstens jr. He collected 520,000 guilders: 56.2% of the amounts cashed by non-residents and 38.9% of overall payments. Anthonie jr. ran operations of a similar scale in Rotterdam[62] and was also found in Enkhuizen.[63] His success not only derived from his ability to accurately assess discounts but also from the fact that he was able to efficiently fund his business. This not only depended on credit being cheaper in Amsterdam than elsewhere in the Republic.[64] Financiers like Anthonie Carstens jr. were also highly skilled in mobilizing a large network of lenders. The following section will discuss these networks.

Figure 6 about here

FINANCING THE FINANCIER

Although their portfolios of transport-letters were large, the annual income of financiers was modest. The fourteen financiers identified in a 1742 tax report, for instance, had a combined annual income of only 15,200 guilders. The four largest of them – including Anthonie Carstens jr. – reported an annual income of 1,500 guilders.[65] Contrary to what was previously thought financiers thus only received a modest compensation for the amount of capital and work they put into their businesses. This suggests that discounts were indeed in line with those computed in Figure 5. Additionally, many of them must also have been dependent on external funding to finance their operations.

Jan Carstens, who reported an income of 1,000 guilders in 1742, may serve as an example.[66] At an annual return of 2.5% his income represented a wealth of 40,000 guilders, but this would not have been sufficient to finance his purchases of transport-letters. If he

[61] Amsterdam financiers had an advantage in realizing economies of scale. The local VOC chamber was the largest in the Republic and Amsterdam was home too to the WIC, NAVY and a number of plantation companies. This gave local financiers a competitive edge over financiers from other towns.
[62] ***.
[63] Van Alphen 1988, 115.
[64] *Database publicly registered and notarized loans*.
[65] The list also included the other two financiers mentioned in Table 1. See Van Alphen 1988, 56-57, who based himself on Oldewelt 1945.
[66] Van Alphen 1988, 57.

replicated his purchases from employees on the *Amsterdam* (Table 1) on the other fifteen ships that left town that year, he may have bought over 600 new contracts. Taken at 80 guilders each these transport-letters represented a value of around 50,000 guilders. Since financiers repeated such purchases each year, Carstens would have spent over 100,000 guilders before he was able to collect his first payments. A successful financier was therefore not only able to adjust discounts, but also very skilled in mobilizing a large network of lenders.

Fortunately for these financiers the Dutch Republic was home to many people that had money to spare for investment. This had already enabled the Dutch public authorities to issue a sizeable domestic debt and had also made possible considerable foreign investments.[67] However, many of these investors had long time horizons and preferred low-risk investments. It was the accomplishment of the specialized financiers that they were able to turn transport-letters into exactly such an investment. Their actuarial skills enabled them to compute and pass on risks to the employees that signed a transport-letter. This strongly reduced the risk of lending to these specialized financiers and that enabled them to attract funding under normal conditions. They were thus specialists in qualitative asset transformation. They attracted funding from people who were too risk-averse to invest in transport-letters themselves, but who were willing to lend safely through normal obligations. The financiers then used this money to invest in the more complex and risky transport-letters themselves. Unfortunately, no ledgers of financiers have survived to illustrate this practice in detail but the insolvency file of Anthonie Carstens jr. (1777) offers some valuable insights.[68]

It is not fully clear how many people exactly lent money to Carstens, but they seem to have numbered at least 62. Their addresses situate many of these people in the better parts of town.[69] In general these people seem to have felt safe to lend their money to Carstens. Satisfaction with Carstens' business is reflected, for example, in the long-term relationship with at least one lender. Johannes Caudri provided 11,800 guilders to Jan and Anthonie Carstens through five obligations. The first obligation from Jan (2,000 guilders)

[67] Riley 1980; Dormans 1991; Van Bochove 2008, 127-136; Gelderblom and Jonker 2011.

[68] SAA, 5072, 2896. It is not clear what the reason for this insolvency was, but the high mortality and low recovery rates of the 1770s (see below) were probably responsible for it.

[69] Herengracht (7), Keizersgracht (1), Leidsegracht (7), Prinsengracht (7), Singel (10). Van Bochove and Kole 2011 explain that, because of a shift in administrative practices in the Insolvency Chamber in 1777, insolvency files are generally more complete from then onwards.

mentioned in the insolvency file dated from 1 November 1754 and 1755. The second obligation (1,000 guilders) was dated 1 March 1759. Anthonie borrowed on 1 November 1756 (1,800 guilders), 1 July 1758 (2,000 guilders) and 16 January *** (5,000 guilders).

Lenders seem to have been satisfied with private loan contracts rather than notarized contracts.[70] On 1 April 1770 Geertje Heijdeman bought a private life annuity from Anthonie Carstens for 600 guilders. Private loans were also provided by Sara, Elizabeth and Johanna van Heijningen: 3,500 guilders on 1 January 1764 and 2,500 guilders on 12 December 1765. Mattheus van Heijningen also possessed a private bond for 4,000 guilders (1 January 1764). It is also noteworthy that lenders did not charge excessive rates of interest. Geertje Heijdeman received 24 guilders or 4% per year on her life annuity. Heijdeman previously received 3.5% on her 1756 obligation of the same capital sum that was converted into this life annuity. Mattheus van Heijningen also received 3.5% on his obligations. It should not be lost out of sight that transport-letters were also handed over as collateral, but this was common practice even for highly respectable merchants.[71]

In addition to this the high number of female lenders (27) could point to a stable business too. Since widows often lived from the revenues of their investments, the number of widows within this group (13) is of particular importance.[72] The existence of clusters of lenders further suggests that lenders recommended Carstens to each other. Abraham Swartwout occupied a central position in one of these networks. The list shows that four other lenders – Jan, Cornelis and Sara Swartwout as well as Barta van Essendaal – stated they lived with Abraham. Another such network centered around Abraham Wijnands. In this case Elisabeth and Helena Wijnands and Helena Honnoré stated a similar address.

This scattered evidence suggests that the buyers of transport-letters were a regular part of Amsterdam's credit market. The activities of Carstens and other financiers produced an equilibrium in which funding could be attracted and transport-letters could be used

[70] *Database publicly registered and notarized loans* shows that neither Jan nor Anthonie recorded a loan before a notary in 1740. The importance of private loans is further corroborated by the pre-printed loan contract used by Cornelia and Johanna Margaretha de Kemp. They used a contract that was bought in the bookshop of Jan ten Houten situated at the corner of Rokin and Gapersteeg. See SAA, 5072, 3729. See Van Bochove and Kole 2011 for the position of (pre-printed) private loan contracts in the credit market.

[71] See Van Bochove and Kole 2011 for the case of Haarlem silk merchant Simon Bevel. Quite similarly, Cornelia and Johanna Margaretha de Kemp borrowed 2,600 guilders from Hendrik Berg on 28 January 1784 for 6 months at 4%. They handed over various collaterals and the contract also included margin call stipulations. See SAA, 5072, 3729.

[72] ***.

extensively by VOC employees. Yet, it was not a segment without its problems. The following section will discuss how frictions could upset the status quo.

FRICTIONS

A deeper understanding of what could upset the business of financiers requires a closer inspection of their pricing of transport-letters. What the financiers' skills enabled them to do was to price transport-letters when recovery rates were stable in the short run. As long as changes emerged gradually over time financiers could adapt to the new circumstances. Events that suddenly took them outside their safety margins, however, jeopardized the income and financial position of their businesses. The non-arrival of updates and rapid increases of mortality rates were the main culprits.

Updates that arrived in the Republic with some delay did not nearly upset income as much as updates that did not get there at all.[73] The latter had to be established by the VOC before it could request new updates to be made in Batavia. It might take years for these new updates to be compiled and to arrive in the Republic. In the meantime financiers did not receive payments on their transport-letters and this was a major impediment to those that strongly relied on external funding. The case of Abraham van Roijen (see Table 1) illustrates this. In December 1746 he was forced to borrow heavily because the updates on board the ship *Nieuwland* had not arrived in the Republic. This ship had set sail from Batavia on 10 January, but went missing on its way to the Cape of Good Hope. Interestingly, the two notarial deeds listed the VOC as his lender. Both on 14 and 27 December Van Roijen received a 10,000 guilder loan at 3% from the Company. In return he offered a general mortgage and handed over transport-letters to the value of 40,000 guilders as collateral. An important condition for Van Roijen was that he could redeem the loans once the updates had arrived in Amsterdam.[74] Unfortunately it is unclear whether the VOC stepped in financially on more occasions to support financiers like Van Roijen.

Although the non-arrival of updates caused financial frictions between income and expenditure, it did not exert an impact on recovery rates. In this respect an unexpected increase of mortality rates – especially up to the Cape of Good Hope – was a more serious

[73] In such instances the VOC's cashiers wrote the comment "no book" (*geen boek*) on the transport-letters. This prevented financiers from selling them without informing the buyer about this situation. See SAA, 5060, 170.
[74] SAA, 5075, 12889 deeds 456 and 466; *Dutch Asiatic Shipping*, ship id 7238.4.

threat. Financiers were rather vulnerable to this because they could not change their discounts *ex post*. Although mortality rates always fluctuated they were never that high and never increased so rapidly as during the 1770s (see Figure 1). During these years many employees died of typhoid and especially the VOC's military personnel was hit hard.[75]

Anthonie Carstens probably was another victim: he became insolvent in 1777 (see above). Those that managed to stay in business sharply increased their discounts. This was of particular importance for those employees that stayed with innkeepers prior to departure. The large discounts made it difficult to use transport-letters to compensate innkeepers for their services. Since future employees could no longer rely on them to provide board and lodging the labor supply of the East India Company was jeopardized.[76] To ensure it had enough employees the VOC eventually turned into a financier itself. In 1772 the chamber Enkhuizen was the first to do so. During the 1770s the VOC purchased hundreds of transport-letters, but mainly those belonging to soldiers. Between November 1774 and December 1780, for instance, the small Hoorn chamber financed 420 soldiers. Until 1779 Amsterdam had done similarly for 1,534 soldiers. Due to the Fourth Anglo Dutch War (1781-1784) the VOC was forced to purchase the transport-letters of other employees as well. During the years 1781-1786 Hoorn purchased 1,124 transport-letters and Zeeland bought 3,839 transport-letters during the years 1783-1789.[77]

The VOC also resorted to using recruiters to enlist soldiers from 1780 onwards. A recruiter (*werfofficier*) received the rank of lieutenant (50 guilders per month) and he could hire three corporals (14 guilders per month) to assist him. The recruiter would receive 100 guilders per eligible recruit. When he managed to raise a hundred men within a year he received a bonus of 600 guilders and would go to Asia at a salary of 80 guilders per month. If he would not succeed this would be 300 and 50 guilders respectively. Soldiers would receive a chest and kit from the VOC. They could not sign a transport-letter and would not be paid during the voyage to and from Asia. Upon arrival in Asia, however, they would receive 100

[75] According to Bruijn 1976, 223 the mortality rate was 23% during the period 1770-1775. Bruijn, Gaastra and Schöffer 1987, 163 points out that the mortality rate was 24.3% during the period 1780-1784. ***.
[76] Carstens' insolvency may have worsened the situation for it forced innkeepers to find new outlets for their transport-letters.
[77] Van Alphen 1988, 41; Dillo 1992, 93; De Vries and Van der Woude 1997, 645. That Zeeland paid 335,000 guilders or c.48% for nearly 700,000 guilders of nominal debt shows that discounts were indeed large.

guilders.[78] The database *VOC Sea Voyagers* shows that recruiters were responsible for almost 18% of the labor supply of the chamber Amsterdam during the period 1780-1794.

In addition to these measures the VOC also hired complete regiments abroad. The Württemberg, Luxembourg and De Meuron regiments represented some 4,750 men.[79] Combined these various measures enabled the VOC to attract soldiers – and to a lesser extent sailors too – but it had to provide a substitute for the market in order to accomplish this. The equilibrium previously realized by the financiers was thus replaced by one maintained by the Company itself.

CONCLUSION

During the seventeenth and eighteenth centuries salary loans were widely used in the Dutch Republic's maritime sector. Employers like the East India Company facilitated the use of these loans in order to satisfy their large demand for laborers. To attract sufficient numbers of employees they had to address their financial concerns. This paper showed that the main reasons for signing a transport-letter were to pay for board and lodging, to insure the risk of dying and to generate a lump sum. The sustained use of transport-letters was only possible, however, because two fundamental problems were solved.

It was demonstrated that the VOC had put in place clear rules applying to transport-letters. This removed moral hazard problems and protected the interests of lenders. This made sure that a willing group of buyers existed for these transport-letters. It was further shown that specialized financiers were able to accurately determine the risks of transport-letters through the formation of large portfolios. Their actuarial skills enabled them to approximate their present value. This was a crucial accomplishment for it allowed them to determine the price at which they could trade and make their long-term investments. This also made it possible to tap into the wealth of risk-averse investors to fund their businesses. Qualitative asset transformation was at the core of their operations. Unlike what was previously thought, the market for transport-letters was fairly efficient. Prices seem to have been in line with those predicted by the present value model and the income of even the largest financiers was modest. The VOC thus provided a unique case to demonstrate how highly developed Amsterdam's financial market actually was.

[78] ***.

[79] ***.

Nonetheless, specialized financiers were not immune to shocks. Updates that did not arrive could lead to an imbalance between income and expenditure. These, however, could more easily be coped with than with sudden shifts in the mortality regime. The rapid increase of death rates during the 1770s – caused by an outbreak of typhoid – upset the equilibrium that had existed previously. High mortality rates not only forced financiers to increase discounts, but also confronted them with large numbers of transport-letters that did not perform as anticipated. To maintain its labor supply the East India Company was eventually forced to establish a new equilibrium by becoming a financier itself.

REFERENCES

- Alphen, Marc van, ‘Handel en wandel van de transportkoper: Opkopers van VOC-transportbrieven in Enkhuizen (1700-1725)’ (Unpublished MA thesis University of Amsterdam, 1988).
- Alphen, Marc A. van, ‘The Female Side of Dutch Shipping: Financial Bonds of Seamen Ashore in the 17th and 18th Centuries’, in: J.R. Bruijn and W.F.J. Mörzer Bruyns (eds.), *Anglo-Dutch mercantile marine relations 1700-1850: Ten papers* (Amsterdam, 1991), 125-132.
- Bavel, Bas J.P., ‘Rural wage labour in the sixteenth-century Low Countries: an assessment of the importance and nature of wage labour in the countryside of Holland, Guelders and Flanders’, in: *Continuity and Change* 21 (2006), 37-72.
- Bochove, Christiaan van, *The Economic Consequence of the Dutch: Economic Integration around the North Sea, 1500-1800* (Amsterdam, 2008).
- Bochove, Christiaan van, ‘Stuck in the Sound: Danish Borrowing in Amsterdam Between 1757 and 1824’ (paper 2011).
- Bochove, Christiaan van, and Heleen Kole, ‘The Private Credit Market of Eighteenth-Century Amsterdam: Big Money in a Small World’ (paper 2011).
- Bochove, Christiaan van, Michael Milo, Daphina Misiedjan and Ton van Velzen, ‘***’ (paper 2011).
- Boon, Piet, *Bouwers van de zee: Zeevarenden van het Westfriese platteland, c.1680-1720* (The Hague, 1996).
- Brug, Peter Harmen van der, *Malaria en malaise: De VOC in Batavia in de achttiende eeuw* (Amsterdam, 1994).
- Bruijn, J.R., ‘De personeelsbehoefte van de VOC overzee en aan boord, bezien in Aziatisch en Nederlands perspectief’, in: *Bijdragen en mededelingen betreffende de geschiedenis der Nederlanden* 91 (1976), 218-248.
- Bruijn, J.R., F.S. Gaastra and I. Schöffer, *Dutch-Asiatic Shipping in the 17th and 18th Centuries* I (The Hague, 1987).
- Bruijn, J.R., and J. Lucassen (eds.), *Op de schepen der Oost-Indische Compagnie: Vijf artikelen van J. de Hullu* (Groningen, 1980).
- Collins, Daryl, Jonathan Morduch, Stuart Rutherford and Orlanda Ruthven, *Portfolios of the Poor: How the World’s Poor Live on $2 a Day* (Princeton, 2009).
- Dekken, Marjolein van, *Brouwen, branden en bedienen: Werkende vrouwen in de Nederlandse dranknijverheid, 1500-1800* (Amsterdam, 2009).
- Dillo, Ingrid G., *De nadagen van de Verenigde Oostindische Compagnie 1783-1795: Schepen en zeevarenden* (Amsterdam, 1992).
- Dormans, E.H.M., *Het tekort: Staatsschuld in de tijd der Republiek* (Amsterdam, 1991).
- *Dutch Asiatic Shipping* (URL: http://www.historici.nl/Onderzoek/Projecten/DAS/EnglishIntro).
- Easterly, Michael Edward, ‘Your Job Is Your Credit: Creating a Market for Loans to Salaried Employees in New York City, 1885-1920’ (unpublished dissertation UCLA, 2008).
- Easterly, Michael, ‘Your Job is Your Credit: Creating a Market for Loans to Salaried Employees in New York City, 1885-1920’, in: *Enterprise & Society* 10 (2009), 651-660.
- Gaastra, Femme S., *The Dutch East India Company: Expansion and Decline* (Zutphen, 2003).
- Gelder, Roelof van, *Het Oost-Indisch avontuur: Duitsers in dienst van de VOC* (Nijmegen, 1997).

- Gelder, Roelof van, *Naporra’s omweg: Het leven van een VOC-matroos (1731-1793)* (Amsterdam, 2003).
- Gelderblom, Oscar, and Joost Jonker, ‘Public Finance and Economic Growth: The Case of Holland in the Seventeenth Century’, in: *The Journal of Economic History* 71 (2011), 1-39.
- Gerwen, Jacques van, and Marco H.D. van Leeuwen, *Studies over zekerheidsarrangementen: Risico’s, risicobestrijding en verzekeringen in Nederland vanaf de Middeleeuwen* (Amsterdam, 1998).
- Gøbel, Erik, *Jens Mortensen Sveigaards ostindiske rejsebeskrivelse 1665-1684* (Copenhagen, 2005).
- Hart, Marjolein ’t, Joost Jonker and Jan Luiten van Zanden (eds.), *A Financial History of The Netherlands* (Cambridge, 1997).
- Heijden, Manon van der, and Danielle van den Heuvel, ‘Sailor’s families and the urban institutional framework in early modern Holland’, in: *The History of the Family* 12 (2007), 296-309.
- Heuvel, Danielle van den, ‘Getrouwd met Jan Compagnie: Oost-Indiëvaarders en hun echtgenotes in Enkhuizen en omgeving (1700-1750)’, in: *Tijdschrift voor Zeegeschiedenis* 23 (2004), 30-42.
- Heuvel, Danielle van den, *‘Bij uijtlandigheijt van haar man’: Echtgenotes van VOC-zeelieden, aangemonsterd voor de kamer Enkhuizen (1700-1750)* (Amsterdam, 2005).
- Heuvel, Danielle van den, *Women and entrepreneurship: Female traders in the Northern Netherlands, c.1580-1815* (Amsterdam, 2007).
- Hoboken, W.J. van, ‘Een rijke transportkoper uit de 17de eeuw’, in: *Amstelodamum: Maandblad voor de kennis van Amsterdam* 41 (1954), 105-107.
- Ketting, Herman, *Leven, werk en rebellie aan boord van Oost-Indiëvaarders (1595-1650)* (Amsterdam, 2002).
- Kuijpers, Erika, *Migrantenstad: Immigratie en sociale verhoudingen in 17e-eeuws Amsterdam* (Hilversum, 2005).
- Lottum, Jelle van, *Across the North Sea: The Impact of the Dutch Republic on International Labour Migration, c.1550-1850* (Amsterdam, 2007).
- Lucker, Ivonne, ‘Jacob Dirksen: A Norwegian Sailor in the Dutch Republic’, in: Louis Sicking, Harry de Bles and Erlend des Bouvrie (eds.), *Dutch Light in the “Norwegian Night”: Maritime Relations and Migration across the North Sea in Early Modern Times* (Hilversum, 2004), 81-91.
- Maassen, H.A.J., *Tussen commercieel en sociaal krediet: De ontwikkeling van de Bank van Lening in Nederland van Lombard tot Gemeentelijke Kredietbank, 1260-1940* (Hilversum, 1994).
- McCants, Anne E.C., ‘Goods at Pawn: The Overlapping Worlds of Material Possessions and Family Finance in Early Modern Amsterdam’, in: *Social Science History* 31 (2007), 213-238.
- Moree, Perry, *‘Met vriend die God geleide’: Het Nederlands-Aziatisch postvervoer ten tijde van de Verenigde Oost-indische Compagnie* (Zutphen, 1998).
- Moree, Perry, *Kikkertje lief: Brieven van Aagje Luijtsen geschreven aan haar man Harmanus Kikkert stuurman in dienst van de VOC* ([Den Burg], 2003).
- Murphy, Anne L., ‘Trading options before Black-Scholes: a study of the market in late seventeenth-century London’, in: *The Economic History Review* 62 S1 (2009), 8-30.
- Nederveen Meerkerk, Elise van, *De draad in eigen handen: Vrouwen en loonarbeid in de Nederlandse textielnijverheid, 1581-1810* (Amsterdam, 2007).

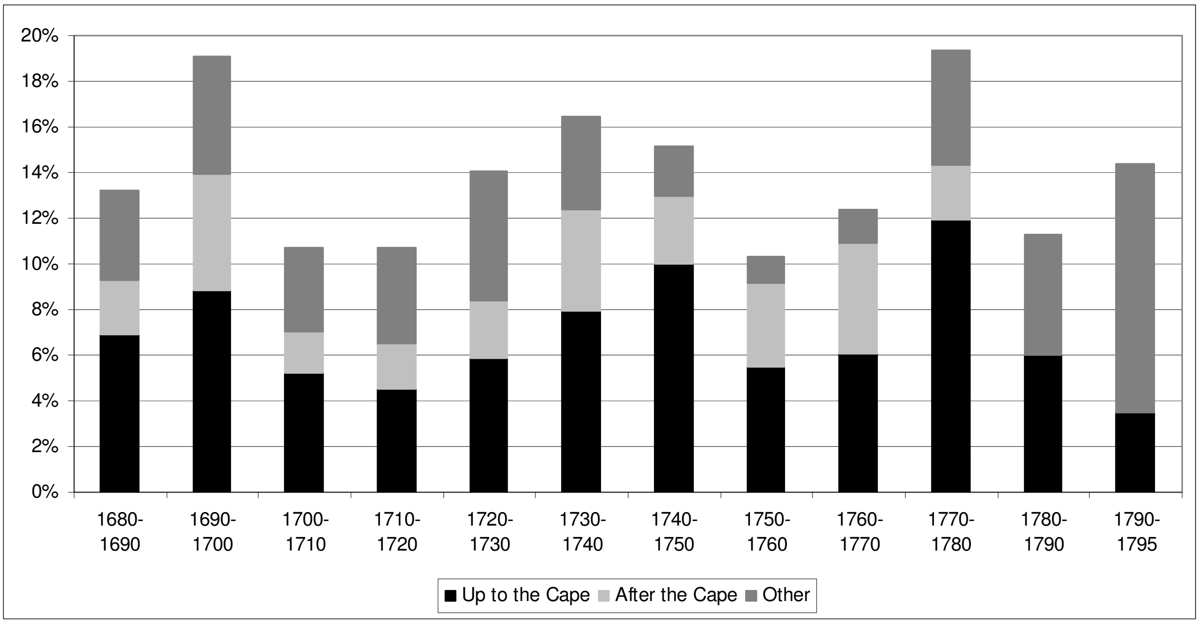
- Oldewelt, W.F.H., *Kohier van de personeele quotisatie te Amsterdam over het jaar 1742* (Amsterdam, 1945).
- Riley, James C., *International Government Finance and the Amsterdam Capital Market 1740-1815* (Cambridge, 1980).
- Royen, Paul C. van, Jaap R. Bruijn and Jan Lucassen, *"Those emblems of hell"? European sailors and the maritime labour market, 1570-1870* (St. John's, 1997).
- Teugels, Jozef L., and Bjørn Sundt (eds.), *Encyclopedia of Actuarial Science* (Chichester, 2004).
- Velzen, Ton van, 'Uitgevaren voor de Kamers; 700.000 mensen overzee', in: Jan Parmentier (ed.), *Uitgevaren voor de Kamer Zeeland* (Zutphen, 2006), 11-30.
- *VOC Sea Voyagers* (URL: http://vocopvarenden.nationaalarchief.nl).
- Vries, Jan de, and Ad van der Woude, *The First Modern Economy: Success, Failure, and Perseverance of the Dutch Economy, 1500-1815* (Cambridge, 1997).
- Wit, Annette de, *Leven, werken en geloven in zeevarende gemeenschappen: Schiedam, Maassluis en Ter Heijde in de zeventiende eeuw* (Amsterdam, 2008).
- Zanden, J.L. van, *The Rise and Decline of Holland's Economy: Merchant Capitalism and the Labour Market* (Manchester, 1993).

Table 1: *The three most important financiers of the* Amsterdam *(1740).*

	Jan Carstens	**Abraham van Roijen**	**Reinier de Wolff**
SAILORS			
Bootsmansmaat	1	0	0
Derdewaak	0	0	1
Hooploper	3	4	4
Jongmatroos	8	5	2
Kwartiermeester	1	0	1
Matroos	4	2	3
Onderkuiper	0	1	0
Onderstuurman	0	1	0
Onder(scheeps)timmerman	0	0	2
SOLDIERS			
Adelborst	1	0	2
Bosschieter	2	6	3
Konstabelsmaat	0	1	0
Lanspassaat	1	0	0
Sergeant	0	0	1
Soldaat	19	9	24
Tamboer	1	0	0
Sailors	17	13	13
Soldiers	24	16	30
Total	41	29	43
% Sailors	41.5%	44.8%	30.2%
% Soldiers	58.5%	55.2%	69.8%

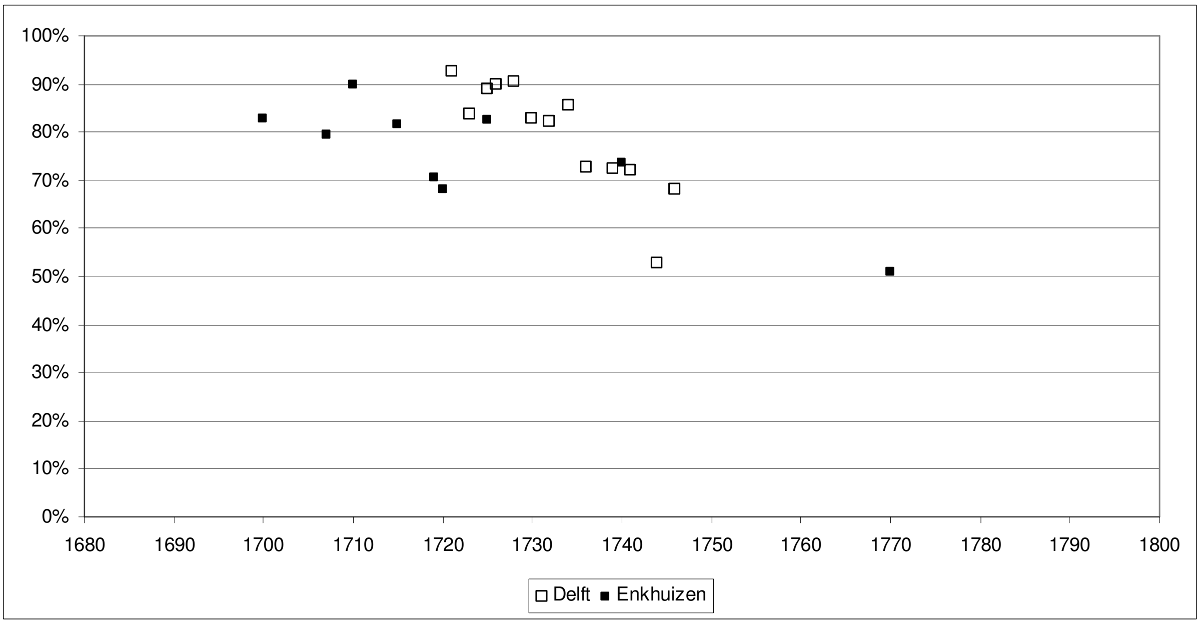
Source: NA, 1.04.02, 6106.

Figure 1: *On-board mortality rates of VOC employees*.



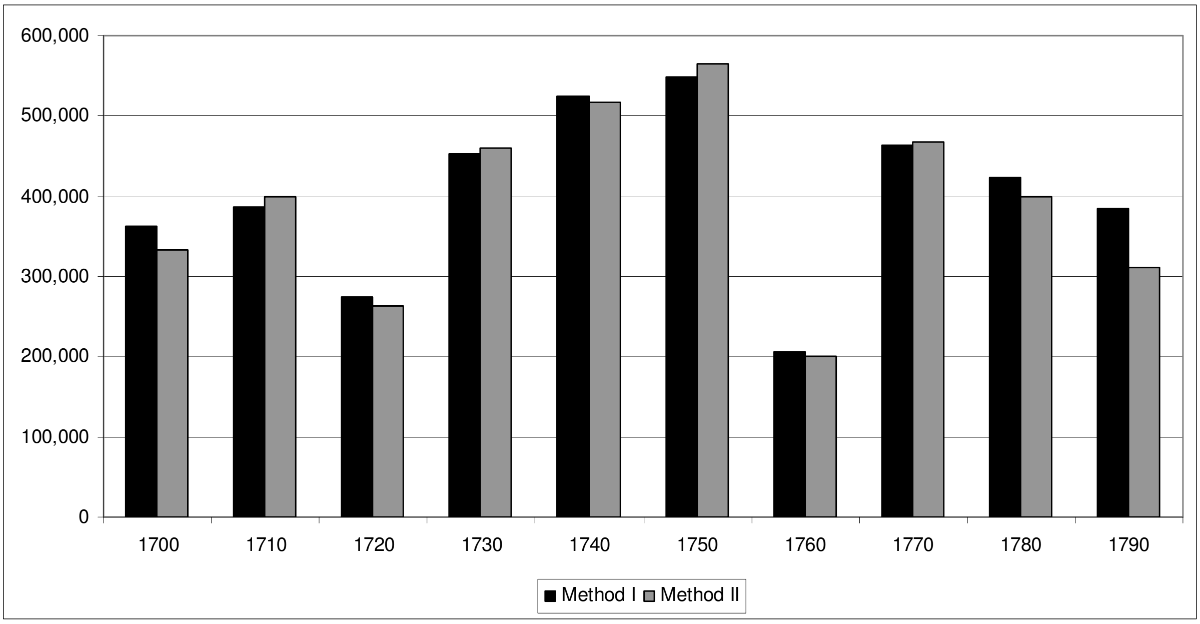
Source: Bruijn, Gaastra and Schöffer 1987, 163.
Note: The mortality rate has been calculated as total deceased employees relative to the number of employees shipped to Asia. The number of employees that died after the Cape was not available for the periods 1780-1790 and 1790-1795.

Figure 2: *Recovery rates in Delft and Enkhuizen as a percentage of the face value.*



Source: Van Alphen 1988, 52-53; ***.
Note: The Delft data are rates per ship whereas the Enkhuizen data are rates for a number of financiers.

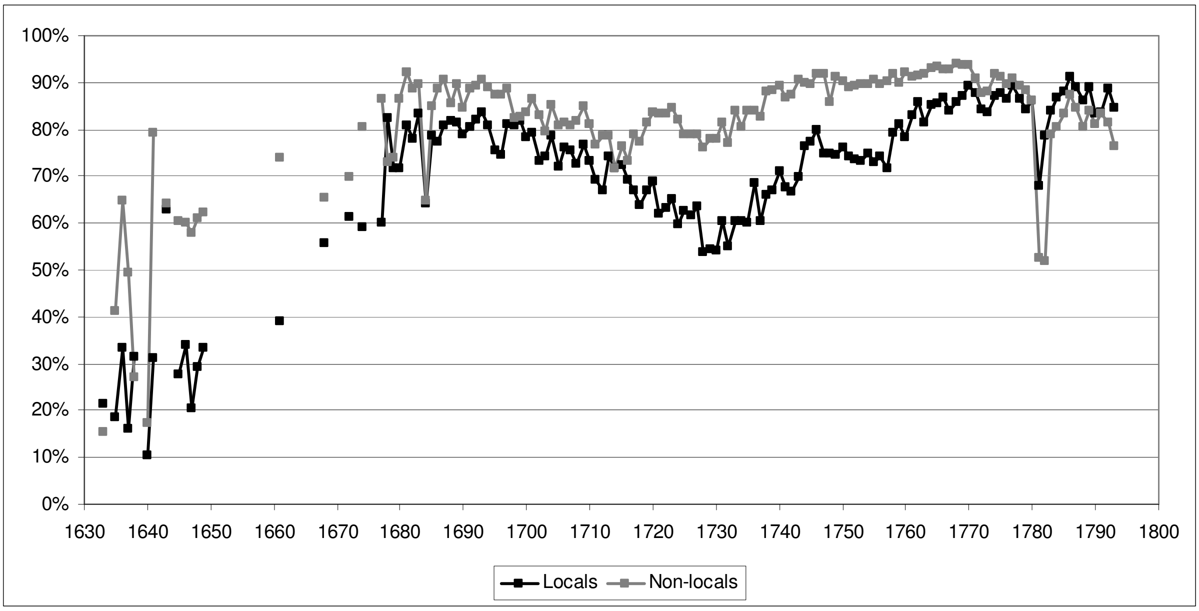
Figure 3: *Face value of all new transport-letters in Amsterdam in selected years (in guilders).*



Source: NA, 1.04.02, ***.

Note: In these sample years 134 ships sailed out for the chamber Amsterdam. The total face value was listed as a summary statistic in 106 ledgers. For the missing cases the debt was estimated based on the average debt per ship (I) and the average debt per tonnage (II).

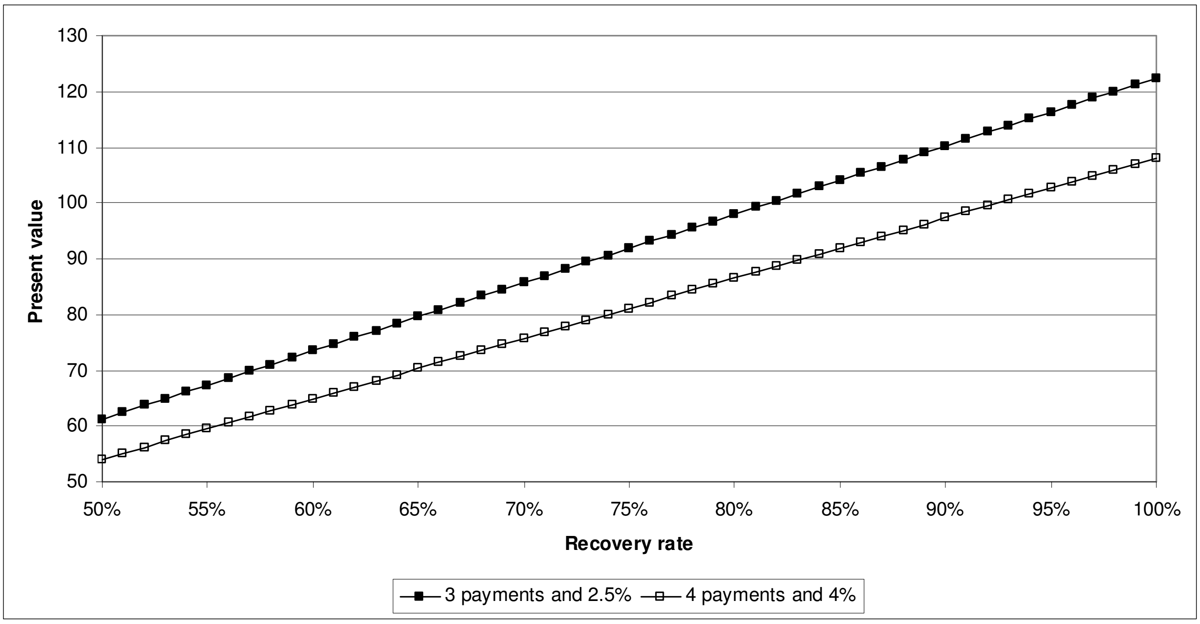
Figure 4: *Share of employees on board Amsterdam VOC ships with transport-letters*.



Source: Based on *VOC Sea Voyagers*.

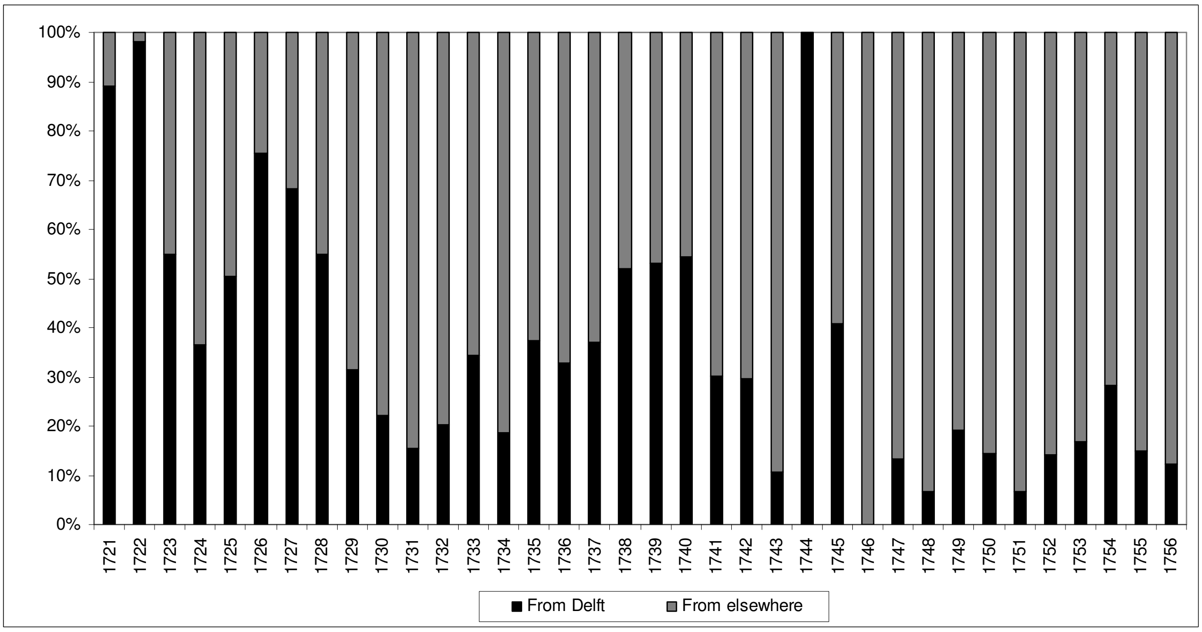
Note: Employees that joined the Company through a recruiter were not included.

Figure 5: *Estimated present value of a 150-guilder transport-letter*.



Source: see text.

Figure 6: *Payments to locals and non-locals in Delft.*



Source: ***.