



Munich Personal RePEc Archive

**The costs and benefits of microfinance.
The market for Dutch East India
Company transportbriefen in 18th
century Amsterdam**

Malinowski, Mikołaj

Utrecht University

9 November 2012

Online at <https://mpra.ub.uni-muenchen.de/64632/>

MPRA Paper No. 64632, posted 28 May 2015 02:26 UTC

The costs and benefits of microfinance. The market for Dutch East India Company transportbriefen in 18th century Amsterdam.¹

Mikołaj Malinowski²

m.malinowski@uu.nl

Utrecht University

This paper has been later published as (this is a very similar version that was submitted to the journal):

The costs and benefits of microfinance. The market for Dutch East India Company transportbriefen in 18th century Amsterdam In: *Social and Economic History Annals* 72, 2012

Introduction

Access to credit is widely regarded as a prerequisite of economic growth and development. It is believed that a lump sum once raised has a capacity to elevate the poor by means of investment in one's own business or human capital. This idea is known as a 'microfinance promise'. Unfortunately, the poor lack financial assets that could be used as a collateral when applying for a loan, they also lack a human capital which would allow them to make a credible commitment in the eyes of the creditors. This is why the underprivileged are locked in a so-called 'poverty trap'. As the poor rarely can offer any guaranties at present, modern microfinance institutions need alternative solutions to the lack of credibility/collateral problem. A potential solution might be to make use of a claim on a future remuneration as a security. This however brings about many problems related to the unpredictability of the future and general mistrust. Despite these odds, Amsterdam financial market in the 17th and 18th century was able to create a sustainable microfinance instrument working as a salary loan known as a transport-letter (transport-brief). In more detail, the employees of the Dutch East India Company (hereafter VOC) were given an

¹ The paper is an outcome of a project organized at Utrecht University about "Cost and Benefits of Microfinance" (2010/2011). The project was a part of Academie Assistenten program organized by The Royal Dutch Academy of Science. The author wishes to acknowledge a tremendous input of: Christiaan van Bochove and Oscar Gelderblom in writing this paper, as well as thank Declan Aylward for the priceless editorial and linguistic support.

² Utrecht University; m.malinowski@uu.nl.

opportunity to sell their future income at a discount with a use of this document, i.e. to obtain a salary loan without the need to use a physical asset as a collateral. An interesting phenomenon about this market was that it created a system of lending with the use of a secondary market as an intermediary. In the majority of cases, the transport-letters were sold primarily not to a person collecting the debt directly, but to an intermediary who, often on the same day, sold this asset to a professional buyer/creditor that bought 'to hold'.³ Both the development of the salary loans and the creation of a secondary market were exceptional by the early modern standards.⁴

What makes the case of the transport-letters even more interesting is the trade without financial journalism. Amsterdam was one of the cradles of this kind of journalism which is crucial for the development of any market as it provides merchants with a reliable and accessible information about the prices.⁵ As every employee was different, for example regarding the occupation, these instruments differed in risk and were, therefore, not fungible. It was thus impossible to create a uniform information about their price that would be publishable in a journal. This suggests that traders in the market were able to price the instruments correctly by themselves.

The transport-letters were popular instruments without a use of a physical collateral and financial journalism, as well as developed a secondary market. This paper is intended to explain this phenomenon by answering the research question: 'how was it possible for a system of salary loans obtained with the trade in the VOC transport-letters based on the intermediation of a secondary market to work sustainably?'. In order to address this issue, several problems need to be investigated. The first sub-question is: 'how was there a primary market for these instruments possible, i.e. how could they create a credible commitment in the eyes of any buyer of a transport-letter? The second sub-question is: 'how were the asymmetries of information overcome in the secondary market?'. The third sub-question that needs to be answered is about the long-term sustainability of the system: 'how could the buyers, given the lack of a relevant

³ Van Bochove, C. & Van Velzen, T., Loans for Salaried Employees: The Case of the Dutch East India Company, 1602-1795, Paper Presented at EHA Conference, Boston 2011.

⁴ Easterly, M., Your Job is Your Credit: Creating a Market for Loans to Salaried Employees in New York City 1885-1920 in: *Enterprise & Society*, Vol. 10, 2009; Dickson, P. *The Financial Revolution in England: a Study in the Development of Public Credit, 1688-1756*, London 1967; Murphy, A. L. *The Origins of English Financial Markets*, Cambridge 2009.

⁵ McCusker, J.J., *The Beginnings of Commercial and Financial Journalism: the Commodity Price Currents, Exchange rate Currents, and Money Currents of Early Modern Europe*, Amsterdam 1991.

financial journalism, assess the risk correctly and purchase the instruments at the right price?'. Had it been different, the system would have collapsed as the buyers would have gone bankrupt or the sailors would have not obtained credit at such a high expense.

There are many ideas grouped around contract theory and information economics that provide theoretical insights as to how such a system could exist. According to Avner Greif, 'a possibility of an ex-ante commitment to being able and willing to fulfil contractual obligations ex-post' is a precondition for any deal to be signed. In his view, institutional developments can explain changes in the markets. This is because they have the power to mitigate the risks and allow debtors to make a credible commitment as perceived by the always sceptical creditors.⁶

This paper argues that the instrument worked despite the above mentioned problems because: (1) there were institutions mitigating the possible asymmetries of information and risks, allowing the employees to make a credible commitment, as well as allowing the traders to exchange the transport-letters; (2) due to specialisation of the buyers of the transport-letters and their domination in the market, the system was sustainable; despite the lack of financial journalism providing them with a ready information, large portfolios allowed lenders to gain knowledge and assess the risk correctly.

This paper will proceed as follows, part I will present the transport-letters and their market. Part II will describe the used sources. Part III will be devoted to the theory of the contract and information economics. Parts IV and V will deal with the asymmetry of information problem on the primary market, namely adverse selection and moral hazard problems, respectively. Part VI will address the problem of the asymmetry of information on the secondary market. Part VII will deal with the problem of creating the knowledge about the correct pricing by the specialised buyers of the transport-letters. The last part will summarise and conclude.

⁶ Greif, A., The Fundamental Problem of Exchange: A Research Agenda in Historical Institutional Analysis in: *European Review of Economic History*, Vol. 4, 2000.

Part I What is a Transport-Letter and Who Trades in it?

The VOC, next to the Navy, was the biggest employer in the Republic of the Seven United Provinces.⁷ It was created in 1602, when the competition between numerous independent companies trading with the East-Indies was so stiff and the margin of profit diminished so greatly that it threatened the very existence of many of the independent companies.⁸ It was politically justified to promote the presence of the Dutch merchants in the East-Indies, as the young Republic was interested in cutting the economic bases of its enemies—Portugal and Spain who were also engaged in the colonial trade in the region.⁹ In order to make it successful, the States-General gave the company many economic and political privileges.¹⁰ The company was subdivided into six chambers located in Amsterdam, Middelburg, Enkhuizen, Delft, Hoorn and Rotterdam. The company developed so rapidly, that it required an ever-growing amount of employees. In the 18th century, it was sending to East-Indies between four and seven thousand people every year.¹¹ It was forced to find ways to attract new people to serve with them, which was a difficult task, due to the very long duration of the service. Traditionally, the labour force was accustomed to a shorter duration of employment, counted in months rather than years. Therefore, shipping to the East-Indies put an employee in an entirely different position than joining a crew on a traditional transport or fishery boat.¹²

The longer duration of the service created some novel problems for the employees concerning their cash flow. The anticipated longer absence required a form of sustainable provision for the sailor's family during his employment, as the employee was no longer capable of providing for his family on the regular basis.¹³ In addition, an employee from outside the city would need money to finance his stay in Amsterdam while waiting for a departure on one of the

⁷ De Vries, J. & Van Der Woude A., *The First Modern Economy : Success, Failure, and Perseverance of the Dutch Economy, 1500-1815*, Cambridge 1997.

⁸ Carlos, A. & Nicholas, S., "Giants of an Earlier Capitalism: The Chartered Trading Companies as Modern Multinationals" in: *Business History Review*, Vol. 62, No. 3, 1988.

⁹ Gaastra, F.S., *The Dutch East India Company: Expansion and Decline*, Walburg 2003.

¹⁰ *VOC 1602-2002: 400 Years of Company Law*, Gepken-Jager E. & Van Solinge, G. & Timmerman, L. (eds.), Deventer 2005.

¹¹ Gaastra, F.S., *Op. cit.*, 2003.

¹² Van Bochove, C. & Van Velzen, T., *Op. cit.*, 2011.

¹³ Van Der Heijden, M., & Van Den Heuvel, D., *Sailors' Families and the Urban Institutional Framework in Eary Modern Holland in: The History of the Family*, Vol. 12, 2007.

ships.¹⁴ In order to address these needs, the VOC offered many ways in which an employee or his family could obtain the money. Before the beginning of his employment, upon signing the contract, an employee could take two months' salary known as a handgeld. The second option was a month-letter (maandbrief); With the use of this a sailor could allow a member of his family to collect three months' salary from his account every year. Even when an employee did not request such an instrument, a wife could come and claim part of her husband's income.¹⁵ An employee could also withdraw six month's salary every year from his account, while being in the East-Indies. Of course, he could also take all the accumulated savings from his account after the return to the Netherlands, once his employment would have been finalised.

The handgeld was often not enough to cover all the expenses of a low-rank employee in Amsterdam. In addition, a month-letter could be used, for the first time, only after several months, when the information from Batavia about the employee's cash flow would have finally arrived.¹⁶ Therefore, it did not provide money for the family instantly. In addition, due to a high mortality rates on the VOC ships, there was a substantial risk that the family would not be able to collect the money at all, as the sailor might die before earning any wage.

For all these reasons, i.e. (1) to finance a stay of a sailor in Amsterdam and to insure his family and (2) give them money to make-ends-meet, before they would be able to use the month-letter, a transport-letter was designed.¹⁷ In principle, with the use of this instrument an employee could entitle someone to collect a certain amount of money from his salary account. This instrument could be sold by the employee to someone at a discount, i.e. for a price below its face value, before the beginning of his employment. In such a situation, in a practical sense, the money paid for the letter was a credit and the discount was an interest rate. The transport-letter was, therefore, a form of a salary loan. The holder of this instrument could collect the money from the account of the employee directly.¹⁸ A holder of a transport-letter could collect the debt only if there was some money left on the account. Holders of the month-letters were allowed to

¹⁴ Van Alphen, M., 'Handel en Wandel van de Transportkoper: Opkopers van VOC transportbrieven in Enkhuizen (1700-1725)' (Unpublished MA thesis, University of Amsterdam), 1988.

¹⁵ Van Der Heijden, M., & Van Den Heuvel, D., *Op. cit.*, 2007.

¹⁶ Van Bochove, C. & Van Velzen, T., *Op. cit.*, 2011.

¹⁷ *Ibidem.*

¹⁸ *Ibidem.*

collect the money before the holders of the transport-letters. In a case of the debtor's death the remaining debt was not inherited by the family.¹⁹

There were numerous problems related to the collection of the debt. The most important one was a serious possibility of death of an employee during his service for the company. Figure 1 plots the mortality of the VOC employees. According to the results, the journey to the East-Indies was the most hazardous part of the whole employment. A typical duration of the voyage between the Netherlands (Patria) and Asia (Batavia) took between 238 and 257 days.²⁰ In addition, throughout all of the 18th century, more than ten percent of the employees would die during the service. As Patria never knew if the employee was still alive, i.e. if he was actually earning any money, it gave the money from his account only after a ship with an information about his cash flow came from Batavia.²¹ A fleet usually sailed to Amsterdam twice a year.²²

Figure 1 On-board mortality of the VOC employees, represented as percentages of the total crew.

Now that the basic principles of the transport-letters have been described, it is worthwhile to take a closer look at the actors active in the market, namely employees, intermediaries and professional buyers, as well as scenarios typical for this market. The employees were a very diversified group. In fact, there were 67 different occupations that someone could be assigned to while enlisting with the company.²³ All the employees of the company were male. Salary of the employees varied greatly and was strictly related to their occupation.²⁴ The VOC's demand for the employees throughout the early modern period was so high that increasingly more employees came from abroad. In 1607 only five percent of those destined to Asia were foreigners. This number increased and in 1635 it was already around 32 percent. In 1780 nearly half of the

¹⁹ Ibidem.

²⁰ Bruijn, J.R. & Gaastra, F.S., *The Dutch East India Shipping, 1602–1795, in a comparative perspective in: Ships, sailors and spices. East India Companies and their Shipping in the 16th, seventeenth and eighteenth Centuries*, Bruijn, J.R. & Gaastra, F.S.(eds), Amsterdam 1993.

²¹ Van Bochove, C. & Van Velzen, T., *Op. cit.*, 2011.

²² Gaastra, F.S., *Op. cit.*, 2003.

²³ VOC Sea Voyagers project database: available at: <http://vocopvarenden.nationaalarchief.nl/>, access 5.10.2011.

²⁴ Van Bochove, C. & Van Velzen, T., *Op. cit.*, 2011.

employees came from outside the Republic.²⁵ Service with the company usually lasted approximately five years.²⁶ Figure 2 plots that in the 18th century 60 to 80 percent of the employees of the Amsterdam's Chamber issued a transport-letter, with a decline towards the end of the 18th century.

Figure 2 Share of employees signing a transport-letter in selected years, 18th century (Chamber Amsterdam).

Innkeepers and brokers were the people for whom the original transport-letter was usually drawn. In practice, these two groups served as intermediaries between the debtors (employees) and creditors (specialised buyers of the transport-letters). For this reason these people were known as the soul-traders.²⁷ The innkeepers and brokers were in need for liquidity; They had to pay their retailers for goods and, therefore, were always in need of cash.²⁸ Concerning the brokers, the trade in the securities was one of their many occupations, as they did not have enough capital to purchase many instruments to hold. For this reason, in order to buy new ones, they had to sell the old ones first. Therefore, both the innkeepers and the brokers were likely to sell the instrument to specialised buyers in the secondary market soon after they had obtained it.

This last group defined as the specialised buyers, collectors or creditors, usually bought noteworthy amounts of transport-letters and made their living out of this trade (see part VII). Christiaan van Bochove and Ton van Velzen present a case of Carstens family, who gathered knowledge about this trade for many generations and combined collecting the claims with running an inn.²⁹ This group needed to mobilise significant funds in order to purchase the instruments. Figure 3 presents the inflow of the new obligations in several selected years. The values oscillated between two hundred and five hundred thousand guilders. This money came usually from the financial market, rather than the savings of these individuals.³⁰

²⁵ Van Lottum, J., *Across the North Sea: The Impact of the Dutch Republic on International Labour Migration, c.1550-1850*, Amsterdam, 2007.

²⁶ Van Der Heijden, M., & Van Den Heuvel, D., *Op. cit.*, 2007.

²⁷ Van Alphen, M., *Op. cit.*, 1988.

²⁸ Van Bochove, C. & Van Velzen, T., *Op. cit.*, 2011.

²⁹ *Ibidem.*

³⁰ Van Alphen, M., *Op. cit.*, 1988.

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

Marc van Alphen in his study presented a group of financiers in Amsterdam financing the big buyers using the instrument as a collateral for loans. The interest on these loans at the end of the 18th century was high and around six percent, i.e. twice the coupon on the Holland's public debt bonds.³¹

Moreover, Christiaan van Bochove and Ton van Velzen argue that it was a very difficult trade. Not only it required mobilising significant funds to purchase the instruments and wait for the repayment, but it also demanded an ability to price the value of all the instruments. If the specialised buyers purchased them too cheaply they would go bankrupt, if they bought too dearly they would be crushed by a stiff competition (see part VII).³²

There were several possible scenarios in the trade in this security (see table 1). A transport-letter could be used as an extension of a month-letter. For example, a husband who wanted to permit his wife to take more money from his account than just the three month's salary, could not do so in any other way than by drawing a transport-letter and giving it to her for free. In such a situation, the wife could either restrain from selling the instrument and gradually collect the full face value of the instrument herself, or save a possibility of obtaining a loan later (scenario A).³³ She could also sell the instrument to a broker at a proper discount, to get a part of the money up front and transfer the risk related to her husband's death (scenario B). In addition, Christiaan van Bochove and Ton van Velzen describe situations where an employee sold a transport-letter directly to a specialised buyer to obtain the credit (scenario C).³⁴ In both of these situations (B and C), we can talk about households obtaining a salary loan on the primary market.

Table 1 Various scenarios in the market for the salary loans with the use of a transport-letter.

³¹ Ibidem; Gelderblom, O. & Jonker, J., Public Finance and Economic Growth, The Case of Holland in the 17th Century in: *The Journal of Economic History*, Vol. 71, No. 1, 2011.

³² Van Bochove & Van Velzen, Op. cit., 2011.

³³ See: NA, 1.04.02,5481 folio 91.

³⁴ Van Bochove & Van Velzen, Op. cit., 2011.

An employee instead to his spouse could give the document to an intermediary who would then sell it to a specialised buyer. There were two main scenarios possible. In the first one an employee would use the document as a means of payment and give it to an innkeeper with whom he would be staying before the beginning of his employment. The innkeeper would cash the document by selling it to a professional creditor (scenario D). An employee could also sell the document to a broker at a discount, in order to get the money up front. Then the broker would sell the instrument to a professional buyer (scenario E). Scenarios D and E were the most common ones in the market (see part VI).

Part II Sources

The study of the market for transport-letters is based on the data obtained from the VOC ledgers (scheepssoldijboek). Every ship of the VOC had its own book, recording the cash flow on the salary accounts of its crewmen. Every book was kept in two copies. One was used in Patria and a second in the East-Indies. Updates were sent to the Republic each year to keep both the copies identical.³⁵ There was much information recorded in the book, namely: name of the ship, origin of the ship, year of the departure, destination, name of a sailor, origin of a sailor, his occupation, his salary, existence of a month-letter or transport-letter, a cause of termination of the employment and the time of termination of the employment. This information was gathered by the VOC Sea Voyages project conducted by the Dutch National Archive. The database constructed by the project accounts for approximately 740,000 observations from the 17th and the 18th century.

Unfortunately, the database does not present any information about the size of the payment obligation, nor the actual payments from the individual accounts which were also recorded. For this reason, additional data was collected for the benchmark years 1700 and 1780. One big and few smaller ships were chosen to make the sample representative. In addition, data on one ship from 1740 were also collected, in order to have any insight into the period between these observations.

³⁵ Ibidem.

Table 2 Basic descriptive statistics of the collected data.

The new database broadens the original one by: the name of the original creditor(s), possible relation of the original creditor(s) with the employee, size of the debt(s), name of the collector(s), possible relation of a collector with the employee, dates of the collections and sizes of instalments. In total there were data collected regarding 1,313 debt contracts that were successful, i.e. someone managed to collect any money using the transport-letter as a claim from an account. There were records on 2,594 individual payments collected. This subset of collected data is the core of the empirical analysis. It must be underlined, that the debt contracts which were not successful were not taken into account in the analysis as they have not left much trace in the sources. Table 2 presents the basic descriptive statistics of the collected data. The very low percent of the repaid debts from the ship *Held Woltemade* was caused by the fact that the ship was taken by two English frigates on the first of July 1781.³⁶

There were numerous problems related to the data collection. First, the person listed as an original creditor may have not necessarily purchased the transport-letter. Christiaan van Bochove and Ton van Velzen provide an example of a sailor who sold his letter to a professional buyer and still had his innkeeper listed as a creditor.³⁷ It is impossible to tell, using the available data, how common such a practice was. Therefore, for the purpose of this study, all the people listed as the original creditors will be considered as such.

Moreover, an employee could have issued a number of transport-letters. In such a case, where there were several collectors it could prove hard to find information as to which one was collecting money using which transport-letter. If there were a few collectors visible, it was hard to tell if the instruments were sold to one person who sold it to someone else in a secondary market later, or if there were different owners of different instruments. Luckily, there were only 67 cases of multiple transport-letters in the database. Moreover, in many cases there was incomplete information about either a date or the name of a collector; there was only information about the amount of money paid for the debt. Fortunately, this was marginal and occurred only 85 times, mostly in 1780 and among soldiers and sailors.

³⁶ Dutch Asiatic Shipping project database: available at: <http://www.historici.nl/Onderzoek/Projecten/DAS>, access 23.10.2011.

³⁷ Van Bochove & Van Velzen, Op. cit., 2011.

Part III Relevant Theory

This paper is intended to address three research questions: (1) 'how was a primary market for these instruments possible?'; (2) 'how were the asymmetries of information overcome in the secondary market?'; (3) 'how could the buyers, given the lack of a relevant financial journalism, assess the risk correctly and purchase the instruments at the right price?'. As has already been mentioned, according to Avner Greif, 'a possibility of an ex-ante commitment to being able and willing to fulfil contractual obligations ex-post' is a precondition for any deal to be signed. Lack of surety that this could and would happen prevents people from engaging in business deals. The author, therefore, calls this problem the Fundamental Problem of Exchange (hereafter the FPOE). The idea that the information and confidence in the future are the crucial preconditions for any deal to be made is widely used in economics. It is the basis of the information economics and contract theory.³⁸

According to the theory, information, the key component, can be symmetrical or asymmetrical and perfect or imperfect. The actors in the market, i.e. creditors and debtors, are known in the literature as principals and agents, respectively.³⁹ The imperfect/perfect dimension of the information deals with the problem of the very existence of the information on the market. In a perfect situation, all the factors influencing the terms of a contract are known by one of the sides or the other. In the case of an imperfect situation, no one possesses the knowledge about some crucial factor. The asymmetry of information problem deals with the question of distribution of the information on the market. If the information is symmetrical, both the principal and the agent are equally aware of all the factors that can influence the terms of the exchange. If the information is asymmetrical, one of the players, usually the agent, can use this fact to her advantage by hiding some important piece of information that could have a negative effect on her utility. Conversely, agents who compete between each other for contracts/loans are interested in making the principal aware of their positive qualities to increase their utility. Usually, information on the market is asymmetrical. These features of the markets link to two problems known in the literature as adverse selection and moral hazard. In principal, the adverse

³⁸ Greif, A., Op. cit., 2000.

³⁹ According to the convention principal is a he and agent is a she.

selection problem stems from the asymmetry of information upon signing a contract. It consists of attracting a wrong group of agents by the principal. There can be things that the agent knows about himself that are unknown to the principal, at the time of signing the contract. In order to mitigate this risk he increases the price of his services. By setting the price too high, the principals risk attracting only those agents who do not intend to hold to their contractual obligations and, therefore, are ignorant towards the price.⁴⁰ The asymmetry of information and adverse selection in particular are problematic for the exchange for several reasons. First and foremost, due to a lack of full trust and complete information about the agent, the principal has a tendency not to believe that he is going to honour his obligations. Asymmetry of information decreases utility of one of the sides, prevents the principal from assessing the risk correctly and forces him to buy the contract too dearly (and decrease the agent's utility) or too cheaply (and decrease his). The principals do not trust strangers as they lack reliable information about their financial situation and willingness to honour the commitment.

The second problem related to the asymmetry of information is the moral hazard. Put simply, it consists of a question about the credibility of the commitment of an agent and his willingness to honour his obligations, after the principal has honoured his. Once the agent's needs have been satisfied, he can selfishly choose to rebel and not make the promised effort. Whereas the adverse selection problem consists of the lack of knowledge about the agent at the time of signing the contract, moral hazard is related to a lack of control/information over the future actions of the agent, as well as perfect or imperfect information about the conditions that would influence his behaviour after signing the contract. Moral hazard is problematic in many ways. If the agent's effort is not observable once he has signed the contract he will exert the effort level that is most beneficial for himself not the principal. Due to the lack of knowledge and surety, exactly like in the case of adverse selection, imperfect information and uncertainty will result in bad pricing.

⁴⁰ Akerlof, G.A., "The Market for 'Lemons': Quality Uncertainty and the Market Mechanism in: The Quarterly Journal of Economics, Vol. 84, No. 3, 1970.

Part IV Overcoming the Adverse Selection Problem in the Primary Market

The adverse selection problem in the case of the 18th century primary market for salary loans with the use of the transport-letters could potentially have been a major obstacle. There were numerous things an employee could have been eager to hide from the creditor that would have influenced his evaluation of the risks involved. For example, in order to increase his utility an employee could have been tempted to lie to the principal about his real occupation. The salary of an employee depended on his rank. Therefore, the pace of repayment was a function of the occupation. Table 3 plots that the mean payment, i.e. money collected by a collector, differed between the occupations. They were crucial also because the mortality decreased with the higher ranks on the ship, i.e. the higher the rank the greater the chance of employee's survival. Empirical studies show, that the chance of death of the low-rank employees, especially sailors and soldiers was much greater than in the case of the high-rank personnel.

Table 3 Mean payments by category of occupation, data for 1700 and 1780.

The second problem was the family situation of an employee. The closest family was entitled to collect the money before the owner of a transport-letter through the use of a month-letter. They were thus collecting money that otherwise would be collected by a holder of a transport-letter. In order to study the impact of the month-letters on the dealings of the holders of transport-letters, several OLS (ordinary least squares) regressions were made. The results of the empirical analysis show that a simultaneous issue of a month-letter decreased probability of a full repayment of the obligation by 36 percent. This is because, in the case of people whose families had a month-letter, on average nearly eight guilders (fl.) were deducted from their accounts with every payment. Given the high mortality the pace of repayment was crucial. The empirical analysis shows that, even these of the studied employees who also issued the other document that repaid the debt in full did so on average half a year later. All of this proves that traders in transport-letters could be indeed reluctant to buy claims on those who issued also a month-letter. Other obligations of an employee were yet another problem. Potentially, he could have issued several transport-letters, sold them and let the creditors worry about the order of claims. Moreover, he

could have taken out a loan far beyond his factual potential of repayment. Additionally, a sailor could have been aware of his poor health or even a terminal condition and yet still sign for a loan.

The institutional arrangements present on the market mitigated the above mentioned problems. The issue of occupation and salary was solved by the clerks of the VOC. The transport-letters were issued by the company. The letters stipulated various information about the employee. Among them were: name, origin, rank, salary and name of the ship he served on. The information about the occupation and the salary was, therefore, clearly specified on the document and certified by the VOC. The problem of the month-letters was more complicated. The document did not inform the principal about the family's situation and the existence of the people entitled to collect the money via a month-letter. This information was present in the VOC ledgers, but access to these books was limited to the clerks of the VOC. The transport-letter, however, provided information about the origins of the employee. If an employee was from Amsterdam it was not a problem for someone from his family to visit the VOC headquarters and collect the money, therefore it was more probable that he would issue a month-letter. However, families from outside the city could still be interested in going occasionally to collect three months' salary. They could also hire a specialist, for example a captain of a ferry, to collect the money for them.⁴¹ In the case of the foreigners, the transport costs were likely too high for their spouses to come and claim the money. The possibility of an intermediation was also much smaller. Therefore, the information about the origins of an employee that was available to the principal, could be used as an, imperfect, indication of the existence of a month-letter. This intuition is supported by the findings presented in the table 4. Employees from outside the Republic were much less likely to allow someone to collect the money with the use of a month-letter.

Table 4 Prevalence of month-letters among the studied sailors coming from the cities which appear more than five times.

⁴¹ See: Utrecht's Archive [U083b027](#).

The third problem was the potential existence of many other creditors and selling out by an employee more future income than he would be able to earn. This problem was solved by a credit ceiling imposed by the VOC. There were few levels of restriction. Most of the employees could sell no more than 150 guilders of their future income. The high-rank employees however, such as officers, could have debt obligations for up to 300 guilders.⁴² In addition, an employee could divide the debt and sell it partially to few people. Since the threshold was a function of the occupation, which was known to a principal, he was also aware of the ceiling. Therefore, if the principal decided to buy a transport-letter allowing to collect the amount of money equal to the ceiling, he could be certain that there were no other collectors. This was the dominant situation.

The last problem was related to the health situation of an agent. The transport-letter stipulated information about the occupation which translated into health conditions on a ship. In the primary market this problem could have been also solved by a phenomenon known in the literature as signalling, i.e. conveying creditable information. The principal bought the transport-letter from the agent directly. This meant that he was able to make his or her own impression regarding his health. For example, the principal could see his teeth and the overall state of health, and assess the risk.

To sum up, the actors in the market were able to overcome imperfection and asymmetry of information. Principals were able to design different contracts for different types of buyers and distinguish which employee fit to which category. This was possible thanks to the appropriate design of the transport-letter that stipulated appropriate information, limits on borrowing kept by the VOC and a personal contact between principal and the agent.

Part V Overcoming the Moral Hazard Problem in the Primary Market

The moral hazard problem might have been relevant for the market for the transport-letters for several reasons. Firstly, an employee was signing a contract with the VOC possibly months before the actual start of his employment. He was, however, able to sell a transport-letter right after signing the contract. Therefore, since he already had the money for selling the document the employee could have been tempted not to start the actual employment. He could have simply

⁴² Van Bochove, C. & Van Velzen, T., Op. cit., 2011.

fled the city never to return. Secondly, there was a problem related to the sailor's ability to spend money during his service. Since the employee already took the money for his future earnings, why should he limit his consumption in Batavia? In addition, any health expenses or penalties were also deducted from the sailor's account. The conditions which would force an agent to use the money in Batavia or make him to risk his health or disobey the company were unknown to the principle.

The VOC created a list of rules that secured interest of the creditors and the credibility of the company. An employee could spend his wage on consumption in the East-Indies. In order to protect holders of the month- and transport-letters and ensure that there would be some funds to pay for a medical treatment or punishments, which an employee would have to cover himself, the VOC allowed an employee to take a maximal six month's salary from his account a year.⁴³ Therefore, the VOC solved the problem of the potential frivolous consumption by itself. Moreover, an employee could not return to Patria if there was no one-year wage on his account saved, to ensure that all the claims on his account would be satisfied.⁴⁴ In general, sailors mobility was greatly restricted.

As described, an employee could choose to run from Amsterdam before boarding the ship, but after obtaining the money. According to Marc van Alphen, the innkeepers, known as the soul-traders, made sure that their 'guests' would not escape.⁴⁵ It was in their best interest, as usually they were also the original buyers of the transport-letters and therefore were interested in the repayment of the debts. They were also allowed to take the handgeld, which they were obliged to return to the VOC, should the employee run away.⁴⁶ In contrast, Christiaan van Bochove and Ton van Velzen cast some doubt on this traditional story and give examples of the situations when the employees could enjoy freedom of movement and still stay with an innkeeper.⁴⁷ There was no (known) regulation and control over the sailors who came from Amsterdam, as they did not stay with an innkeeper. In their case, however, some reputation mechanism could take place, which discouraged them from breaking the deals with the people from the same city.

⁴³ VOC Sea Voyagers project database.

⁴⁴ Van Bochove, C. & Van Velzen, T., Op. cit., 2011.

⁴⁵ Van Alphen, M., Op. cit., 1988.

⁴⁶ Ibidem.

⁴⁷ Van Bochove, C. & Van Velzen, T., Op. cit., 2011.

A study of the sailors who did not board a ship (figure 4) plots that the number of the people who escaped and issued a debt obligation was limited, and nearly always less than 50. In addition, having in mind that more than the half of the employees were signing the debt obligation, it is important to notice that the number of the people who signed the instrument and escaped was minimal in a comparison to those who did not (660 to 7088). Clearly, there was a mechanism that was preventing people with debts from escaping. In addition, out of these 660 people who escaped 302 (45 percent) came from Amsterdam and 358 (55 percent) did not. At the same time, 62 percent of all the employees on average came from outside Amsterdam, whereas 38 came from the city. Similarity of the respective shares suggests that both the people coming from Amsterdam and the newcomers who signed a debt contract were similarly constrained. This contradicts the idea that the newcomers were locked up by the innkeepers whereas the people from Amsterdam were entirely free.

To summarise, next to the adverse selection there was also the problem of moral hazard. It consisted of the lack of control over the future actions of the employee. The VOC solved this problem partially by imposing various regulations and limits on spending. Illness and punishment were, however, an unresolved problem. In addition, the indebted employees were probably forced to board the ship.

Figure 4 Number of people who did not board a ship of the VOC, debtors vs. no debtors, by year, 18th century (Chamber Amsterdam).

Part VI Overcoming the Asymmetry of Information on the Secondary Market

Now that it has been proven that a transport-letter was a reliable security, it is time to address the question ‘how come a secondary market for these instruments was possible and how were asymmetries of information overcome?’. The adverse selection and moral hazard problems were nonexistent in the secondary market, due to the change in the actors. The documents in this market were exchanged between two traders, rather than the borrowers and lenders. For this reason, the adverse selection and moral hazard problems must have been dealt with in the primary market first for a secondary market to exist. Despite this, the only possible remaining

problem was the asymmetry of information, as it was hypothetically possible that a seller of the instrument possessed an important information, which he or she was hiding in order to sell the instrument at a higher price.

The analysis of the asymmetry of information problem will be subdivided into three phases corresponding to three different situations in the market. The first phase deals with an exchange before the information about sailors' earnings and well-being arrived from Batavia, i.e. before there was any money to collect. The second phase was when the information arrived and changed the situation in the market. The third phase was during the time of the actual collection of the money. Due to an entirely different dynamics, one should rather talk about a secondary market of the first phase and a second secondary market in the second and third phases (during the collection). In the first phase, secondary market was used to contact borrowers and lenders, whereas later it was used as an exit strategy for lenders enabling the liquidity.⁴⁸

Once the initial outline has been presented it is worthwhile to proceed with the analysis of the first phase of the trade, i.e. before the information on the well-being of an employee arrived. In this phase no one knew which sailors were going to survive the trip to Asia and which were not, therefore, no one knew which of the instruments were worthless. The only kind of asymmetry of information was between the original buyer of the document and the second holder, as the original buyer met the employee in person and was able to assess his health condition. It could also have been theoretically possible that an original buyer, as any holder of the instrument, could have lied about the employees' qualities, for example by saying that his rank had been higher than in reality.

This problem was overcome by the market. Table 5 plots that nearly all the documents changed hands after the original transaction. The material was based on the comparison of the people showing up to collect money with the people listed as the original creditors. As mentioned, it is impossible to tell what happened with an instrument if no one collected any money. Different names, i.e. change in the ownership of the document on the secondary market, appear from 84 percent of the cases in 1700 to, as high as, 100 and 97 percent in 1740 and 1780 respectively. The same names appear rarely (always less than five percent) and mostly in case of family members and institutions such as orphanages, which were practically selling the children

⁴⁸ Harris, L., *Trading and Exchanges: Market Microstructure for Practitioners*, Oxford 2003.

to the VOC (Weeshuijs te Haarlem, Weeshuis te Leiden, Weeshuis van Buijksloot, Amsterdamse Weeshuis), i.e. in the situations when someone wanted to allow a person to collect the money rather than obtain a credit. There is, however, an interesting case of a group of specialised buyers appearing both as original creditors and collectors. It suggests that there used to be a segment of the credit market that was not using the intermediation of the secondary market. This phenomenon, however, seems to have been marginal (only eight percent at the beginning of the century) and that nearly disappeared throughout the century. The professionals also bypassing the intermediation of the secondary markets in 1700 were: Jacob Croeger/Kroeger (34 instruments), Catharina van Gogh (3 instruments) and Jan Sijmons (3 instruments). In general, it can be concluded that, the instrument nearly always changed hands on the secondary market.

In contrast, as stated before, Christiaan van Bochove and Ton van Velzen, using additional sources, provide an example of a sailor who listed someone as a creditor and sold the instrument to someone else.⁴⁹ It is therefore impossible to tell, using only the VOC ledgers, which changes in the names were indications of transactions and which were not. In addition, as has been explained earlier, there are problems with identification of the family members in the database. It is likely that many of these holders were people related to the household of the employee.

Table 5 Change in the ownership in the secondary market (before the collection).

The asymmetry of information was overcome by the proper design of the instrument as it stated all the necessary information. In addition, it is unlikely that meeting a sailor in person would provide the original holder with a significant advantage. This is because, hypothetically, the VOC screened qualities of the employee even before any trader, when deciding whether to employ him. For this reason being employed could be used as a some sort of a health certificate. Nevertheless, all the subsequent transactions were characterised by a perfect symmetry of

⁴⁹ Van Bochove, C. & Van Velzen, T., Op. cit., 2011.

information, all the traders knew only what was written on the instrument, as well as a lack the entirely imperfect information if the employee was still alive.

How was it possible, if there was no means of determining which sailor was alive and which was not, that the people traded in this instrument so extensively? Joseph Stiglitz suggests that situations of perfect information and situations of entirely imperfect information create similar circumstances in the market.⁵⁰ No one knew which instruments were going to pay back and which were useless. This created a symmetry of information. This is the same principle that applies to the famous Schrödinger's cat theoretical experiment; If a cat was to be locked in a box with a poison, and there would be a 50 percent chance for the poison to kill the cat within an hour, after that period for an outside observer the cat would be both alive and dead in the same time, as there would be no chance of knowing his condition.

In addition, all the instruments were, in the end, bought by the collectors. Table 5 plots that there were very few instruments that did not change hands, and it was often because the instrument was given to a person to hold (a family member or an orphanage). For this reason, they could be traded safely as there was no risk, for a person not interested in collecting the money, that he or she would end up with a worthless document. This argument supports Joseph Stiglitz's thesis that lack of information can foster the trade in a way similar to the perfect information.

Once the symmetry of information is proven in the first phase it is time to move to the analysis of the problem in the second phase. At this point the information about the condition of an employee comes to Amsterdam for the first time. As has been mentioned, the most dangerous part of the employment was the journey to the East-Indies. The situation can be compared to a lottery; The winning transport-letters and losing were being 'drawn'. The question is: 'how could the market have had reacted to those changes, given the potential asymmetry of information?' When a current holder of the transport-letter went to the VOC to check the information and collect the money he, and only he, was informed about the condition of the employee. If the letter turned out to be worthless due to the death of the employee, the holder could have done two things. He could dispose of the letter, or make a use of the asymmetry of information and the fact that only the holder of the letter could check the account, and try to sell it to someone

⁵⁰ Stiglitz, J.E., *Economics of Information and the Theory of Economic Development*, NBER Working Papers 1566, National Bureau of Economic Research, Inc. 1986.

pretending that it was a 'winning ticket'. If the employee was alive, the holder could decide to either hold to the document, in order to collect more money in the future, or sell the document on the secondary market at a higher price as the risk was lower than in the first phase, i.e. 'cash the prize'.

Table 6 Change in the collectors by year, a comparison of the first and the last person collecting the money from an account (secondary market in the second and the third phase).

Any sort of a lie was not an option in the market, clerks of the VOC put all the relevant information about the employee directly on the letter, i.e. size of the claim, collected money and a possible termination of employment. Therefore, the institutions created by the VOC prevented existence of worthless transport-letters, or sale of an instrument which had been already used to collect the money to a naive buyer. In fact, this sole institutional arrangements solved all the information problems in the secondary market.

In the collection phase collectors could have had new incentives to sell the instrument such as: (1) since the value of the instrument was diminishing with the collection, in the end the transport costs (for example, travelling to Amsterdam to collect money) could be greater than the obligation; (2) investors could have been in need for money and therefore would have need to liquidate their assets; (3) an employee could have signalled with his poor repayment that he was a bad debtor, i.e. there was little money on his account due to family, or his poor health situation, and therefore, the holder could have decided to sell the asset.

As in the previous cases, the holder could be willing to sell a bad instrument and try to hide its condition. Table 6 also illustrates the situation in this phase of the trade, showing examples of changes in the ownership of the instruments. It suggests that the problem that could possibly threaten the exchange was mitigated. The asymmetry of information problem was overcome by the fact that the performance of the employee was noted on the transport-letter, i.e. all the transactions and dates. It was, therefore, impossible to hide it.

Part VII Development of the Specialised Market

Now that it has been proven that the secondary market for the transport-letters managed to eliminate the problem of the asymmetry of information, it is time to move to the problem of the imperfect information. The main hypothesis here is that the buyers did not require an institution that would price the instruments for them, but were able to do it correctly by themselves thanks to the specialisation.

As has been described earlier, the market for the transport-letters was a competitive one. Christiaan van Bochove and Ton van Velzen argue that if a buyer was not able to price the risk correctly, he was either forced out from the market by the competition or went bankrupt.⁵¹ Having said that, it is worthwhile to take a closer look at the possible types of collectors and conceptualise their behaviour in the market. This theoretical distinction will allow for a better understanding who the people trading in the market actually were.

One can imagine three classes of investors operating on this market. The first class, which can be called amateurs or speculators could be characterised by the fact that they did not construct big portfolios and were not interested in long-term investments. They bought instruments in order to re-sell them and they were not particularly interested in pricing them appropriately due to the instant transfer of the risk. The second group can be described as semi-professionals, they did collect many instruments and were characterised by a long perspective when investing, but might have lacked the full knowledge about all the insights of the trade in an instrument. Due to a lack of knowledge, they tended to price the instruments incorrectly and fall from the market. In addition, as they were not fully specialised, they could have sometimes been in need of liquidating their assets to meet some other commitments. The last group consisted of the specialised buyers, they treated the trade in the transport-letters as a profession. They bought many instruments to hold and were prepared for a long-term investment. They also possessed the knowledge on how to price the instruments correctly.

The traders could obtain the information about the correct pricing by experience. The knowledge could be passed from generation to generation, as in the case of the Carstens family, described by Christiaan van Bochove and Ton van Velzen. The other way of getting the

⁵¹ Van Bochove, C. & Van Velzen, T., Op. cit., 2011.

experience was collecting extensive portfolios of instruments and learning what should the optimal discount rate be. The bigger the portfolio, the higher the chance of assessing the appropriate discount rate correctly, in line with the central limit theorem. In addition to this, having such portfolios would also be an indicator of a specialisation.

To sum up, the existence of large and specialised portfolios could be a sign of two things. One is that the holder was a specialised buyer and was learning how to price the instruments. On the other hand, if the collectors on the market purchased only small amounts of instruments, it could have been a sign that they were not specialised, i.e. that they speculated or were semi-specialised and, as a consequence, they did not obtain any or gained only little knowledge about the instrument.

The best way to observe characteristics of these theoretical investors in the market for the VOC transport-letters is by observing how much money they managed to collect. This variable depends both on the size of their portfolios and duration of the investment. Collection of large amounts of money shows that they possessed many instruments and held on to them. Small amounts indicate that they either owned little portfolios and/or were not holding on to them. An empirical analysis proves that the market was gradually more and more dominated by few specialised buyers. In more detail, in the year 1700 the share of the people collecting small amounts of debt was around 50 percent. By 1780 this share dropped to approximately 20 percent. It is clear that the market was evolving towards the specialisation. In the year 1700 only three individuals possessed shares of as high as ten percent of the global collected debt (Lijber Amelonger, Jacob Croeger, and Jan Bergh), and were followed by a homogenous group of investors having around five percent of all the debts collected. In 1780, just two people controlled one third of the market (Jan Starink [20%] and D. Waalwijk [12%]), followed by six individuals having more than five percent. Together, these merchants held more than three quarters of the market. A study of this inequality with the use of the Gini coefficient suggests a similar trend. The coefficient grew from 0.68 in 1700 to 0.80 in 1780, which suggests a growing inequality among the collectors, i.e. dominance of the specialised individuals. In the case of the benchmark year 1740, two thirds of the market was part of very large portfolios (Jan Carstens [28%] , R. de Wolff [23%] and Abraham Roijen [16%]) and four fifths by large buyers in general. The results for the year 1740, even though support the thesis are also overestimated due

to the fact that only one ship was used in the sample. In addition, the table 6 shows that there was no secondary market in the collection phase in 1740 and 1780. This suggests that these specialised buyers were therefore buying to hold.

The question remains, as to whether this specialised group was indeed more successful in a correct assessment of the risk. A study of the recovery rates, i.e. the size of the debt reclaimed, can provide some insight. It must be stated that low recovery rates do not necessarily have to mean poor pricing of the purchased documents; It is possible that the specialists took into account such a high risk when purchasing the instruments. Table 7 shows that the specialised buyers, in 1700 and 1740 were enjoying higher recovery rates in comparison to the total market, with Jacob Kroeger as the only exception.

Table 7 Recovery rate of the individual big buyers in comparison to the total debt, by year.

1780 is an interesting case as the recovery rates of the selected specialised buyers were much lower than the already low total recovery rate. One reason for this could be that the contracts that came from 1780 were signed before the outburst of the fourth Anglo-Dutch war, which began in December 1780 and lasted until 1784. For this reason the traders priced the risk incorrectly, as they, most probably, did not anticipate this political/military events. For example, they purchased transport-letters of crewmen selling on the ship *Held Woltemade*. As mentioned, this ship was taken by two English frigates on the first of July 1781.⁵² Interestingly, the analysis without the captured *Held Woltemade*, still yields the same results, i.e. that recovery rates of the two specialised buyers were lower than the total one. This suggests that the traders indeed gained their expertise by rising big portfolios and obtaining experience. Such a system would be expected to fall under unprecedented external shocks to the market or a structural discontinuity.

There were several consequences of the fact that the market was dominated by the specialised buyers. As there were increasingly more individuals possessing significant portfolios, they could learn from them about the correct pricing of the instruments. Had the market been dominated by a swarm of the individual buyers there would have been a chaos, as no one would have been able to price the instruments systematically. Another consequence was that the size of

⁵² Dutch Asiatic Shipping database.

the secondary market was minimal. It has been presented in a great detail that there was no problem with selling the instrument. However, as the people were buying them to hold, hardly anyone was doing so. Thanks to the institutions in the market mitigating the moral hazard problem, collectors were sure that sooner or later there would be money on the account, provided that the employee survived. In addition to this, as they held big portfolios, they were not interested in the transaction costs, such as travelling to Amsterdam, exceeding the anticipated payment.

Part VIII Summary and Conclusions

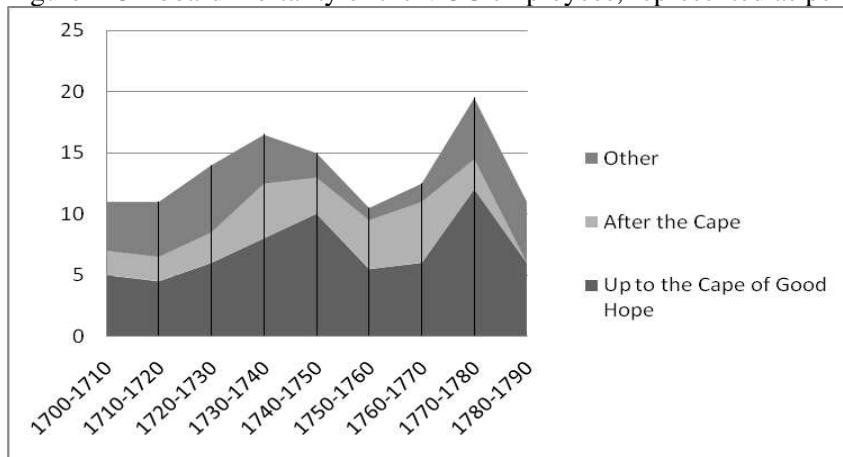
In this paper, the system of contacting borrowers and lenders on a market for the salary loans obtained with the use of the VOC transport-letters by the intermediation of a secondary market has been described. It has been investigated how it was possible for such a system to develop. The hypothetical explanation is two pronged, on the one hand it is suspected that there were institutional arrangements present in the market, which allowed the poor to make a credible commitment in the eyes of the lenders, as well as mitigating mistrust on the secondary market. On the other hand, the system is suspected to have been sustainable, thanks to the development and dominance of a specialised group of buyers, who were able to price the risk correctly. It has also been noted that the system was an outcome of the historical circumstances. On one side, there were employees who needed to support and insure their families or finance their stay in Amsterdam before the departure. On the other, there were investors acting in a well developed financial market. In the middle, there were the innkeepers, hosting the employees, as well as the people who were trying to make-ends-meet working as brokers. Self interest on the part of all three groups was the fuel for the system.

In order to investigate the hypothesis, three sub-questions were posed. Firstly, it had to be understood what made the transport-letter an interesting security to purchase, i.e. why people were willing to pay for it. Secondly, it was asked how were the asymmetries of information overcome on the secondary market? The asymmetries are believed to be an impediment to exchange. Lastly, it has also been asked how could the buyers assess the risk correctly and purchase the instruments at the right price? For the purpose of the analysis, contract theory and

information economics were used with special focus on adverse selection and moral hazard problems. It has been described that the construction of the document, together with a control over the actions of the employees provided by the VOC, ensured that there would be money on the employees' accounts and that the creditors would be able to collect it. In addition, there was no asymmetry of information on the secondary market, as all the existing and relevant information was noted on the document. It has also been shown empirically, with the use of specially collected primary sources, that the market was indeed dominated by a group of specialised buyers. They possessed extensive portfolios, which allowed them to price the transport-letters correctly and stay in the business.

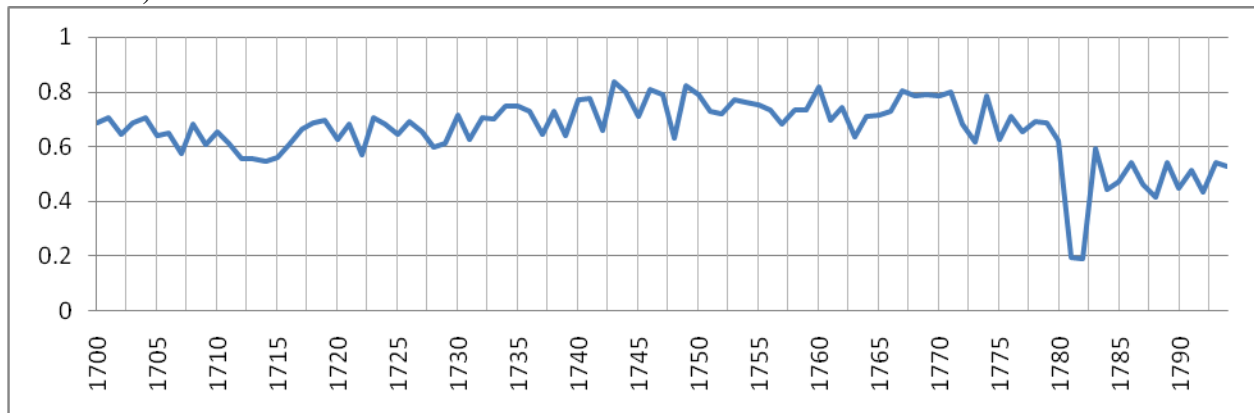
The system offers few insights as to how to organise a microfinance institution. Firstly, the system allowed poor employees, lacking both physical assets and credibility that could be used as a collateral, to obtain a loan on the private credit market, which would not have been given to them in a pawnshop nor by a money broker. In addition, they gained access to a long-term credit which was exceptional. However, there were significant costs related to the existence of this system, that an employee had to cover. Next to the high discount that he was losing, an employee had to face a great limitation of his freedom. As shown, there are reasons to suspect that, once getting the loan he could not leave the city before the departure. In addition, the VOC limited his spending and freedoms in the East-Indies, to ensure that there would be money earned to put on his account. In summary, in order for the system to be sustainable the employees had to suffer even more discomfort than they would have had experienced merely due to the nature of the service. It also seems that the VOC created this system for its own profits, to enable the employees to work with them, rather than for the sake of the poor sailors and soldiers.

Figure 4 On-board mortality of the VOC employees, represented as percentages of the total crew.



Source: Bruijn, J.R. & Gastra, F.S. & Schöffer, L., Dutch-Asiatic Shipping in the 17th and 18th Centuries, The Hague 1987..

Figure 5 Share of employees signing a transport-letter in selected years, 18th century (Chamber Amsterdam).



Sources: VOC Sea Voyagers project.

Figure 6 Face value of all new transport-letters issued in Amsterdam in selected years (in guilders).



Source: Van Bochove & Van Velzen, Op. cit., 2011.

Table 3 Various scenarios in the market for salary loans with the use of a transport-letter.

scenario	Type	comment on primary transaction	intermediary holder	collector
A	no loan	no cash	Family	family
B	primary market	no cash	Family	collector
C	primary market	no intermediation, cash/credit transaction	none, bought directly by a collector	collector
D	intermediation of sec. market	no cash/instrument as payment	Innkeeper	collector
E	intermediation of sec. market	cash/credit transaction	Broker	collector

Table 4 Basic descriptive statistics of the collected data.

ship	year	n. crewmen	n. transport-letters	n. any payment	n. repayment	% repayment
Amsterdam	1740	285	220	187	72	32.7
Generale Vrede	1700	333	269	254	142	52.8
Groenendaal	1780	359	274	248	92	33.6
Held Woltemade	1780	292	169	157	10	5.9
Herstelder	1780	61	50	50	37	74.0
Kattendijk	1700	211	163	142	82	50.3
Mercuur	1780	206	164	158	91	55.5
Overnes	1700	161	130	117	71	54.6
total	x	1908	1439	1313	597	x

Source: see the text.

Table 3 Mean payments by a category of occupation, data for 1700 and 1780.

occupation	% of all employees	number of payments	mean payment in fl.
high-rank = entitled to 300fl. Debt	9.24	173	104
Boschiter (gunner)	23.8	577	54
Matroos (sailor)	29.38	530	73
Jongmatroos (deck hand)	2.66	37	54
Hooploper (low rank sailor)	4.97	102	41
Soldaat (soldier)	19.09	508	40
Other	10.39	236	66

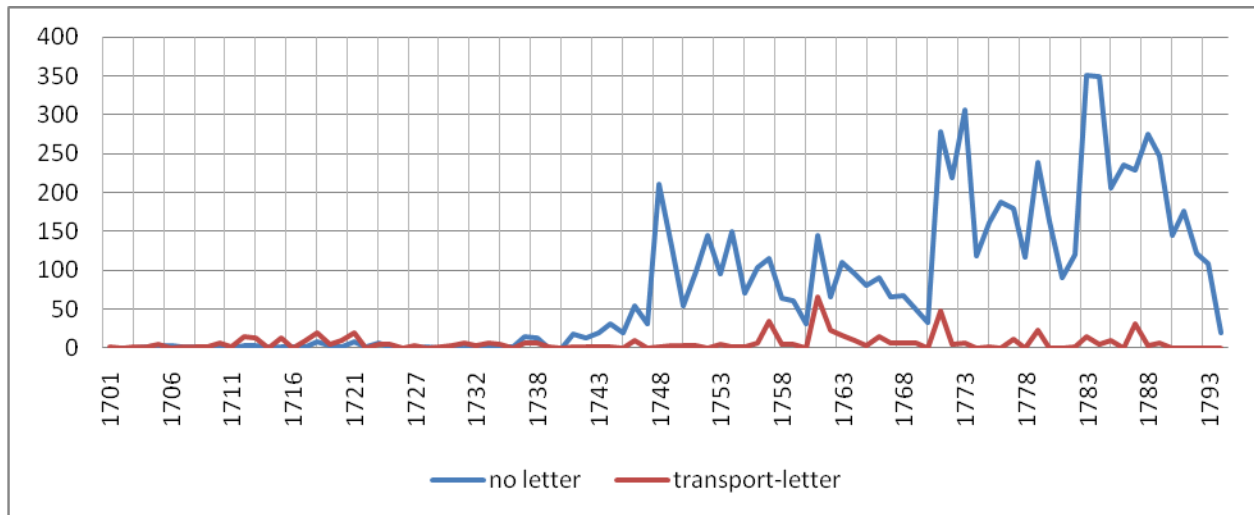
Source: see the text.

Table 4 Prevalence of month-letters among the studied sailors coming from the cities which appear more than five times.

Place of origin	no letter	letter	% letter	Dutch/foreign city
Sardam	3	3	50	Dutch
Amsterdam	301	113	27	Dutch
Haarlem	17	6	26	Dutch
Rotterdam	11	3	21	Dutch
Utrecht	13	3	19	Dutch
Konigsberg	6	1	14	Foreign
Hamburg	19	3	14	Foreign
Stokholm	13	2	13	Foreign
Leiden	19	2	10	Dutch
Bergen	6	0	0	Foreign
Berlin	7	0	0	Foreign
Kopenhagen	8	0	0	Foreign
Paterboorn	8	0	0	Foreign
Bremen	10	0	0	Foreign
Gdańsk	10	0	0	Foreign
Other	670	55	8	primarily foreign
all cities	1121	191	15	

Source: see the text.

Figure 4 Number of people who did not board a ship of the VOC, debtors vs. no debtors, by year, 18th century (Chamber Amsterdam).



Sources: VOC Sea Voyagers project database.

Table 5 Change in the ownership in the secondary market (before the collection).

relation between original holder and collector	1700	1740	1780
n pairs	512	184	612
different name	432 (84,3%)	184 (100%)	592 (96,7%)
same name: family	15 (2,9%)	0	2 (0,3%)
same name: institution	0	0	7 (1,1%)
same name: specialist	40 (7,8%)	0	2 (0,3%)
same name: other	25 (4,9%)	0	9 (1,5%)

Sources: see the text.

Table 6 Change in the collectors by year, a comparison of the first and the last person collecting the money from an account (secondary market in the second and the third phase).

Change	1700	1740	1780
Yes	121 (27,5%)	6 (3,3%)	21 (3,5%)
No	319 (72,5%)	174 (96,6%)	581 (96,5%)
N	440	180	602

Source: see the text.

Table 7 Recovery rate of the individual big buyers in comparison to the total debt, by year.

buyers	recovery rate
Total 1700	78.97
Lijbert Amelonger	80.82
Jacob Croeger	64.59
Jan Bergh	81.42
Total 1740	48.09
Jan Carstens	64.39
R. de Wolff	59.53
Abraham Roijen	62.68
Total 1780	59.3
1780 without <i>Held Woltemade</i>	66.09
Jan Starink	50.68
Jan Starink without <i>Held Woltemade</i>	59.65
D. Waalwijk	55.58
D. Waalwijk without <i>Held Woltemade</i>	60.92

Source: see the text.

Bibliography:

Sources:

VOC Sea Voyagers project database: available at: <http://vocopvarenden.nationaalarchief.nl/>, access 5.10.2011.

Dutch Asiatic Shipping project database: available at: <http://www.historici.nl/Onderzoek/Projecten/DAS>, access 23.10.2011.

VOC *scheepssoldijboek*, Dutch Nationaal Archief (NA): 1.04.02.5481, 1.04.02.5488, 1.04.02.5492, 1.04.02.6691, 1.04.02.6696, 1.04.02.6698, 1.04.02.6699.

Secondary and related literature:

Akerlof, G.A., *The Market for "Lemons": Quality Uncertainty and the Market Mechanism* in: *The Quarterly Journal of Economics*, Vol. 84, No. 3, 1970.

Van Alphen, M., *'Handel en Wandel van de Transportkoper: Opkopers van VOC transportbrieven in Enkhuizen (1700-1725)'* (Unpublished MA thesis University of Amsterdam), 1988.

Van Bochove, C. & Van Velzen, T., *Loans for Salaried Employees: The Case of the Dutch East India Company, 1602-1795*, Paper Presented at EHA Conference, Boston 2011.

Bruijn, J.R. & Gaastra, F.S. & Schöffer, L., *Dutch-Asiatic Shipping in the 17th and 18th Centuries*, The Hague 1987.

Bruijn, J.R. & Gaastra, F.S., *The Dutch East India Shipping, 1602–1795*, in a comparative perspective in: *Ships, sailors and spices. East India Companies and their Shipping in the 16th, seventeenth and eighteenth Centuries*, Bruijn, J.R. & Gaastra, F.S.(eds), Amsterdam 1993.

Carlos, A. & Nicholas, S., *Giants of an Earlier Capitalism: The Chartered Trading Companies as Modern Multinationals* in: *Business History Review*, Vol. 62, No.3, 1988.

Collins, D. & Morduch, J. & Rutherford, S., & Ruthven, O., *Portfolios of the Poor: How the World's Poor Live on \$2 a Day*, Princeton 2009.

Dickson, P. *The Financial Revolution in England : a Study in the Development of Public Credit, 1688-1756*, London 1967.

Easterly, M., *Your Job is Your Credit: Creating a Market for Loans to Salaried Employees in New York City 1885-1920* in: *Enterprise & Society*, Vol. 10, 2009.

Gaastra, F.S., *The Dutch East India Company: Expansion and Decline*, Walburg 2003.

Gelderblom, O. & Jonker, J., *Public Finance and Economic Growth, The Case of Holland in the 17th Century* in: *The Journal of Economic History*, Vol. 71, No. 1, 2011.

VOC 1602-2002: 400 Years of Company Law, Gepken-Jager E.& Van Solinge, G. & Timmerman, L. (eds.), Deventer 2005.

Greif, A., *The Fundamental Problem of Exchange: A Research Agenda in Historical Institutional Analysis* in: *European Review of Economic History*, Vol. 4, 2000.

Harris, L., *Trading and Exchanges: Market Microstructure for Practitioners*, Oxford 2003.

't Hart, C.M. & Jonker, J. & Van Zanden, J.L., *A Financial History of the Netherlands*, Cambridge 1997.

Van Der Heijden, M., & Van Den Heuvel, D., *Sailors' Families and the Urban Institutional Framework in Early Modern Holland* in: *The History of the Family*, Vol. 12, 2007.

Van Lottum, J. *Across the North Sea: The Impact of the Dutch Republic on International Labour Migration, c.1550-1850*, Amsterdam, 2007.

Macho-Stadler, I. & Pérez-Castrillo, D., *An Introduction to the Economics of Information*, New York 1997.

McCusker, J.J., *The Beginnings of Commercial and Financial Journalism: the Commodity Price Currents, Exchange rate Currents, and Money Currents of Early Modern Europe*, Amsterdam 1991.

Murphy, A. L. *The Origins of English Financial Markets*, Cambridge 2009 .

Neal, L., *The Rise of Financial Capitalism*, Cambridge 1990.

Neal, L., *How it All Began: the Monetary and Financial Architecture of Europe During the First Global Capital Markets, 1648–1815* in: *Financial History Review*, No. 7, 2000.

Riley, J., *International Government Finance and the Amsterdam Capital Market, 1740-1815*, Cambridge 1980.

Stiglitz, J.E., *Economics of Information and the Theory of Economic Development*, NBER Working Papers 1566, National Bureau of Economic Research, Inc. 1986.

Sylla, R., *Financial Systems and Economic Modernization* in: *The Journal of Economic History*, Vol. 62, 2002.

De Vries, J. & Van Der Woude A., *The First Modern Economy: Success, Failure, and Perseverance of the Dutch Economy, 1500-1815*, Cambridge 1997.