



Dipartimento di Storia e Civiltà

**Should we Trust?
Explaining Trade Expansion in Early Modern Spain
Seville, 1500-1600**

Montserrat Cachero Vinuesa

Thesis submitted for assessment with a view to obtaining the degree of
Doctor of History and Civilization of the European University Institute

Florence, 28 May 2010

EUROPEAN UNIVERSITY INSTITUTE
Department of History and Civilization

Should we Trust?
Explaining Trade Expansion in Early Modern Spain
Seville, 1500-1600

Montserrat Cachero Vinuesa

Examining Board:

Prof. Giovanni Federico (European University Institute)
Prof. James Simpson (Universidad Carlos III de Madrid)
Prof. Harold James (Princeton University and European University Institute)
Prof. Maristella Botticini (Università Bocconi)

© 2010, Montserrat Cachero Vinuesa

No part of this thesis may be copied, reproduced or transmitted without prior permission of the author

To my parents,
to Miguel

Acknowledgments

This PhD dissertation took root several years ago in the *Archivo General de Indias* when I became absolutely fascinated by how merchants invested in the Atlantic Trade. It was James Simpson who worked very hard to make me focus on the economic side. I owe him greatly for his guidance and professional support since this early stage of my research and academic career.

Giovanni Federico has been my supervisor and mentor. During my stay in Florence he was always available to talk about the research whenever I needed it, offering consistently kind and wise advice. On occasions, he had to be extremely patient in dealing with my passion for the subject and trying to put me on the right track. He especially helped me to improve my econometric skills. I learnt very much from him.

During the years that I spent in Madrid, the Economic History Department in Carlos III University offered the right environment for developing the major hypothesis of my dissertation. I would especially like to thank to Carlos Álvarez for the long coffee discussions, to Steffano Battilosi for the technical assistance, and to Stefan Houpt for encourage me to continue with my academic career.

Pascal Courty's feedback represented a unique opportunity to develop my research. I am especially grateful for his comments and his patience when sharing long coffees and discussion at Villa San Paolo. At the European University Institute, I also benefited from comments of professors Karl Schlag, Bartolomé Yun and Diogo Curto. I am also grateful to Ana Crespo Solana and Sheilagh Ogilvie for their wise advice.

This PhD dissertation has greatly benefited from colleagues who became very close friends. Juan H. Flores read and corrected chapters from this dissertation. He has also been personally involved in my job searching process. With Alexander Elu I shared seminars and research struggles; he supported me emotionally so many times and helped me with my English writing. I must also thank Paulina Granados for the STATA tutorials. Even in her busiest moment she made time for me.

I cannot finish these acknowledgments without including my friends in Florence. Chema, Meri, Cecilia, Igor, Alessandra V. and Alex K listened to me patiently and acted as the public for my pre-presentations' performances. I specially thank to the members of Cottoneschi-Carretti family – Amelia, Andrés and Elliot - they are also responsible for this PhD dissertation.

I would like to stress also my infinite debt to my parents Manuel Cachero and Francisca Vinuesa for their belief in me and in my work. Over so many years they have offered not only financial but also emotional support.

There are no words to express my gratitude to my husband, Miguel. He has been intimately involved in the creation of this thesis, offering technical support and assuming a certain amount of geographical distance for the benefit of my professional career. On the personal side, he has also revealed himself as a perfect partner for life.

Table of contents

Chapter 1: Introduction	7
1.1. Macro analyses	11
1.1.1. Explaining growth	13
1.1.2. Distribution of wealth	17
1.2. Institutions and trade	23
1.3. Historical Research on Atlantic Trade.....	25
1.3.1. Quantitative History	26
1.3.2. The importance of consumption.....	27
1.3.3. Network analysis.....	27
1.3.4. Risk and business.....	29
Conclusions	29
 Chapter 2: How trade was organized	31
2.1. The institutional side of trade	32
2.1.1. House of Trade	33
2.1.2. The consulate.....	35
2.1.3. Institutions on the other side of the Atlantic	36
2.2. Seville: Port of the Indies.....	37
2.3. The practical side of trade	39
2.3.1. Access to credit.....	40
2.3.2. Levels of trade.....	41
2.4. Legal Enforcement.....	43
2.5. Insurance system.....	45
2.5.1. Elements of the insurance contract	46
2.6. Strategies to control investment	46
2.6.1. Networking and the debt-collector system	47
Conclusions	49
 Chapter 3: Sources.....	50
3.1. The Archive of Notary Offices at Seville	51
3.2. An inventory for contracts.....	53
3.2.1. What kind of information can we extract from the inventory?	54
3.3. Codifying data	55
3.4. Measuring samples	57
3.4.1. Proxies and the information from the archive.....	57

3.5. Contracts and their typology.....	59
3.5.1. Company.....	60
3.5.2. Transport.....	61
3.5.3. Agency.....	62
3.5.4. Collecting debts.....	63
3.5.5. Debt and Purchase.....	63
3.5.6. Tendencies on contracting	64
3.6. Basic statistics	66
Conclusions	68
Appendix.....	70
 Chapter 4: Testing trust	 74
4.1. The role played by trust.....	75
4.2. The data set.....	77
4.3. Discussing variables	78
4.3.1. Measuring trust	80
4.3.2. Studying control	87
4.4. Some Econometrics.....	90
4.5. Quantile Regression.....	95
4.5.1. Quantile process	96
4.5.2. Testing the quantile regression.....	99
Conclusions	99
Appendix.....	101
 Chapter 5: Testing Moral Hazard	 103
5.1. Defining Moral Hazard	104
5.2. A brief description of the data.....	107
5.2.1. Information from the data base.....	108
5.3. Approaching suspiciousness.....	110
5.3.1. Destination	112
5.4. Alternative explanations	115
5.4.1. Business is business	115
5.4.2. Principal's ability.....	117
5.4.3. The cost of default.....	118
5.4.4. Economic environment.....	120
5.5. To monitor or not to monitor: That is the question	123
5.5.1. When was the right time?	126

Conclusions	130
Appendix.....	131
Chapter 6: Testing Adverse Selection.....	133
6.1. Adverse Selection and contracts.....	135
6.2. Regulation on contracts.....	137
6.2.1. Legal norms	138
6.2.2. Forms.....	139
6.3. Data	141
6.3.1. Literature in the contract.....	142
6.3.2. Clauses	143
6.4. Econometric strategy	148
6.4.1. Explanatory variables	148
6.5. Collateral as a screening device.....	151
6.6. Explaining contracts' complexity.....	153
6.6.1. Different clauses and different explanations	156
Conclusions	164
Appendix.....	166
General Conclusions.....	168
References	172

List of figures

Figure 1.1. GDP per capita series by Maddison	12
Figure 1.2. GDP per capita series by Van Zanden	13
Figure 1.3. Total imports and exports	14
Figure 1.4. Evolution of Real wages in Spain	18
Figure 1.5. Spain and England real wages	19
Figure 1.6. Real wages of building labourers	20
Figure 1.7. Real wages of craftsmen	20
Figure 1.8. Spanish cities in the European Ranking of population	21
Figure 1.9. Population in Major Spanish Cities	22
Figure 2.1. House of Trade's real income	35
Figure 2.2. Population in Seville	38
Figure 2.3. Seville in the Ranking of European cities	39
Figure 2.4. Interest rates	41
Figure 2.5. Mail ships	42
Figure 2.6. Duration of Lawsuits	43
Figure 3.1. Inventory's composition	54
Figure 3.2. Proxies for the total number of contracts	58
Figure 3.3. Comparing proxies and samples	59
Figure 3.4. Evolution of contracts	65
Figure 3.5. Occupations	66
Figure 3.6. Proportion of merchants	67
Figure 4.1. Distribution of contracts	77
Figure 4.2. Size of the business	79
Figure 4.3. Potential links	81
Figure 4.4. Proportion of individuals sharing nationality and family links	82
Figure 4.5. Number of people per contract and same occupation	83
Figure 4.6. Professional links	84
Figure 4.7. Proportion of people engaged in previous contracts	85
Figure 4.8. Average contract per capita and proportion of merchants	86
Figure 4.9. Average number of institutions per capita	87
Figure 4.10. Proportion of contracts with endorsement	88
Figure 4.11. Evolution of the debt-collector system	89
Figure 4.12. Monitoring after the contract	90
Figure 4.13. Quantile process	97
Figure 5.1. Principal-debtor conflict	106

Figure 5.2. Size of the contract	107
Figure 5.3. Total exports	108
Figure 5.4. Duration of the contracts	109
Figure 5.5. Information about the debtor	110
Figure 5.6. Destinations	113
Figure 5.7. Population and merchant community per destination	114
Figure 5.8. People per contract	116
Figure 5.9. Proportion of contracts with endorsement	117
Figure 5.10. Total number of bankruptcies per year	118
Figure 5.11. The cost of default	119
Figure 5.12. Risk during the journey	120
Figure 5.13. Size of the credit contracts	121
Figure 5.14. Time to monitoring	127
Figure 6.1. Evolution of printed forms	141
Figure 6.2. Number of clauses per contract	145
Figure 6.3. Total number of clauses in sample B	146
Figure 6.4. Average number of clauses per decade	147

List of tables

Table 2.1. Confiscation of gold and silver	45
Table 3.1. Comparative statistics	68
Table 4.1. OLS Regressions	92
Table 4.2. Shift Dummies	93
Table 4.3. Significant variables	92
Table 5.1. Hypotheses	122
Table 5.2. Regression results	124
Table 5.3. Significant variables	126
Table 5.4. Additional Regression results	128
Table 6.1. Regulation on contracts	139
Table 6.2. Clauses	143
Table 6.3. Explanatory variables	150
Table 6.4. Collateral Regression	151
Table 6.5. Significant variables	153
Table 6.6. All clauses' Regression	154
Table 6.7. Significant variables	156
Table 6.8. Guarantee Regression	157
Table 6.9. Penalty Regression	158
Table 6.10. Payment Regression	160
Table 6.11. Obligation Regression	162
Table 6.12. Guarantee, Penalty, Payment and Obligation	163

Chapter 1: Introduction

From the early 21st century, the discipline of Economic History has paid a growing amount of attention to the phenomenon of preindustrial trade. Estimations of GDP per capita by Maddison (2001) and (2003) and Van Zanden (2005), for example, have attracted significant interest from scholars in different countries and have emphasized the relevance of Atlantic trade and its consequences for economic growth. Especially noteworthy in this regard has been the contribution of Acemoglu et al. (2002) and (2005). Their analysis of the different growth patterns among western States has placed Atlantic trade firmly in the spotlight. Taking the year 1500 as a starting point and conducting a long-term analysis, these authors have assessed the importance of political institutions as a major explanation for differences among States in terms of GDP per capita. They argue that the introduction of a parliamentary monarchy regime in England and the Netherlands explains the increments in GDP per capita for both countries. By contrast, countries such as Spain and Portugal, which continued as absolute monarchies, experienced much lower levels of development.

These papers, and particularly those by Acemoglu et. al., seem to have opened a veritable Pandora's Box within Economic History, and their contribution has consequently been followed by a number of papers that focus on explicitly on Atlantic trade. Prominent among this literature are works that analyze the role of political institutions [Rei (2008), Rei (2009)],¹ explore the sources of the trade boom [O'Rourke and Williamson (2002a) and (2002b)],² study the impact of American products on the

¹ The role of political institutions has been also explored by Rei (2008) and (2009). She states that differences in trade organization among States took root on the differential political regimes. Rei analyzes the case of Portuguese expansion in America and the East Indies compared to that of the English and the Netherlands.

² O'Rourke and Williamson (2002a) and (2002b) refer to Atlantic trade as the 'trade boom' phenomenon. The authors have searched for possible explanations of the participation of different countries in such a global enterprise. They state that the combination of supply and demand effects is what explains the investment in Atlantic trade. They emphasize the necessary role played by the supply of new territories during the 16th century, and the demand coming from America as what forced Europeans to export their products to the colonies. However, from the 17th century onwards, the European demand for American products was the predominant phenomenon. Indeed, exotic products coming from the Indies, such as tea and chocolate, became increasingly popular in European markets.

increment of European living standards [Herst and Voth (2009)],³ and even explain the political tradition of states according to the European migration [Angeles (2009)].⁴

However, this sizeable body of work on the effects of and possible explanations for Atlantic Trade is in sharp contrast to a general lack of interest in *micro* analysis. Apart from some noteworthy exceptions, most Economic Historians have shown little interest in the way in which economic exchange was carried out. An exception is the analysis of Avner Greif. In his study of Maghribi traders, Greif has stressed the role of personal relationships among traders as an explanation for long-distance investments, and his ideas have had a great impact in Economic History and his explanation about long-distance trade has largely been accepted as conventional wisdom among scholars.

In contrast to this commonly accepted thesis, I show in this dissertation how explanations of preindustrial trade based on personal links and reputation are in fact very limited because the Atlantic was not an exclusive business for closely-knit groups. Indeed, sources have already proved how trade involved a large number of non-professionals. In trading with these non-professional individuals merchants were forced to find different means of solving the problem of long-range monitoring. As I show here, they did so in a surprisingly sophisticated manner: they substituted the traditional trust based on reputation and personal links by tools that controlled their debtors in America. Throughout this PhD dissertation I demonstrate how these tools were used as solutions to asymmetric information problems in long distance trade.

These control instruments, considered as institutions in the dissertation, were applied *ex ante* using contracts as screening devices and *ex post* with the adaptation of the medieval debt-collector system for the trade with America. These institutions contributed considerably to the increase in trade and thereby had a major impact on economic growth in Early Modern Spain. Moreover, the use of these control instruments allowed the Spanish to establish a different model for their trade with America compared with their rivals. The application of such tools explains why relevant merchants traded with common people; unlike in England, among the Spanish a considerable proportion of the population participated in commercial exchange: from peasants to artisans, sailors or merchants invested in the Atlantic Trade.

In addition to making this corrective to the received historical wisdom, another key aim of this dissertation is to show the potential of a novel set of sources, under-

³ Recently, Hersh & Voth (2009) have investigated the impact of these foreign products coming from America in the European population. In their opinion, it is the demand and consumption of exotic products that explains the improvement in European standard of living from the 19th century.

⁴ In his last paper Luis Angeles establishes a correlation among the proportion of population from European origin in the Latin American countries and the degree of freedom in the political regimes.

utilized hitherto: namely contracts. Contracts are used as the major source for this dissertation since they reflect the boundaries of economic activity and establish the rules of the game for transactions. Somewhat fortunately, for the case of the Atlantic Trade almost all businesses were engaged in making contracts before shipping, and all of these documents can thus be accessed at the notary offices' archive in Seville. These sources are essential for the elaboration of multiple proxies for different aspects of trade. Access to the credit market, popularity of destinations, merchant communities, population at destination or insurance are some examples on this and are discussed at length in this dissertation. Yet, although these sources provide an almost complete inventory of trade, they have not yet been exploited by economic historians. Perhaps the chaotic organization of the archive or the use of alternative sources such as dowries and probate inventories has discouraged scholars from using contracts. Whatever the reason for their neglect, this information from contract has been hand-collected here and analysed, complete with secondary sources from the historical literature. This dissertation therefore hopes to open up a wealth of information for analysis beyond the specific themes focussed on here.

Finally, from a methodological point of view, this thesis represents an example of empirical analysis of asymmetric information. I test not only *ex post* moral hazard (chapter five) but also *ex ante* adverse selection (chapter six). I also measure, for the first time, the impact of controlling techniques over trade, and offer an explanation for a different and particular trade model where participation is not limited to relevant traders.

In order to make these arguments, the dissertation is divided into two parts. The first, comprised of chapters one to three, aims to describe the historical framework and the sources used in the analysis. The second part (chapters four, five and six) constitutes the major contribution of this dissertation and is devoted to empirical analysis.

Chapter two describes the institutional framework designed by the Spanish rulers for the Atlantic Trade. Comparative analyses frequently cite this institutional framework as an example of inefficiency. They note Spain's absolute monarchy, which exerted the power to confiscate goods coming from America, its inefficient court system which accumulated delays on the solution of conflicts, its royal monopoly which apparently restricted the number of participants in trade, and finally its high taxes, should not be expected to have encouraged investment. Yet these very weaknesses of the legal system in 16th Spain explain why economic agents developed their own tools to protect investments, and why, counter intuitively, trade actually flourished.

Chapter three represents a full description of sources. As pointed out above, contracts made for the purpose of Atlantic trade are an under-utilized source for

Economic History, but represent the major source for this dissertation. Indeed, contracts have frequently been used by scholars as source for asymmetric information tests. Yet such empirical asymmetric information analyses are rare given the difficulties in finding an appropriate data set [Lyons (1996), Prendergast (1999) or Chiappori & Salani  (2002)]. For empirical tests contracts must document transfers among economic agents and show a certain degree of standardization. Chapter three therefore proves that the contracts accessed to build the data sets used here fulfil all the theoretical requirements of contract theory.

Chapter four is devoted to the analysis of the role played by trust in preindustrial trade. To this end, I design trust measures based on a triple criteria: personal relationships, impersonal reputation and repeated interactions.⁵ My aim is to test the impact of trust on investment decisions. In this regard, the dependent variable is the size of the contract. The degree of enforcement is also introduced in the analysis given that the ability to control can also explain trade. The enforcement hypothesis is proxied using two variables: the existence of a debt-collector system used to monitor debtors overseas and the endorsement. Through a quantile regression I demonstrate that for the case of Atlantic trade, the ability to control investments was more significant than the personal links.

Chapter five deals with the moral hazard problem. In this chapter I argue that 16th century traders used the debt-collector system to reduce asymmetric information, in the sense that it was mostly individuals suspicious of opportunistic behaviour that were personally monitored by a debt-collector. The major hypothesis is also controlled for here by using alternative variables such as economic environment, ability to control and business features. The legal enforcement is also introduced into the analysis at this stage, mainly as an alternative to the debt-collector system. Results show that the decision to send a debt-collector to America was mainly motivated by the degree of suspicion of the principal.

Chapter six focuses on the role played by written contracts. If commercial agreements were externally enforced by the debt-collector system, why assume the cost of contracting? The chapter thus tests the hypothesis that 16th century merchants used contracts for the Atlantic trade as screening devices. This hypothesis was also controlled by using factors such as legal regulation on contracts, the relevance of the business, and the economic environment. For the test, I use collateral requirements and the complexity of contracts, as measured by the number of clauses. In both cases I

⁵ With this procedure I include in the analysis different determinants of trust from the most traditional position of historians analysing merchant networks to Greif's theories, passing through recent theoretical economic models.

detect an adverse selection effect since suspicious individuals are willing to accept higher requirements in the contract. Results also highlight an incentive effect, as the increment of conditions in the contract drove individuals in general to select riskier destinations with higher expected profits.

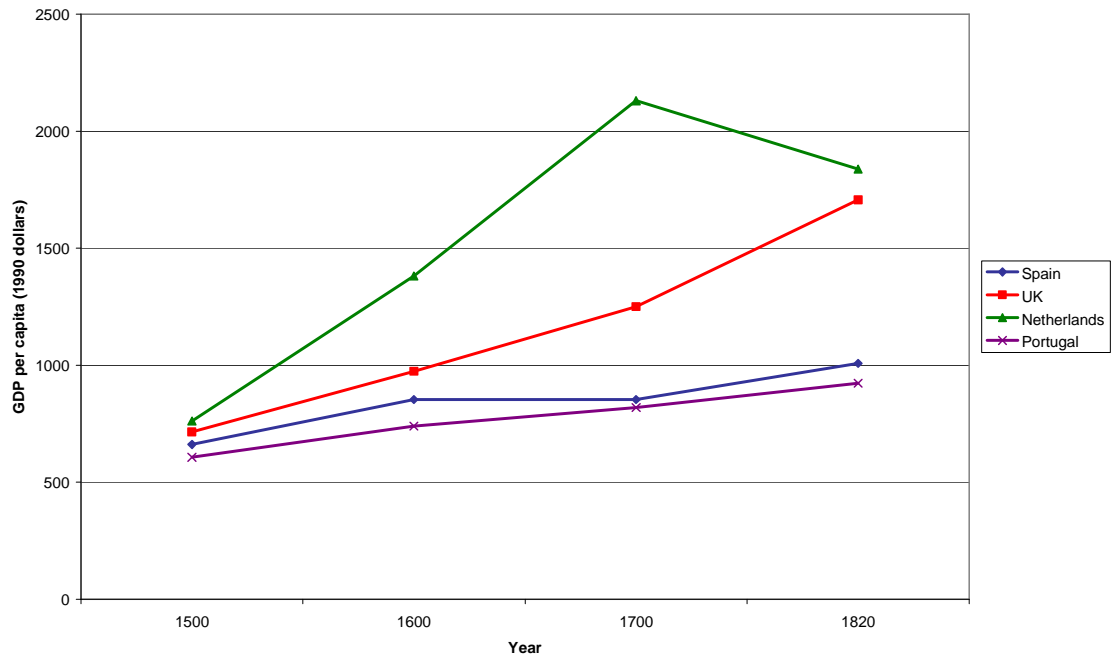
Before moving on to these chapters, however, this first chapter contains a review of the relevant literature. Section 1.1 describes estimations of historical GDP per capita and standard of living. The results presented from different sources show how the following analysis has been framed. Section 1.2 is devoted to the institutional analyses applied to preindustrial trade. Section 1.3 reviews the major tendencies in historical analyses. A short conclusion sums up the main points of the chapter.

1.1. Macro analyses

The growth of Atlantic trade and its economic implications is one of the most important and celebrated debates within the discipline of Economic History. Between the 16th to the 19th century a number of countries participated in trade with America, although the consequences of this trade varied widely. Despite problems concerning the collection of data for such an early period, Maddison has shown the different development patterns of the states that participated in the Atlantic Trade.⁶

⁶ For problems on data collection and veracity in the Spanish case see Yun (1994).

Figure 1.1: GDP per capita series by Maddison



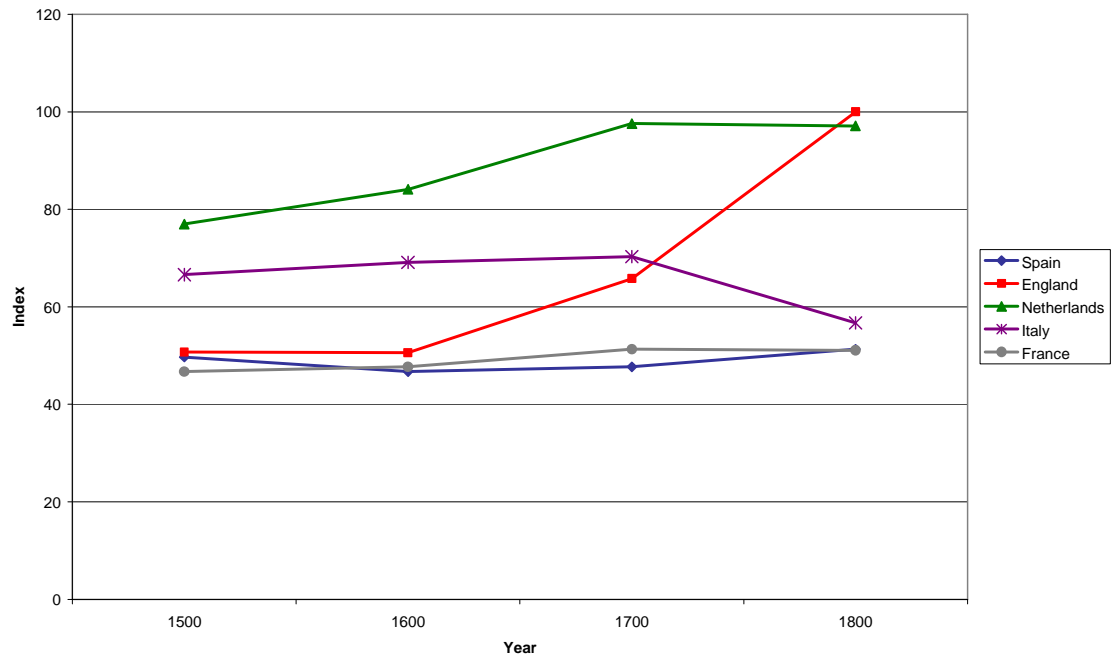
Source: Maddison (2001), Maddison (2003)

During the 16th century economic growth was strong and sustained for all participants in the trade with the new continent. However, in the 17th century, growth patterns changed only for Spain, which began a stagnation process that would continue until the end of the century. The 18th century saw a recovery of Spanish GDP, however, at the same time the period witnessed the opening up of a significant gap between the English and the other economic powers. This gap still persists today.

The estimation of GDP series by Zanden (2005), on the other hand, is not so optimistic. The author affirms that economic growth during the Early Modern period in Europe was very slow with the exception of England and Netherlands, as shown in figure 1.2.⁷

⁷ In this case there is no information about Portugal, and the figure shows the France and Italy series instead.

Figure 1.2: GDP per capita series by Van Zanden



Source: Van Zanden (2005)

Apart from England and Netherlands, the prior figure shows a stagnation process that occurred over the course of nearly two centuries. England follows the general tendency during the 16th century, but during the following century the country experienced rapid and sustained economic growth. The Netherlands started from the highest GDP levels at the beginning of the period, and unlike the other countries, managed to maintain permanent growth until 1700. The Spanish case is here quite different from the numbers presented in Maddison (2001) and (2001). Whilst in Maddison the GDP series experienced a modest increment during the 16th century, van Zanden (2005) by contrast shows a decline. Alternative estimations of GDP have placed Spain closer to Maddison's numbers.⁸

1.1.1. Explaining growth

Acemoglu et. al. (2005) states that despite some differences, all Atlantic traders experienced GDP per capita growth during this period. Scholars even suggest the existence of a phenomenon called the "trade boom after Columbus" to explain such

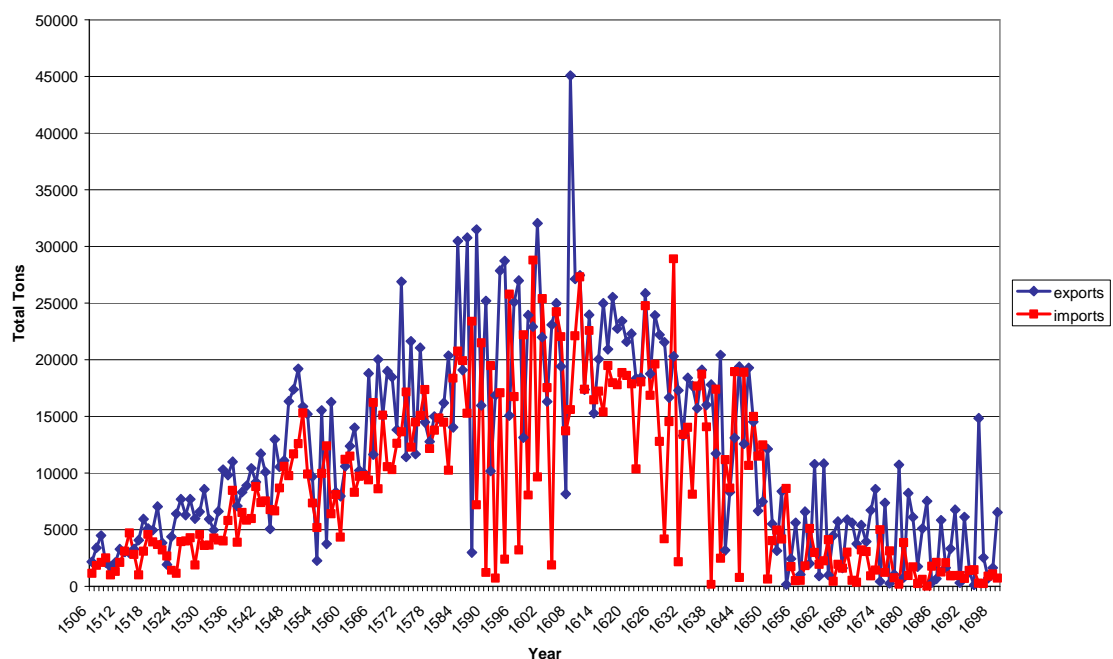
⁸ See Yun (1994) and Carreras (2003). Recently, Álvarez-Nogal & Prados (2007) has revisited data on Spanish GDP from different sources, and the authors conclude that during the first century of Atlantic Trade Spain presented positive economic growth.

a tendency.⁹ In any case, the intellectual debate about the possible causes of development is still ongoing.

O'Rourke and Williamson (2002a) point out different causes for the trade boom after 1492. In their paper, the authors affirm that while for the 16th century trade increased considerably due to supply factors in the new territories. During the 17th century it was European demand that pushed economic exchange with the New World. The growth in European income produced in particular a demand for exotic goods from America and Asia.¹⁰ Trade throughout the 18th century trade is thus explained by this combination of demand and supply.¹¹

Prior explanations of the shape of Atlantic trade in these years, however, seem not to fit with the case of the Spanish. Here exports were always more important. The following figure shows the imports and exports of Spain with its colonies during the 16th and 17th centuries.¹²

Figure 1.3: Total Imports and Exports



Source: Chaunu (1955), Vol. 6.

⁹ This was the title to an O'Rourke and Williamson paper published in *The Journal of Economic History* in 2002.

¹⁰ This theory is not new. Indeed, before the publication of this paper many scholars had supported the idea of increments on consumptions as a pull factor, see for instance Patrick O'Brien or Maxine Berg. Recently, this issue has been revisited by Hersh & Voth (2009).

¹¹ The major problem of this explanation is the data set. Indeed, they collected the available information on imports and exports but limited it to trade in *luxury products*. At least for the Spanish case, trade was in fact much wider, including all sorts of products such as wine, oil or iron manufactured together with textiles, sugar, leather, spices and precious metals.

¹² The graph has been created with data from Chaunu (1955).

Numbers from Chaunu (1955) show a constant expansion of exports and imports during the first century of trade, rising to a maximum in 1608. From this year the tendency begins to reverse and both magnitudes decline drastically. Among the exports we can find products such as silk from Granada, iron from the Basque Country, wine and oil from Seville, and other agrarian products from Castile. Textiles also represented an important part of exports. Nevertheless, the demand for cloth and fabrics was provided by foreign producers, mainly from Flanders and France.¹³ In terms of imports, the most popular products arriving in Spain were sugar, leather and dry materials during the 16th century. In the 17th century these products lost their hegemony and were gradually substituted by tobacco and cacao.¹⁴

Alternative explanations to that of O'Rourke & Williamson (2002a) for the trade boom can be found in the decline on entry barriers. This fact has been understood as an incipient *market integration* process. The controversy about the existence or not of a globalization process after the Discovery of America has been heavily debated among scholars. Understanding globalization as price convergence, the classic argument by O'Rourke and Williamson (2002b) considers 1820 as the starting point for the market integration process.¹⁵

Recently, Klas Rönnbäck (2009) has uncovered strong evidence about price convergence for different commodities in the Atlantic trade. He detects a slow convergence during the period 1550-1610 measured by the coefficient of variation and using prices from eleven commodities.¹⁶ The author maintains that this convergence process was due to an increasing amount of competition and thus a decline in monopoly rents. Although Rönnbäck mainly uses prices from Portuguese and British traders, he applies his conclusions to the Spanish case. However, in the list of products used by Rönnbäck only cacao has a Spanish-American origin and those series start in 1686.¹⁷

Elsewhere, a decline in transport costs has also been proposed as an alternative possible explanation for the trade boom. There is an agreement among historians on the existence of a decline in transport costs during the 16th and 17th

¹³ For a more detail information on textile exports, see Sanz Eufemio (1986), vol. 2.

¹⁴ It is important to note that imports are underestimated because of smuggling. In order to avoid taxes, ships coming from America used to stop along the Andalusia coast to unload merchandise illegally. Experts tried to estimate what part of total trade represented smuggling; however, that seems an impossible task based on suppositions and opinions. Although these numbers do not reflect exactly the reality this is the only available data for Spanish Early Modern trade.

¹⁵ Many other scholars find evidence of price convergence prior to this period. Jacks (2004) for instance, detects a market integration process in the Baltic and North Sea region during 1500-1800. For the specific case of the transatlantic trade Flynn and Giraldez (2004) find strong evidence on the international silver market.

¹⁶ Among the commodities we find products such as sugar, tobacco, cacao, tea, cloves, pepper or coffee.

The author compares prices of these items in the colonies with prices in Europe.

¹⁷ He uses cacao from Venezuela, and the series of prices goes from 1686 to 1778.

centuries.¹⁸ Scholars are in agreement that technological advances in navigation resulted in higher capacities of trading ships and thus reduced transport costs. Unfortunately, series on freight cost for the case of Spanish are not available. Indeed, data from freight costs at such an early stage of trade is very scarce and we have only the odd scattered piece of information.¹⁹

In any case, North (1991) points out that “declining transportation costs have themselves not been a sufficient reason to induce the growth of international trade.”²⁰ Instead he offers an explanation for trade participation based on the instruments which improved enforcing mechanisms. Such mechanisms made possible the enforcement of contracts at lower costs.

Other studies have focussed on specific explanations for specific countries. For the case of the Netherlands, Barbour (1950) stresses the importance of an open migration policy which attracted businessmen together with a development on financing long-distance trade. For the British the major innovation was the adoption of the parliamentary system in 1688 which produced the flowering of the capital market. Moreover, the diffusion of the joint-stock company reduced considerably the risks attached to long-distance trade.²¹ The Spanish case was the opposite. Spain retained an absolute monarchy far removed from the parliamentary model of the British. The monarchy imposed restrictions on the participation in trade, which also differs markedly from the Dutch model.

Despite restrictions imposed by the rulers, trade and GDP per head in Spain showed a positive tendency, at least during the 16th century; how can we explain this growth in trade? The economic historical record proves that when the authorities cannot provide the correct institutional framework to facilitate transactions economic agents develop their own instruments to this aim. In Spain, during the 16th century, merchants frequently used a debt-collector system together with screening devices to decrease asymmetric information. I argue that it was the application of these instruments that explains the participation of a considerable proportion of Spanish population in the Atlantic trade.

Summing up, the trade with America produced positive effects on the economy of countries which took part in it. Scholars address different causes for explaining this trade boom. Some of them point out the supply of European products for the new

¹⁸ See García-Baquero (1992).

¹⁹ There are some remarkable exceptions like Menard (1991) who collects freight rates of wine from Bordeaux to London. Chaudhuri (1978) and Davis (1962) offer freight rates from India in the period 1650-1730. More recently, Harley (1988) shows evidence on freight rates for the UK since 1741. For the Japanese case see Yasuba (1978) and Harlaftis & Kardasis (2000) for trade between the Black Sea and the Egyptians ports.

²⁰ North (1991), p. 23.

²¹ See Dickson (1967).

territories or the explosion in the consumption as pull factors for such phenomenon. Others stress the impact of a decline of entry barriers or on transport costs. However, none of these explanations seem to fit with the Spanish case. Instead, sources show how merchants adopted alternative instruments to enforce contracts and reduce transaction cost.

1.1.2. Distribution of wealth

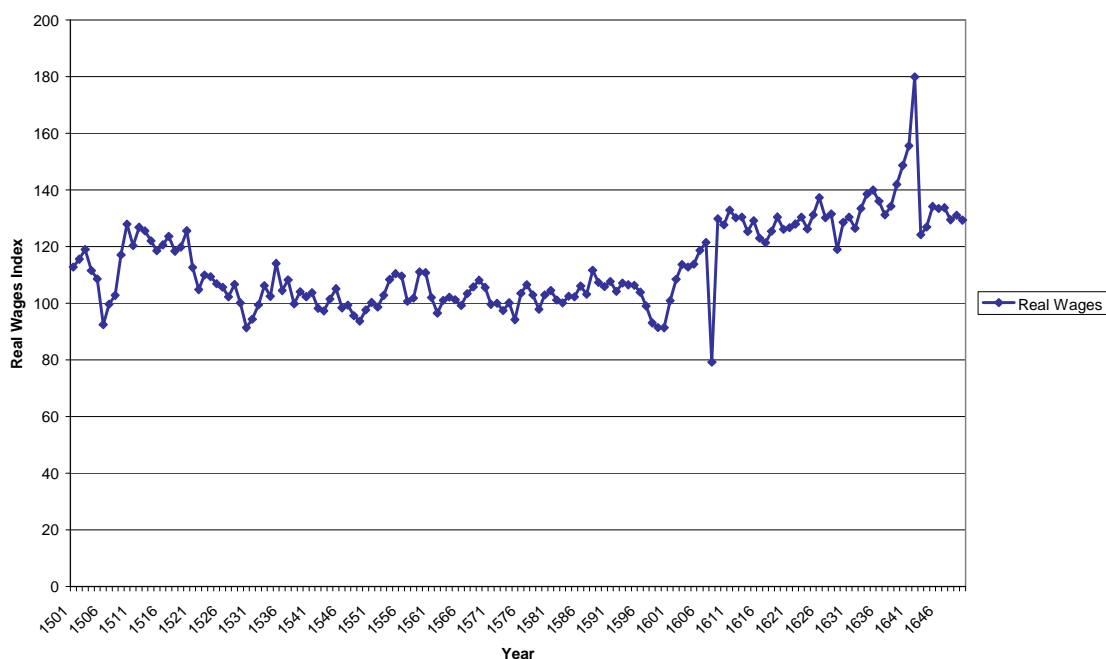
The previous section reviewed the literature quantifying the importance of the Atlantic Trade. The aim of this section is to check whether profits also had a social as well as economic impact. This sub-section reviews the literature about estimations of standards of living.

Estimations for Spanish GDP are shown in figure 1.1 above. However, Maddison (2001) uses data from Castilian agrarian production alone. Alvarez-Nogal and Prados (2007) have therefore corrected the series of GDP per capita using data from other Spanish regions, and augmenting it with some numbers on urbanisation. The authors affirm that by the end of the 16th century Spanish per capita income was among the highest in Europe, and that it was only from 1590 that Spain experienced an absolute decline. This affirmation stresses the fact that Spanish economic growth took place during the first century of trade and remarks the importance of analyse what mechanisms lay behind such development.

In terms of standard of living during the 16th and 17th centuries the Spanish did not experience significant change, as shown in figure 1.4 below.²²

²² Both are aggregated indexes. The price index includes all sorts of consumption products and the wage index comprises salaries from diverse occupations from accountants to artisans or priests.

Figure 1.4: Evolution of Real Wages in Spain



Source: Hamilton (1975)²³

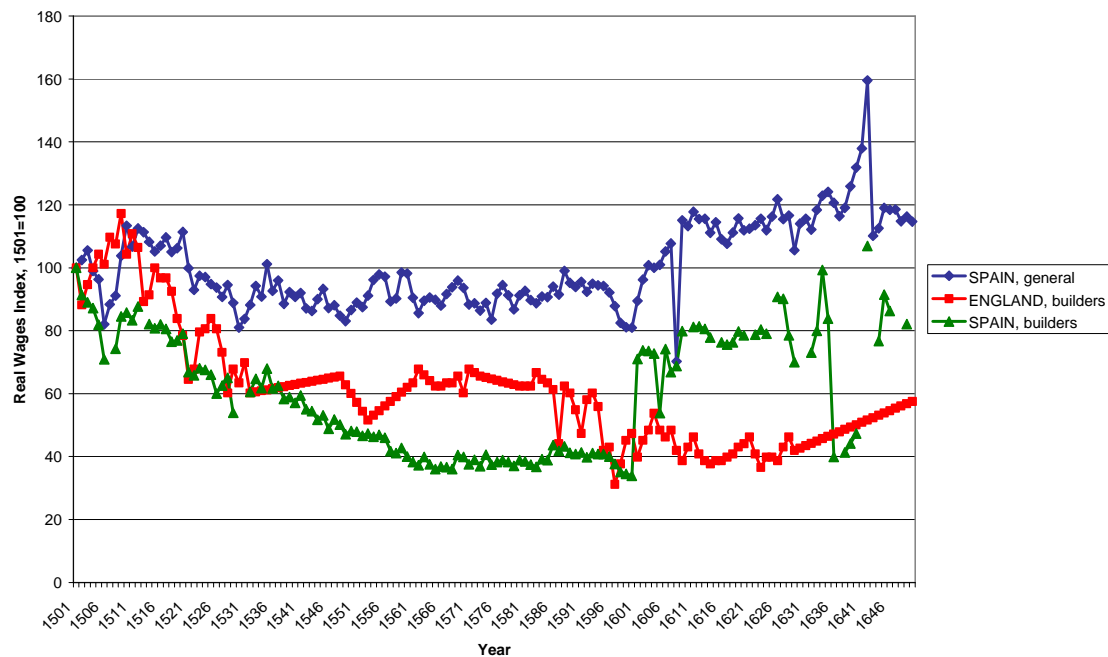
The series of real salaries by Hamilton demonstrate how until 1600 wages remained almost constant, showing only increments of around 20% during the 1610's. This result contrasts with Maddison's large numbers which show stagnation in GDP per capita during the same period. The data set collected by Hamilton also supports the idea that it was not only the relevant traders but also the population in general that profited from the American trade.

Figure 1.5 shows the real wage index for Spain together with the series of real wages only for builders' craftsmen in both countries during the 16th and 17th centuries.²⁴ Although data from Phelps Brown and Hopkins (1956) only represents salaries of a group of professionals in one region of England, it has been used as a general proxy for the whole country. By contrast, Hamilton (1975) offers a complete series of real wages for a wide range of professions in the different Spanish regions.

²³ I have used the first available Spanish edition of Hamilton book although the original text was published in English by Harvard University Press in 1934.

²⁴ While the Hamilton index covers all regions from Spain, the Phelps-Hopkins index only comprises southern England.

Figure 1.5: Spain and England Real Wages



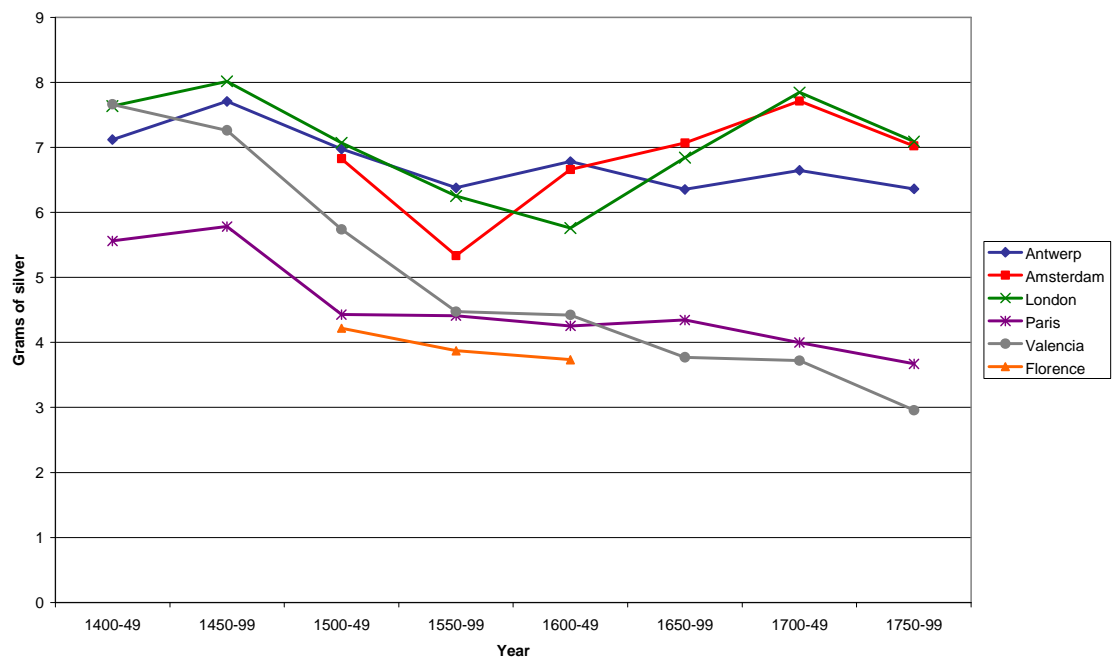
Source: Own elaboration with data from Hamilton (1975) and Phelps Brown & Hopkins (1956)

The results are even more surprising: with the exception of the years between 1506 and 1516, the level of real wages in Spain seems to be higher in general terms. Workers in England suffered a continuous fall followed by stagnation in real wages during the 16th century while the tendency for Spanish was to remain more or less constant. Comparing results only for builders, we can confirm that in the period between 1530 and 1600 the English performed better than the Spanish, these tendencies only being inversed during the 17th century.

More detail data can be found in Allen (2001) and Allen (2005). In each case the author collects data on the salaries of craftsmen and building labourers from different European cities, converting all series to grams of silver. The final result is a rich database of real wages which covers the major cities in Europe during a 400 years period. The richness of the data set together with its accessibility explains why it has been frequently used by economic historians.²⁵ The following graphs represent the data series for a select group of European cities.

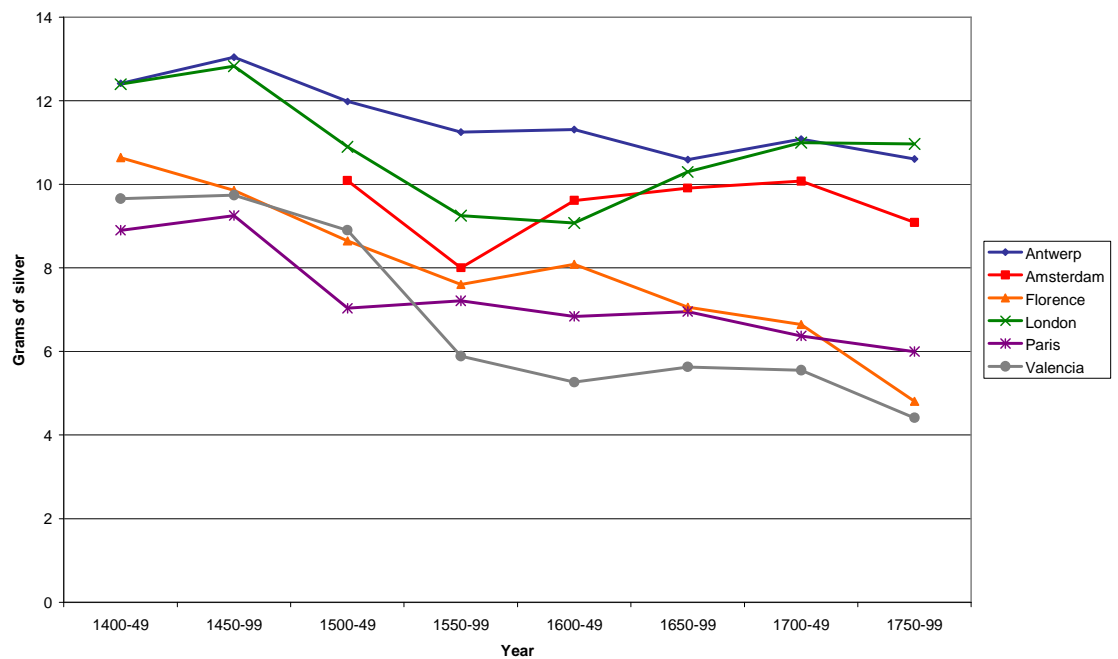
²⁵ The data set is available at: <http://www.economics.ox.ac.uk/members/robert.allen/WagesPrices.htm>

Figure 1.6: Real Wages of Building Labourers



Source: Allen (2001), Allen (2005)

Figure 1.7: Real Wages of Craftsmen

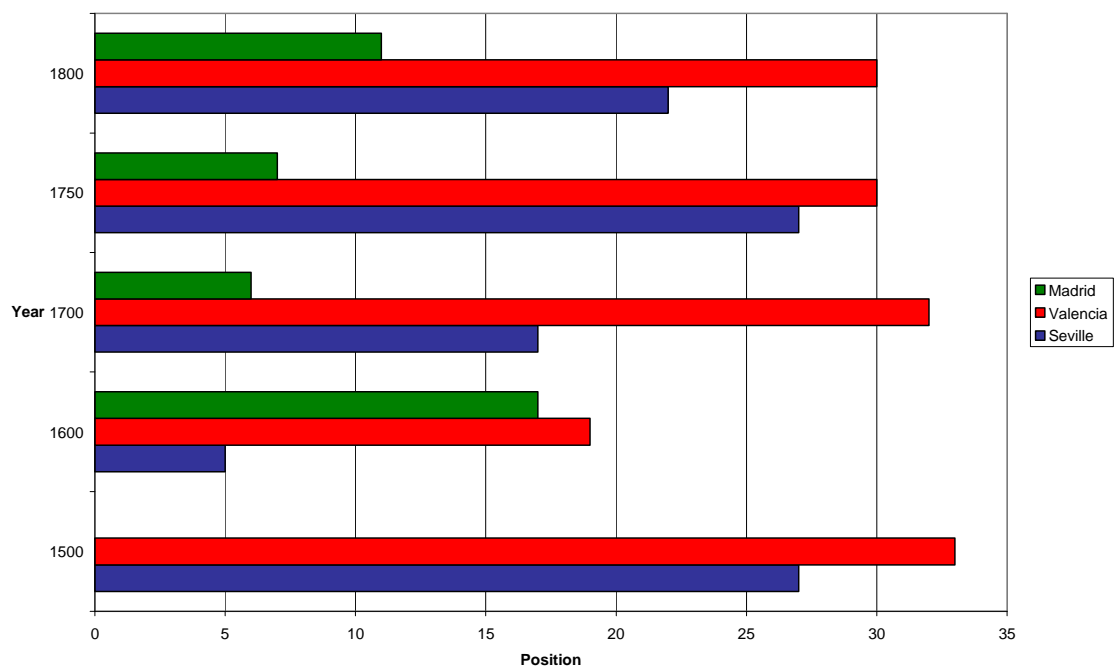


Source: Allen (2001), Allen (2005)

In general, data from major cities shows a decline in real wages in Europe during the 16th and 17th centuries. The differences between trends in Allen's database and the data set presented by Hamilton lies in the collection of data: while Hamilton collects salaries from a wide range of occupations, Allen's data is reduced to craftsmen

and building labourers. Allen also selects a sample of relevant cities for every country, and he includes only Valencia for the case of Spain. As shown in figure 1.8, Valencia was not the most important city in Spain, neither in economic terms nor in terms of population. This issue is more remarkable if we take into account the relevance of Allen's data frequently used in Economic History's analyses.

Figure 1.8: Spanish Cities in the European Ranking of Population

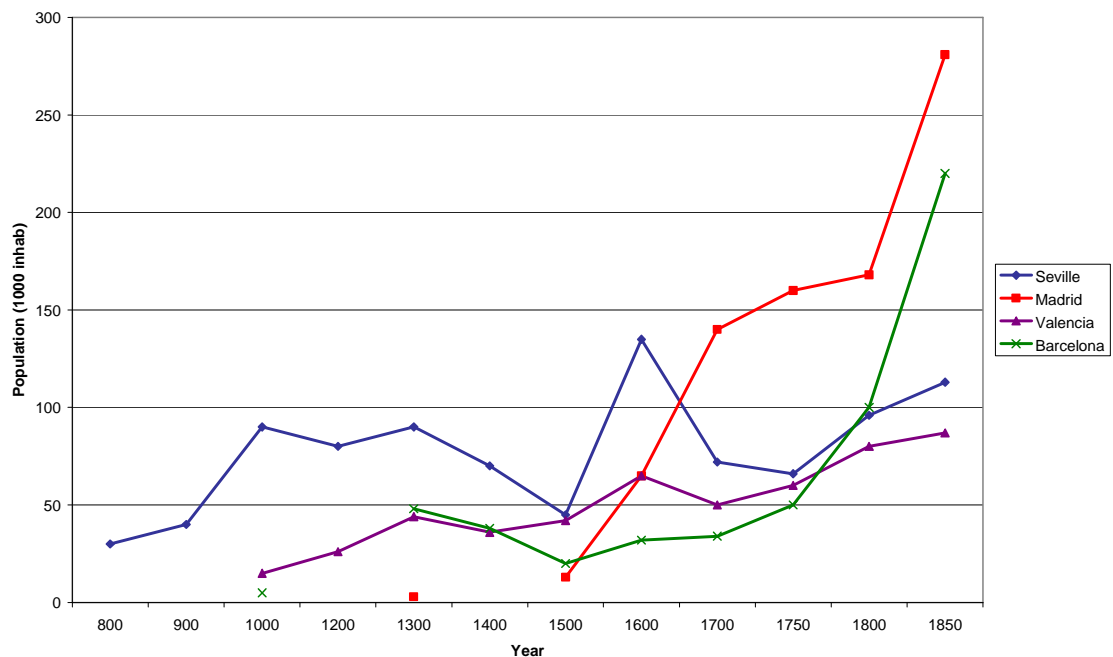


Source: Bairoch (1988)

The prior figure represents the relative position of three Spanish cities in the European ranking of population. In 1500 Seville occupied the 27th position while Valencia was still in the 33rd and Madrid does not even appear among the 60 most important cities. At the beginning of the 17th century Seville is the 5th most important city, and Valencia and Madrid are still at positions 19 and 17 respectively. In 1700 the decadence and decline of Seville and Valencia and the progressive flourishing of Madrid began.

Comparing the major cities in Spain, therefore, Valencia is always exceeded by Seville and Madrid and also by Barcelona from the second half of the 18th century as presented in figure 1.9. Thus, it is questionable whether the criteria used by Allen (2001) for selecting Valencia as representative city for all Spain is appropriate.

Figure 1.9: Population in the Spanish Major Cities



Source: Bairoch (1988)

Despite the data presented for the city of London, in general terms there is broad agreement about the decline of standards of living in England during the 16th.²⁶ For the Spanish case, however, and with the exception of Valencia, Alvarez-Nogal & Prados (2007) present evidence of a stability of real wages in the same period. This suggests the same conclusion as the Hamilton data series: real wages in Spain during the 16th century remained constant, while in England workers suffered sustained losses in purchasing power.

How can we explain such a tendency? Contracts in the archive confirm a fact that many historians have highlighted previously: an important part of the Spanish population took part in the Atlantic trade. This reality makes the Spanish one a very different case to the others. Indeed, while for the British and the Dutch it was chartered companies that controlled trade, for the Spanish this trade was conducted as an open business. Despite the existence of an absolutist state and the inefficiency of government institutions that was its consequence, it was only transaction costs that operated as an entry barrier to the Atlantic Trade. These transaction costs were compounded mainly by taxes, acquisition costs and delivery costs. The considerable participation in trade for the Spanish case ensured that profits – although not as high as English profits – were distributed among a wider sector of the population. It is this variable which explains why the standard of living of living of the Spanish population was superior to the English for more than a century of trade.

²⁶ See Clark & Hamilton (2006), Clark (2007) and van Zanden (2005).

1.2. Institutions and trade

Institutions are a hot topic in Economic History. The importance of institutions lies in their utility to decrease the costs of transacting increasing trade and economic growth.²⁷ The logical connection between institutions and economic growth has generated a controversial debate about which came first, efficient institutions or economic growth?

Laporta et al. (2004) answer the question by affirming that economic growth came first. The authors maintain that only societies with a high degree of economic growth have been able to develop the most efficient institutions. They focus on human capital as a major source of economic growth, relegating institutions to a secondary place in this story. In a similar vein, North (1981) affirmed that institutions adjust in time and do not affect outcomes that much in the long run. Indeed, he developed a methodological framework which emphasizes how institutions have adapted to economic changes.²⁸

By contrast, Acemoglu et. al. (2002) and (2005) affirm that efficient institutions produce economic growth. In their papers it is efficient political institutions that explain economic growth, not the other way around. This is the predominant approach in Economic History and this thesis aims to contribute to it through an analysis of market institutions that for the case of Spanish were successfully applied to the Atlantic trade.

Institutions have been analyzed from two different standpoints: on the one hand, as formal institutions created by rulers, and, on the other, as informal institutions which emerged as a consequence of individual decisions in the market. As North states, institutions are sets of rules which can be politically determined or can be the result of decisions of the market.²⁹ This concept absolutely differs from that given by classical historians. Here institutions have been limited to organizations and the institutional studies reduced to a simple description of such an organization.³⁰

Referring to the Atlantic trade, Acemoglu et. al. (2005) show the effect on GDP per capita of different political regimes. Their results highlight how countries such as England and the Netherlands were successful at developing the right political institutions. Elsewhere, the Spanish and the Portuguese did not perform so well. These

²⁷ Williamson (1998), p. 37.

²⁸ See North (1981) and North (1990).

²⁹ North (1991), p. 9.

³⁰ See, for instance, the analysis of Schäfer (2003) on the *Consejo de Indias* or Martiré (2005) on the Audience system.

Hispanic countries retained old-fashioned institutions, such as absolute monarchies, which did not constrain political power.³¹

Although results are consistent, the data set is not. Firstly, for the Spanish they used data from Philips (1990) and Maddison (2001) – which are published in English – in both cases they ignore the two major data sets.³² Secondly, to estimate Atlantic trade they use a proxy of 400 tons per average annual voyages, equivalence which remains constant over time. However, during the 16th and 17th centuries, nautical technology developed very quickly, producing concomitant changes in the capacity of cargo for the different ships.³³ Finally, they approach distances in kilometers for the different Atlantic ports without taking into consideration geography or changes in communications technology.

With regard to political institutions and commercial exchange, Claudia Rei has recently shown the differences in trade organization and their consequences on economic growth. Rei (2009) analyzes how countries choose different forms of organizing trade according to the distribution of bargaining power between the king and the merchants. Results have been used to explain the backward Portuguese state as opposed to the more advanced English state.

The market level also has been explored. The relevant analyses of merchant coalitions carried out by Greif (1989) and Greif (2006) remark upon the importance of cooperation among economic agents as an explanatory factor for long-distance trade. In Greif's opinion, market-institutions that encourage cooperation will produce growth in investments and trade flows. The reduction of uncertainty is the consequence of rules of behaviour observed by all members. Merchant members of these coalitions trusted each other and thus engaged in contracting between them because they had to preserve their reputation, to the extent that future profits depended on it. Nevertheless, Greif's explanation seems to be limited by the number of participants in the business, and trade is only explained when it takes place inside limited groups.

Also at a micro-level and for the English case, Anne Carlos has analysed internal organizational problems in the *East Indian Company* and *Hudson Bay Company*. She shows the efficiency of the trade-on-their-behalf system used by the company to give incentives to agents overseas. As Carlos (1995) demonstrates, the system was efficient not only at reducing opportunistic behaviour but also in increasing trade.

³¹ The Spanish case was an example of composite monarchy, where the power was far from being absolute. For this historical debate see Yun (2004) and Yun (2009).

³² The major data set are in quantities and prices. The first was collected by Chaunu (1955) and the second by Hamilton (1975).

³³ See García-Baquero (1992).

Finally, especially remarkable in terms of micro-level studies is the contribution of Akerberg and Botticini (2000). Their paper analyses the expansion of the sharecropping institution in medieval Italy. Using an original data set from the Florentine *catasto* of 1427,³⁴ Akerberg and Botticini (2000) demonstrate that the expansion of sharecropping was the result of imperfect capital markets. Moreover, landlords also used share contracts to decline moral hazard.

Analyses within Economic History have largely focused on the role played by political institutions on trade and economic growth. The few analyses that have been devoted to the market level have only considered how institutions explained intra-group trade. This dissertation thereby contributes to the analysis of institutions used in the Atlantic trade at a micro level. The successful adaptation of the medieval debt-collector system together with the use of contracts as screening devices reduced asymmetric information problems considerably, thus contributing to increased trade participation. In fact, it demonstrates that it is the application of these market institutions that explains why relevant merchants contracted with non-professional traders.

1.3. Historical Research on Atlantic Trade

The importance of Atlantic Trade has attracted the interest of scholars who from the beginning of the 20th century had described many aspects related to the commercial exchange with America. The extent of this literature forces me to undertake a – necessarily partial – survey, stressing the major gaps.

The publication of *Trade and Navigation between Spain and Indies* by Haring in 1918 was the first attempt to review more than two centuries of economic and social exchanges as a whole.³⁵ Haring describes the institutional organization of trade by the Spanish monarchy, highlighting the special legal regime of silver mines. He also remarks on the dark side of the Crown, with frequent confiscations, high taxes and a policy of personal licence which favoured specific interest groups. This pessimistic vision was translated into the historical debate and even nowadays persists in the form of a general agreement among scholars about the poor reach of profits from the Atlantic Trade.³⁶

³⁴ The data set includes more than 2000 land plots and 300 landlords.

³⁵ Haring (1918).

³⁶ See O'Brien (1982).

1.3.1. Quantitative History

In 1934 the young Earl J. Hamilton presented his doctoral dissertation at Harvard University. The aim of his thesis was to explore the possible causes of the inflationary process which took place in Castile during the 17th century. Magnitudes such as the arrival of gold and silver from America and the increments on prices were first connected here.³⁷ With access to copious amounts of information Hamilton was the first to build series on wages and prices for the years between 1500 and 1650. Although his hypothesis of inflation motivated by external factors has since been found to be insufficient, he established a precedent in economic history. Hamilton's analysis has been completed with additional explanations by scholars such as Morineau, who points out the importance of internal factors in price revolution.³⁸ In this direction, Pierre Vilar (1974) and Jordi Nadal (1959) also show the effects of prices on variables such as growth in population and demand.

It is not only prices but also volume of merchandise that has been quantified. The first tentative study in this direction was carried out by Chaunu (1955). Based on sources from the *Archivo General de Indias* in Seville, Chaunu approaches the sizeable topic of nearly two centuries of trade. His main contribution is the analysis of economic cycles through the quantification of the volume of merchandise transported between Spain and America.

As with other topics in Economic History and beyond, following on from these general works, research on quantification for the Atlantic Trade has generally become more particular, focussing on either specific products or specific merchants' groups. This is the case of the slave trade analysed by Vila Vilar (1977), the cochineal trade by Sarabia Viejo (1998), or exports of iron products by García-Fuentes (1991). Elsewhere, Sanz Eufemio (1986) introduced series of products exported from Castile to America via Medina del Campo.

But despite this growth in knowledge regarding Atlantic trade, only one study has used contracts as its main source, as I do here. Bernal (1992) analyzes the credit market in Seville with a data set of contracts from the major archives in the city. He shows the facilities for access to credit and the high degree of implication of society in general. His study comprises three centuries of trade with data regarding Seville and Cadiz, the former for the 16th and 17th centuries while the second for the 18th century, when Cadiz replaced Seville as a financial centre. Despite its importance, the study is

³⁷ Hamilton (1934).

³⁸ See Morineau (2003).

merely descriptive without any in-depth analysis about risk and the strategies used to avoid it.

1.3.2. The importance of consumption

Recently, many studies have focused on the impact of Atlantic Trade from the demand side. Following the analysis of scholars such as Patrick O'Brien and Maxine Berg for the English case, the Spanish case has been investigated regarding changes in consumption patterns due to the opening of the American market. This work uses probate inventories and dowries as their main sources, and the idea behind these studies is the analysis of demand for new products and its role as pull factor for trade. Exotic goods coming from the New World arrived in Spain, and it was the progressive popularization of such goods which forced a process of democratization on consumption. In other words, these exotic items shifted from being luxury items to being normal goods.

Yun and Torras (1999), for example, contains a compilation of recent works on the Spanish case following this methodological approach. A special number of articles in the *Revista de Historia Económica* have also been dedicated to consumption in pre-industrial Spain; in the journal we find different quantitative works on consumption patterns.³⁹ In this regard, the contribution of Ramos Palencia (2001) for textile products' consumption is remarkable. Also Renate Pieper has research exotics goods imports from America in European markets. Unfortunately, the results have not been published yet. Finally, Herst & Voth (2009) have recently stressed the role played by consumption in the rise of European standard of living after 1492. These scholars show that living standards rose because of the growing availability of new goods.

1.3.3. Network analysis

The participants in the Atlantic trade have also become an object of analysis as commercial networks have attracted the interest of historians during the last decades. These studies aim to reconstruct personal relationships and connections among merchants on both sides of the Atlantic.

Noteworthy on this topic is the contribution of Pike (1966), and her analysis of Sevillian society in general and of the Genoese merchants in particular.⁴⁰ In the same vein, Caunedo del Potro (1991) and Palenzuela Dominguez (2003) describe the

³⁹ This was a special number of the journal edited by Enrique Llopis, Jaume Torras and Bartolomé Yun.

⁴⁰ For the study of the Genoese community in Seville, see Pike (1966).

economic activities of merchants from Burgos who took part on the Atlantic Trade. With a similar approach Otte (1996) studies major merchant communities in Seville during the 16th century; however the different groups are analysed as unique components, thus omitting all kind of relationships among them. For a later period – 18th century – Fernández Pérez (1997) analyses merchant networks in Cadiz, here not only describing but also studying the relationships behind connections within the network.

Network analysis is often the result of a more general piece of research. This is the case for Vila Vilar (1991) and Vila Vilar and Lohmann Villena (2003), which both describe the activities of the families Corzo-Mañara and Almonte respectively through the prior analysis of Vila Vilar on slave trade on which these families were especially active. Similarly, Lorenzo Sanz (1986), with regard to his prior work on bankruptcies in Castile he addresses a list of the most relevant businessmen, stressing their activities and the relationships among them.

This body of work offers rich information on mercantile practices and particular groups. Nevertheless, it has two important weaknesses. First, with a few exceptions the word ‘network’ is really limited to a description of the connections among participants in a business without an economic analysis of the forces behind such connections.⁴¹ To illustrate, concepts such as density or stability applied to the networks are almost entirely missing. Second, this kind of analysis reduces trade to mercantile elites, forgetting that a significant proportion of society was involved in the American business. The real implication of society in economic transactions is not a new phenomenon, as Dominguez Ortiz (2003) and Morales Padrón (1989) mention. Unfortunately, there is no deep analysis on this topic yet.

From the other side of the Atlantic many scholars have described merchant communities using network analysis. Brading was the first to attempt such a task. With sources from a previous analysis on the mining industry in Mexico, Brading (1971) studies the role played by merchant communities. Equally important is the research carried out by Bern Hausberger (2003) and Antonio Ibarra (2007).

Recently, a new methodology has been applied to the merchant communities based on the application of Geographic Information Systems and spatial statistics to study the cooperation among merchants on creating commercial networks.⁴² This research is very new and part of a project financed by the European Science

⁴¹ The exceptions are the analysis by Fernández Pérez (1997) on merchant from Cadiz during the 18th century and Crespo Solana (2001) which connects merchants between Cadiz and the Low Countries.

⁴² For additional information on this methodology, see Crespo (2009).

Foundation.⁴³ The novelty of the project explains why results have not been published yet.

1.3.4. Risk and business

Since these pioneering works on Atlantic History, many scholars have tried to answer questions related to uncertainty and risk. The first attempts were focused on navigation and the risk during the journey. Aspects such as routes, maritime catastrophes or piracy have been widely analysed by such authors as Haring (1918), Fernández Navarrete (1954), Deschamps (1956),⁴⁴ and the insurance system itself as an instrument aimed at reducing maritime risk has also become an object of much study. The research on this field stresses the legal aspects of the determinants of contracts or the government regulation.⁴⁵ Despite this, it is still very difficult to find research with technical data such as premiums, deductibles or coverage for the insurance market, for example. The single exceptions are Bernal (1994) and Cruz Barney (1998).

In general, analyses of uncertainty and risk in economic transactions are rare pieces of research. For the case of Medina del Campo traders, it is remarkable the contribution of Sanz Eufemio (1986) on bankruptcies. This unique work explores the causes and consequences of being officially declared bankrupt. Especially relevant among the impressive collection of sources is the correspondence of merchants.

Conclusions

Despite this sizeable literature on the Atlantic trade, there remains a lack of *institutional* analysis. My research interests are at the market level, analyzing private institutions and how individuals take economic decisions. More specifically my objective in this dissertation is to study the private arrangements that allowed people to participate in trade in the Spanish's case. Following North: "how individuals make choices under conditions of uncertainty and ambiguity are fundamental questions that we must address in order to make further progress in the social sciences."⁴⁶

One additional goal of this study is the analysis of trade in a broad sense, in opposition to those studies where trade is restricted to close groups of merchants. In

⁴³ *Dynamic Complexity of Cooperation-Based Self-Organizing Commercial Networks in the First Global Age*, European Science Foundation (TECT).

⁴⁴ Major technical issues are summarized in García-Baquero (1992).

⁴⁵ See Céspedes (1948) and Basas Fernández (1997).

⁴⁶ Frängsmyr (1994), p. 32.

fact, throughout history trade has always been carried out by very heterogeneous people from different professions, origins, social statuses or even religions. Although well-known merchants have at times monopolized an important part of trade, we cannot restrict the object of analysis to a group of people. By contrast, I will explore how trade was carried out in general, not restricting myself to a particular group. I describe and analyze instruments to control investments which were used for everybody: merchant, sailor or artisan.

Chapter 2: How trade was organized

In the historical literature some of the main aspects of the Atlantic trade have been analysed in depth. In most cases, however, the analysis consists of an impressive collection of data without further economic analysis. This research covers macro-aspects such as volume of merchandise, institutional design, migrations, pressure groups or political power. By contrast, more detailed explanations about market institutions are pretty scarce. There is still no clear answer for questions such as was how trade carried out? How were decisions taken? How did traders control investments?

The answer to these questions is closely related to the organization of trade. As Chaudhuri states, "the systematic organization of multifaceted forms of long-distance trade was aimed at reducing transaction costs."⁴⁷ This organization can be understood at both the macro and micro levels: on the one hand, the organization designed by rulers and local authorities; and, on the other hand, organizational forms created by economic agents to facilitate transactions. The first refers to those organizational forms used to respond to political needs, while the second to an efficiency criterion. Unfortunately, in the case of early modern Spain it is still not clear what kind of mechanisms sustained trade organization at the market level.

Traditional studies have relied on reputation as the explanatory factor for such organizational forms. This argument cannot be extended to all trade since only professional merchants cared about reputation. At least for the Spanish case, a considerable proportion of the population participated in trade, and most of these individuals were non-professionals from whom reputation was not an issue. In these circumstances explanations such as reputation or networks seem to be insufficient.

⁴⁷ Chaudhuri (1991), p. 422.

This chapter thus aims to describe the organization of trade both at the macro and micro level with special emphasis being paid to aspects that could generate uncertainty such as long-distances and the role of the government in trade regulation. The chapter is organized as follows. Section 2.1 describes the institutional framework that the Spanish monarchy designed for the trade with the colonies. Section 2.2 emphasizes the role played by Seville as port of Indies. Section 2.3 reviews some practical aspects of commercial transactions highlighting the major innovations applied in the Atlantic trade. Section 2.4 analyses the instruments to enforce contracts provided by the State. Section 2.5 denotes some aspects of the insurance system which seemed to be a deficient tool for risk protection. Finally, section 2.6 introduces some notes about enforcement institutions frequently used by traders. The conclusions of the chapter are presented in a short final section.

2.1. The institutional side of trade

The discovery of America opened up a new era in world history. The conception of the world's geography and the distances between its lands both changed radically in a short space of time. A cause and effect of this new global reality was rapid improvement in oceanic navigation and shipping technology, with the development of faster and lighter ships capable of cover much greater distances more quickly. Cartographers also re-drew maps of the world, changing the dominant visual perception and understanding of the world and the place of Europe and of Europeans' within it.

From an economic point of view, of course, America fundamentally meant potential profit. Very soon the new territories were revealed as an incredible source of wealth. Spanish traders very quickly began to exploit this source, not only for its spices but also its gold, silver and dye. When the Spanish monarchy realized the economic potential of the New World, it inevitably tried to take its part of the cake. It was the idea to extract revenues from America that inspired the King to organize trade with Indies as a royal monopoly.

From a geographical point of view, the discovery was not limited to a series of factories on the coast like those the Portuguese had constructed. By contrast, America was considered a continent, and the administration of these enormous territories was far from easy. Oliva Melgar affirms that the geographical dimensions of America motivated a change in the regulation of the new territories.⁴⁸ The direct exploitation of

⁴⁸ Oliva Melgar (2004), p. 16.

such a huge territory was a cost that the monarchy was simply not able to afford, and this lack of economic resources forced the Spanish monarchy to design a more complex system of economic extraction. The new system was also inspired by the royal monopoly but direct exploitation was put into private hands. The Crown received benefits in the form of taxes, but the risk was assumed by economic agents. Indeed, the biggest journeys and expeditions – including Cortes in Mexico and Pizarro in Peru – were financed by merchants and bankers, not by the Crown.

From a legal point of view, the Spanish monopoly obeyed three principles: one unique port (Seville), a unique organism to control trade (House of Trade), and one court. This regulation represented a change from the previous system based on a distribution of competencies among merchant guilds. In fact, the Mediterranean trade was regulated through merchants guilds called *Consulados del Mar* (Consulates). Local merchants who were members of these institutions obtained the right to organize trade privately. The Crown, in exchange, received periodical payments. The royal monopoly broke the bargaining power of merchants, forcing them to negotiate individually instead of as a group.⁴⁹

In the opinion of Haring, the new trade's organization was carried out according to the mercantilist ideas of the time, mainly national power and self-sufficiency.⁵⁰ Rei explains differences in trading organization with reference to the economic dependence of the monarchy. She affirms that “if the king is flush with capital he chooses to maintain control, but if not, he franchises out the organization delegating control to the merchants”.⁵¹ Although the Spanish pretended to maintain a monopoly over Atlantic trade the financial situation of the monarchy was critical.⁵²

To conclude, it is therefore necessary to distinguish between theory and reality. In theory the Spanish monarchy exercised a monopoly over trade, but at the local level not only large companies but also more modest merchants and common people participated in the game of Atlantic trade. Only historians who have worked at this level know that prohibitions were not respected and enforced and that limitations were often avoided.⁵³

2.1.1. House of Trade

⁴⁹ For historical debates regarding the institutional regulation of trade, see Oliva Melgar (2004).

⁵⁰ Haring (1947), p. 313.

⁵¹ Rei (2008), p. 8.

⁵² In fact, the constant problems of controlling all territories forced the king to turn to bankers frequently, see Carande (2001)

⁵³ See for instance Bernal (1992), Vila Vilar (1991) or Otte (1996).

The *Casa de Contratación*, or House of Trade, was created in 1503 as the sole institution for controlling trade with the colonies. Following the model imposed by the *Casa da India* in Lisbon, the House of Trade assumed all sorts of functions related to the Atlantic. It was used by the monarchy as an instrument for fiscal and mercantile control, as the House was the only organism with competences in the collection of taxes. Moreover, the institution was in charge of the expedition of licences, both to participate in the slave trade and also to migrate to the Indies.⁵⁴

This organism was also responsible for the control of gold and silver coming from America, from its departure in the Atlantic ports to its arrival at Seville's mint.⁵⁵ Initially, the House assumed a number of competencies with regard to maritime traffic, organizing the fleet system and examining ship pilots. These functions, however, were later transferred to the Consulate.

One of the most relevant functions of the House of Trade was to be a court for all conflicts related to America: mercantile, criminal or civil. Haring affirms that the jurisdiction of American trade had belonged exclusively to the House until 1524 and was independent from all State authorities except from the king.⁵⁶ It was in 1524 that the king established the *Consejo de Indias* as a supreme court for all conflicts related to the colonies.⁵⁷

The control of political institutions in America constituted an additional competence for the House of Trade.⁵⁸ Officers at the House exchanged information periodically with their correspondent at the different custom offices. The establishment of multiple custom offices at the major American ports obeyed the idea of control the merchandise, both on departing and arrival. The communication system with the House of Trade was expanded to other authorities in the Indies such as governors or local court members as the colonization process moved forward.

It is not possible to assert that America was an unprofitable business interest for the monarchy. Indeed, the Spanish Crown received an important economic injection from taxes. Figure 2.1 shows the consistent growth in income from taxes collected by the House of Trade at Seville.

⁵⁴ Yun (2002), p. 61.

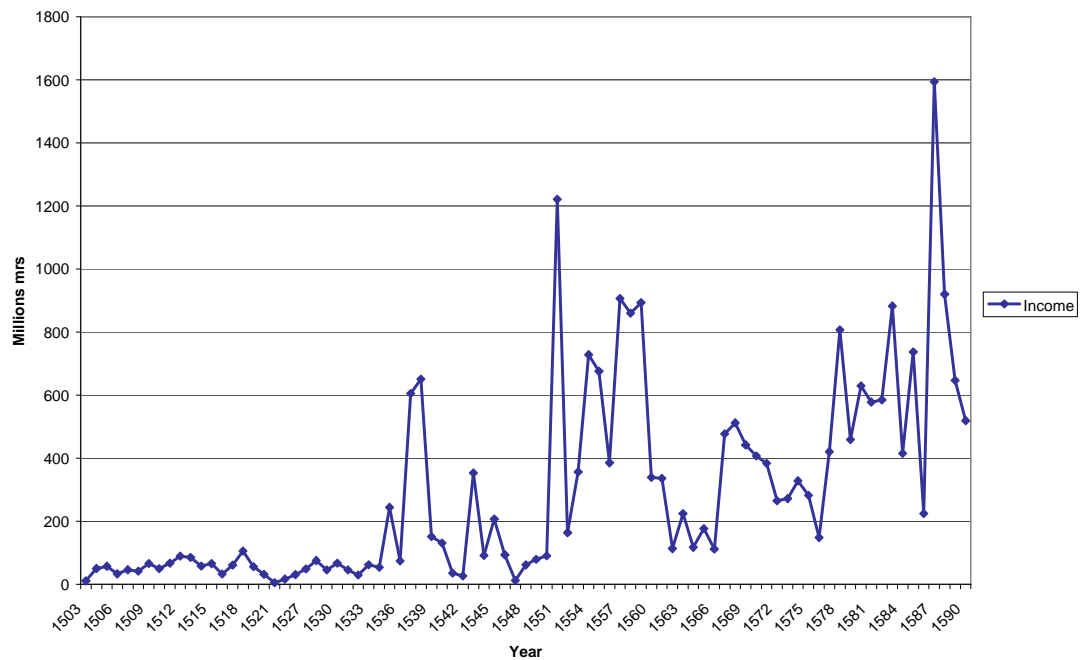
⁵⁵ Oliva Melgar (2004), p. 17.

⁵⁶ Haring (1979), p. 53.

⁵⁷ The *Consejo de Indias* is analysed in depth in Schäfer (2003).

⁵⁸ Haring (1918), pp. 14-15.

Figure 2.1: House of Trade's Real Income



Source: Haring (1979)

During the first thirty years income was modest, but from 1530s profits increased dramatically, growing from 25 to 1600 millions of *maravedís*. These numbers prove that the major problem for the Spanish monarchy in these years was not income but expenditure: the maintenance of the Spanish Armada and the military campaigns in Europe produced a persistent deficit on the Royal Treasury. The permanent economic deficiency repeatedly forced the Crown to negotiate loans with merchant-bankers who obtained licence for establishing a Consulate in Seville.

2.1.2. The consulate

Consulates appeared in Italy during the Middle Ages. As an institution the consulate was basically designed as a merchant guild with the purpose of secure commercial transactions at the market. In accordance with this aim, consulates upheld certain rules of behaviour in order to promote honest trade, the observation of which was compulsory. The non-observance of such precepts caused damage to reputation and a loss of profits.⁵⁹

As a guild, membership was restricted to Spanish merchants. To obtain membership potential traders had to prove that trade was their major occupation. In this sense, the Consulate can be defined as the institutionalization of the merchant

⁵⁹ Smith (1972), p. 3.

community at a local level; foreigners and non-professional merchants were therefore excluded. The protection of commercial interests, however, was not restricted to the national territory but was extensible to members when they were abroad. Consulates acted as merchant coalitions providing advantages for members such as the settlement of commercial disputes among their members by an arbitration process.⁶⁰ Moreover, these organisms also assumed competencies on insurance and exchange rate regulation.

The Consulate of Seville was created in 1543 assuming functions related to the organization of the fleet system which was transferred from the House of Trade. Additionally, the Consulate was responsible for the regulation of market aspects such as the price of freight or the insurance contract.⁶¹ In the opinion of Oliva Melgar, this organism played an important role on the origin of commercial companies.⁶²

The Consulate was regulated by a body of legal norms called *Ordenanzas*. The first ordinances were approved in 1543, and were revised only on two occasions, in 1572 and 1766.⁶³ Most of the rules were devoted to the regulation of maritime insurances or the arbitration process. Surprisingly, in the rules which regulated the Consulate of Seville, we find not a single word on rules of behaviour for their members. By contrast, Consulates like the Burgos contained a complete list of precepts that must be observed by members. The lack of a behavioural code indicates that a great part of trade was conducted outside of this institution.

Once again, it should be noted that consulates had a local character and only merchants from the city could be members. This criterion had important implications: it considerably limited the reach of the institution, and only a small proportion of the participants in the Atlantic trade were represented by this organism. For instance, in sample A of 2500 contracts analysed in this dissertation, merchants from Seville only represented 7,5% of the total participants in trade.

2.1.3. Institutions on the other side of the Atlantic

The special circumstances which followed the discovery of America forced the appointment of Christobal Columbus as Viceroy of the Indies. Following his very early death the Genoese substituted him with his son Diego Columbus. However, the Crown always tried to limit his competences, which generated frequent conflicts. After the

⁶⁰ Bernal (1992), p. 53.

⁶¹ Oliva Melgar (2004), p. 18.

⁶² Oliva Melgar (2004), p. 18.

⁶³ Heredia Herrera (1973), p. 23.

death of Diego the position of Viceroy of the Indies was eliminated, and a Governor for Santo Domingo was appointed in its stead.

At the first stage of the colonization process the monarchy established two organisms: a custom office and an Audience. The former was created in 1503 with the tax collection and royal mines inspection as major duties.⁶⁴ The Audience of Santo Domingo was created in 1511 as a civil and criminal court for the new territories.⁶⁵ The Audience also assumed competences with regard to coordination. For instance, the president of the Audience maintained periodic meetings with the chairman of the custom office. The Audience of Santo Domingo was also responsible for the coordination of the rest of courts created in America, beginning with Mexico in 1526.

2.2. Seville: Port of the Indies

There is general agreement among historians about the importance of Seville before the discovery of America. Scholars like Collantes de Terán (1977), Carande (2001) and Ladero Quesada (1980) have supported this argument with information on the population and the economic activity of the city. In to their opinion, the large population boom took place in the city during the Middle Ages, when the number of families increased by an order of 40%. From this time, Seville became the largest city in Spain. The most significant growth in population in the city took place during the 16th century, as shown in figure 1.9. Madrid and Barcelona, which are today the largest cities, began to take off by the second half of the 17th century. The share of Seville in terms of the total urban population of Spain passed from 10% in 1450 to 14,15% in 1500.⁶⁶

As the most significant centre of Spanish population in the 17th century, Seville was also the headquarters for the important merchant communities, mainly foreigners. Morales Padrón states that from the 13th century foreign groups of merchants settled in Seville, thereby placing its economy within Mediterranean commercial networks.⁶⁷ The city became an important link in the new commercial routes connecting Italy with England and Flanders via Iberian ports.⁶⁸ This status was underpinned by the geographically privileged position of the city: through the river *Guadalquivir* it was connected with the Mediterranean ports and North Africa. In terms of defence the city

⁶⁴ Haring (1925), p. 310.

⁶⁵ Commercial conflicts were judged at the House of Trade in Seville, the Audience of Santo Domingo only had competence to extradite the accused to Spain.

⁶⁶ Pike (1966), pp. 21-22. For the case of Seville, Ruth Pike calculates the urbanization rate as the proportion of Spanish population living in the city.

⁶⁷ Morales Padrón (1989), p. 17.

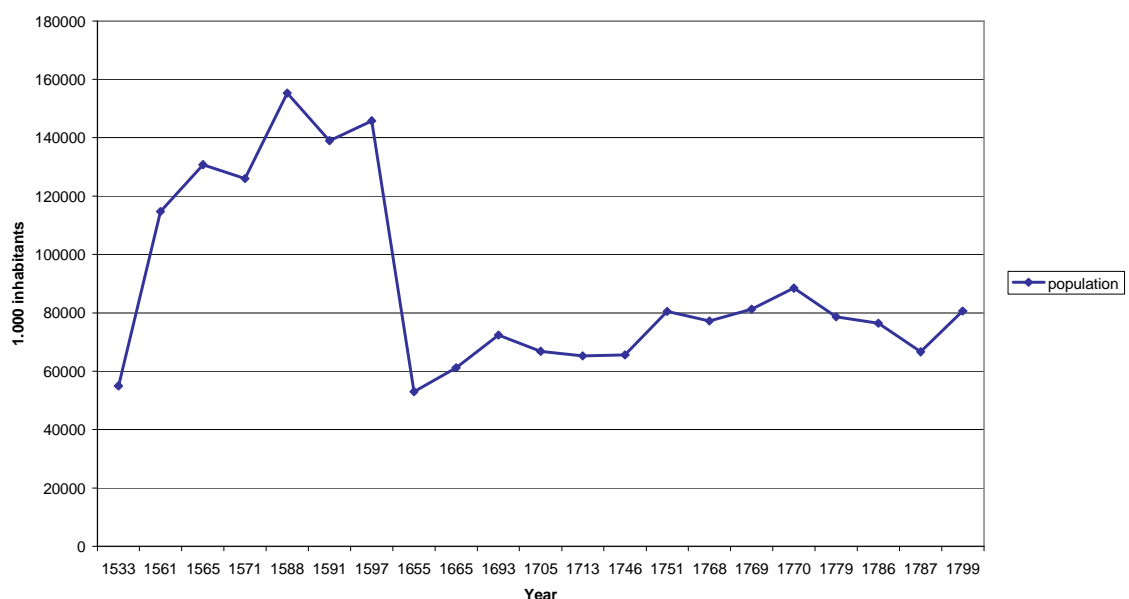
⁶⁸ Carande (2001), pp. 35-41.

also had a comparative advantage: an internal port protected from piracy. These factors together justify why the Spanish monarchy selected the city as unique port for the trade with America.

Yet, despite the importance of Seville prior to the opening up of American trade, the fact remains that the discovery of America produced major benefits for the city. During the 16th century, Seville became “not a city but a world”, as described by the chronicler Fernando de Herrera.⁶⁹ In a similar vein, the writer Santiago Montoto defined the city as an “ocean of businesses”.⁷⁰ Trade had a large impact on the local economy, not only via intermediation but also by stimulating local production. Scholars like Bernal (1992) or García-Baquero (1986) contend that Seville contributed to the supply of American markets with products such as oil, wine or cereals, and analysis of historical contracts supports this idea. Olive oil from the Aljarafe, wines from North Seville and wheat from Guadalquivir Valley were highly appreciated in the Indies.

The population of Seville also grew as a result of the economic activity. Many people from distant regions and countries descended upon the city, attracted by the flourishing trade there. The next figure shows the important growth in population which Seville enjoyed during the first century of trade. After these years, Seville began to fade as a trading and population centre, being substituted by Cadiz in the 18th century as the main port for the trade with America.

Figure 2.2: Population in Seville



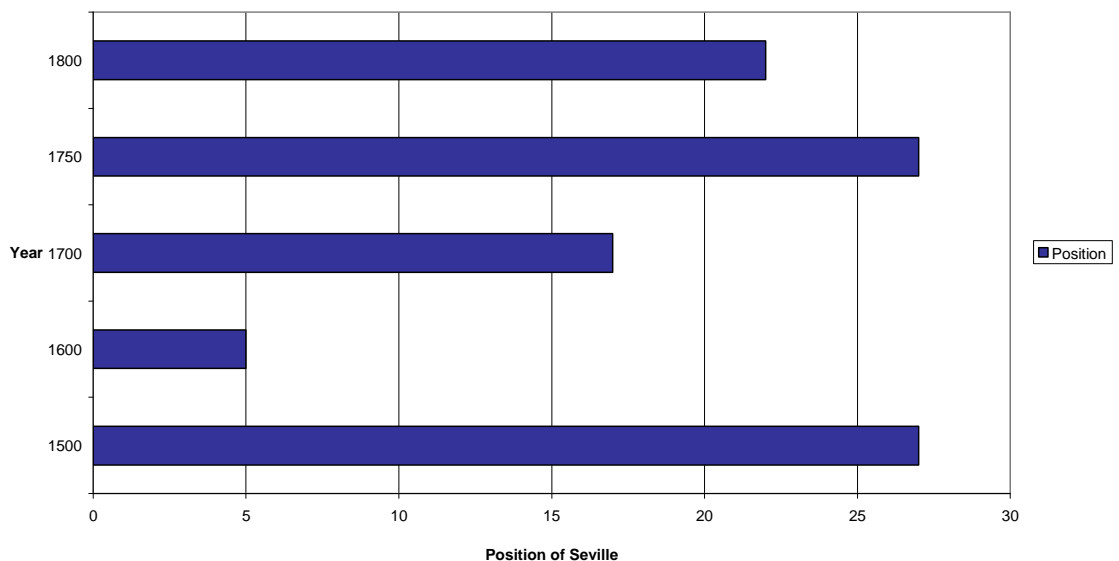
⁶⁹ Herrera (1955), p. 648.

⁷⁰ See Montoto (1911). For more detail descriptions of the city see García-Baquero & Collantes de Terán & Bernal (1992) and Domínguez Ortiz (2003),

Source: Bairoch (1988)

Data from different European cities confirm the development of Seville during the 16th century. The following figure represents the position of Seville in the ranking of population for European cities from the 16th century.

Figure 2.3: Seville in the Ranking of European Cities



Source: Bairoch (1988)

At the beginning of the century the city occupied 27th position in the ranking of cities in Europe; but by the end of the century it is considered the fifth most populous city. This rapid development seems to have stopped during the 17th century, and Seville's decline is confirmed during the 18th when the city falls further, back indeed to the 27th position.

2.3. The practical side of trade

Practically, it was the fair system that drove the commercial revolution which took place in Europe during the Middle Ages. The periodic meeting of traders produced a growth in commercial transactions and contributed to the development of credit instruments and new forms of legal association. The diffusion of bills of exchange specifically reduced the risk assumed by traders on delivering gold and silver. These

new financial instruments allowed merchants to carry out multiple transactions with only a single document.

During the Middle Ages, and more specifically in the 14th century, the system of sending goods to a correspondent on consignment became very popular among European traders.⁷¹ The system was used most heavily in the Baltic area, where the organization passed through individual merchants with professional independent agents.⁷² On the contrary, Mediterranean trade was mainly channelled via big companies with branches in the main cities and permanent factories.

These commercial innovations were transferred to the trade with America where permanent agents and the goods on consignment system coexisted together with alternative forms of organization. It became very popular, for instance, for there to be a presence on commercial transactions of non-professional merchants acting as agents. In the Atlantic, sailors, masters, artisans, bureaucrats and migrants traded as a secondary occupation obtaining extra income.

2.3.1. Access to credit

Whilst the Greco-Roman economy was well supplied with cash, credit was a necessary instrument in the medieval system. Experts agree that the economic take-off experienced during the 14th and 15th centuries was fuelled by a closer collaboration of people using credit.⁷³ For the Spanish case, Bernal (1992) has highlighted the high degree of activity in the credit market. Everybody participated in the credit transactions and merchants, artisans or shipmasters daily negotiated loans. Unfortunately, there is no robust analysis of the credit market during the 16th century. The only data is provided by Bernal (1992) and results seem to be biased.

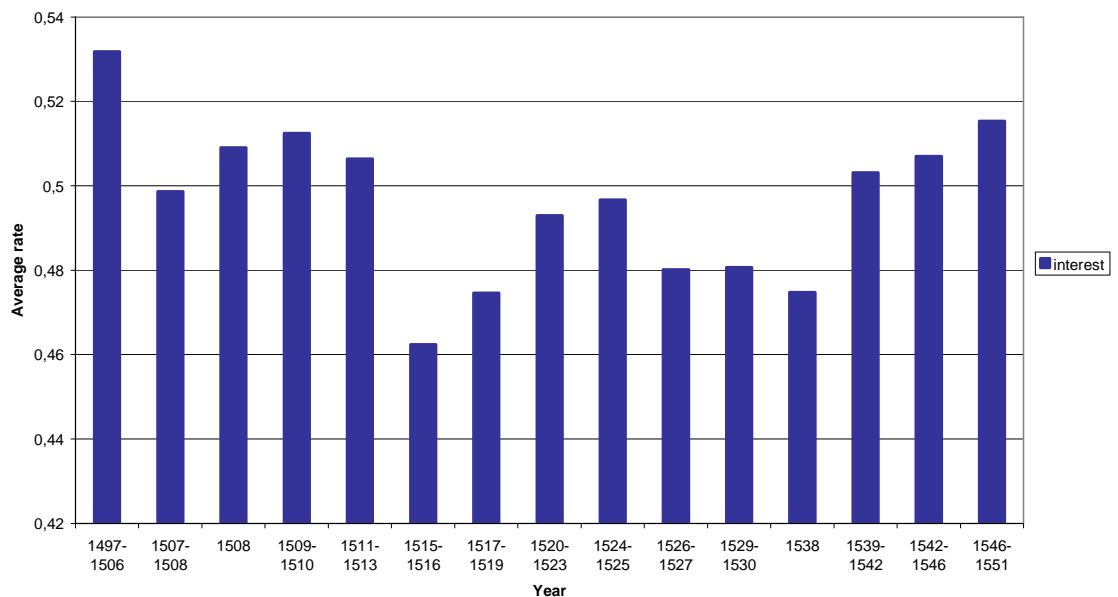
Ignoring the data problems previously explained, Bernal (1992) detects a some curious tendencies during the first decades of trade: in the credit market the volume of loans remained constant. Most likely, in this initial stage bankers were more careful. By contrast, during the second half of the 16th century the amount of money on credit increased drastically. This tendency continued during the 17th century. Interest rates were also extremely high. The only available analysis for the credit market in Seville during this period paints a sad picture, with interest exceeding 50%. During the first half of the 16th century the average interest rate remained above 45% as shown in figure 2.5.

⁷¹ De Roover (1971), p. 44.

⁷² Spufford (2006), p. 106.

⁷³ Lopez (1971), p. 72.

Figure 2.4: Interest Rate



Source: Bernal (1992)

For the Atlantic trade, one of the most popular credit instruments was the sea loan or *préstamo a la mar gruesa*.⁷⁴ In this contract, borrowers agreed to assign loans to merchandise acquisition and freight expenses. As sea loans were associated with one journey, the repayment was established in Seville, thirty days after arrival. Occasionally, the loan was negotiated by the master and divided among traders loading merchandise in the ship. In case of joint negotiation, interest rates were lower.⁷⁵

2.3.2. Levels of trade

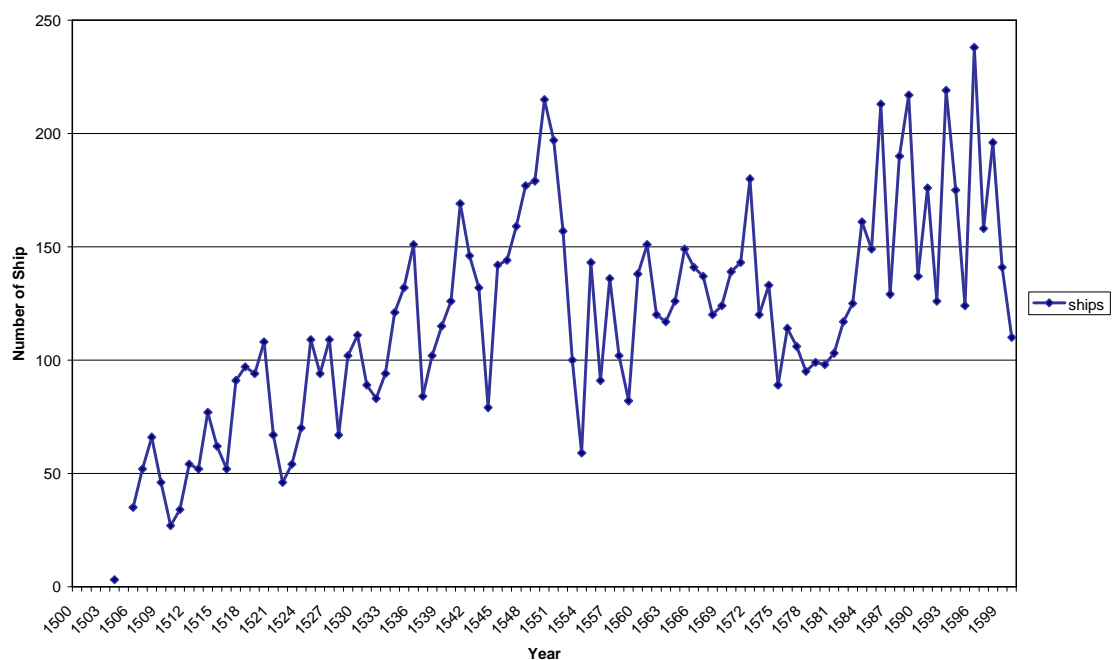
Before concluding this section it is important to establish a distinction among traders, because not all participants in commercial exchange with America traded in the same conditions. An important part of trade was managed by merchants from all over Europe. These relevant merchants enjoyed access to privileged information and numerous advantages that came from being part of trading organizations such as consulates. At this level of trade reputation was very important and coalitions worked.

⁷⁴ Otte (2006), p. 176. This contract was also studied for the case of Venice by Gonzalez de Lara (2001).

⁷⁵ Pike (1972), p. 86.

The flow of information coming from the other side of the Atlantic presents a positive tendency during the 16th century as shown in figure 2.6.⁷⁶ Merchants with a larger agent network in America controlled a bigger part of this precious information. On occasion, merchants in Seville even knew more about markets in America than agents residing in the major trading centres of the New World.

Figure 2.5: Mail Ships



Source: Chaunu (1955), Vol. 8

As has already been mentioned, it was not only professional merchants but also individuals from different occupations that participated on trade. Traders thus belonged to diverse social statuses such as sailors, clergy or artisans. They invested in the Atlantic trade and worked together with relevant merchants. In order to gain an impression of this milieu, **Sample A** of this dissertation of more than 2723 people professional merchants only represents 34% of the total. In spite of this fact, scholars show a lack of interest about this level of trade which is present only in quantitative analysis. Indeed, collections of data regarding volume of total exchange contain these transactions but without further explanations. This is unfortunate; as I show in this dissertation, the social composition of the Spanish Atlantic Trade had a large impact on the way in which it was conducted, and how it changed over time.

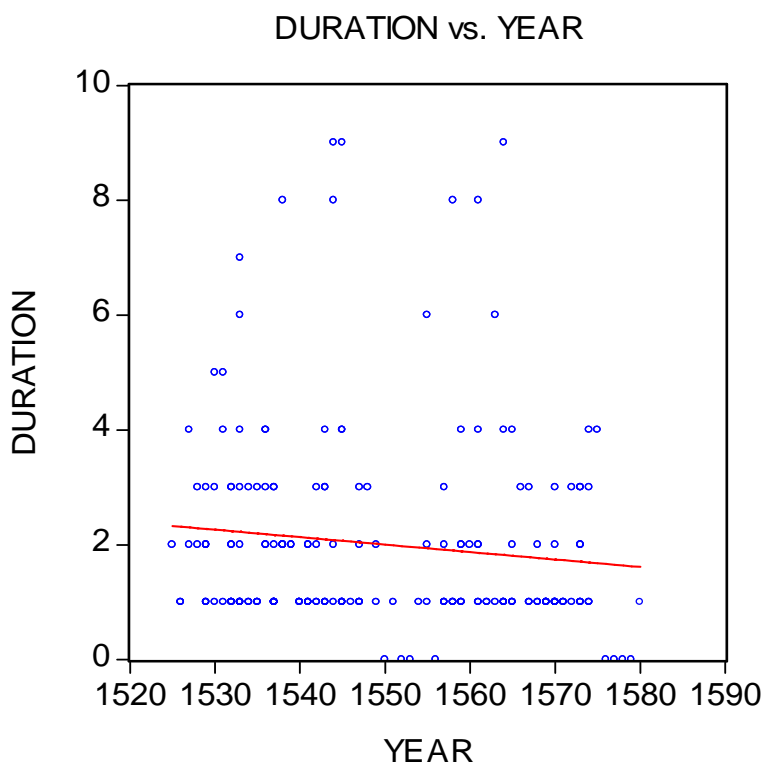
⁷⁶ Information about the mail system during the 16th century does not exist. Scholars such as Vallejo (1998) and Bose (1942) affirm that at this first stage letters were transported in private ships together with merchandise. Following that I have built a proxy using the number of ships arriving from America with data from Chaunu (1955).

2.4. Legal Enforcement

Following North (1991), trade expansion can be explained through a strong State which enforces agreement reducing transaction costs among economic agents.⁷⁷ Unfortunately, this was not the case of Spain, which has been repeatedly referred to as synonymous with inefficiency in trade. This section aims to describe the legal system designed by the Spanish rulers for the trade with America. With this aim in mind, I describe here the tools provided by the State to enforce contracts and analyze their efficiency.

Within the institutional framework for the trade with the New World the Crown established a specific court to solve conflicts: the House of Trade. The Audiences in America were subsidiaries and every lawsuit related to trade had to be judged in Seville. In special if rare cases, people could go to the *Consejo de Indias* in Madrid, which acted as a Supreme Court.⁷⁸ The efficiency of this legal system was limited because of the high cost of lawsuits, both in terms of money and time. Figure 2.7 shows how time consuming a judicial process in 16th century Spain could be. The duration of every lawsuit is measured in years.

Figure 2.6: Duration of lawsuits



Source: Own elaboration with data from *Archivo General de Indias*. Section: Justicia

⁷⁷ North points out the importance of mechanisms such as increment on number of courts or merchant laws, see North (1991), pp. 29-32.

⁷⁸ The relationship between both institutions has been studied by Schäfer (2003).

The figure presents somewhat depressing results: people had to wait on average between one and four years to obtain legal resolution following the opening of legal proceedings. Occasionally, lawsuits were ongoing for almost a decade as reflected in the maximum values in the graph. The situation becomes even more worrying when we take into account that the regression line is nearly flat what means that there are no changes on time. In other words, the efficiency of institutions did not improve, at least not during the 16th century.

From 1543, however, the Consulate also acted as a court, offering a shorter and cheaper procedure: that of the arbitration. In this procedure there was a third person, normally a professional merchant, who acted as referee between parts.⁷⁹ The procedure increased possibilities to solve commercial disputes at a low cost. Unfortunately, only members of the Consulate had access to arbitration.⁸⁰

The persistence of contradictions among legal norms should be added to the inefficiency of the court system. The rules dictated by the Crown were arbitrary and imposed in the interest of groups close to the rulers. In 1503, for instance, the King prohibited the cultivation of grapes and the production of wine in America in order to protect local production in Spain. However, in 1519 the House of Trade received instructions to send a number of grapevines to be planted in Santo Domingo.⁸¹ Despite the prohibition, in Peru the farmers produced wine on their own initiative without opposition from authorities.

In addition, the constant deficit on the Royal Treasury forced the monarchy to confiscate precious metals coming from America. Wars, the maintenance of military detachments and debts in general allowed the Spanish Crown to kidnap American gold and silver. On exchange merchants received the equivalent of the quantity confiscated in national bonds (*juros*). The transaction was unfavourable to economic agents since the bonds were practically irrecoverable. This practice constituted a serious obstacle to trade.⁸²

As presented in table 2.1, sequestration of gold and silver from America occurred regularly during the 16th century.⁸³ The first quarter of the century was the most intensive, coinciding as it did with the financing of various military campaigns, including the war with France and the offensive against Protestants in Flanders and Germany. This military activity, together with the only modest benefits received from

⁷⁹ Cuesta Sáez (1994), p. 319 and Coronas González (1994), p. 262.

⁸⁰ This institution is similar to those analysed at North, Milgrom & Weingast (1990).

⁸¹ Haring (1979), p. 158.

⁸² See Lorenzo Sanz (1982), Vol. 2, pp. 101-115.

⁸³ For the period 1500-1600 the Crown confiscated gold and silver in 30 occasions, data about quantities is only available for 16 of them. For this reason table 1 takes into account only the number of years with at least one confiscation. See Lorenzo Sanz (1982) and Abed Al-Hussein (1986).

America, produced a huge deficit on the Royal Treasury.⁸⁴ During the rest of the century the number of confiscations decreased, reaching a minimum in the final quarter. Even this optimistic result implies a great disincentive for investments; during this period merchants suffered at least one confiscation in 5% of the years.

Table 2.1: Confiscation of Gold and Silver

Period	Years with at least one confiscation
1500-1525	11
1526-1550	6
1551-1575	7
1576-1600	5

Source: Lorenzo Sanz (1985), Vol.2

The arbitrary legal system seemed to generate more uncertainty than the economic conditions. With a legal system which offers such poor tools to avoid opportunism people had to develop informal procedures to solve conflicts. Some of these informal systems have been only superficially studied, yet others have been completely ignored.

2.5. Insurance system

In the case of Atlantic trade, insurance was compulsory. According to Cruz Barney (1998) the reason for this was the cost assumed by the Crown in rescuing the ships. Certainly, in the case of accident or natural catastrophe, the insurance company reimbursed the value of the merchandise included in the policy and the authorities had to pay for the rescue of the ship.⁸⁵

Initially, the House of Trade was designed to control the insurance market. However, this competence was transferred to the Consulate in 1543.⁸⁶ Merchants could only insure a part of the merchandise and not the total value because it was compulsory to support at least a part of the loss. In the case of Seville the maximum part covered by insurance was established at 2/3.⁸⁷ The merchandise was evaluated by agreement between the insurer and the insured. In case of conflict, the Consulate

⁸⁴ We should not forget that during most of this period America was reduced to the Caribbean area. The major profits arrived after the discovery of the continental area, mainly Mexico and Peru both in 1521.

⁸⁵ Heredia Herrera (1973), pp. 164-166.

⁸⁶ Heredia Herrera (1970), p. 222.

⁸⁷ Basas (1957), p. 332.

could mediate. In any case, the insurance contracts covered only the risks to delivering: namely fire, natural disasters and piracy.

According to García-Baquero (1992), the contract was valid for a period of two years, beginning when the merchandise was loaded. In case of damages to merchandise, the period for restitution was six months, this period being extended to 18 months in cases where the ship disappeared. The procedure for restitution required a royal certification from the place where the damage was caused. The master of the ship was responsible for sending the certification within a two year period.

2.5.1. Elements of the insurance contract

After the signature of the contract, the trader had a three month period to pay the cost of the insurance. This cost had two components: a fixed and a variable component. The fixed cost was mainly the official register in the House of Trade or the Consulate, this cost varied through the century, 16 mrs for every 100 ducados insurance until 1572 and 34 mrs from 1572. The variable cost or premium was established legally at the level of 5% of the merchandise's value and would fluctuate according to the type of items insured: for money it was between 5% and 10%, for slaves and animals between 8% and 12%, and for merchandise in general – fabrics normally – around 20%.

2.6. Strategies to control investment

During the 16th century, merchants investing in the Atlantic Trade developed several strategies to control their business overseas. These private control tools can be classified into two groups: those incorporated in the contracts as clauses and others external to the business. In the first group we can place the endorsement and the seizure of goods, while networks and debt-collectors can be placed in the second group.

The endorsement mechanism consisted of the introduction of a third person responsible for payment in those cases in which the debtor was not able to afford it. The harassment of seizure was also included in the contracts. The debtor signed a clause according to which all their properties, movable or immovable, were offered as guarantee for the payment. The seizure of goods was a procedure legally regulated. To initiate a seizure procedure it was necessary first to legally declare the formal

bankruptcy of the debtor and arrange a posterior meeting of creditors. This time-consuming process was used as a last recourse.

2.6.1. Networking and the debt-collector system

One of the most analysed control mechanism was networks. A network can be defined as a group of people connected by personal relationships. The importance of a network as a control tool lies in the circulation of information. In this sense, Early Modern merchants used their connections to obtain information about the economic activity of their agents and debtors overseas. Major problems regarding this control tool are related to its limitations. Indeed, a network by definition had to be constituted by a limited number of links otherwise the utility of the network will disappear. As the number of nodes in the network increases the cost of manage them increases too.

An alternative strategy for controlling debtors overseas was the use of a third person to collect debts. As has already been highlighted by acknowledged experts such as Bernal (1992) or Lorenzo Sanz (1986), these debt collectors were very popular in the 16th century. However, a further analysis of this technique has not been undertaken. Empirical works on different historical and geographical frameworks also stress the importance of this control technique. Hoff and Stiglitz (1991), Siamwalla (1991) or Aleem (1991) point out the efficiency of a similar debt collector system in rural credit markets.

This technique, considered as an institution, was applied in special contracts called *poder para cobrar en Indias*. In the contract, a person acted as eventual agent with the only purpose of finding one or several people and to collect debts from them. These debts were the result of selling merchandise on credit.⁸⁸ The items were sold at Seville and after the signature of the contract the debtor went to America with the merchandise while the merchant stayed at Seville. The period and the place for the payment was clearly stipulated in the contract – normally Seville. If, after a period of time, no payment was made, a debt collector was sent to America.

As the collection of debt is the main objective the principal provided all sorts of details about people they were sent monitor: their name, the quantity of their debt, cities where the debtors might be found, etc. The eventual agent or monitor could be a sailor, a master, a migrant going to America or a professional hired at the market for

⁸⁸ On occasion, the debt was simply the consequence of a loan. In these cases the procedure was exactly the same.

that purpose. From an economic point of view, this can therefore be considered an external enforcement instrument.

Obviously, the agent sent to America and the debtor had the possibility of colluding against the principal; however, this probability decreased if the cost of this behaviour exceeded the benefits for collectors. In order to explain this we should focus on the debt-collectors, who can be classified into three categories: professional collectors, seamen who frequently crossed the ocean, and members of the merchant's network. In the first case, collusion by a professional debt-collector hired at the market could seriously damage his reputation and lead to him being excluded from future contracts.⁸⁹ Besides, these agents received their honoraries at Seville once the payment was made, and their salaries depended on the cash collected. But in the case of collusion, they would receive nothing.⁹⁰ This monetary cost should be added to the loss of reputation. With regard to the second case, sailors and masters very often had special agreements with merchants by which, acting as debt-collectors, they received merchandise at lower prices.⁹¹ Again, cheating on the merchant meant a possible future loss, and a permanent one as well.⁹² Third, in the case of members of the principal's network, mainly relatives and permanent agents, opportunism could be punished with a definitive exclusion from future transactions.⁹³ This is added to the fact that, in every instance, the principal could always send another debt-collector to monitor behaviour at the cost of a new contract.⁹⁴ To sum up, the delinquent customer in America could bribe the debt-collector by paying at least as much as the collector could expect from the principal plus a quantity for the damage on reputation and the exclusion from further transactions. But, in any case, this payment could prevent the principal from sending another debt-collector.

⁸⁹ In these terms the merchant Andrés de Areilça referred to his agent Juan de Lariz as follows: *"He spent the money on cards games and women. He received money from my debtors and signed secret contracts with them"*, Archivo General de Indias, Section *Indiferente*, N. 1, doc. 2, p. 1.

Merchants also reported positive behaviour as showed in the following quotation which is part of a testimony given during a lawsuit at Seville in 1525: *"He heard in this city and in Valladolid that Juan Guevara was a trustworthy person and that Andrea Valenti trusted him and employed him frequently as an eventual agent"*, Archivo General de Indias, Section *Justicia*, 700, N. 8, Vol. 1, p. 69.

⁹⁰ These honoraries generally consisted of a share of the total debts collected, see Lorenzo Sanz (1986), Vol. 2, p. 135.

⁹¹ Seamen were excluded from taxes and although it was not their main activity they traded on their behalf, see Pérez-Mallaina Bueno, P. E. & Gil-Bermejo García, J. (1984), p. 280 or Bernal (1992), p. 157.

⁹² Sailors collected minor debts, and therefore the benefits from remain honest exceeded benefits from cheating.

⁹³ Greif's argument fits with this case since the transaction is carried out inside a well-defined group.

⁹⁴ The principal had the opportunity to send a new agent to monitor the debt-collector just assuming the cost of contracting, and the debt-collectors in general knew about the possibility of being monitored. This was the case of Francisco Calvo who sent Andrés Villalobos to Mexico to control his debt-collector Juan Álvarez, Seville Notary Offices' Archive, Office XV, Book II, p. 67, Year 1517. Also to Mexico was sent Pedro Hernández by order of the merchant Francisco García Caborredondo, his main duty was to monitor Francisco Ávila who was the first debt-collector that the merchant sent to America, Seville Notary Offices' Archive, Office XXIV, Book I, p. 67, Year 1572.

This monitoring technique obviously had a cost. The agent normally received a percentage of the debt collected. We find references of such costs in the historical literature. Lorenzo Sanz (1982) estimates the salary of a debt-collector as between 8% and 10% depending on the difficulties of receiving the payment. Unfortunately, contracts which include this information are rare. One thing we know for sure is that contracts show how principals would group several debts in order to minimize the total cost of monitoring.

The importance of these contracts lies in their utility for controlling debtors in a scenario characterized by asymmetric information and long distances. Contracts considerably reduced the cost of transacting. People could save effort in terms of time and money by building a strong relationship prior to business because merchants did not need to trust if they could control. This explains the massive participation in trade and the high volume of purchase on credit. Merchants could sell on credit and afterwards send someone to collect debts.

Obviously, this is not to say that trust was not important. The importance of merchant communities, family links and networks to explain trade is reinforced by a very particular way of controlling debtors overseas.

Conclusions

The historical framework previously described discouraged investment: a weak state that changed the rules of the game according to interests of pressing groups; an apparently royal monopoly which served to restrict the volume of trade; a court system which performed inefficiently in solving conflicts; and finally an absolute monarchy with the power of confiscate goods coming from America. To these facts we should add long-distances, new routes and communication problems in general, which generated asymmetric information.

Despite this, trade existed and was growing at least throughout the 16th century. Traditional explanations of economic transactions in such a high-risk scenario have passed through reputation mechanisms or trust, emphasizing the role played by family links, neighbourhood and friendship. For the case of Seville and the Atlantic Trade, however, these explanations are quite limited. This dissertation therefore aims to contribute to the analysis of alternative institutions used by traders to solve asymmetric information problems. The debt-collector system and the use of contracts as institutions passed as screening devices.

Chapter 3: Sources

The use of contracts in economic exchange is a very old phenomenon. Since ancient times economic agents have written down the conditions of economic transactions in documents in case of conflict arising later. The Atlantic Trade was no an exception to this, and many traders registered contracts before going to America. The result is the existence of a wide range of contracts available for economic analysis. These contracts constitute the major source for this dissertation.

The importance of contracts lies in establishing the rules of the game for transactions. As North (2004) has pointed out, “contracts contain the provisions specific to a particular agreement”.⁹⁵ Eggertsson (1990) stresses the fact that contracts’ analysis should be an important part of economic research since their clauses reflect the rights and conditions of economic transfers between parties.⁹⁶ Despite the importance of these documents, in Economic History contracts’ analyses are pretty scarce, and pieces of research such as Akerberg and Botticini (2000), Rei (2009) or Hejeebu (2005) are rare.

By contrast, historians more generally have recognized the importance of these sources and research using contracts is more abundant. Referring to the medieval Commercial Revolution, for instance experts affirm that “the development of commercial contracts is as crucial in the history of trade as of tools and techniques in the history of agriculture.”⁹⁷ Unfortunately, most historical research on contracts is merely descriptive and scholars have often focussed on participants in the business more than in business itself. The greater use of contracts as a source for Economic History would therefore seem only natural.

⁹⁵ North (2004), p. 47.

⁹⁶ Eggertsson (1990), p. 52.

⁹⁷ Lopez (1971), p. 73.

This is even more so since in microeconomic analysis itself contract theory occupies a privileged place. Indeed, theoretical models have focused on contracts as solutions for asymmetric information problems [Stiglitz & Weiss (1981), Greenwald (1979), Guash & Weiss (1980), Guash & Weiss (1982), Spence (1973)]. Empirical analysis on principal-agent conflict also uses contracts as a major source. The studies on insurance markets of Chiappori and Salanié or the credit card analysis of Ausubel are clear examples of that trend. In this thesis asymmetric information holds a privileged place. This offers an additional reason to use contracts as major source dissertation, since most theoretical questions regard solutions offered by economic agents to overcome information problems.

This chapter is organized as follows. Section 3.1 describes one of the major archives for contracts in Spain, highlighting its importance for the analysis of Early Modern commercial transactions. Section 3.2 analyses the only inventory for historical contracts for the Spanish case. Sections 3.3 and 3.4 deal with sorting: while section 3.3 is devoted to the study of the data-collection process, section 3.4 measures the importance of the samples selected. Section 3.5 introduces some remarks on contracts' typology showing their evolution on time. Section 3.6 presents some simple statistics to describe the group object of analysis. The final section contains some conclusions.

3.1. The Archive of Notary Offices at Seville

The strong tendency towards bureaucratization of the Spanish monarchy in this period inevitably produced a huge number of documents relating to many aspects of Spanish life. As a result, and because of the organization of trade with America via Seville, the notary's archive of the city presents one of the most complete collections of trading contracts in Europe.

The contracts in the archive cover a chronological period spanning the Middle Ages to the present day. This dissertation deals with the analysis of Atlantic trade, and more specifically with the solutions designed to meet asymmetric information problems in the new geographical framework, and since the focus on the analysis is from a very early stage in the trade onwards, the sample of contracts selected chronologically runs approximately from 1500 to 1600.

The archive itself is divided into 24 notary's offices, the majority of them without indexes. The distribution of the offices reflects the medieval geographical division of the city based on churches jurisdictions and guilds. As the city was growing, new offices

appeared in different areas; nevertheless, in the 16th century, it reached its maximum size and the numbers of offices remained constant from then on.

For every office can be found piled into often a very large number of bundles. Generally one bundle corresponds to one year. However, for busy periods, it is possible to find two or more bundles annually. For instance, for the first half of the 16th century there are more than a thousand bundles. Each bundle reflects a part of the economic activity of the city, including numerous different sorts of documents: from dowries to contracts or testaments. This has obviously discouraged historians from using these sources. Yet, notwithstanding the difficulties associated with accessing them, these documents taken together represent an important source for social and economic history.

Elsewhere, dowries and probate inventories have been frequently used by social historians. Most analyses in this field focus on issues related to the social structure of the city [Aguado (1994), Álvarez Santaló and García-Baquero (1981), Morell Peguero (1986) and Candau Chacón (1991)]. Aguado (1994) and Morell Peguero (1986) show a general overview of the society according to their patrimonial level, and the rest of studies focus on specific social groups as the nobility or the clergy. These social historians have been more interested on the division of groups according to their patrimonial distribution, for this reason they avoid contracts.

By contrast, Otte (1996) uses contracts as his main source. He works with a sample of contracts to explain some aspects of the economic activity in Seville before the discovery of America. From agrarian production to local industries or trade, his description is full of details about the quantity or quality of products. However, the study is focused on the description of businesses of some important families, and with this aim the author collects contracts according to the traders and not to the contract itself. Economic information from the contract is ignored; the focus of the analysis is instead on the reconstruction of merchant networks.

Bernal (1992) is the only piece of research based on contract conditions and using documents from the notaries' archive in Seville.⁹⁸ In this book, the author describes some aspects related to the formal documents such as their historical origin, people involved or legal requirements. The major goal of this analysis is the reconstruction of the pool of lenders and borrowers and conditions of the local credit market. The analysis itself, however, is merely descriptive and results may be biased by unbalanced samples.

⁹⁸ Bernal (1992).

Recently, a research group coordinated by Renate Pieper has worked with documents from the above mentioned archive.⁹⁹ The aim of the project has been the reconstruction of 17th century mercantile networks in Seville, Bruges and Genoa. Although the topic could be attractive, once again the object of study is people, and not contracting.

In conclusion, therefore, contracts from the notaries' offices in Seville can be considered to have been under-analysed. The staggering number of documents without any logical organization and the more ready availability of sources from others archives in the city have discouraged researchers from incorporating contracts into their analysis.¹⁰⁰ The few scholars that have analysed such sources from this archive, moreover, have focused on social and not on economic history. At times, they have shown an interest in the economic content of the documents, yet this has been expressed merely descriptively and not analytically, as is my explicit intention here.

3.2. An inventory for contracts

The notaries' archive of Seville has been only partially inventoried. The first attempt took place during the 16th century. It was the custom then to register a summary of all contracts at the end of each year, and add a report to each bundle. Unfortunately, only a few of these documents have survived. For instance, only 38 registers are available for the whole of the 16th century and the most of them with mistakes in the foliation.

The 19th century witnessed a great deal of classification and cataloguing, and Seville was no exception. The bundles from the different notaries' offices were organized together with those relative to the administration of the city. Paradoxically, the classification process started with the latter which offered no palaeographical problems. The initiative was soon interrupted and the 16th century sources were handled only superficially. Thus as it stands today the only register for the oldest papers of the archive has been made by a local foundation.¹⁰¹ The initial aim was to collect documents related to America according to the people involved and ignoring the businesses. The final result is a mess of different sort of documents, Atlantic trade contracts together with testaments, dowries or hire. The inventory is composed of 10 volumes and comprises the 16th century as a whole. In the collection, every volume

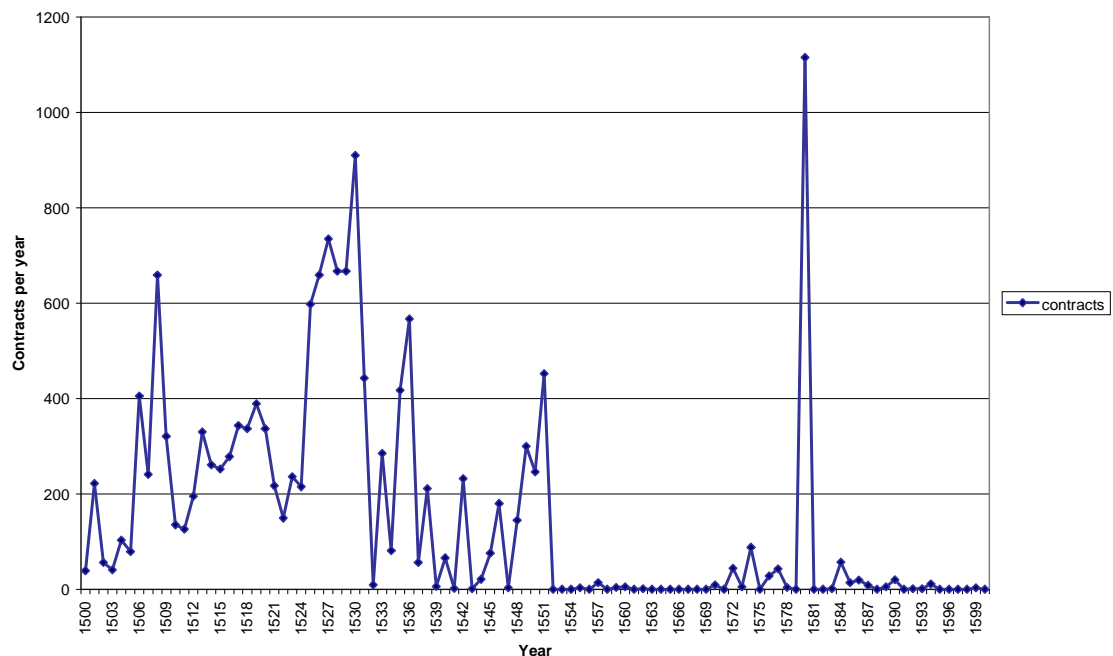
⁹⁹ Results from this research have been not published yet.

¹⁰⁰ More specifically, I refer to the Indies Archive (*Archivo General de Indias*). This archive contains all administrative and religious documentation from the West Indies. Moreover, in the Indies Archive there is an special section with all lawsuits since early 16th century to the 19th century.

¹⁰¹ The project was held by Instituto de Estudios Hispano-Cubanos in Seville.

contains between 1600 and 2000 contracts. I examined all of them, around 5000 pages. The composition of the inventory in terms of number of contracts per year is reflected in the following figure.

Figure 3.1: Inventory Composition



Source: Catálogo de los Fondos Americanos del Archivo de Protocolos, Vols. 1-10.

The criterion for publishing contracts is random and the total number of documents change along with the century, with the first half very well documented and a second half under-analysed. However, this is the only available printed source and it represents a complete overview of nearly a century of trade. Its analysis will definitively shed light on the explanation of the trading organization.

3.2.1. What kind of information can we extract from the inventory?

The inventory is organized following the criteria of one entry per contract. Every inventory contains information such as date or notary's office. Additionally, the inventory offers information about the nature of the contract, objective and duration. In occasions, also information on prices and destination in America is available. In all cases the information about the business is augmented with personal data about the participants which includes names, origin, residence, family links and professions.

The parties in the contract always introduced themselves by giving their full names followed by their professions and their personal origins. Family links are also mentioned in contracts and thus in the inventory. The information in this regard is very rich, including not only direct links but also these which were indirect, such as son in-law. Occasionally, they inserted the expression *estante en* or *vecino de*, the former alluding to their provisional residence while the latter referred to a permanent address. These categories could be changed by the person taking advantage of local tax policy. For instance, a Genoese born in Seville and living in Seville always presented himself as *estante in* Seville, suggesting that his residence was temporal because of the taxes privileges of the Genoese community. In the database information like this is registered so as to appear in the inventory.

3.3. Codifying data

As explained in the previous section, the inventory contains all sorts of contracts from company to agency, debt, purchase or transport. Information from the whole inventory has been personally collected and organized into a database. This information constitutes a sample with more than 2500 contracts covering different types of business. The only contracts rejected were those that because of their object have no interest for the economic analysis. More specifically, I exclude from the analysis dowries, probate inventories and testaments.

The information from the inventory constitutes a major source for chapter 4, which is focused on the development of trust measures. This chapter assesses the role played by personal relationships in pre-industrial trade. Nevertheless, the sample has a weakness since most contracts are concentrated in the first half of the century. In order to overcome this I introduce a different sample with contracts hand-collected from the archive, this sample is the major source for chapters 5 and 6 which are focused on the analysis of asymmetric information problems.¹⁰² Also, documents from the archive are full-contract and they have information about clauses which was crucial from the adverse selection analysis in chapter 6. From now on I will refer to information from the inventory as **sample A** and to the hand-collected contracts as **sample B**.

Documents in sample B are non-exclusive contracts, which is to say that the customer can select one or more merchants and trade with them all. The merchant can also contract with more than one customer, unlike agency contracts which were

¹⁰² More specifically, chapter 5 deals with the ex post moral hazard, while in chapter 6 the test has been designed for ex ante adverse selection.

exclusive. Specific prohibitions appear in agency contracts about trading with other principals or on their behalf. I deliberately avoid agency contracts because in these documents important data such as salary or commissions are missing.

Sample B contains a total of 280 contracts, 28 of them for every decade: i.e. 28 contracts from 1510, 28 for 1520 and so on. The size of the sample constitutes an effort to ensure the high quality of the data. Indeed, it is almost impossible to find appropriate information from the 16th century since there is no periodical register of contracts in the archive, and index of documents are very scarce. Moreover, the staggering number of contracts per year made the collection of documents a very easy task. The degree of conservation of these sources is also terrible, meaning that on occasion the documents are unreadable.

The databases resulting from both samples are equally organized with one table for personal information and another for conditions of the business. In the case of contracts – hand-collected from the archive – there is an additional table on clauses. Economic information about the transactions includes the object of the business, the size of the contract, duration and destination. Where available, it also includes data about conditions of the business as prices or merchandise description. Rights and duties of both parties in the contract are registered in clauses. I identify more than twenty. Clauses have been clustered into different categories: guarantee, obligation, payment and penalty. All clauses are matched with the contracts in which they appeared.

In both databases, personal information was augmented with historical analyses of merchant's families and their economic activity in Seville during the 16th century. In this regard, I included information such as institutional membership or joint business. This information was used to proxy personal reputation.

The resulting data set has been also complete with external information about economic environment. For variables like confiscation of precious metals by the Crown, volume of trade, delays in the fleet system, bankruptcies, courts' efficiency or access to the credit market among others I have used information from secondary sources. These variables have been introduced in the econometric models.

In terms of results both samples have seem to be equivalent. This equivalence can be seen in table 4.2 when regression was run for samples A and B.¹⁰³ Fortunately, results seem to be quite similar.

¹⁰³ As both samples have different compositions the regression was run for all contracts in sample B and only purchase contracts for the case of sample A.

3.4. Measuring samples

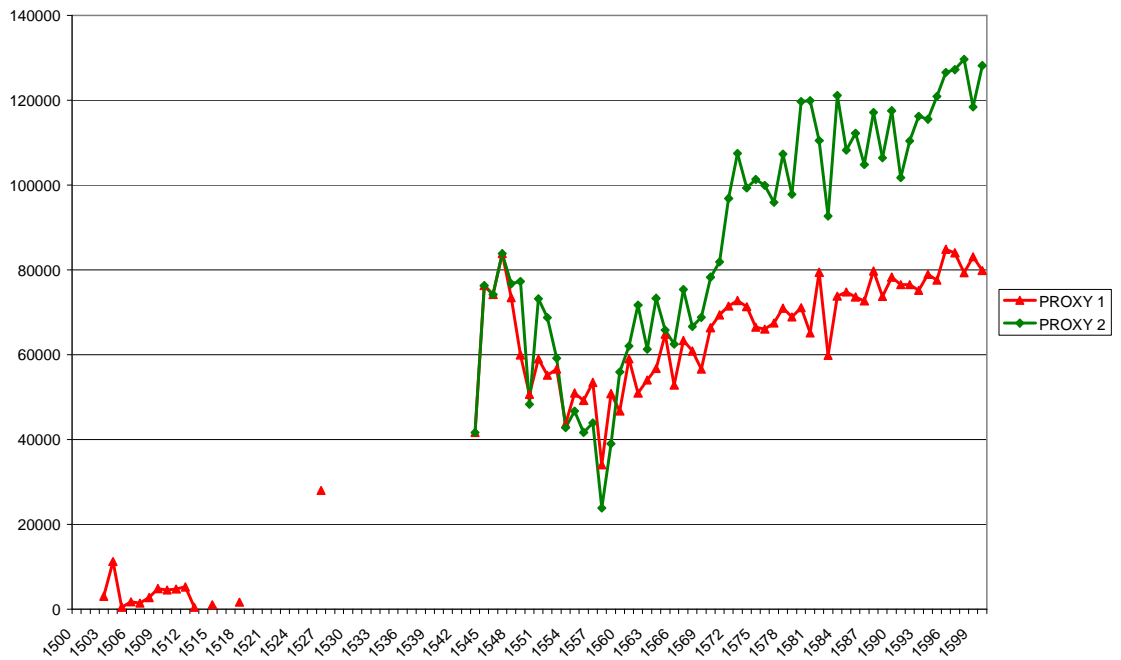
This section aims to measure whether both samples represent the universe of contracts. I will run a simple exercise which consists of comparing the composition of **sample A** and **sample B** with the total amount of contracts per year. Unfortunately, information about the annual volume of contracts is not available and we have to use proxies.

3.4.1. Proxies and the information from the archive

The information in the archive is divided into the 24 notary's offices which covers different periods. For every office, documents are organized into bundles per year. In the bundles documents appear in chronological order, thus mixing contracts related to trade with dowries or testaments. As pointed out in previous sections, during the 16th century it was customary to add at the end of every bundle a register of contracts. Unfortunately, only a few of these documents have survived. This information has been used to build proxies.

Proxy 1 is an annual average of contracts, but only for notary offices with an index. Proxy 2 is built with data from the office number 19, which is the most representative for trade. Notaries were placed in different areas of the city, and office 19 was in a privileged position. This office was established close to the cathedral in the *Gradas'* square which was usual meeting point for merchants. For this reason office 19 registered most of trade contracts. Figure 3.2 presents the results from both proxies, with blank spaces in absence of data.

Figure 3.2: Proxies for the Total Number of Contracts

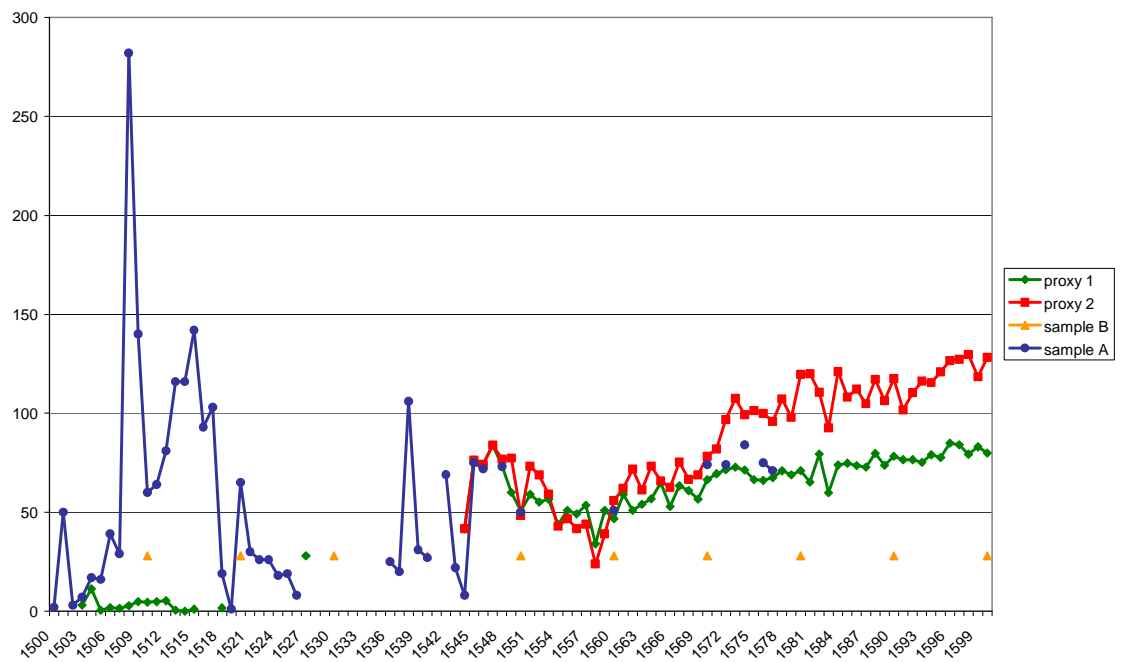


Source: Own elaboration with data from *Archivo Protocolos Notariales de Sevilla*

If Proxy 1 represents the average, including all offices from with available information, and if Proxy 2 reflects the large numbers, both account respectively for the minimum and maximum in annual contracts. Samples, to be representative, should be at least proportional to a number between those limits. As showed in figure 3.3, only sample A remains between both limits.¹⁰⁴

¹⁰⁴ In figure 18, proxies are in thousands of contracts in order to appreciate more clearly the distances between the variables.

Figure 3.3: Comparing Proxies and Samples



Source: Own elaboration

The design of **sample B** – which remains constant for all periods – made it impossible to be between such limits, mainly if we take into account that the number of annual contracts is growing throughout the century.

3.5. Contracts and their typology

The general structure of contracts is very simple: introduction, personal data and clauses. Documents started with a formal sentence which offers a clear idea of the type of business. In the databases contracts are classified according to the initial key words which appeared in the margin of the contracts, generally on the first page.¹⁰⁵ Following this notation there are four types of contracts: company (*carta de compañía*), agency (*poder*), transport (*fletamento*) and debt (*obligación*). To these four categories I add one more, the purchase contract, which used to appear as a specific variety of debt because the merchandise was commonly sold on credit.

¹⁰⁵ See reproductions from legal contracts at the end of the chapter, with key words in red.

3.5.1. Company

The contract for partnerships in the trade with America was inspired in the medieval *commenda*. Of Greco-Roman origin, this document was widely used and generally adopted during the Middle Ages.¹⁰⁶ The major difference from the medieval model was the aim. Indeed, an Atlantic company was not an occasional partnership for a single venture.¹⁰⁷ By contrast, the objective was to maintain the flow of goods and money during a fixed period of time which used to fluctuate between two and six years.

The minimum size of the contract was two people. Similarly to the *commenda* or *societas maris* one of them played the role of principal while the other was the agent. When the number of parties to the agreement increased, one of them was selected as administrator assuming all the obligations of a principal. The agent had to travel with the merchandise to the Indies and settle there for the period established in the contract. His main duty was sell the merchandise and send the money back to headquarters in Seville. However, during his stay in the Indies, he also had to provide periodical information about the evolution of the business. It was compulsory for both parties to note all the transactions in the accounting books.

The principal through Seville provided the goods requested by the agent and received the money. Some contracts even regulated the procedure by which money was officially registered on behalf of the principal. Regarding capital supply, there was no clear model. At times, the initial capital was provided by the principal and the agent contributed with his work.¹⁰⁸ In exchange for his services the agent received one fourth of the net profits in return.¹⁰⁹ The system coexisted with the *societas maris* in which the supplies of capital and the participation in the benefits were identical for both parties – one half.¹¹⁰ Nevertheless, the sophistication level was very high and it is possible to find variants. For instance, companies with five partners had two of them acting as agents receiving only 12.5% of the profits each.

The system designed to share responsibility also constituted a difference with the medieval *commenda*: while in the *commenda* the agent did not assume any risk in these companies, losses in the later system were divided between partners as benefits. More specifically, agents participated in the losses to the same extent as in the profits.

As merchandise was the major point in business, contracts used to contain an inventory of items. Sometimes the contract even included the name of the ship onto

¹⁰⁶ Lopez (1971), pp. 74-77.

¹⁰⁷ De Roover (1971), p. 106.

¹⁰⁸ This system was literally adopted from the *commenda*.

¹⁰⁹ De Roover (1971), p. 50.

¹¹⁰ González de Lara (2003), p. 481.

which the merchandise was loaded. When partners contributed just with monetary capital the contract contained full details about the acquisition of the merchandise.

Agents were always expected to trade for the company and not on their own behalf. There were specific prohibitions about trading mines, slaves, ships or houses. Even participation on other companies was forbidden. Occasionally, agents were allowed to develop additional trading activities. But in such cases they had to share with the principal half of benefits from this private trade. Contracts could be very restrictive and agents were not allowed to borrow, underwrite insurance, or leave the country without permission. Agents were even obliged to observe some rules of behaviour such as not to gamble, keep women in their quarters or accept gifts.¹¹¹

3.5.2. Transport

The transport contract or *fletamento* had as purpose the delivery of goods. The price of the service was fixed per tons transported although for the transport of liquids, such as oil or wine, the price was established for each item. In these cases there was a set of standard containers like *pipas*, *botijas peruleras* or *botas* and prices were fixed for per unit transported.¹¹² The trader would pay the service after the delivery in the Indies with a deadline of thirty days maximum.¹¹³

The possible damage of the merchandise transported was also regulated in the contract. To this end the person contracting the delivering service could insure the cargo or just pay an extra to guarantee the arrival of the merchandise in perfect conditions. In the first case the risk is transferred to an insurance company while for the second it was the master of the ship who assumed the risk during the journey. This extra payment could be also in kind. In one of the contracts analysed the merchandise to be transported was wine barrels and the master received three barrels for each hundred. In cases involving fragile merchandise or for animal transport a member of the crew was assigned to look after the transported goods.

Penalties in these contracts were specific for each part. If the merchandise was not loaded because it was overweight it was the master who had to pay the cost of

¹¹¹ De Roove (1971), p. 81.

¹¹² It is very difficult to find a measure of the capacity of these containers. However, we know that *botijas* were the biggest one followed by *pipas* and *botas*.

¹¹³ If after this period, the merchant did not pay then the *pena del doblo* was applied. This penalty consisted of double payment for the same service.

transporting all goods on a different ship.¹¹⁴ Similarly, when the merchant decided not to send the goods he had to pay out the equivalent of the cost of the journey.¹¹⁵

One variant of this contract was the transport-agency, in which obligations of the master were extended after the delivery. In these contracts, the master acted as an eventual agent once he arrived in the Indies, selling merchandise and collecting debts.

3.5.3. Agency

Agency contracts are similar to company contracts since, as already pointed out, in early modern firms one of the partners used to perform as agent. At times, however, companies hired professional agents at the market. These are precisely the kind of contracts which I refer to under the label *agency*.

Conditions in general did not change very much from what was explained above regarding the company contract. As the typical principal-agent conflict agents were rewarded with a salary proportional to business' income. This salary used to fluctuate between 8 and 6%.¹¹⁶ Agents also received an extra payment for allowances, mainly accommodation and maintenance.¹¹⁷

In company contracts travelling-partners were forbidden from trading on behalf of other companies. By contrast, professional agents were not devoted exclusively to the firm. These agents were free to trade on behalf of other merchants. As a matter of fact, trade for more than one principal increased their reputation since a merchant satisfied with the services of a professional agent could recommend him to other traders. As is already known, reputation was crucial for being successful as an independent professional.

In addition, the market for independent agents was not segmented by aspects such as nationality or religion. Scholars recently have been interested in cross-cultural trade. They state that cultural differences could affect trade. This issue has been supported also by the literature in merchant communities which affirms that trade was mostly carried out inside members of the same group. Both visions are pretty narrow and sources show a very different picture, following the maxima *pecunia non olet* merchants from different cultures trading together. Florentine agents for instance worked for both Castilian and Genoese merchants at the same time.¹¹⁸ Genoese even

¹¹⁴ There were all sort of legal norms regulating the maximum tonnage of ships.

¹¹⁵ This amount of money was known as *flete in vacío*.

¹¹⁶ Lorenzo Sanz (1986), Vol. 2, p. 135.

¹¹⁷ The percentage could vary but it was customarily at 4%.

¹¹⁸ See the litigation between these merchants in the Indies Archive, Archivo General de Indias (AGI), Justicia, 700, N. 8.

traded with Christians and Muslims simultaneously during the Middle Ages in the Kingdom of Granada. This is not to say that merchant communities were not important. Indeed, intra-group trade represented an important proportion of total trade. But we should not forget that relevant traders frequently look for partners outside their networks. Hitherto, such extra-group trade has been ignored by economic historians.

3.5.4. Collecting debts

A different variety of the agency contract is the debt collector contract. In the document the agent had as a main duty to find agents, partners or debtors in America and collect debts and information. Debts were the result of delivering merchandise to agents or customers overseas. From an economic point of view, this was a monitoring technique – the principal was controlling agents on the other side of the Atlantic by sending a new agent. The collector could be a professional hired at the market or a sailor, a master, a migrant, a relative, a neighbour or another merchant.¹¹⁹

This instrument was frequently used in Atlantic trade and will be object of analysis in this thesis. Here, the debt-collector system is considered an institution, employed to solve the moral hazard problem (chapter 5). Moreover, the system seems to be significant for explaining early modern trade, even more than personal trust (chapter 4).

3.5.5. Debt and Purchase

Also known as *obligación*, in these contracts one person is bound to pay a certain amount of money to another individual in a pre-fixed period of time.¹²⁰ Although in the database debt and purchase appear as separate categories, from the legal point of view there is no difference between the documents since the purchase is done on credit. It is possible to define a purchase contract as a debt caused by the acquisition of merchandise where.¹²¹

A different type of debt contract frequently analysed by historians is the sea loan or *cambio marítimo*.¹²² This contract was drawn up between a merchant-banker and the person responsible for the ship, usually the master or the captain. The loan was used for the supply of the crew and passengers during the journey, and as

¹¹⁹ See database's figures.

¹²⁰ See contracts at the appendix.

¹²¹ The only difference is the inclusion of merchandise's description in the contract for purchase.

¹²² See De Roover (1971).

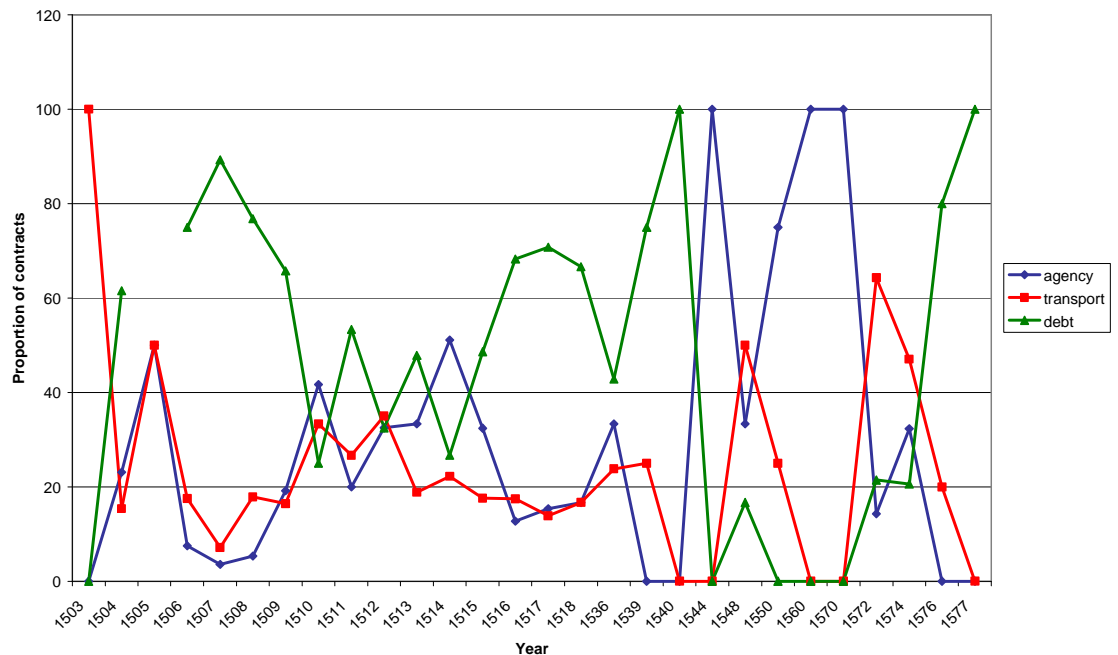
collateral, masters offered a mortgage over the ship. Payment was made upon return from the journey. In case of purchase, the contract was signed by a merchant and a trader. When two or more traders appeared in the contract as partners the document included the clause *in solidum*.¹²³ Surprisingly, in most cases it was the seller who assumed the risk of the journey and the delivery of merchandise was done at his expense. This type of contract was a kind of hybrid between credit and insurance. For this reason it was important to describe the journey with full details including origin, destiny, stops and duration. In the case of changes on routes, the risk was passed on to the debtor. Regarding expiry dates, generally, the term for these contracts was established at a maximum of two years, considering that the contract finished when the moneylender received the payment. However, both parties could choose a shorter or longer period of time.

3.5.6. Tendencies on contracting

In order to conclude this section I analyze the evolution of the diverse contracts through time. I organized all contracts into three categories – agency, debt and transport. In the agency group I include both agency and company contracts, while in the second category is included debt and purchase contracts. The third category only consists of delivery contracts or *fletamento*.

¹²³ This clause obliged both partners to be equally responsible for the payment.

Figure 3.4: Evolution of Contracts



Source: Own Elaboration from Sample A

The most commonly used contracts were debt contracts, at least during the first half of the century. As Bernal shows in his analysis, the credit system was quite well developed in the 16th century and everyone, from the sailor to the aristocrat, had ready access to credit.¹²⁴ The evolution of this system, however, was quite unstable, with an important expansion in the first decade of trade, followed by a decline during the 1520s. After that change is irregular, rising to two peaks, one in 1540 and other in 1576, where debt represented 100% of all contracts. The sharp changes in the variable are due to unbalanced samples.¹²⁵

Although highly volatile, the other categories of contracts seem to present a similar evolution over time. At the beginning of the century, both contracts represent 50% of the total and after this peak the proportion of agency and transport begin to decline to almost 10%. Nevertheless, during the second half of the century the situation seems to be more favourable for both.

The growth in the number of transport contracts is parallel to the increment of trade in general. The regulation of the fleet system and the geographical expansion drastically increased the volume of ships crossing the ocean and thus the volume of delivery. Regarding agency contracts, the proliferation of companies and the increment

¹²⁴ See Bernal (1992), pp. 56-57.

¹²⁵ Note that figure 19 was elaborated with sample A which was built with data from the inventory. Although biased this is the only available data about the evolution of the credit market.

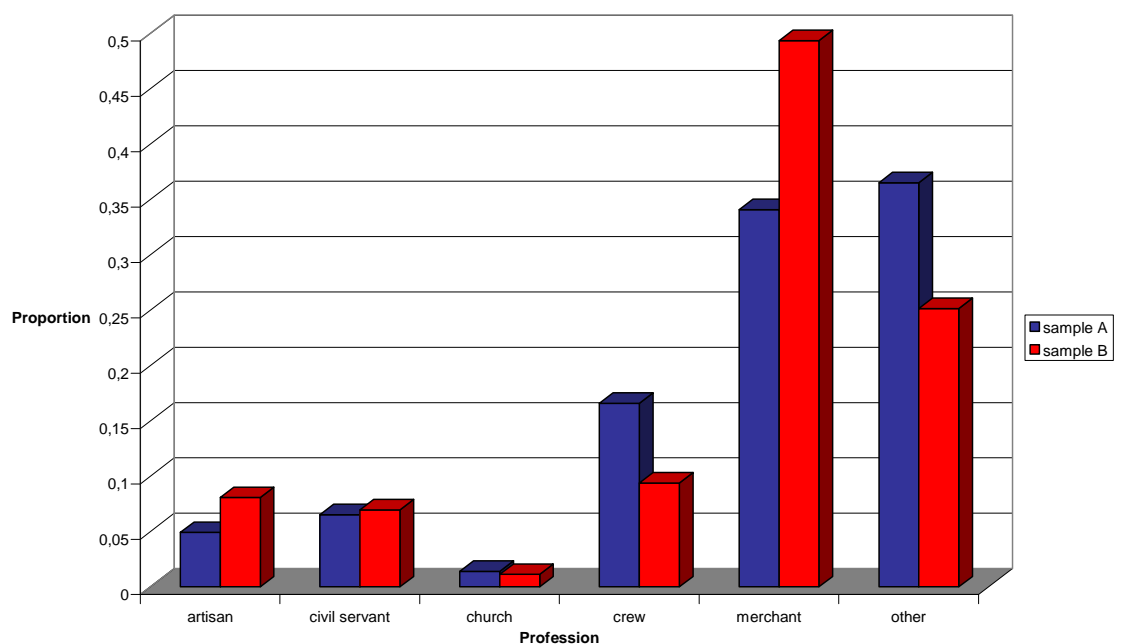
on the number of permanent agent and debt-collectors sent to America can explain the growth in this category. The phenomenon grew up with the establishment and development of merchant communities in the New World.

3.6. Basic statistics

This section aims to compare the samples' composition through some basic statistics. The focus of the comparison is people and not the condition of contracts. My interest in this section is simply to highlight differences between both groups of analysis. It should be remembered that sample A is built with information from the inventory while for sample B hand-collected contracts are the major source.

Regarding professions, individuals are divided in different categories. Most people are group among merchants, civil servants, members of the Catholic Church or artisans. The group crew includes all seamen from sailors to masters or pilotes. The group others is a kind of ragbag including peasants, members of the Royal Army and professionals as lawyers or physicians. Figure 3.5 shows how in sample B merchants are the predominant group. These professional traders represent nearly 50% of total population. As sample A contains an important number of delivery contracts, the group crew is largely represented. More specifically, the proportion of people in this group is double the number of crew members from sample B.

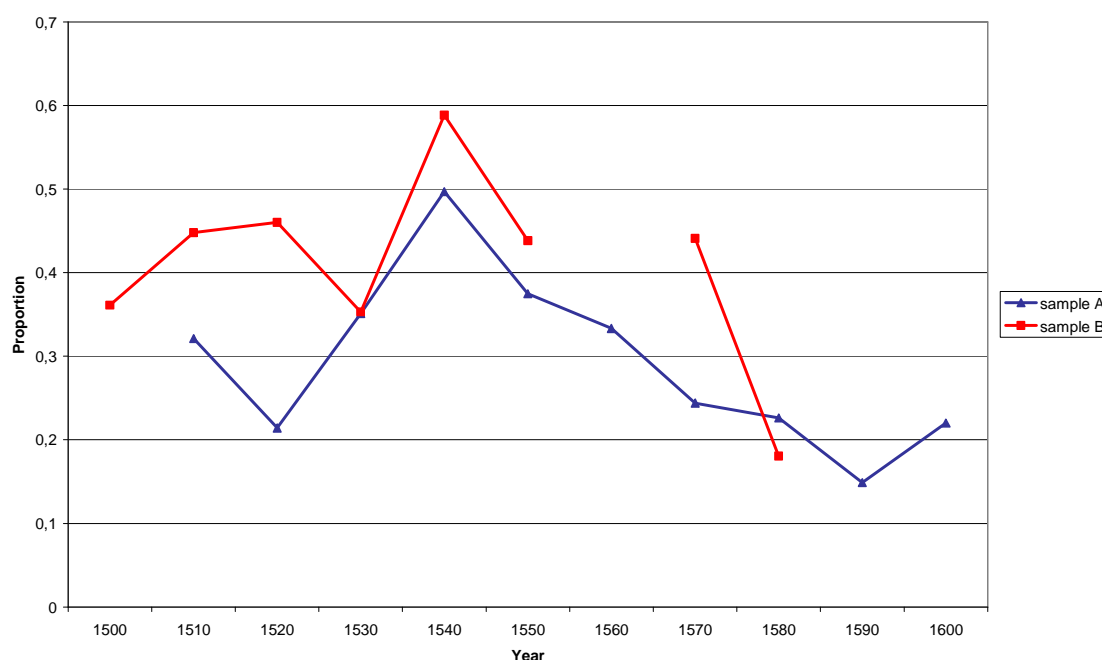
Figure 3.5: Occupations



Source: Own Elaboration from Sample A and B

Restricting the analysis to professional merchants, figure 3.6 give us an idea of their evolution over time. In both samples the largest proportion of professionals traders from the pool of people appear during the 1540s. After this peak I detect a decrease in levels of professionalization over time which is confirmed with a clear fall in the proportion of merchants, although trade in the second half of the century is increasing.¹²⁶ The highest profits accumulated during the first years of trade acted as a pull factor in the second half of the century and, as a consequence, participation increased. From this moment non-professional merchants become an active party in commercial transactions. This phenomenon can be interpreted as a democratization of trade.

Figure 3.6: Proportion of Merchants



Source: Sample A and Sample B

In this dissertation the relevance of traders is proxied through reputation and commercial experience.¹²⁷ Reputation is usually very difficult to measure. However, during the 16th century membership of institutions related to trade, such as Consulates, represented can be considered to have represented the holding of a good reputation. In both samples I approach personal reputation through institutions' membership. To proxy the experience on trade I measure the proportion of contracts signed by every trader.

¹²⁶ For tendencies on total trade volume, see chapter 1.

¹²⁷ See chapters 4, 5 and 6.

Table 2 compares some basic statistics for both populations. In **sample A** for instance, the population was more active with a mean of nearly 9 contracts per capita. By contrast, in sample B the mean is only 2.2 contracts per head. The differences in this regard can be explained via composition of each sample. Indeed, in sample A appears a very active group: the seamen. The presence of this group –which is underrepresented in sample B– raises the mean' value.

The variable *institutions per capita* also supports the previous explanation. The mean of 9% in case of sample A is very low compared to the 35% in contracts from sample B. The population analysed in hand-collected contracts is mainly composed by professional merchant members of relevant institutions while the group of individuals from the inventory is more heterogeneous.

Table 3.1: Comparative Statistics

	Sample B	Sample B	Sample A	Sample A
	Contractspc	Institutionspc	Contractspc	Institutionspc
Mean	2.205729	0.350595	8.957267	0.098392
Median	1.291667	0.333333	5.500000	0.000000
Std. Dev.	2.463626	0.395552	10.97872	0.213877
Sum Sq. Dev.	1693.377	43.65268	299643.2	113.7177
N	280	280	2487	2487

Source: Own Elaboration with Sample A and B

Conclusions

In the last few decades the reconstruction of networks has attracted considerable interest from historians. To this end, scholars have been searching for personal information about the parties involved in economic transactions. It is precisely this interest in personal details which has relegated information regarding conditions of the business to second place. By contrast, economists have shown more interest in the contract itself, taking into account aspects such as incentives or penalties. Nevertheless, this analysis has mainly been theoretical and contract studies have been reduced to several models lacking any connection with the real world.¹²⁸ With a few important exceptions, such as studies of the insurance market or the econometrics of auctions, the empirical studies in contract theory are virtually inexistent.¹²⁹

The major reason for the lack of empirical studies lies in the difficulties associated with finding data sets which fulfil the requirements for econometric analysis. Following Chiappori and Salanié, a data set for the purpose of studying contracts must

¹²⁸ Chiappori & Salanié (1996), p. 2.

¹²⁹ For auctions see Laffont, Ossard & Vuong (1995), for insurance see Chassagnon & Chiappori (1995)

include information about the agent's basic characteristics, transfers between parties and the outcome of the relationship.¹³⁰ Nevertheless, these characteristics could be unobserved or just partially observed.¹³¹ There is a huge number of sources documenting Atlantic trade, and an important part of these sources are original contracts. Scholars interested in these sources have focused on the analysis of aspects related to participants on trade and ignored the economic analysis of the documents. One of the goals of this dissertation, therefore has been to study these documents from the economic point of view.

¹³⁰ Chiappori & Salanié (1996), p. 3.

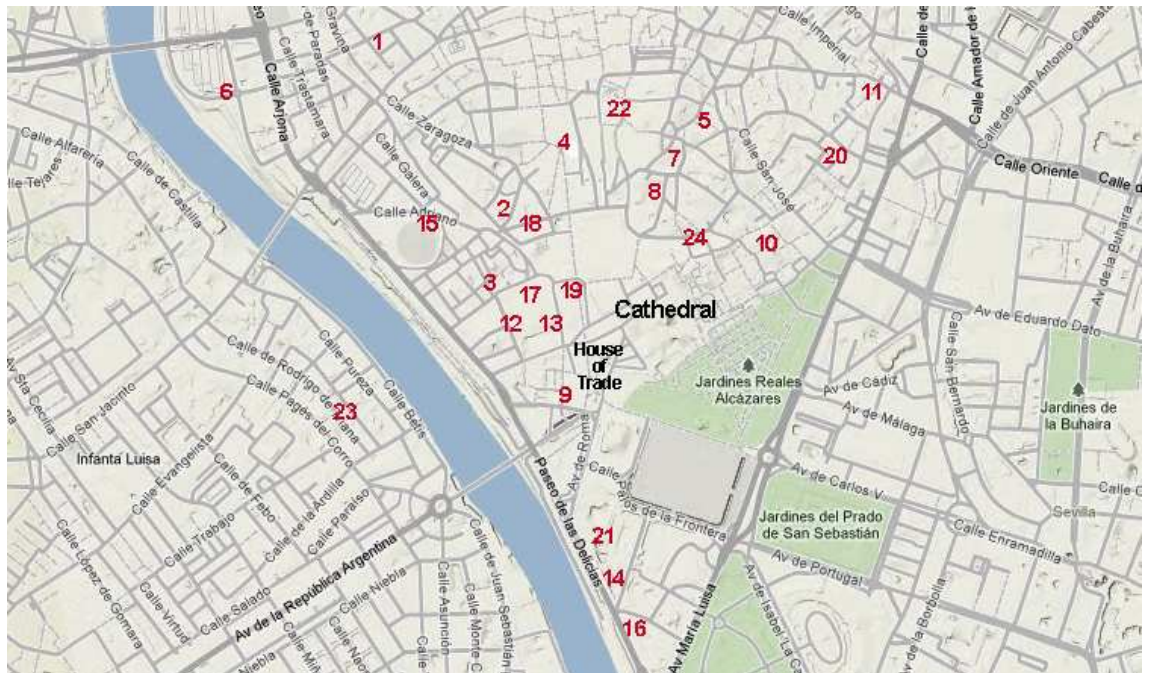
¹³¹ Akerberg & Botticini (2002), p. 566.

Appendix

Notary offices' distribution

1. San Juan de la Palma
2. Sierpes
3. Santa Catalina
4. Barrio del Duque
5. Alcaysería de la seda
6. Posada de la Parra
- 7 and 8. Alcaysería de la seda
9. Colcheros (nowadays Tetuán)
10. Cabeza del Rey Don Pedro
11. Cruz del negro
- 12 and 13. Plaza de San Francisco
14. Tundidores
15. San Lorenzo
16. Calle de tundidores
17. Plaza de San Francisco
18. Sierpes
19. Punta del diamante
20. Calle del rosario
21. Calle de tundidores
22. Junto a la cárcel
23. Barrio de Triana
24. Calle de manteros

Map 1: Notaries at Seville



Source: Own elaboration with Google maps

Image 1: Debt contract

404

ARCHIVO HISTÓRICO
PROVINCIAL
SEVILLA

Debt contract document, handwritten in Spanish, dated 1504. The document is written in a cursive script and includes a red rectangular stamp in the upper left corner. The text describes a debt contract between a creditor and a debtor, detailing the terms of the loan and the obligations of the parties involved. The document is signed by the parties and includes a notary's signature.

[illegible]

Chapter 4: Testing trust

During the first century of the Atlantic trade GDP per capita in Spain grew, and the significant contribution made by Andalusia to this growth suggests that international trade probably played a significant part in that story.¹³² In the same period – 1500-1600 – Seville moved up in the population ranking of European cities, from the 10th to the 5th most populous.¹³³ In terms of standards of living, the Spanish population also experienced a change, at least compared to the rest of Europe: while in England real wages declined during the 16th century, in Spain they remained constant.¹³⁴

This positive economic picture contrasts with the existence of a weak state in Spain, which offered poor enforcement mechanisms and ruled according to interests of certain groups close to the monarchy. The weaknesses of the tools offered by the rulers forced private agents to develop their own mechanisms for enforcing contracts. Yet despite this, trade existed and grew consistently, at least throughout the 16th century.

Recently, microeconomic research has focused on the analysis of trust as an explanation for contract enforcement. Several theoretical models find a strong correlation between degree of trust and economic growth [Knack & Keefer (1997), Temple & Johnson (1998) and Zack & Knack (2001)]. Scholars like Neace (1999) or Johnson et. al. (2002) even highlight the importance of trust in an environment with no legal enforcement.

¹³² In 1530 the the index of GDP per capita in Andalusia was 113.6 superior to a general 87.2 for all Spain, see Álvarez-Nogal & Prados (2007), p. 353.

¹³³ See Bairoch (1988).

¹³⁴ This affirmation is based on the classical data from Hamilton (1975). Álvarez-Nogal & Prados (2007) show regional tendencies in real wages, while Catalonia and Valencia registered a decline on income regions as Madrid or New Castile saw growth in standards of living for the 16th century.

Historians have also emphasized the role of trust. The analysis of family firms or merchant communities stresses the importance of trade among individuals who share personal links, beliefs or race. More recently, network analysis has been applied to historical research although results are merely descriptive.

In economic history, the major contribution is the analysis of merchant coalitions by Avner Greif. Greif (2006) assesses trust as the major explanation for trade inside medieval merchant guilds. Members of the guild trusted each other and observed strict codes of behaviour since their reputation depended on it. For Greif the importance of reputation lies in not in social status but in economic issues since future transactions depended on present behaviour.

This chapter aims to test explanations regarding Atlantic trade at the market level. I introduce in the analysis trust measures based on personal relationships, reputation and repeated transactions assessing all of them as explanatory factors for investments decisions. Alternative instruments to enforce contracts are also introduced in the analysis. In the econometric test, I control by the debt-collector system and endorsement. Contracts from the archive show clear evidence that merchants adopted the medieval debt-collector system in trade in America. Such documents are not entirely new for historians; a number of experts have mentioned them previously. What is new, however, is the explanation of the role of these contracts in increasing trade participation.

Through the use of econometric models and information from contracts (sample A) I test the hypothesis of the relevance of personal relationships. The rest of this chapter is organized as follows. The first section reviews the relevant literature about trust and the role played by personal relationships as an explanation for trade. Section 4.2 presents a few remarks on the data set used for this chapter. Section 4.3 discusses the variables used in the econometric tests. Sections 4.4 and 4.5 show results from the tests. The final section contains some conclusions.

4.1. The role played by trust

Following Gambetta (1988), “when we say we trust someone we implicitly mean that the probability that he will perform an action that is beneficial is high enough for us to consider in engaging in some form of cooperation with him”. This general definition of trust was précised by Durlauf and Fafchamps (2006), who distinguish between generalized and personalized trust. The former focus on the preconceptions that people of one identifiable group has for people from another identifiable group. The

latter concerns the evolving relationship between two specific agents. Microeconomic models have predominantly focused first on the concept of trust, then introducing aspects to delimitate groups such as religion or nationality.

Empirical analysis is scarce since trust is hard to measure. However, as Adam & Roncevic (2005) state: “if one wants to make progress and test its relevance it needs to be measured, albeit imperfectly.” Trust measurements have been mostly based on aspects such as race, age, religion, education, year of born or origin [Glaeser, Laibson, Scheinkman & Soutter (2000)]. There are also models which approach trust through attitudes towards cooperation like participation in voluntary actions [Putnam (1993)] or blood donation [Guiso, Sapienza & Zingales (2004)].

Historians have also analyzed trust. In fact, research in this field tends to consider personalized commercial relationships. Modern approaches focus on aspects such as cross-cultural trade or merchant networks.¹³⁵ The first approach is closer to the anthropology, highlighting aspects like ethnicity or religion. The network analysis approach, on the other hand, departs from a sociological concept frequently used also in economics, although this promising new instrument of analysis is still at a very early stage and the studies published are merely descriptive.¹³⁶

Within Economic History the most remarkable contribution has been made by Avner Greif. Greif (2006) analyses preindustrial trade inside merchant coalitions. In this institutions member trusted each other. The author argues that the major source of trust within the coalitions was reputation. Certainly, members observed correct behaviour in order to preserve their reputation, since not only present but also future profits depended on it. Traders suspicious of opportunist behaviour were excluded from future transactions. However, Greif’s analysis is based on game theory and his results have not been empirically tested.¹³⁷

Most research on trust measurement comes from microeconomic analysis. While historical research has focused on descriptive studies in Economic History analysis is centred in macroeconomic questions avoiding behaviour analyses and the scarce relevant contributions have not an empirical support. This chapter introduces measures of personal trust based on relationships, reputation and repeated transactions. Moreover, I test all of them as explanatory factors for investments decisions in early Atlantic trade. To this end, I run econometric models using sample A as the data set.

¹³⁵ For a review of these studies see Molho & Curto (2002).

¹³⁶ See for instance Hausberger & Ibarra (2003), Ibarra & Del Valle (2007), Crespo Solana (2009) and Hausberger (2009).

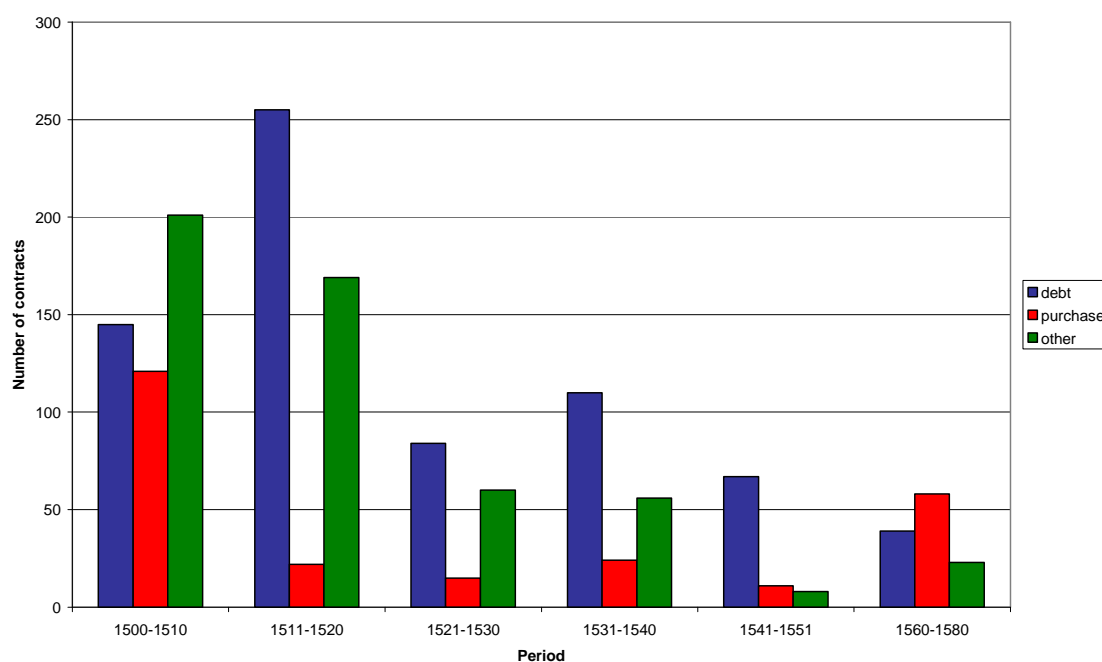
¹³⁷ For a review of Avner Greif’s theories see Edwards & Ogilvie (2008).

4.2. The data set

As explained in the previous chapter, **sample A** contains different kinds of contracts. These documents have been classified into three different groups – debt, purchase and other – according to the aim of the business. The two first categories involved credit. The third group is a kind of rag-bag comprising company, agency and transport contracts.

In the pool of contracts debts represent the largest proportion with more than 47% of the total, followed by the category ‘other contracts’ which represents 35%. The purchase contracts are noticeably scarce, making up only 17% of the total data. The distribution on time however offers a different view. The first decade of the 16th century was prolific in terms of contracts as shown in Figure 4.1, and most of them belonged to the group *other*. This result can be explained by the high number of transport contracts.

Figure 4.1: Distribution of contracts



Source: Sample A

The second decade of trade presents an important change in terms of the credit market. The number of credit contracts increased dramatically due to the impact among population of news about profits in the New World. The prior figure also shows the group ‘others’ as increasing during for the years between 1511 and 1520. This growth was due to company and agency contracts which represent more than 15% of the total contracts for this period. In this period, companies and permanent agents became much more popular. probably as a result of the colonization process and the development of merchants communities in the Indies.

The economic activity in the two first decades of trade is impressive compared to the rest of the century, and figure 4.1 shows a decline in the number of contracts in general. However, this is just the consequence of the selection criteria at the inventory. In fact, trade is increasing throughout during the century and for these last decades the number of contracts should be higher. In spite of this fact, the inventory represents only the printed source of contracts for the Spanish-American trade and the data set used for this chapter is the result of the whole inventory analysis.

4.3. Discussing variables

Botazzi, Da Rin & Hellmann (2006) stress the issue that the macroeconomic literature struggles with problems of endogeneity. The authors defend a more micro-based approach which promises to identifying more precisely the effect of trust on economic transactions. In this chapter I test the role of trust in preindustrial trade. Both trust and trade have been estimated with micro-data. Trade, which will be the dependent variable in all regressions, is proxied with the size of the contract.

The size of the business is measured in different ways according to the type of contract. In debt contracts, for instance, the size of the business is the amount of money lent. For purchase contracts, the size is the value of the merchandise sold. The group *other contracts* is the most heterogeneous and it is not always possible to find information about the size of the business.¹³⁸ More specifically, from the group *other contracts* I include transport contracts in which the size of the business is the price paid for the delivering service, and company contracts whose value is the total capital from the partners' contributions.

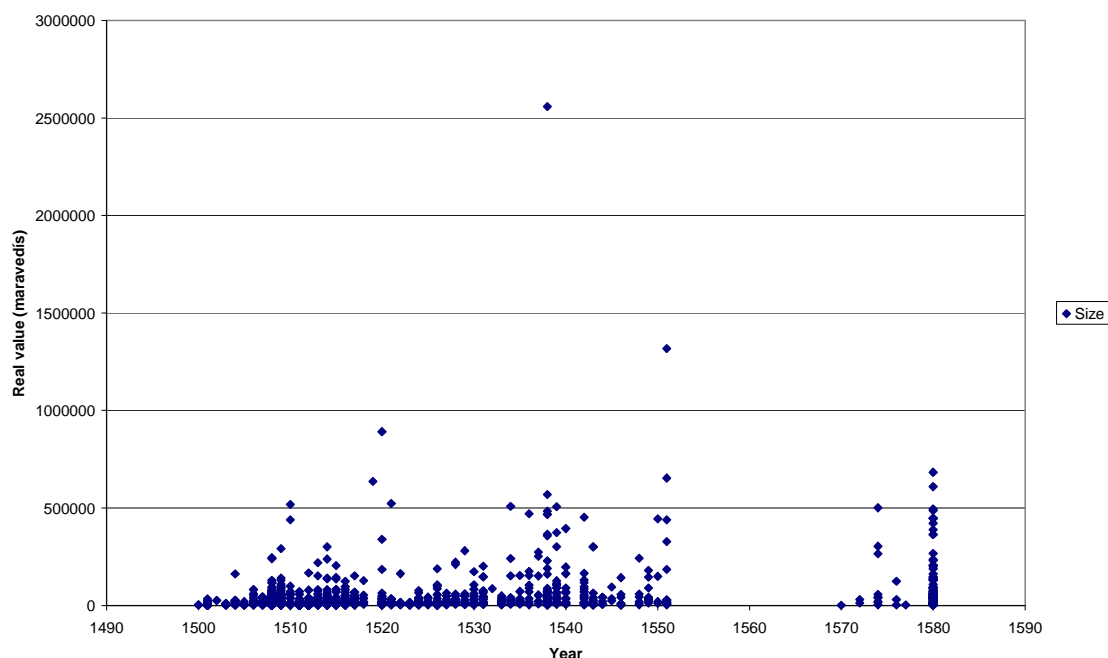
One additional difficulty in the analysis is the multiplicity of currencies. This circumstance is the logical consequence of the chaotic monetary system during the Early Modern period. I convert all values into one currency: the *maravedí*. Additionally, merchants included information in contracts about exchange rates to avoid problems related to changes in values of the different currencies. This information about equivalent ratio among currencies is also incorporated in the analysis.

Figure 4.2 depicts the evolution of the dependent variable across time. Each point on the scatter diagram represents a contract from the data base with the

¹³⁸ Contracts with no clear economic valuation have been dropped. This is the case for those agency contracts which contain a list of task and no information about salaries of the agent. I also drop debt collector contracts to avoid multicollinearity problems. Note that the debt-collector system is included as explanatory variable.

correspondent economic value and the position in time. The size of every contract is expressed in *maravedís*, once corrected by the price index.

Figure 4.2: Size of the business



Source: Sample A

In the different tests the dependent variable is trade which has been estimated through business value. Explanatory variables can be divided into two groups, variables which proxy trust and those one which approach control strategies. Regarding variables measuring trust, I consider personal links and reputation as sources of trust. Personal links are approached by the existence of a relationship between two or more people in three different ways: if they were part of the same family, if they had a joint business, or if they worked together. Impersonal reputation also has been quantified by the belonging to an institution or through their experience as traders. The experience as traders is proxied with the number of contracts signed by a person on average and with their own declaration about being professional merchants.¹³⁹

Regarding control, the principal had three different means of control: introducing a third person into a contract as an endorsement, sending a debt-collector or going to the Courts. These could be complementary strategies, which is to say that they could be used gradually, for instance asking firstly for an endorsement of the contract, and then secondly by controlling for a period of time through the debt-collector

¹³⁹ During the Early Modern period, a public declaration of being a merchant was equivalent to belong to an exclusive group of professionals. This is inherited from the guild medieval system in which for the access to a profession, people needed the approbation of the rest of colleagues.

system and finally going to the courts. Unfortunately, in the inventory there is no information about which contracts were sued and which were not. For this reason, only two variables have been created to express control: one for the possibility of endorsement and other for the number of subsequent monitoring contracts.

4.3.1. Measuring trust

The measurement of trust is a very difficult issue and even more a period like the 16th century. Luckily, as highlighted in chapter 3, sources like contracts offer some relevant information on personal relationships. The previous information has been complete with secondary sources to estimate variables such as institutions membership or joint businesses.

I assume that people may trust others if they are:

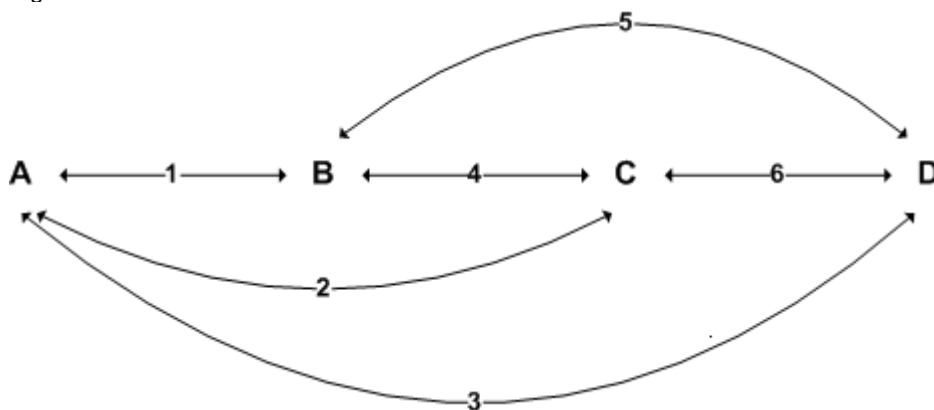
1) More similar to them [Banfield (1967), Alesina & La Ferrara (2000)]. I proxy similarity with people who share family (FL), nationality (PROPSNAT) or occupation (SAMEOCCUP). Here we test for intra-group cooperation.

2) Interacted with longer or more repeatedly [Coleman (1990), Laporta et al. (1997)]. With respect to longer interaction, it was taken into account whether two or more people shared professional activity previously. I measure interaction because being members of the same crew (OLC), joint business (OLP) or belonging to the same institutions (OLI). Repeated interactions have been approached with the number of previous contracts signed (PC). Note that variables joint business (OLP) and previous contracts (PC) seem very similar. The major difference between them is the source. While variable previous contracts is calculated with contracts from the data set the variable 'previous business' is approached using information from secondary sources, mainly historical analyses about merchant families.

3) Respected by them [Greif (2006)]. This issue is linked to reputation. The relevance of an individual as a trader has been estimated through institutional memberships (INSTpc), formal declarations of being a merchant (PMERCHANT) and level of experience at trade (AVCONTpc). Note that these variables proxy individual reputation and by definition I include data per individual. Variables which measure personal interaction do not account for individual data but for a group of people since they are concerned with relationships among two or more individuals.

Family links are mentioned in the contract. The correspondent variable matches two or more people per contract because of kinship. Note that kinship is defined in a wide sense according to the notion of family in Early Modern society. During the 16th century 'family' included first-degree but also distant relatives. Moreover, variable family links takes into account not only the total number of familiar relationships but also the number of potential relations by dividing the proportion of possible and real interactions between people in every contract. To this end, people in the contract are divided into pairs looking for the number of potential relationships. For instance in a contract with individuals A, B, C and D there are 6 possible interactions as shown in figure 4.3. Whether only A and B have a kinship the value of variable family links will be 1/6.

Figure 4.3: Potential links



Source: Own elaboration

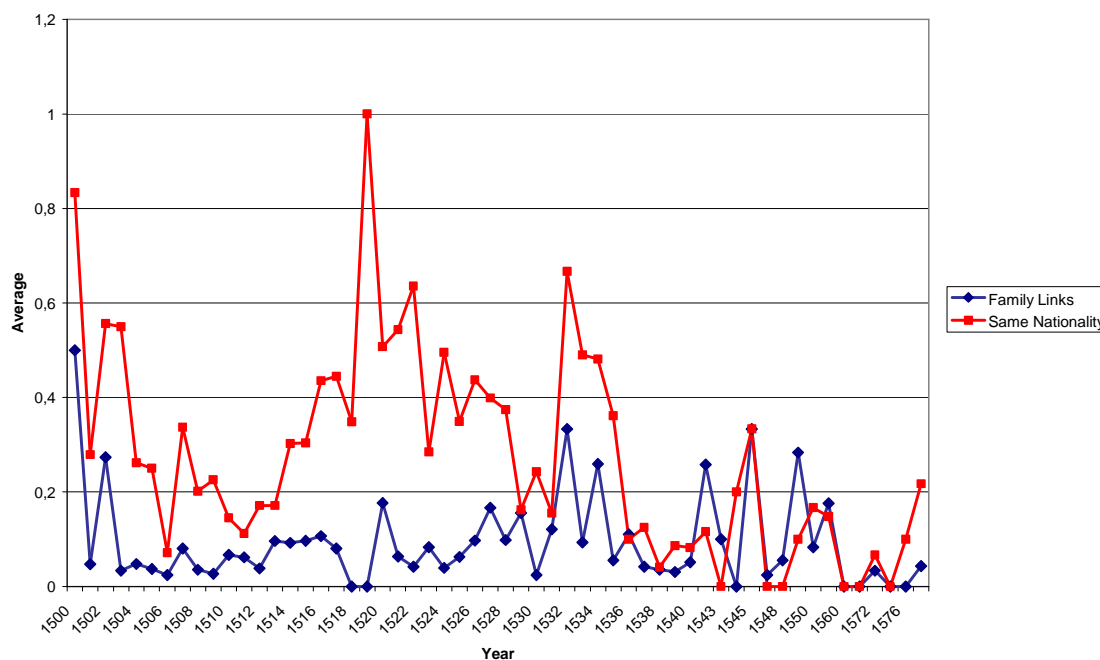
People can also be related because they share nationality. Nevertheless, the concept of nationality during the Early Modern period was very different from our conception nowadays. In the 16th century the feeling of belonging to a place was characterized by a strong local conscience. Following this reasoning, the variable which measures nationality is defined by referring to cities and not to States or kingdoms. Variable PROPSNAT accounts for the percentage of people per contract that share the same origin.

The variable 'same nationality' is related to the role played by merchant communities. Merchant communities have been heavily analysed in historical research. These communities have been defined as a group of traders sharing origin and, in occasions, religious beliefs.¹⁴⁰ Historians have emphasized the role played by these communities in commercial exchange, reducing in most cases total trade to economic transactions intra-group.

¹⁴⁰ This is the case of Maghribi traders in Greif (1989) or the Sephardim in Trivellato (2009).

Taking into consideration variables such as family links and same nationality simultaneously it seems that in the data set the proportion of people sharing family links is lower than those who share nationality. As shown in figure 4.4, on average the proportion of people with the same origin exceeds kinship during the whole period. Only for the last contracts registered at the end of the century and when the proportion of people with the same nationality is lower than 20% are family links higher.

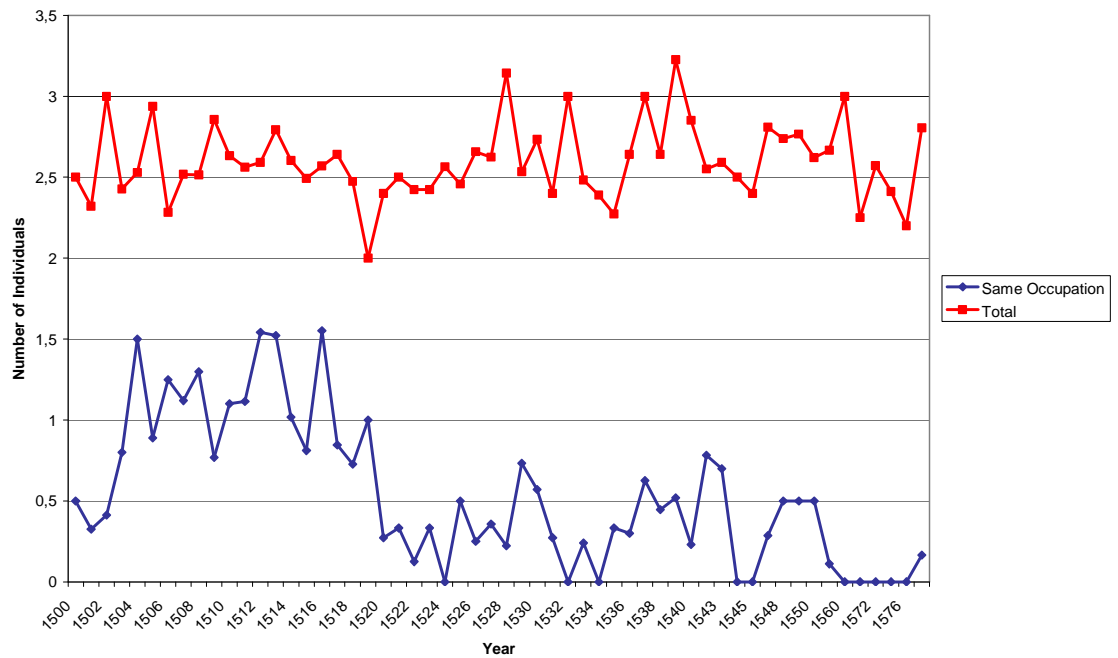
Figure 4.4: Proportion of Individuals Sharing Nationality and Family Links



Source: Sample A

Finally, the last variable for the group that measures similarities counts the number of individuals per contract who share an occupation (SAMEOCCUP). There is a wide range of occupations included in the data set, most of them related to trade. The next figure presents the total number of people per contract together with those who share an occupation. Both series are presented on annual average. Note that while the number of people per contract seems more or less constant those who share an occupation show changes throughout the century. Indeed, during the two first decades of trade members of the same occupation represent the half of the total people. This fact can be explained by the group crew, which was especially active in this period.

Figure 4.5: Number of People per Contract and Same Occupation

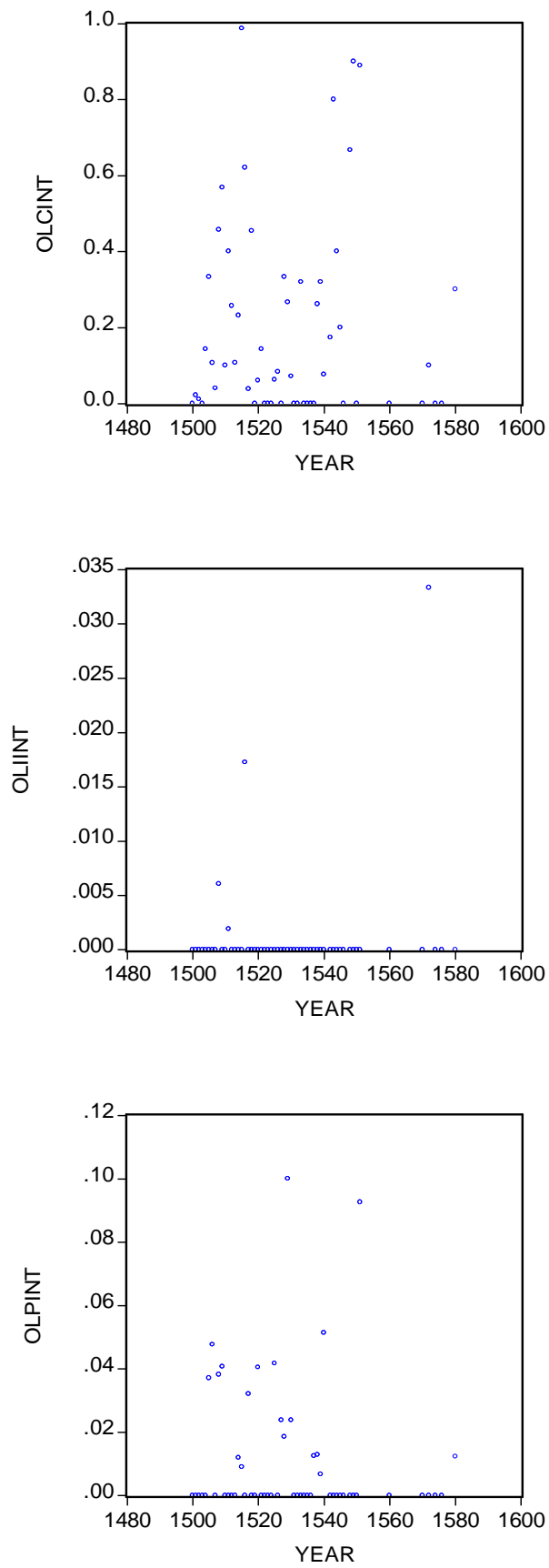


Source: Sample A

The second category of variables refers to longer interactions among individuals. These interactions are understood in a professional way, in other words when two or more people share a personal relationship because they belong to the same firm. Note that in the prior variable (same occupation) the criterion is more wide, and refers to members of the same group of professionals, while in these variables we search for people who are part of the same organization. In this case the criterion is more restrictive. Moreover, these variables have been built with information from secondary sources, while for the variable 'same occupation' contract information was used.

Professional links are split into three different groups: people who are members of the same crew (OLC), of the same institution (OLI), or are partners (OLP). In a similar way to family links, the variables OLC, OLI and OLP measure the proportion of people with professional relationship respect the total number of potential relationships. Figure 4.6 shows the evolution of these variables, each plot depicts the average value per year.

Figure 4.6: Professional Links

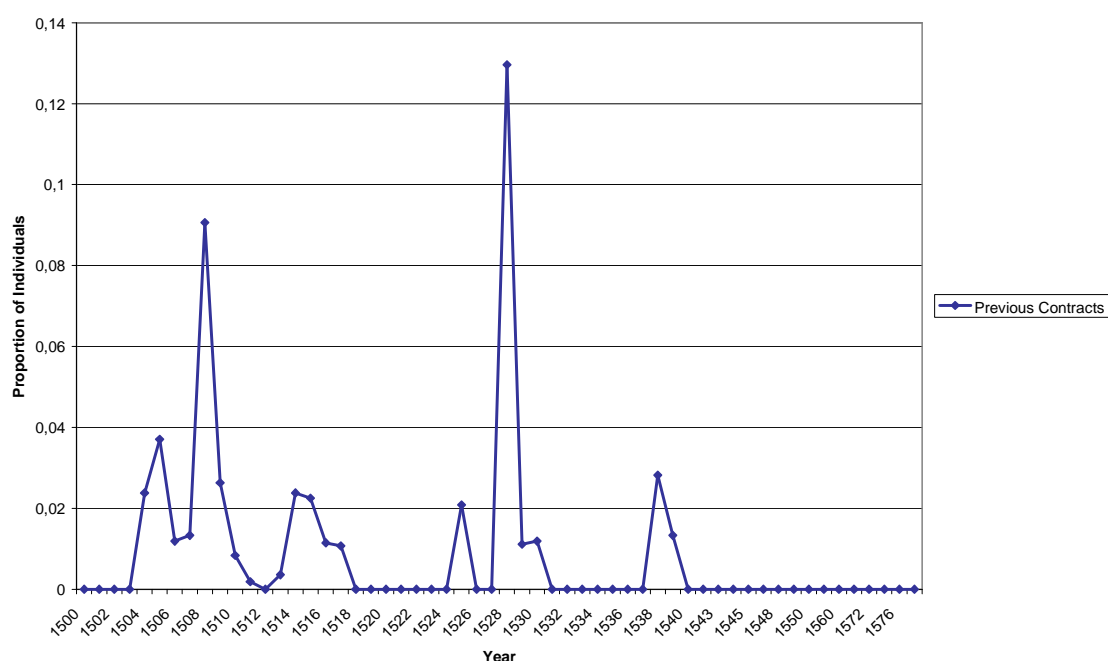


Source: Sample A

In general, relationships based on being partners or belonging to the same institution are almost inexistent. These links are very rare and are decreasing over time. More frequent are links based on being members of the same crew (variable OLC) and most of these are concentrated during the 1520s.

Repeated interactions are proxied using the number of previous contracts between the same people in the data base (PC). As noted in figure 4.7, the proportion of people enrolled in previous contracts is pretty scarce. Indeed, except two outliers the variable remains below 4%.

Figure 4.7: Proportion of People Engaged in Previous Contracts



Source: Sample A

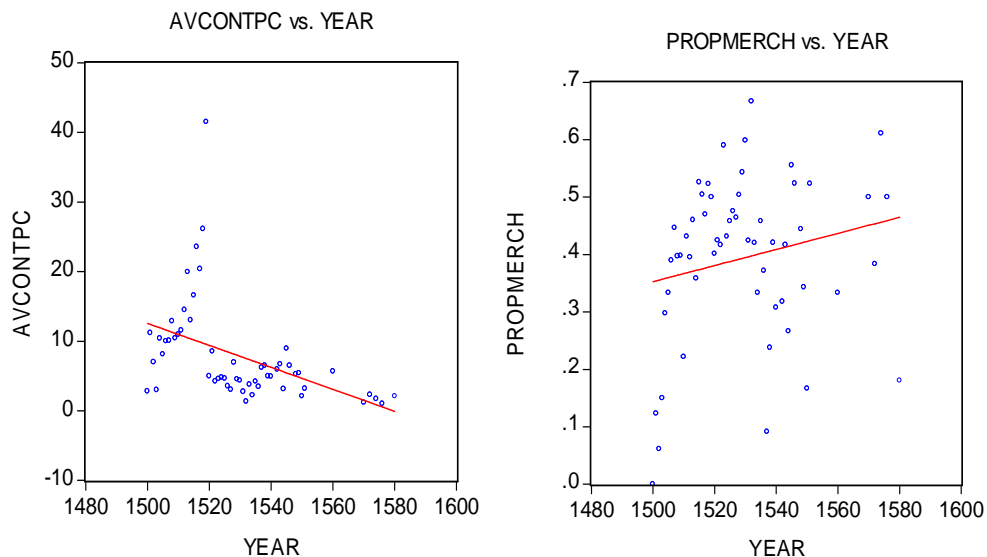
The final group of explanatory variables measures reputation. In order to measure reputation I adopt a double criterion: prior trade experience and institutional membership.

The level of trade experience has been proxied by the average number of contracts and the official declaration of being a merchant. For the first variable I am taking into account the total number of contracts signed and not just previous contracts. Moreover, data in the case of the variable 'average contracts per capita' is individual and not just a result of matching people in pairs. It is also individual for the information regarding personal declaration of being a professional merchant.

From a quick glance at general tendencies, it is quite clear in figure 4.8 how both variables present opposite tendencies. Whilst the proportion of merchants is

increasing over the century experience at trade measured by average contracts is decreasing.

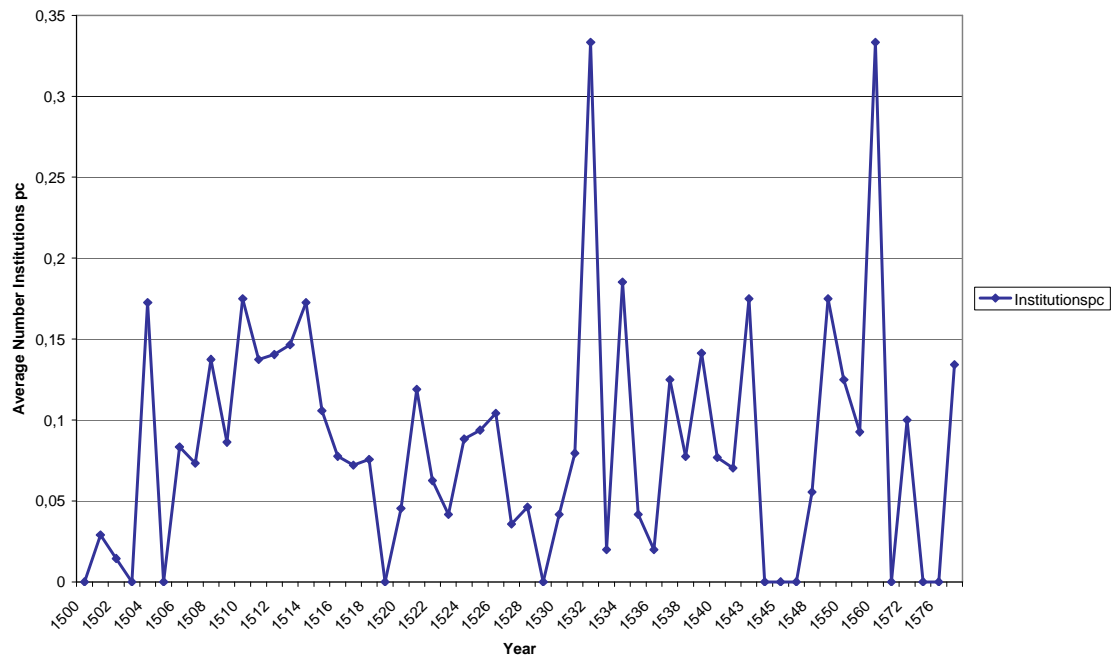
Figure 4.8: Average Contracts per capita and Proportion of Merchants



Source: Sample A

The criterion for selecting institutions is very wide including not only institutions specifically designed for traders, such as the Consulates, but also other organisms like the House of Trade or the Town Council. Note that during the 16th century being part of local government was synonymous of reputation in an economic sense. The acquisition of positions at local government offered access to privilege information and the possibility of gaining lucrative business. Besides, the State provided an additional advantage for members in case of a default on payment. Once the debt was proved, creditors could receive money as part of their salaries. For the test the variable is defined as the number of institutions per capita in every contract (INSTpc). Figure 4.9 shows how members of institutions increased their presence in commercial exchange.

Figure 4.9: Average Number of Institutions per capita



Source: Sample A

4.3.2. Studying control

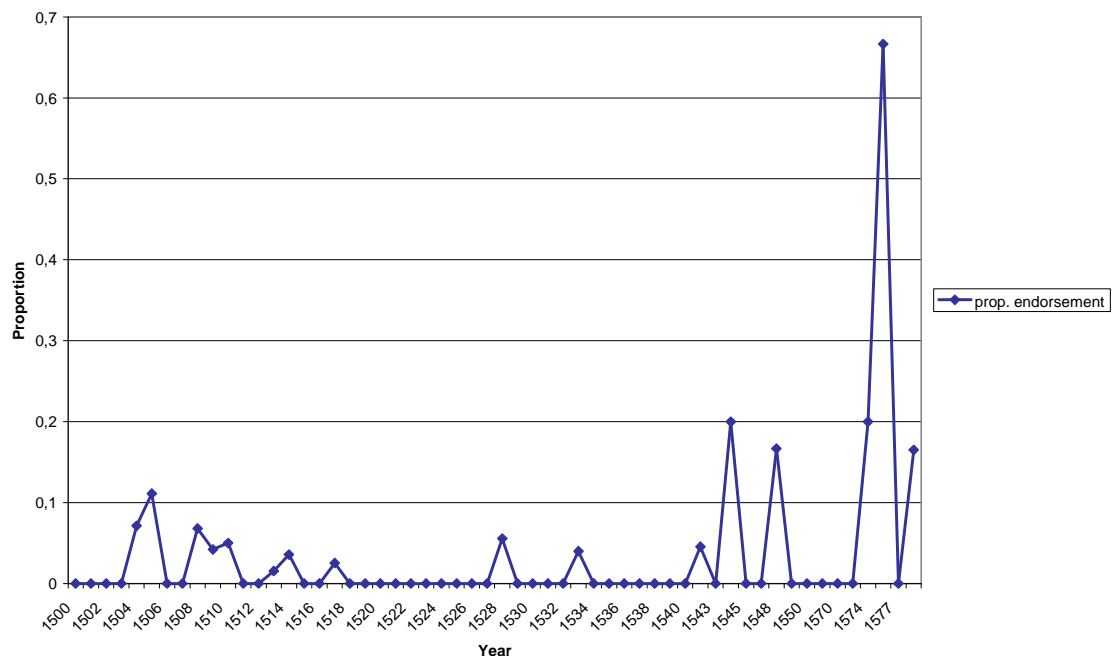
As was pointed out above, in the econometric test I control by the possibility of endorsement and the debt collector-system. Both of these were alternative strategies used by merchants to enforce contracts. While the endorsement appeared at the contract the existence of debt-collector required a new contract. Personal monitoring through the debt-collector system was applied in special contracts called *poder para cobrar en Indias*. In the contract, a person acted as agent with the only purpose of finding one or several people and to collect debts. With this aim in mind the principal provided all sorts of details about people to monitor, name, quantity of the debt, cities where the debtors might be found, etc. The collector or monitor could be a sailor, a master, a migrant going to America or a professional hired at the market for that purpose.

The mechanism for the endorsement is well known: it consisted of the introduction of a third person as responsible for payment, in case of default. For the econometric model the *endorsement* is defined as a dummy variable with $X_i=1$ for the existence of a person who guaranteed the payment and 0 otherwise.

Despite the efficiency of endorsement for enforcing contracts in general, there is no evidence of this practice in most of the periods under consideration, and only at

the end of the century does endorsement seem to be a common practice as it shown in figure 4.10. The figure represents the proportion of contracts which incorporate endorsement in sample A.

Figure 4.10: Proportion of Contracts with Endorsement



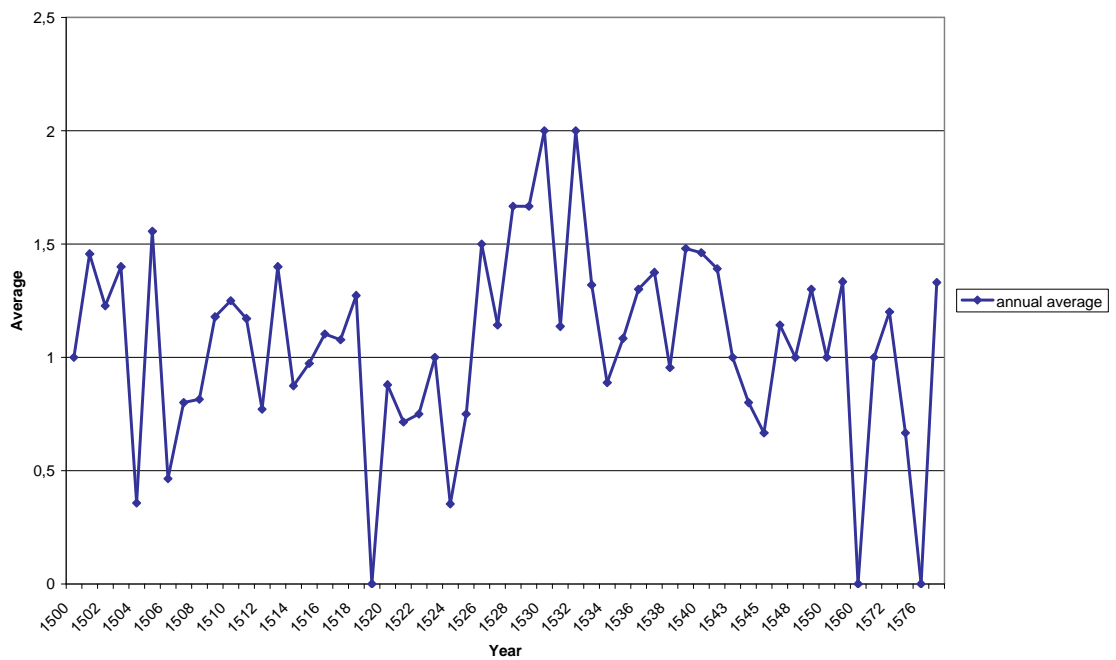
Source: Sample A

The contracts also show evidence of the use of a debt-collector system to control debtors overseas in the trade with America. I consider the existence of debt-collector as an external enforcement instrument. The importance of these contracts lies in their utility for controlling debtors in a scenario with asymmetric information and long distances. This fact reduced considerably the cost of transacting. People could save efforts in terms of time and money in order to build a strong relationship prior to business because merchants did not need to trust if they could control. The use of the debt-collector system can explain why for the Spanish case a considerable proportion of the population participated in trade.

One remaining question concerns the enforcement of these contracts. When the debt-collector arrived in America he presented the contract as a credential letter to enforce the payment. In those cases in which the debtor refused to pay, the debt-collector could threaten him with presenting charges at Audience. At times, these agents had the possibility to renegotiate the terms of the initial contract.

Figure 4.11 shows the evolution of the debt-collector system during the first century of trade. Sample A has been used as data set and the evolution has been proxy with the average number of debt-collector contracts per year.

Figure 4.11: Evolution of the Debt-Collector System



Source: Sample A

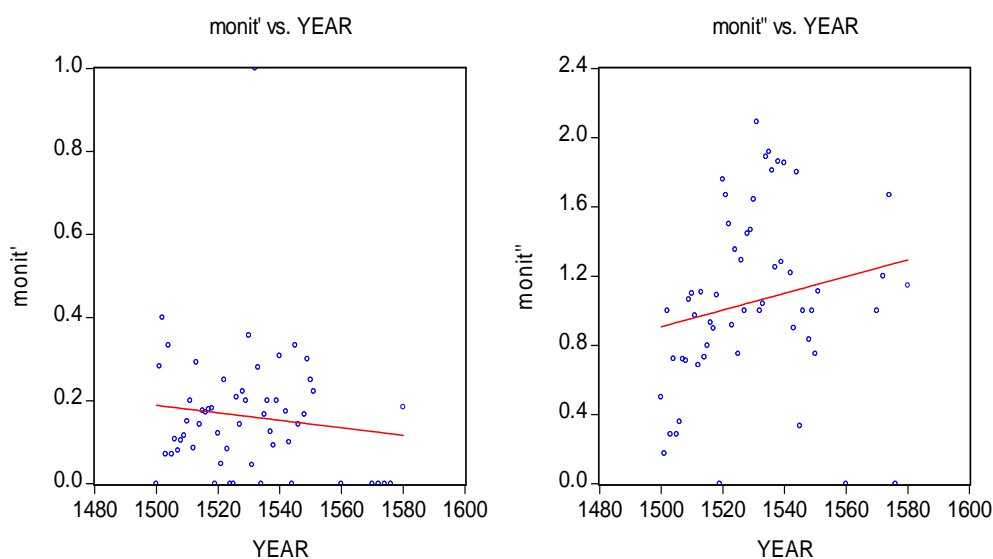
Although the general tendency is positive, the figure shows two different expansive phases: one from 1500 to 1520 and the other from 1526 and 1534. In the first period, the number of debt-collector contracts increases from 1 to 1,5 on average decreasing drastically in 1520. In other words, on average the number of debt-collectors sent to America per contract has increased by a rate of 50%. In the second expansive phase the results are similar, the number of debt-collectors sent per contract increases from 0,7 to 2, the increment this time is 100% greater. During the second half of the century the number of debt-collectors per contract remains more or less stable.

For the econometric tests run in this chapter, I design the variable *monitoring* which reflects for every contract the number of subsequent debt-collector contracts associated with the initial one. By definition, the variable presents several values per year, one value for every contract.

On occasion, debt-collector contracts were signed the same day and at the same notary's office as the main contract. Following that it is possible to split the variable *monitoring* into two: *monit'* and *monit''*. The first reflects the number of debt-collector contracts signed on the same day that as the major contract, while the second contains the number of subsequent contracts signed later. Both variables present opposite tendencies as shown in figure 4.12. The figure represents the number of subsequent debt-collector contracts over time with data from sample A. The regression lines in the plots present a slope with different sign. While the number of debt-collector contracts signed the same day as the main contract is decreasing contracts signed in a

later period trend to increase. It seems that sending a debt-collector in a period of time after the signature of the major contract was the predominant tendency.

Figure 4.12: Monitoring after the contract



Source: Sample A

4.4. Some Econometrics

This chapter measures the relative importance of trust for explaining trade. The magnitude of trade is estimated using the size of the different contracts. Among the explanatory variables we will find those measuring trust through personal relationships and impersonal reputation. I also control by endorsement and the existence of debt-collectors.

A set of regressions will be run in order to test the role played by personal relationships in explaining preindustrial trade. For all regressions the size of the contract is the dependent variable.¹⁴¹ First, an OLS regression:

$$\log Y_{it} = \alpha + \sum \beta_j \log X_{ijt} + u_{it} \quad (1)$$

¹⁴¹Contracts have a temporal dimension since every contract is associated with a specific year. However, the data set cannot be analysed as a time series. By definition, time series are data points spaced at intervals, and these intervals used are regular. In contracts from sample A, the distribution is not regular in time since it is possible to find years with more than 100 contracts and others with no data. Moreover, people involved in contracts can appear repeatedly across the data base but contracts are unique. In other words, contracts appear in one period of time without repetition and as a consequence the data set cannot be analysed as a panel.

Subscript t represents the year with $t=1500, \dots, 1580$, subscript i the group $i=$ DEBT, PURCHASE, OTHER and the subscript j represents the independent variables. The vector of explanatory variables contains measures personal relationships (Flint, OLCint, OLPint, OLLint, PROPSNAT), and reputation (PC, INSTpc, PROPMERCH, SAMEOCCUP and AVCONTpc) together with variables approaching control (END and MONIT).¹⁴²

Residuals are denoted by u_{it} , and it is assumed that there is no correlation between the independent variables and the residuals, that is to say $\text{Cov}(X_{it}, u_{it})=0$.

Second, an OLS regression is run, which introduces dummies per group, as does the fixed effects model for panel data.

$$\log Y_{it} = \alpha_i + \sum \beta_j \log X_{ijt} + \delta_D D_i + \delta_P P_i + u_{it} \quad (2)$$

Where $D_i=1$ for debt contracts and 0 otherwise, and similarly $P_i=1$ for purchase contracts. For the category other contracts it is verified that $D_i=P_i=0$.

Third, an OLS regression adding time dummies. I introduce $t-1$ dummies per years from 1501 to 1580 excluding only 1500. As a result, intercepts change over time.

$$\log Y_{it} = \alpha_t + \sum \beta_j \log X_{ijt} + \delta_{T1} T1_{it} + \dots + \delta_{T80} T80_{it} + u_{it} \quad (3)$$

Equally important is to test both effects simultaneously adding dummies per year and group all together. Here the equation is:

$$\log Y_{it} = \alpha_{it} + \sum \beta_j \log X_{ijt} + \delta_D D_i + \delta_P P_i + \delta_{T1} T1_{it} + \dots + \delta_{T80} T80_{it} + u_{it} \quad (4)$$

The results of these regressions are showed in the following table, in all cases after a robustness tests.

¹⁴² See the list of variables at the Appendix.

Table 4.1: OLS Regressions

	(1)	(2)	(3)	(4)	(5)
Log END	0.046110*** (3.166272)	0.018019 (1.399934)	0.044824*** (3.124661)	0.021164 (1.538706)	0.020190 (1.472015)
Log MONIT	0.025983*** (2.582939)	0.018318*** (1.852323)	0.025824*** (2.555056)	0.022113*** (2.283246)	0.021943*** (2.277615)
Log Flint	0.028112 (1.531252)	0.018108 (1.009638)	0.028263 (1.532462)	0.015164 (0.890724)	0.015036 (0.887260)
Log OLCint	0.013297 (1.473292)	0.011453 (1.302363)	0.013511 (1.487711)	0.011630 (1.280374)	0.011863 (1.319023)
Log OLPint	0.059954*** (4.320575)	0.058192*** (4.541843)	0.060113*** (4.297111)	0.038067*** (3.039360)	0.03808*** (3.046764)
Log OLLint	-0.082788 (-2.196962)	-0.046661 (-0.871207)	-0.084425 (-2.239005)	-0.013371 (-0.148680)	-0.015521 (-0.171201)
Log PROPSNAT	-0.014542 (-1.328682)	-0.005919 (-0.540306)	-0.014612* (-1.302871)	-0.014241 (-1.349479)	-0.014395* (-1.352867)
Log PC	-0.002612 (-0.206937)	0.025402 (2.045489)	-0.002458 (-0.193264)	-0.007356 (-0.575311)	-0.006825 (-0.535235)
Log INSTpc	0.042559*** (3.293383)	0.038562*** (3.084338)	0.042680*** (3.294386)	0.044251*** (3.249256)	0.044243 (3.244539)
Log AVCONTpc	-0.246048*** (-3.910565)	0.014721 (0.8371)	-0.245801 (-3.881866)	-0.013790 (-0.181707)	-0.012896 (-0.170466)
Log PROPMERCH	0.020518 (1.629861)	0.019294 (0.1095)	0.020774 (1.634692)	0.021452 (1.677595)	0.021437 (1.665992)
Log SAMEOCCUP	0.010926 (0.894262)	0.013656 (0.2519)	0.011032 (0.892987)	0.018408 (1.639580)	0.018452 (1.638501)
TIME	-----	0.016362* (9.709137)	-----	-----	-----
N	1468	1468	1468	1468	1468
Periods	57	57	57	57	57
R-squared	0.130815	0.176214	0.130883	0.227886	0.227981
Adjusted R-sq	0.122822	0.167955	0.121545	0.190935	0.189877
F-statistic	3.855176***	9.227501***	3.307324***	6.167218***	5.983135***
DW	1.186391	1.230026	1.186375	1.436376	1.436681

t-statistic values in brackets

*p ≤ 0.10 **p ≤ 0.05 ***p ≤ 0.01

- (1) OLS Regression
- (2) Regression (1) adding time trend
- (3) Regression (1) introducing group dummies
- (4) Regression (1) with time dummies
- (5) Regression (3) plus time dummies

Results confirm the importance of the debt-collector system. The variable Log MONIT is highly significant in all regressions. Coefficients in the different regressions are positive, which can be interpreted as an intensification of control via debt-collector system for larger contracts.

Regarding trust, the only variable which remains significant is OLPint. This variable measures per contract the proportion of people who had conducted business together before. The existence of previous contracts between the same traders reinforces trust and thus facilitates the matching process in the market. Coefficients in the regressions are also positive, which means that for large contracts the importance of previous business increases.

The variable INSTpc also remains significant. This variable represents reputation, but also implies a guarantee for payment. Public institutions, such as the House of Trade or Town Council, offered an alternative procedure in case of default. These organisms offered the possibility to cancel debts with part of the expected salary of the debtor.

The introduction of time dummies seems not to affect the results significantly. However, the proportion of people with the same origin (variable PROSNAT) becomes significant with the introduction of group dummies. Links between people sharing the same origin explains trade although only for specific kind of contracts. This circumstance suggests that for different categories of contracts variables could tell a different story. Indeed, the introduction of group dummies allows for the measurement of changes across categories of contracts, but still we do not know what part of these changes can be allocated to every group. To this end I introduce shift dummies in the analysis.

Table 4.2: Shift Dummies

	(1)	(2)	(3)
Log END	0.046110*** (3.166272)	-----	-----
Log ENDD	-----	0.054368*** (0.996697)	-----
Log ENDP	-----	0.050807*** (1.110906)	0.047891*** (0.992345)
Log ENDO	-----	0.009308 (0.168940)	-----
Log MONIT	0.025983*** (2.582939)	-----	-----
Log MONITD	-----	0.014939*** (1.865927)	-----
Log MONITP	-----	0.014240*** (1.572700)	0.011345*** (1.22379)
Log MONITO	-----	0.050982* (3.423277)	-----
Log Flint	0.028112 (1.531252)	-----	-----
Log FLintD	-----	-0.003962 (-0.140695)	-----
Log FLintP	-----	-0.007602 (-0.176897)	-----
Log FLintO	-----	0.051228* (2.158931)	-----
Log OLPint	0.059954*** (4.320575)	-----	-----
Log OLPintD	-----	0.049992* (1.159659)	-----
Log OLPintP	-----	0.126878 (1.829060)	0.113247* (1.775689)
Log OLPintO	-----	0.054514*** (1.294198)	-----
Log INSTpc	0.042559*** (3.293383)	-----	-----
Log INSTpcD	-----	0.031884*	-----

		(1.407330)	
Log INSTpcP	-----	0.013550 (0.377980)	0.003251 (0.224591)
Log INSTpcO	-----	0.044943*** (2.229448)	-----
Log AVCONTpc	-0.246048*** (-3.910565)	-----	-----
Log AVCONTpcD	-----	-0.032654 (-0.295658)	-----
Log AVCONTpcP	-----	-0.413570 (-2.696145)	-0.587211 (-2.511363)
Log AVCONTpcO	-----	-0.215991*** (-2.579279)	-----
N	1468	1468	280
Periods	57	57	10
R-squared	0.130815	0.186342	0.143391
F-statistic	3.855176***	2.267493***	2.184572**
DW	1.186391	1.189602	1.19204

t-statistic values in brackets

*p ≤ 0.10 **p ≤ 0.05 ***p ≤ 0.01

(1) OLS Regression

(2) Regression (1) adding shift dummies

(3) Regression with sample B

Testing a possible multicollinearity problem, the first column represents the regression from table 4.1, only with significant variables. Table 4.2 demonstrates that all variables remain significant with the exception of family links. The prior result indicates that among the significant variables there is not multicollinearity.

Results from the prior table stress the existence of differences among contracts' categories. *Debt contracts*, for instance, are mostly explained by control techniques, mainly debt-collector and endorsement. In *purchase contracts* the story is more or less the same and only variables representing monitoring and endorsement are significant. Resemblances between stories for these contracts are not surprising since both documents are very similar in terms of duties and rights.

For the group *other contracts* the explanation is quite different. This group contains contracts in which the economic relationship is prolonged for several years.¹⁴³ While debt and purchase normally refer to business deals not necessarily extended in time, company and agency contracts imply stronger economic relationships. It is precisely the strength of the commercial relation that explains why in the group *other contracts* the matching process is more selective.

The results from table 4.2 show how partners were selected using a reputation criteria. Members of relevant institutions or those engaged in business previously were chosen for important contracts. Indeed, variables that measure institutions per capita and links based on previous contracts are strongly significant and positive. Partners

¹⁴³ I refer to company and agency contracts.

were also searched inside the family, although in this data set the importance of this factor is limited. Note that the variable reflecting family links is only significant at 10%.

In addition, the variable which measures the number of contracts on average is highly significant, but negative. The value of the coefficient β in the regression means that the amount of money contracted decreases with the number of contracts per capita. This fact is apparently counterintuitive, but can be explained in terms of the exclusivity requirement for partners in company and agency contracts. As pointed out in chapter 3, company and agency contracts contained specific prohibitions about private trade. It was forbidden for agents and travelling-partners to trade as a member of another company. These prohibitions explain why the average contracts per capita decreases.

Results have shown how in Atlantic trade the control carried out by debt-collector system mattered. Occasionally, this control was even reinforced by endorsement. These two variables mostly explain debt and purchase contracts. For the group *other contracts*, however, the story is quite different. These contracts have a different nature and are explained via previous business and institutions. Indeed, in company and agency contracts the economic relationship was extended over several years. The strength of the relationship controlled people through personal links and reputation. For company and agency contracts people were tested even before the contract through personal relationships.

Finally, the results from the group *other contracts* show important differences according to the quantity contracted. While for small contracts individuals could be involved in other transactions, in large contracts merchants demanded exclusivity to their partners. This differential behaviour suggests analyse large and small contracts separately. With this in mind, the next section tests the data set using quantile regression. This technique allows us to analyze of significant variables for different contracts' sizes.

4.5. Quantile Regression

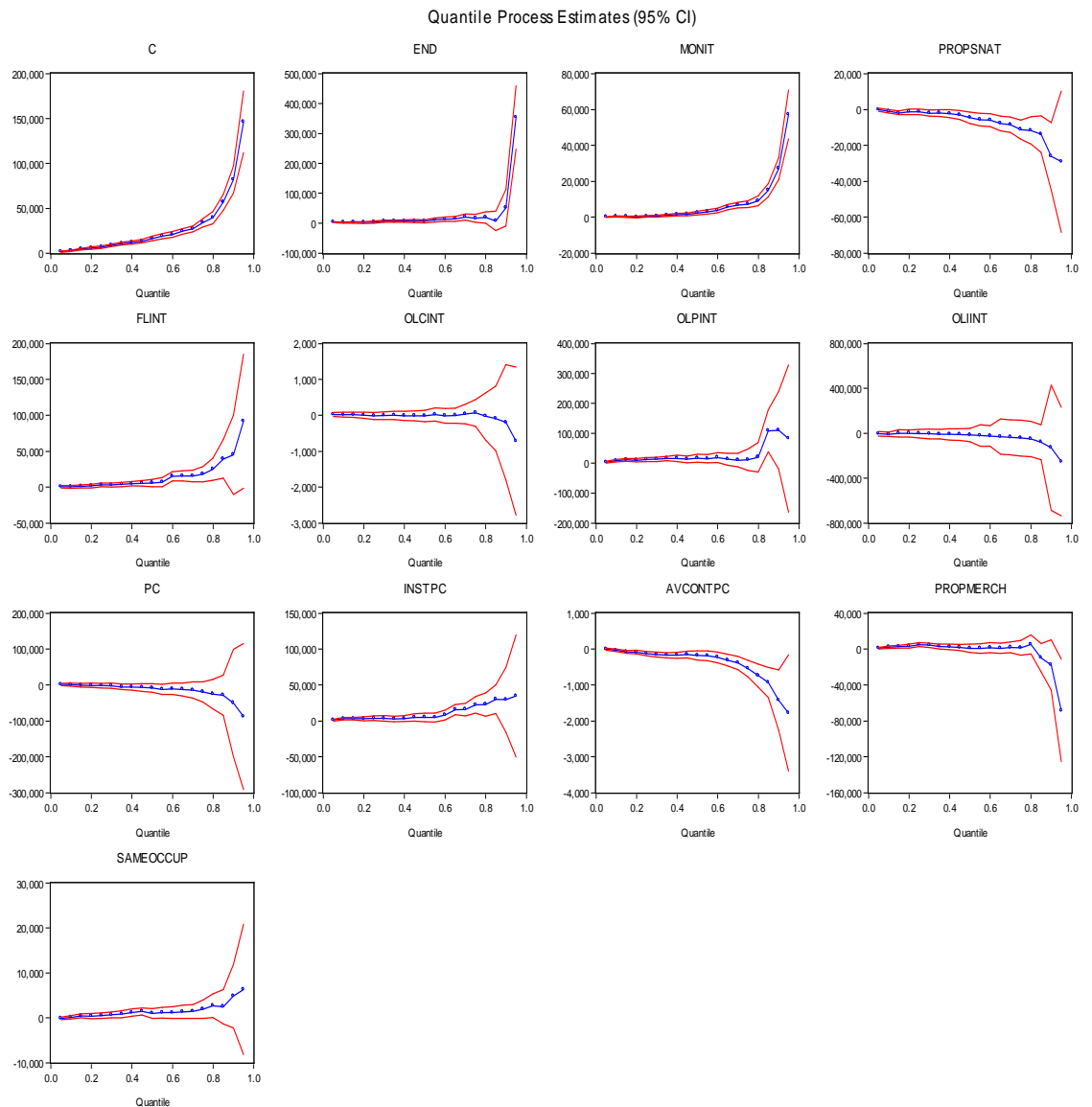
Quantile regression was first introduced by Koenker and Basset (1978). In the model, the estimation of the dependent variable is done through conditional functions. These conditional functions describe the relationship between the mean of Y and the vector of covariates X , assuming that covariates can influence the conditional distribution in different ways: expanding one tail of the distribution, compressing the other tail and even inducing multimodality.

In the data set used in previous regressions the distribution of the dependent variable is skewed to the left. This circumstance indicates that contracts above the medium can be considered outliers, suggesting that explanatory variables probably have something different to say about contracts of values above and below the medium. While in the OLS model the results tend to follow a simple outlier, the influence of an outlying observation in quantile regression is bounded.

4.5.1. Quantile process

Figure 34 presents results from the quantile regression. Each plot depicts coefficients for one explanatory variable at every quantile. The blue line represents the values for the slope coefficient and the area between the red lines is the interval at 95% of confidence for the values of the dependent variable.

Figure 4.13: Quantile Process



The intercept term from the first graph can be interpreted as the conditional quantile function. In other words, values of $\beta_c(\tau)$ reflect the estimated conditional function of a contract with no endorsement and one monitoring contract, no relationship between parts, even with no previous contracts have been signed between them. The intercept term appears not to show large changes along the whole distribution, although the confidence intervals are quite different.

Plots representing variables endorsement and monitoring present more accurate adjustment. The blue line which represents the value of the coefficients is closer to the red lines for the confidence interval of dependent variable. By contrast, in variables which measure personal links (FLint, OLCint, OLLint, OLPint) the confidence interval seems not to fit so well with the value of the coefficients.

Values of $\beta(\tau)$ can be interpreted as normal OLS, that is to say that these values reflect the reaction of the dependent variable with growth in one explanatory variable, *ceteris paribus*. The variable monitoring the plot shows how for larger contracts the control via debt-collector system increases exponentially. Certainly, for the 20% of larger contracts (quantile 0.8) an increase in size more than proportionally to the number of debt-collectors sent. The case of variable AVCONTpc is opposite and the growth in the value of contracts decreases more than proportionally to the average number of contracts per capita signed. Variables with flat slope in the graph are not significant. For these variables $\beta(\tau)$ vectors take null values which means that they are uncorrelated.

Table 4.3 presents the value of $\beta(\tau)$ coefficients for some significant variables.

Table 4.3: Significant Variables

Q _{τ}	Log END	Log MONIT	Log PROPSNAT	Log AVCONTpc	Log INSTpc	R-squared
Q _{0.05}	0.061202*** (1.835137)	0.015508* (1.396879)	-0.008616 (-0.757441)	-0.052062 (-0.689185)	0.049208*** (3.445439)	0.124518
Q _{0.1}	0.040430*** (1.629521)	0.011624* (1.388659)	-0.023272 (-2.358287)	-0.149321 (-2.555928)	0.049454*** (4.319476)	0.154868
Q _{0.25}	0.022692*** (1.250332)	0.006926* (1.073722)	-0.017640** (-2.368369)	-0.212217*** (-4.686142)	0.033076*** (3.941268)	0.184079
Q _{0.5}	0.033534** (2.075284)	0.018870*** (3.481259)	-0.021895** (-3.461593)	-0.147282*** (-3.939491)	0.034575*** (2.865907)	0.229438
Q _{0.75}	0.024841 (1.569945)	0.028016*** (3.884507)	-0.028263* (-4.427177)	-0.239472*** (-3.750441)	0.030681*** (3.550249)	0.248353
Q _{0.9}	0.034047** (1.263798)	0.038667*** (3.922688)	-0.024711 (-2.331253)	-0.296760*** (-4.212689)	0.036916* (2.764399)	0.271175
Q _{0.95}	0.114569*** (3.776773)	0.046059* (4.067517)	-0.029074 (-2.239489)	-0.281642*** (-3.447145)	0.019585 (1.353601)	0.288718

t-statistic values in brackets
 *p ≤ 0.10 **p ≤ 0.05 ***p ≤ 0.01

For smaller contracts merchants did not assume the cost of personal monitoring. In these cases the investments were controlled through alternative strategies like endorsement or institutions. By contrast, important business required more intensive control and the debt-collector system was frequently used in this regard. Note that the variable MONIT is highly significant for the quantiles 50 to 90. The experience at trade proxy by the average contract matters although only for important business.

It is only for central quantiles that the variable reflecting the proportion of people with same origin becomes significant. Surprisingly, the variable has negative values for $\beta(\tau)$ which means that when size of the contract increases the proportion of people from the same city declines. In simpler terms, for large contracts merchants tended to contract with people from other cities. This result contradicts conventional explanations about the role played by merchant communities in commercial exchange.

According to historical research the variable which measures the proportion of people sharing same origins should be significant, mainly for larger contracts. In the data set, however, it appears that people from different origins frequently traded with one another.

4.5.2. Testing the quantile regression

The test was introduced by Koenker & Bassett (1982) as a way to check heteroskedasticity. The null hypothesis is that there are no differences in the slope of the regression curves for symmetric quantiles, namely that $\beta(\tau)$ and $\beta(1-\tau)$ are equal. For the data set the null hypothesis is strongly rejected, which means that the differences between slopes are significant. In other words dispersion measures by interquantile distances significantly increases with scale.

The econometric software also offers the possibility to test for conditional symmetry. In this case, the null hypothesis is that the average value of coefficients for symmetric quantiles is equivalent to the value of these coefficients for the median. Putting it simply:

$$[\beta(\tau) + \beta(1-\tau)] / 2 = \beta(1/2)$$

Introducing the values of variables from the data set the null hypothesis is rejected, as it is in the previous test.

Conclusions

This chapter has presented a different model of trade which has not been analyzed previously. One differential element is participants' profile. In most of the contracts it is found that professional merchants were lending money or selling merchandise on credit to a person who occasionally acted as a trader.

Exhaustive control constitutes also a differential factor. As was already tested in this chapter: control matters. This control was carried out in a different way according to the kind of transaction involved. For debts and purchases control was based on personal monitoring together with endorsement. By contrast, the special nature of company and agency contracts forced participants to use personal guarantees as reputation or repeated interactions.

In addition, contracts have been tested according to the economic importance of the transactions. With this aim in mind, quantile regression was used here. Results show how small contracts were controlled through endorsement and institutions. For larger contracts endorsement was also frequently used together with the experience at trade proxy by average contracts.

The initial hypothesis about the role of trust is not supported by results. On the contrary, control tools seem to perform better as explanatory variables for trade. Nevertheless, this is only the first step in the research; once the importance of these mechanisms is proved by the data the remaining task is to analyze how this instrument was used. The following chapter thus asks who was controlled by this system and why.

Appendix

Variables in the regressions:

YEAR: When the contract was signed.

TIME: Time trend, the variable will take a different value for every year starting in 1500= year 1, 1501= year 2 and so on.

GROUP: If the contract is debt, purchase or other, the values of this variable are 3, 2 and 1 respectively.

BV: Value of the business or size of the business measured in maravedís.

BVdefl: Value of the business deflated or corrected by Hamilton price index.

END: Binary variable for the existence of an endorsement in the contract, the variable will take value 1 if there is an endorsement and 0 otherwise.

MONIT: Number of subsequent monitoring or debt-collector contracts associated.

MONIT': Number of subsequent monitoring or debt-collector contracts signed in the same year as the original one.

MONIT'': Number of subsequent monitoring contracts signed in the following years.

Flint: In every contract proportion of links because of being members of the same family over the total number of potential links in a contract.

OLCint: In every contract proportion of links because of being members of the same crew over the total number of potential links in a contract.

OLPint: In every contract proportion of links because of being partners before over the total number of potential links..

OLLint: In every contract proportion of links because of being members of the same institution over the total number of potential links in a contract.

INSTpc: Number of institutions per capita in every contract.

PC: Proportion of people who appeared together in previous contracts.

AVCONTpc: Average number of contracts per capita.

SAMEOCCUP: Number of people with the same occupation in the same contract.

PROPMERCH: Proportion of merchants in every contract.

SHIFT DUMMIES PER GROUP: The same variables with the letter D, P or O if contracts are debt, purchase or other.

Chapter 5: Testing Moral Hazard

The importance of the debt-collector system as an explanatory variable for Atlantic trade has been proven in the prior chapter. Even nowadays this control tool continues to be used mainly in informal credit markets from rural areas in Asia and South America. The idea is that “this delegated monitoring system is the consequence of the lack of an effective court system to enforce contracts at the village level.”¹⁴⁴ Ghosh and Ray (2001) also argue that where “there is a little reliance on a court of law,” instead “lenders often supervise borrower activities and invest resources on debt collection.”¹⁴⁵

The evidence of this alternative mechanism for enforcing contracts weighs against the most popular theories for long distance trade, which emphasize the role of reputation and the importance of personal relationships. This chapter argues that 16th century traders used the debt-collector system to reduce Moral Hazard in long-distance trade, in the sense that mostly individuals suspicious of opportunistic behaviour were personally monitored by a debt-collector.

First, I question the decision to send a debt-collector to America. The degree of suspicious behaviour has been proxied by the personal reputation and the destination selected. The major hypothesis is that there is a correlation between the market selected by the debtor and the probability of default. In this sense, high-risk individuals will select less popular markets with non-developed merchant communities and where the social cost of default is very low.

¹⁴⁴ Hoff & Stiglitz (1994), pp. 4-5.

¹⁴⁵ Ghosh & Ray (2001), p. 14.

Second, I test the decision of when to send a debt-collector. In this decision, the duration of the contract is the major explanatory variable. In other words, after the principal decides to control by sending a collector longer contracts are become controlled. Variables measuring economic environment, a principal's ability to control together with features of the contract itself have all been included in both tests.

The current chapter uses **sample B** as its main source. Unlike sample A, the contracts in this case are homogeneous. More specifically, contracts in **sample B** are a purchase on credit with a principal staying in Seville and a debtor who travelled to America with the merchandise. These are non-exclusive contracts, that is to say that the customer can select one or more merchants and trade with them all, and the merchant can also enter into contracts with more than one customer.

The rest of the chapter is organized as follows. Section 5.1 analyses the moral hazard problem, placing it into its proper historical context. Section 5.2 describes the data. Sections 5.3 and 5.4 then discuss the different hypotheses and the variables used in the tests. Section 5.5 shows the econometric results. The last section contains the conclusions.

5.1. Defining Moral Hazard

Moral Hazard problems have been analysed as part of a wider literature on the principal-agent relationship. In fact, the typical way of explaining the Moral Hazard conflict is with regard to the difficulties of the principal to obtain information about the agent's effort level. The same problem has been empirically analysed in the field of credit contracts and insurance. Here the conflict arises when the lender has no information about the borrowers' probability of default.¹⁴⁶ Extrapolating this last idea to the historical framework previously analysed, we can affirm that merchants taking part in the Atlantic trade faced a Moral Hazard problem given that they had no information about debtors' probability of default.

Obviously, information problems do not only arise only ex post. Ex ante the principal also faces a screening problem. Indeed, he has to hire the best workers, choose the best borrowers or contract with the low-risk insurees even having incomplete information about them. Only after the contractual relationship is finished can we know with certainty about the efficiency of workers, the occurrence of accidents, or the default on repayments.

¹⁴⁶ For the case of insurance, the unobservable information is not the probability of default but the probability of having an accident, see Chiappori & Salani  (1996).

From a theoretical point of view both problems may be easily separated. However, conflicts arise in the empirical field due to difficulties of designing different econometric tests. As Chiappori (2000) has pointed out, “distinguishing between adverse selection and moral hazard is a difficult task when only static data are available.”¹⁴⁷ In order to test asymmetric information in general the classical contract theory establishes a correlation between the choice of contracts and the probability of default.¹⁴⁸ Following this reasoning, the test will not offer big trouble as we just compare major features in the contract with the default. However, problems arise when we divide asymmetric information into two separate conflicts: adverse selection and moral hazard.

Tests for adverse selection are mainly built on the Stiglitz-Weiss model, which predicts that high risk individuals will be attracted by certain contract conditions.¹⁴⁹ According to this idea, suspicious individuals will accept higher prices, less coverage or higher interest rates given that they have no intention of fulfilling the contract. Empirically, we can test the interaction between prices, interests, or coverage and the default. We can note that this test is very close to the general asymmetric information test. The moral hazard, however, is an ex post problem so here the test is run once the contract is signed. The initial premise is that conditions in the contract may affect the efficiency of the agent. This way, higher prices, higher interest rates, or more complete coverage will affect to the behaviour of borrowers, or insurees, and consequently final outcome of the contract. The test again will connect features in the contract and default.

In order to avoid these problems, recent tests of asymmetric information have used natural experiments or dynamic data. Natural experiments have been carried out mainly in the field of credit cards and insurance, the idea is offer to different individuals a set of contracts and, once they accept, change the initial conditions in the contract. In this way, we can easily separate adverse selection from moral hazard. Using the data from the first proposal we test the effect of the initial design of contracts on the decision of accepting or rejecting the contract, this is the adverse selection experiment. The test for moral hazard is run once individuals accept the first contract. We now test the effect

¹⁴⁷ Chiappori (2002), p. 70.

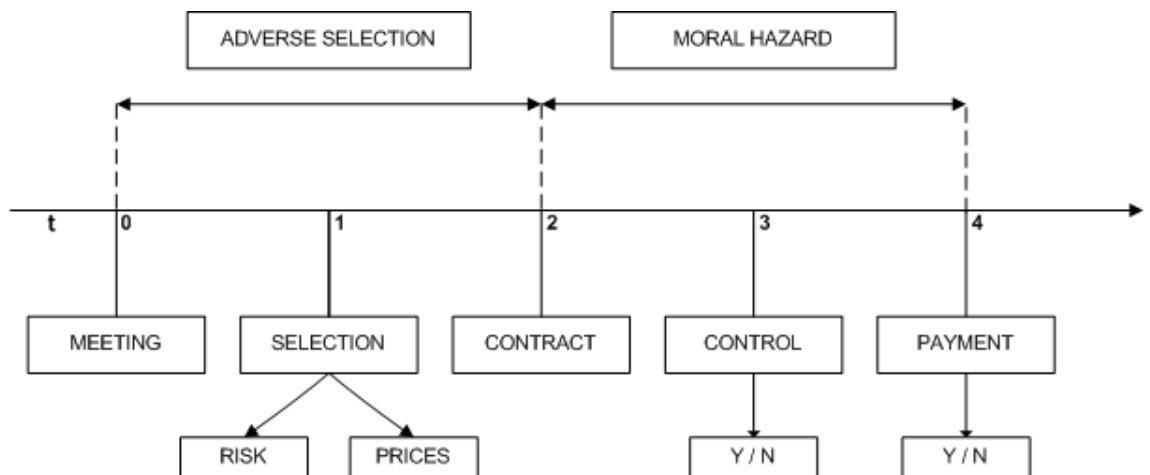
¹⁴⁸ Here, we face the first problem we have to consider, which is that the design of contracts is endogenous or exogenous. In the first case the contract is the result of a negotiation between both parties while for the second case the agent simply will select a contract among a pool of documents designed by the principal. For methodological debates see Prendergast (1999), Hart (2003), and Hart & Moore (2008).

¹⁴⁹ The model was design as a screening mechanism in credit markets, Stiglitz & Weiss (1981).

on the final income induced by the change of conditions.¹⁵⁰ Regarding dynamic data we simply need a set of contracts reflecting repeated interactions.¹⁵¹

Unfortunately, natural experiments are excluded from the present analysis given the nature of the data set. Moreover, I have no information about repeated interactions. How can we solve the problem of isolating moral hazard? I assume that the design of the contract is endogenous. The principal fixed the major features, such as prices or repayment period, but it is the debtor who selects the destination for the merchandise. Opposite to the classical asymmetric information tests, I do not use information from the contract as the dependent variable. Instead, in this thesis contractual features are considered independent variables. The difference lies in the focus; while classical moral hazard tests check the effect of features in the contract (mainly prices, interest rates or coverage) over probability of default, what I am testing is whether the external control via personal monitoring can be explained by the suspicious behaviour. The dependent variable is thus the existence or not of this control and in the classical moral hazard test the dependent variable is contract design. Among the independent variables we can find the degree of suspiciousness.¹⁵² To clarify these concepts the next figure represents the sequence of moves by the principal and the debtor.¹⁵³

Figure 5.1: The principal-debtor conflict



Source: Own elaboration

¹⁵⁰ Karlan & Zinman (2007) run a natural experiment in credit cards markets in South Africa. They randomize 58,000 mail offers along two dimensions: an initial interest rate on the mail solicitation, and a contract interest rate which was revealed only after the borrower agree to the initial offer.

¹⁵¹ See Abbring, Chiappori & Pinquet (2009).

¹⁵² In a different paper, however, I take into consideration contract design, and check the classical Weiss-Stiglitz model that establishes a correlation between suspiciousness and clauses in the contract.

¹⁵³ The theoretical literature refers to principal and agent as the two parties in the conflicts. However, in this paper we will refer to them as principal and debtor. The idea is to point out that both parties are independent in the sense that the second party (debtor) does not belong to the principal's commercial structure.

At time 0 the principal meets a set of potential customers and decides whom to contract with. According to the economic literature, in the selection process the principal will balance between the potential risk assumed by contracting with individuals of doubtful reputation, and the future profits derived from price discrimination.¹⁵⁴ During this process the principal is facing corresponding adverse selection given that he cannot distinguish clearly between high and low risk debtors.

After both parties have signed the purchase contract, the debtor goes to the destination selected in America whilst the principal stays in Seville. It is from this moment on, until the end of the period designated for repayment, that the principal will face the Moral Hazard problem since he has no information about the debtor's probability of default and he cannot control the final outcome of the contract. At the last stage of the graph it is the debtor who decides whether to repay the promised amount of money, or whether to default.

While the Adverse Selection is a problem of screening, the moral hazard is basically a control problem. My basic claim in this paper is that the debt-collector system was used to solve the moral hazard problem given that merchants tried to enforce contracts from Seville by sending an agent overseas. Obviously, only debtors suspicious of opportunistic behaviour were controlled through this system. Therefore, in order to test moral hazard we only need information about the personal characteristics of the debtors and the control exerted by the principals. Whether the Moral Hazard hypothesis is true there must be an interaction between the intensity of the control and the suspiciousness of behaviour.

5.2. A brief description of the data

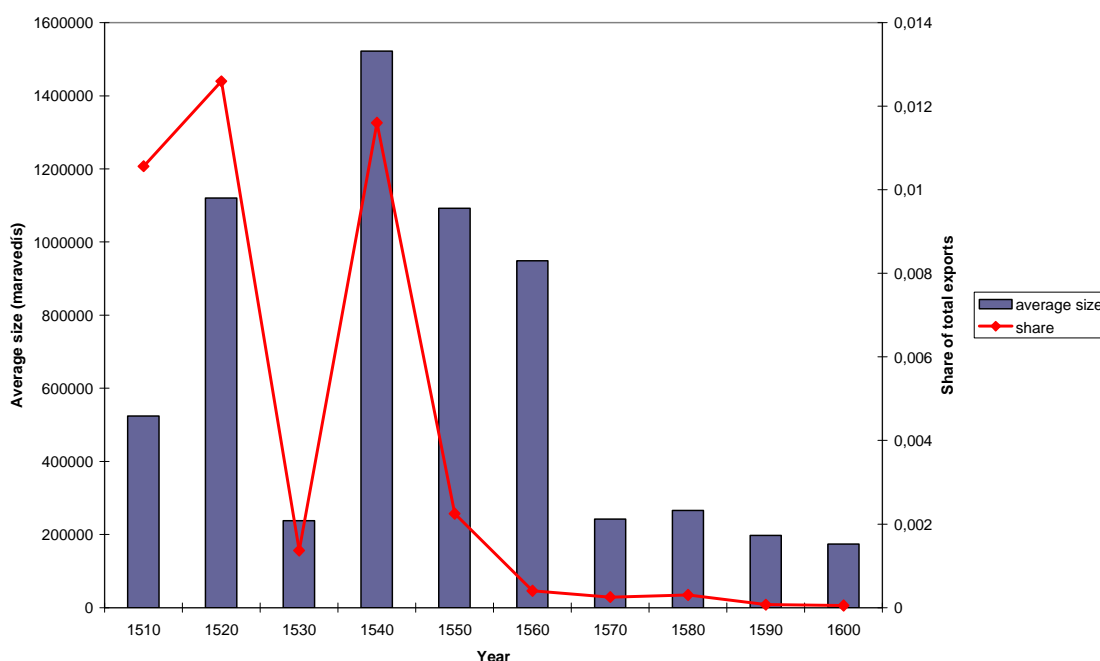
The major source for this chapter comes from **sample B**, which has been collected from original 16th century contracts. All contracts were purchased on credit with a principal or in Seville with a debtor who travelled to America with the merchandise. Fulfilling the theoretical requirement from contract theory, the contracts collected are standardized. Their sheer simplicity allows us to present them as a set of homogenous contracts.

¹⁵⁴ Just remain that according to the Stiglitz-Weiss (1981) model, suspicious individuals will accept higher prices given that they have no intention of fulfilling the contract.

5.2.1. Information from the data base

Given the purpose of this chapter, one of the most relevant pieces of information in contracts concerns transfers between parties. As all contracts were purchased on credit the transfers consist of the price of merchandise sold and the period for repayment. The monetary equivalent to the merchandise sold or size of contracts has been adjusted by the general price index. Figure 5.2 shows differences in sizes of the contracts from sample B. In order to approach the relative importance of these quantities the proportion these contracts represent over the total exports in the same period has also been calculated.¹⁵⁵ The red line reflects the share of contracts from the data set compared to all values of exported goods.

Figure 5.2: Size of contracts



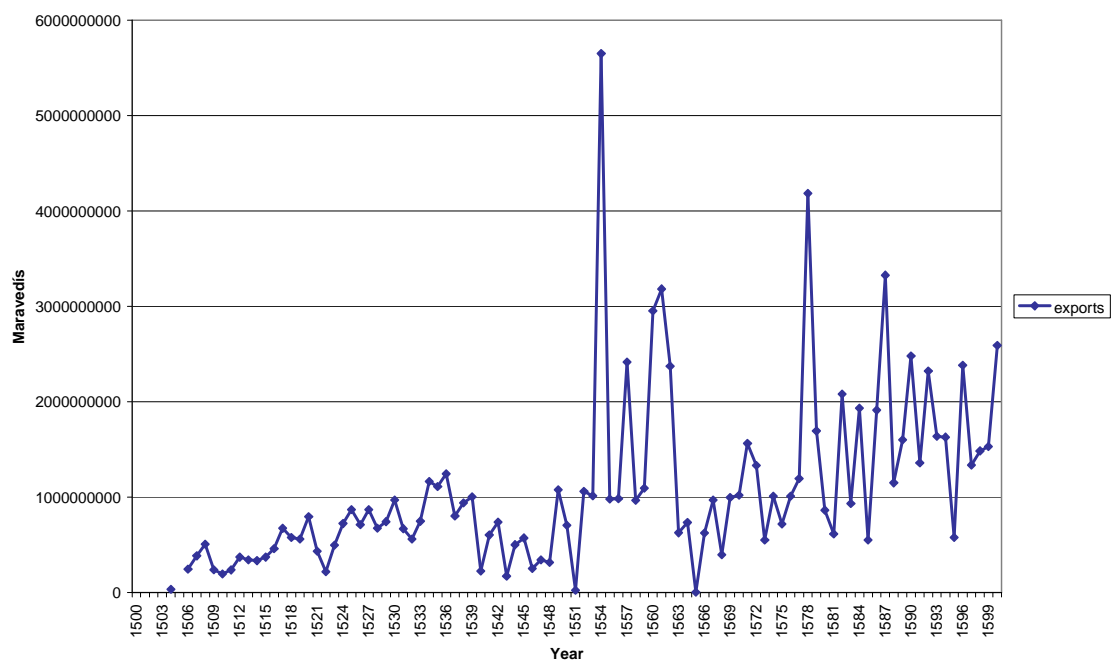
Source: Sample B

The proportion that represents our sample is low (always under 1,4%) and changes over the course of the century. During the decades of the 1520s and the 1540s the share of contracts in the sample reaches a maximum: between 1,2% and 1,3% of the total value of merchandise exported in these years. In periods such as the 1550s and 1560s contracts from the sample represent a high value in average terms;

¹⁵⁵ For the calculation of this magnitude I used tax series, more specifically data from *almojarifazgo* and *averia* in Lorenzo Sanz (1982), Céspedes (1945), García-Baquero (1992) and Chaunu (1955).

however, compared to the total exports the proportion is very low. This data suggests that in this period the total volume of exports to America increased considerably. Figure 5.3 presents the total exports during the whole 16th century. It is easy to verify that towards the mid-point of the century the value of products exported also reaches a maximum.

Figure 5.3: Total exports

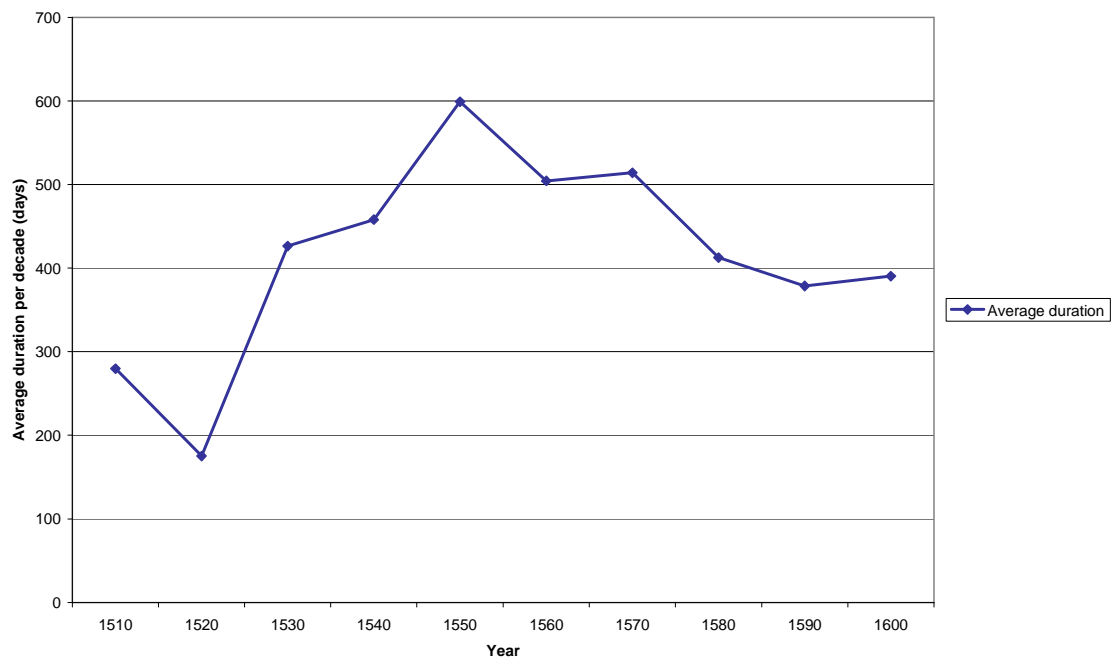


Source: Chaunu (1950), Vol. 6A.

In the contracts, transfers consisted not only of the value of the merchandise but also in the repayment period. With regard to duration of the contracts, I refer to the period for repayment and the total value of the merchandise acquired. One practical problem arises in contracts in which the expression *a tornaviaje* appears, instead of establishing a period of time. The expression *a tornaviaje* implies a one-journey-contract and means that the payment will be made when the merchant returns from America. In these cases, the duration had been estimated using average times for the journey, and adding one month for the merchants to sell the goods.¹⁵⁶

¹⁵⁶ For average times in the journey to America, see Garay Unibaso (1989) and García-Baquero (1992).

Figure 5.4: Duration of contracts



Source: Sample B

In general terms the repayment period grew approximately 40% during the 16th century. As shown in figure 5.4, it increased from 275 days to nearly 400. Note that during the middle decades, not only were contracts larger but also longer.

5.3. Approaching suspiciousness

For contract theory in general, Chiappori and Salani  (2000) state that personal characteristics should also be included in economic analysis. Information such as names, relationship between parts or residence can be easily found in contracts however, some important information is still missing. In this chapter some of this missing information has been proxied using external sources.

This section aims to approach the perceptions of the principal about the degree of risk of his occasional partners. The degree of risk is only partially observable since the probability of default is hidden. I assume that observable risk was based on the reputation of every individual. The personal reputation has been estimated in four measures – institutions, news, contracts signed and profession – using the information available at the contract and additional data from the History literature.¹⁵⁷

The number of institutions (D_i) includes belonging to a group, the news (D_n) proxy the relevance of individuals as traders, and the number of contracts signed (D_c)

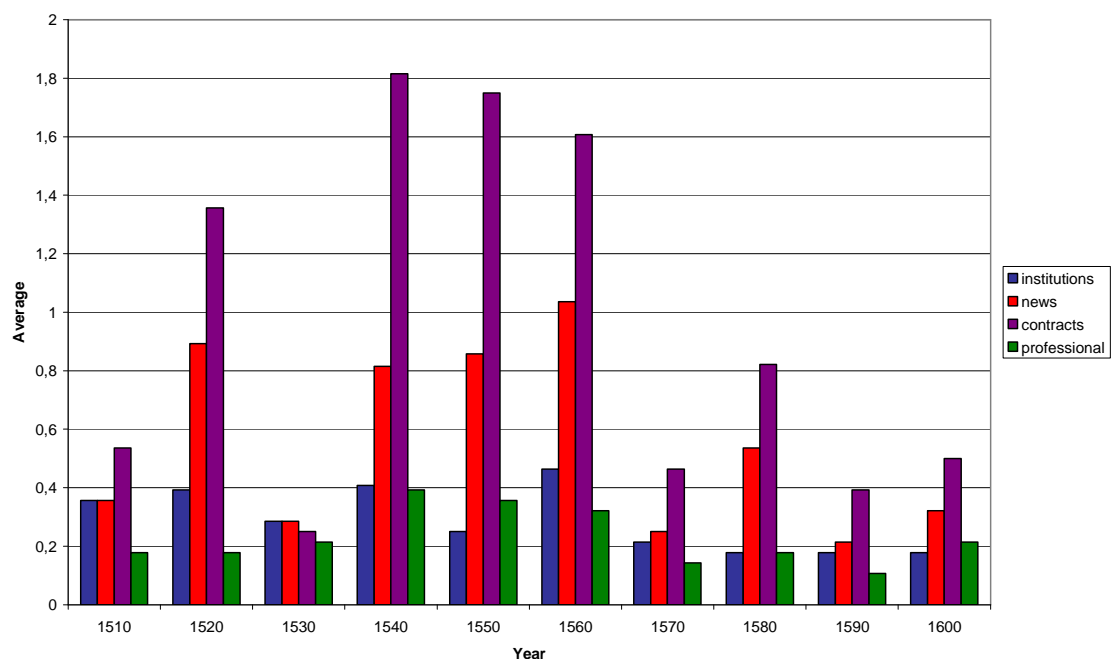
¹⁵⁷ For a more detail information about external sources used in the estimation of variables see Appendix.

offers an image of their real experience at the market.¹⁵⁸ Information regarding institutional membership has been obtained from experts including not only solely merchant institutions but also political institutions. These political institutions mainly refer to local government, belonging to which offered an extra guarantee and represented social prestige.

While discovering the affiliation of individuals to different institutions was a relatively easy task, to proxy their relevance as traders was more complicated. Nevertheless, just taking into consideration the fact that historians have mostly analysed merchant elites, we can proxy the relevance of a trader by accounting for the volume of historical research.¹⁵⁹

I also include a binary variable which measures whether in the contract the individual declared himself as merchant (*profession*). Reminiscent of the medieval guild system, the declaration of being a merchant was extremely important in Early Modern times because it expressed the membership of an individual to a professional group.

Figure 5.5: Information about the debtor



Source: See Appendix

The central decades of the century seem to register the largest values. In this period more than a 30% of debtors were professional merchants belonging to institutions and with an average of 2 contracts per head. Principals should therefore

¹⁵⁸ To account for the number of contract signed I use information from a sample A.

¹⁵⁹ I score a value to every trader according to the number of quotations in historical analysis. Books studying groups of merchants have also been included.

have known about their reputation because historians have analysed them in-depth, as we can check the variable news register for its maximum values.

Connecting this information with figure 5.3 on size of the business, we should extract one initial conclusion: in the sample, the decades from 1540 to 1560 registered the major contracts not only in terms of size of the business but also in terms of debtors' reliability.

All these variables approach the personal reputation of the debtor. To this group is also added the possibility of risk via the formal declaration of bankruptcy. Finding appropriated data for this, however, is nearly impossible since bankruptcy expedients registered at the Consulate in Seville are missing. Luckily, Lorenzo Sanz (1982) and Abed Al-Husseini (1986) offer a list of merchants involved in bankruptcy expedients during this period, the list was elaborated with data from merchants' letters. The variable *broken* is an indicator for being declared officially bankrupt at least once prior to the signature of the contract.

5.3.1. Destination

The group of variables previously described provides measures for the risk perception on each borrower. This constitutes the principal's observable information. Nevertheless, the information about the probability of default is still missing. This information was unobservable in most of cases, and the principal tried to proxy it. A risk assessment analysis could approach the probability of default. However, it was impossible to calculate this probability with exactitude, at least prior to the end of the repayment period. Following that, in the analysis a measure for the unobservable information is introduced – although it should be noted that we are approaching this value but not calculating it.

Prior to the signature of the contract, the customer was responsible for the election of a market in America as destination. This decision was made according to the characteristics of the market such as demand size, prices or competitors. Although factors like merchant communities or emigrant networks could also matter.¹⁶⁰ Moreover, markets represented not only business' probabilities but also a certain degree of enforcement. Santo Domingo, for instance, was the first in having an independent Town Council and an Audience. Cities such as Santo Domingo had

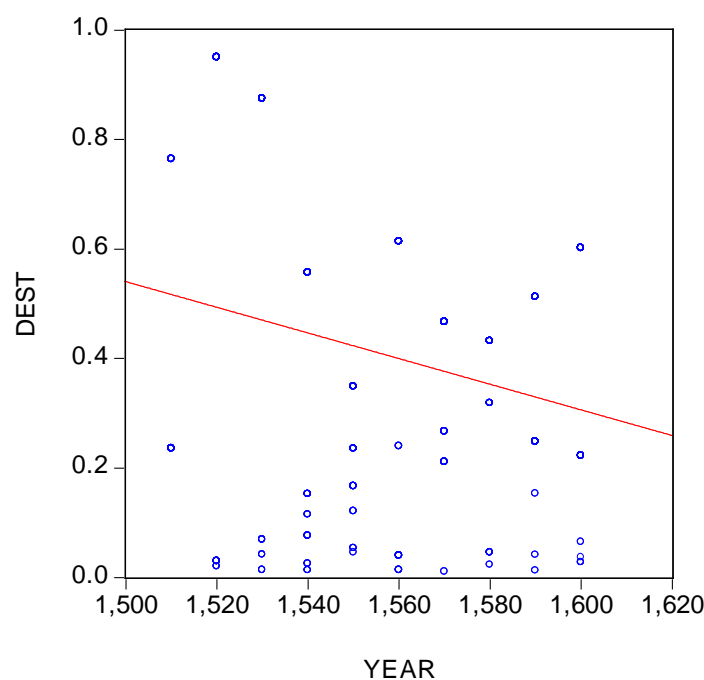
¹⁶⁰ The degree of development of merchant communities is important in the sense that it represents business opportunities, not only in the present but also in the future.

stronger enforcement, and this definitely would not be the destination for debtors with the intention of default.

I consider that debtors self-select themselves by destinations. Popular markets with a strong demand and more developed merchant communities were selected by the best merchants since they were not afraid about competitors. By contrast, less popular markets had a weaker demand. Less qualified merchants would be attracted by these destinations avoiding competition. These individuals tried to obtain profits by exerting monopolistic power. In such destinations, government institutions were not so well developed and legal enforcement was nearly non-existent.

To proxy the popularity of the different destinations selected at contracts, I use information from the fleet system comparing for every year the total destinations of the fleet with the destinations in the contracts from the sample.¹⁶¹ With this information an index was created which measures the relative importance of every destination over the total (variable *destination*). The variable *destination* takes a range of values between 0 and 1, lower values will be interpreted as less popular markets while higher values means more popularity.

Figure 5.6: Destination



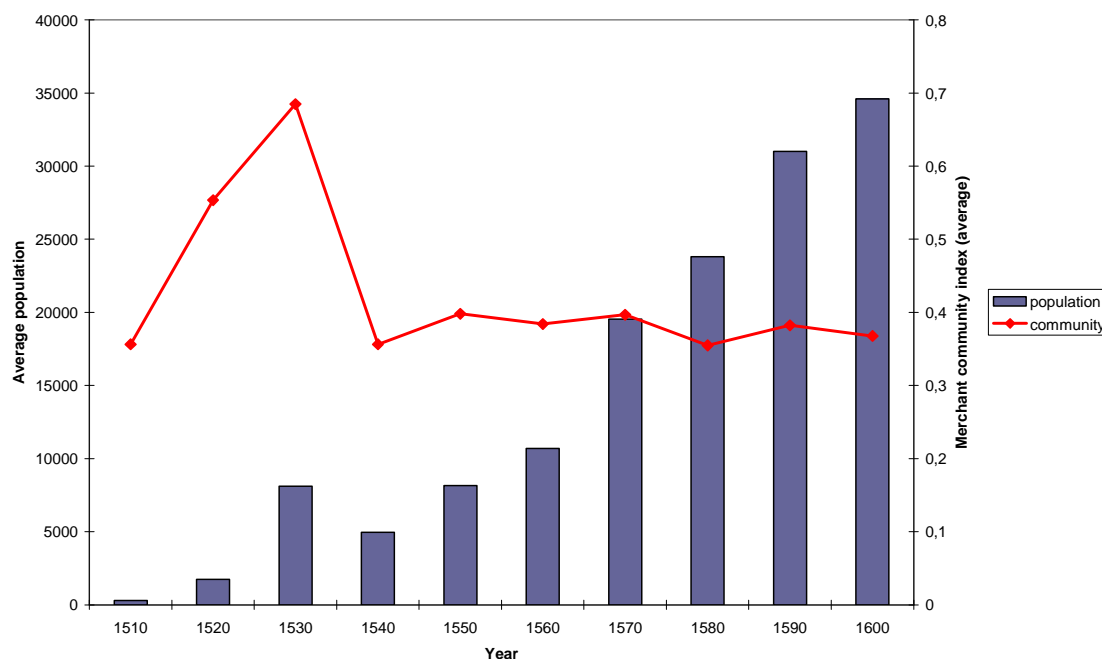
Source: Chaunu (1955), Vols. 1-4 and Sample B

¹⁶¹ For every year it was compulsory for ships to register their final destination with the House of Trade, data which has been collected by Chaunu (1955).

Note that the variable *destination* measures the preferences of the prior figure presents average values of the variable *destination* over the century. During the two first decades the territory discovered was limited to the Caribbean area and the range of destinations was reduced, almost all ships had Santo Domingo as destination. It is this that explains the highest points in the scatter diagram. The discovery of Mexico and Peru during the 1520s thus drastically increased the range of destinations. The economic potential of continental America attracted an important part of the individuals who selected less popular destinations. The expansion of European through continental America explains the tendency to select unpopular destinations as shown by the regression line in figure 5.6.

The variable *destination* proxy preferences of participants in contracts from the data set compared to the preferences of the total population going to America. We should, however, introduce measures for the real features of the different markets in America. According to what was pointed out at the beginning of this sub-section the most relevant characteristics of the markets are: merchant community and demand size. The demand power in every market is proxied by the volume of European population (*population*), and the degree of development of merchant communities (*community*) is measured according to preferences expressed by relevant traders in their passages to America.¹⁶²

Figure 5.7: Population and merchant community per destination



Source: Mörner (1979), Friede (1951), Boyd-Bowman (1979) and (1985) and Sample B

¹⁶² See Appendix.

The prior figure represents the average values of contracts in the different decades for both variables. The variable population, which is represented in bars, shows a clear constant growth. Over the course of time all territories became more and more heavily populated.

The red line in the figure shows the degree of development of merchant communities for the different markets selected in contracts. The values of the variable reflect the average for every period. During the first decades of the century debtors from the database decided go to markets which were also preferred destinations for professional merchants. The advance in the colonization process and the appearance of new markets split destinations. From 1540 onward in only 40% of the cases did the final destination in the contracts analysed coincide with those markets in America with important merchant communities. This trend is maintained until the end of the century.

The variables *destination*, *population* and *community* approach the probability of default which is the unobservable information for the principal. These three measures, together with the group which proxies personal reputation, are the tools for the principal to detect opportunist behaviour. If there is evidence of moral hazard at least one of these variables should be significant in the econometric test.

5.4. Alternative explanations

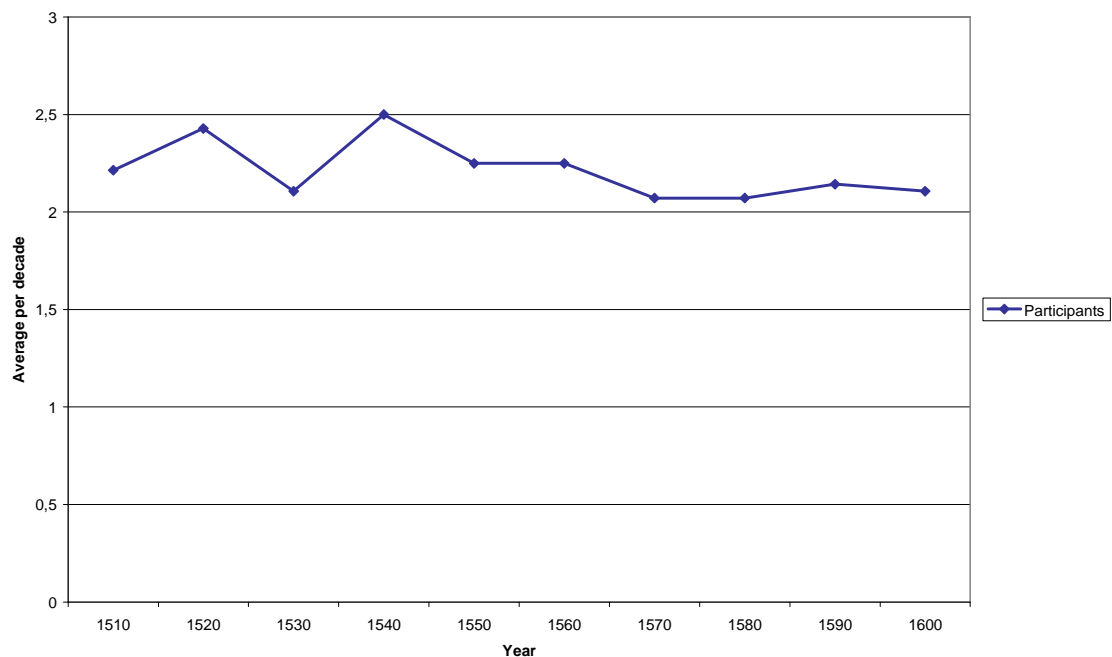
The major hypothesis in the chapter builds on the notion that it is moral hazard that caused the decision to send a debt-collector. Yet, it is also possible to draw different explanations for such a phenomenon. I grouped them into four categories as follows:

5.4.1. Business is business

In business, the common sense imposes a logical relationship between the intensity of control and the volume of investments. As investors taking part in a pool of businesses we will pay more attention to the more relevant ones in monetary terms. Consequently, the debt-collector system could be also motivated by the importance of the business. According to that, we introduce in the analysis some simple measures of the economic transactions such as size, duration in days or number of people. All the information in this case comes from the contracts.

Not only size and duration, but also number of participants in the contract can proxy the importance of the business. In the graph below I represent the variable people per contract on average for every decade.

Figure 5.8: People per contract

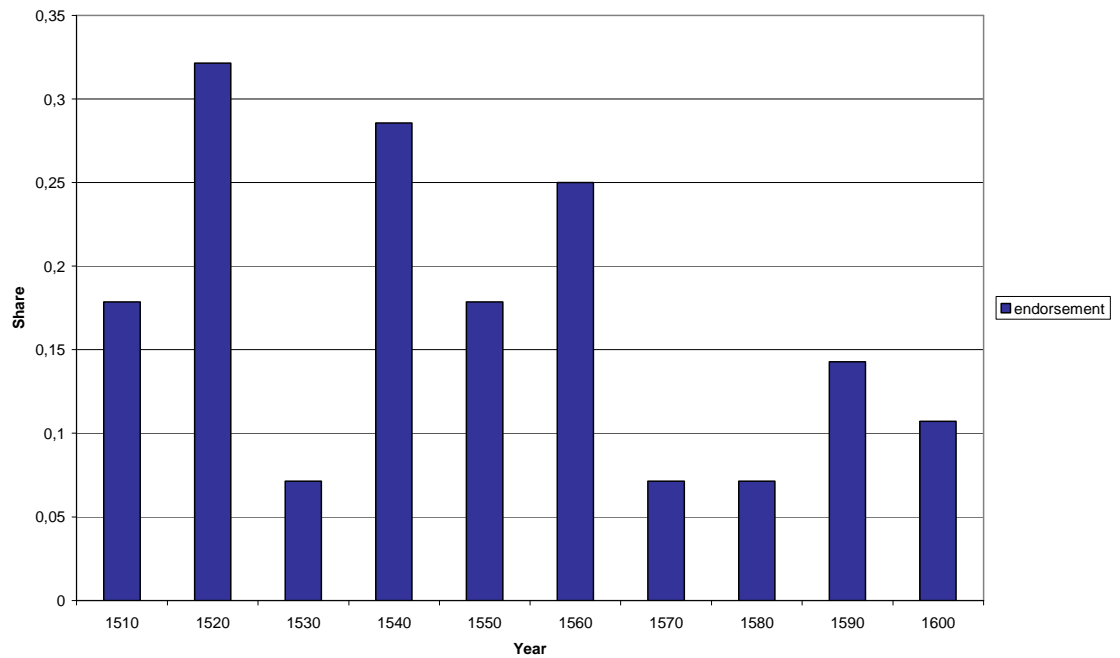


Source: Sample B

Taking into account the fact that the minimum size of the contract is two people, the distribution of this variable in the sample is quite uniform. In fact, it is only during the decades of 1520 and 1540 that contracts increased their average number of participants, reaching 2.5.

To this group of variables I add also a binary one which estimates the existence of endorsement. I include endorsement into the features of the contracts given that in our sample guarantors used to appear in the contract and not in a separate document. Figure 5.9 shows the proportion of contracts which incorporate an endorsement on average.

Figure 5.9: Proportion of contracts with endorsement



Source: Sample B

The prior figure shows how the points with higher proportions of endorsement present similarities with the number of people per contract. This coincidence, however, is not perfect. For instance, the maximum share of contracts with endorsement is in 1520, while the number of participants in the business does not reach a peak until 1540. Contracts in the database are primarily personal business between a buyer and a seller. Occasionally, there is a third person in the contract, who used to be a guarantor.

5.4.2. Principal's ability

The relevance of the principal as a trader is proxied in a similar way as for the reputation for the debtor. The target here is to check whether there is a relationship between the importance of the merchant and his ability to monitor via debt-collector system.

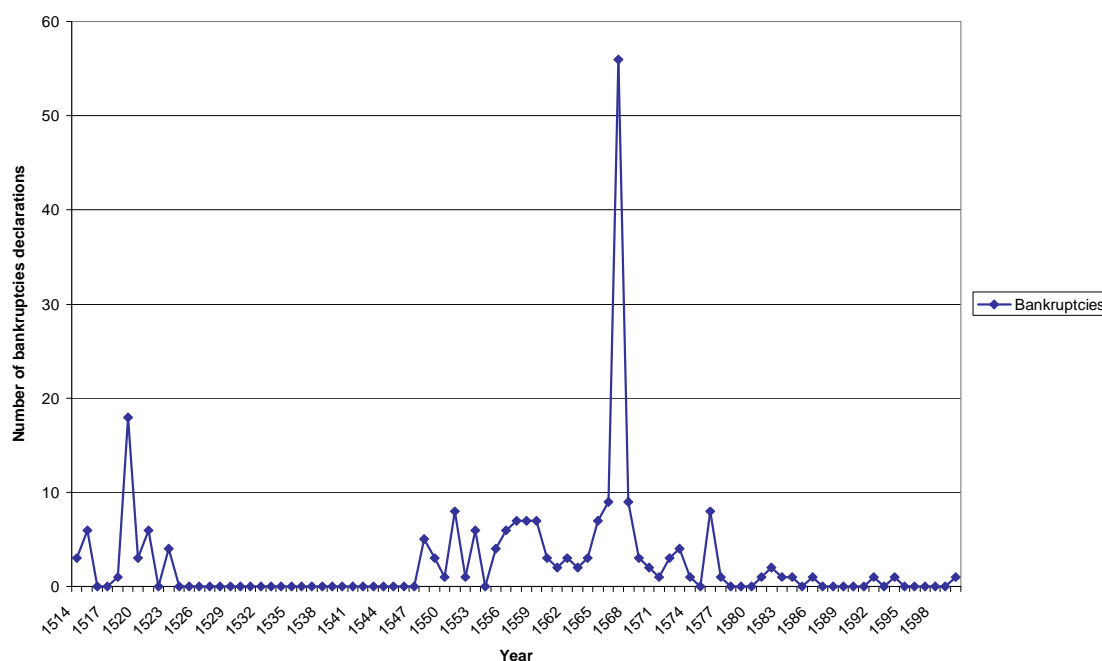
The measures for the reputation of the principal follow the same criteria that in the case of debtors, namely taking into account the belonging to institutions, the number of contracts signed and the amount of news about them. The variables P_i , P_n , and P_c measure this ability to control. Moreover, the best merchants will hire the best debt collectors; the variables A_i , A_n , and A_c measure the quality of the agent sent to America.

5.4.3. The cost of default

In the Karlan-Zinman model the test for moral hazard is carried out by taking into consideration the level of effort and the cost of default. In their words “a set of customers is more likely to default voluntarily when the cost of default decreases.”¹⁶³ Following that reasoning, measures for the default cost are introduced into the model.

The default has two components: social and economic. The social cost or stigma is derived from damage to personal reputation. In the case of 16th century Spain, Lorenzo Sanz (1996) affirms that thieves were declared broken in public. Merchants already knew about this stigma and in periods with a low stigma they may have suspected opportunism and have tried to intensify control. The stigma of being declared broken has been estimated by the number of bankruptcies for every period.¹⁶⁴ The idea below such an estimation is the direct correlation between the individual probability to declare broken and the number of bankruptcies. In periods when the number of bankruptcies is very high social costs decrease, and thus the probability of being declared broken is also high.¹⁶⁵ The following graph presents the evolution of the number of annual bankruptcies during the 16th century.

Figure 5.10: Total number of bankruptcies per year



Source: Lorenzo Sanz (1982), Vol. 2

¹⁶³ Karlan & Zinman (2007), p. 2.

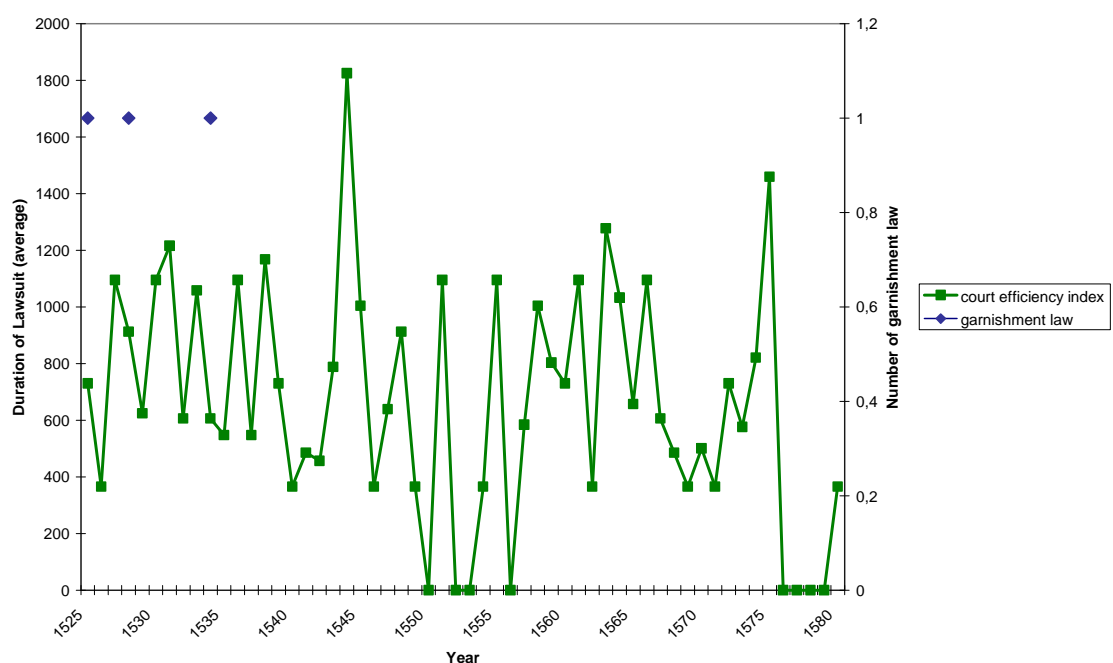
¹⁶⁴ For more details about the construction of this variable, see the Appendix below.

¹⁶⁵ This variable has been designed according to the model by Fay, Hurst & White (1998) for the measurement of the bankruptcy's social cost in the States.

The bankruptcies are presented in waves: a first wave during the period 1514-1523 and a second more intensive wave between 1550 and 1577. The last peak can be explained through the bankruptcy of the Pedro de Morga's bank. Whether this variable explains personal monitoring, in periods with a growth in the number of bankruptcies the proportion of debt-collectors sent to America had to be higher.

Apart from the stigma, the cost of default is also related to the passing of garnishment laws and the efficiency of the Court system. The measurement of the number of laws is quite easy: representing a simple compilation from history books. However, trying to come up with an indicator for the efficiency of the Court system seems more complicated.¹⁶⁶ One of the most frequently used measurements for Court efficiency is the duration of lawsuits, and following that idea I have elaborated an index as the average duration for the previous decade waged by the number of lawsuits. Figure 5.11 presents results from this index, together with the number of garnishment laws.

Figure 5.11: The cost of default



Source: Lorenzo Sanz (1986), Vol. 2

Whilst the line represents the index of court efficiency, the blue points measure the number of garnishment laws. It is remarkable how during the 16th century only 3 laws on this issue were promulgated – in 1525, 1527 and 1535 respectively. The lack of regulation in the bankruptcy process generated certain arbitrariness from which

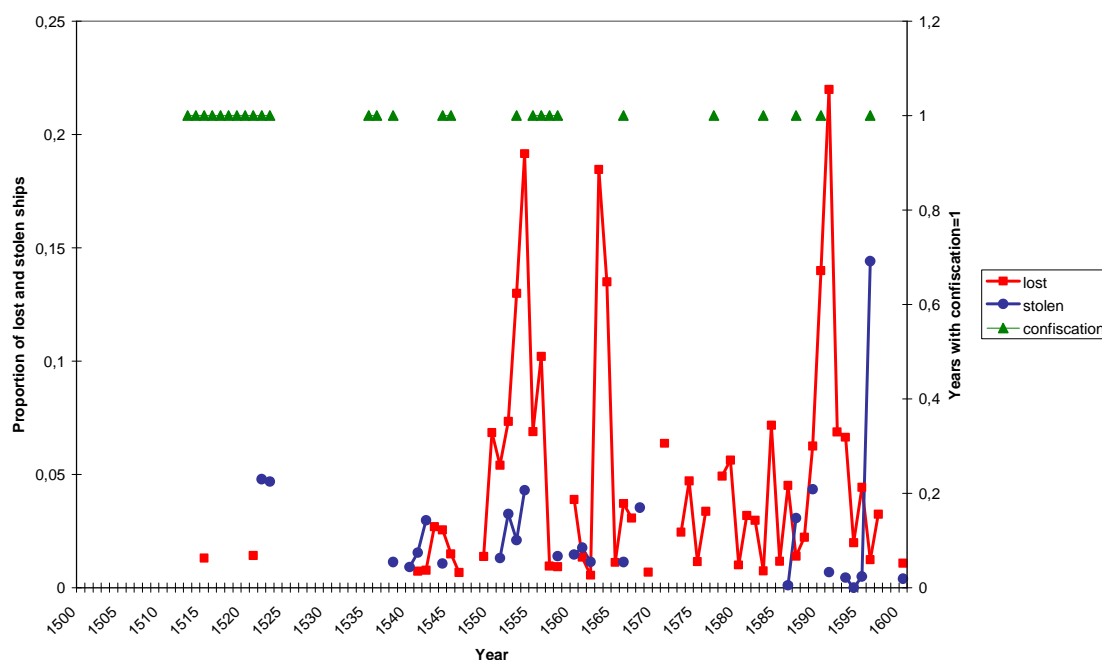
¹⁶⁶ The economic literature on measuring court efficiency is very large, so I have selected the most straightforward proxy given that Court efficiency is not the main issue in this chapter.

members of the courts could take advantage. The court system's response was not very positive either. On average the duration of lawsuits exceeds three years, and this efficiency did not improve during the whole century. Ordinary judges had the power to delay or reduce the official procedure, in accordance with their personal interests.

5.4.4. Economic environment

In the investment process during the 16th century there were also some particularities that we should take into account. First, as previously noted, the Crown had the power to confiscate gold and silver coming from America. This power was exerted many times during the century and represented a menace for all participants in trade. Second, this was the century of piracy. The French and after them the English stole and destroyed many ships with all their cargo. Moreover, frequent tempests also caused great losses for traders. These factors taken together constituted a risk that investors had to face and which could explain also the decision to send a debt-collector.

Figure 5.12: Risk during the journey



Source: Chaunu (1955), Vols. 2-4

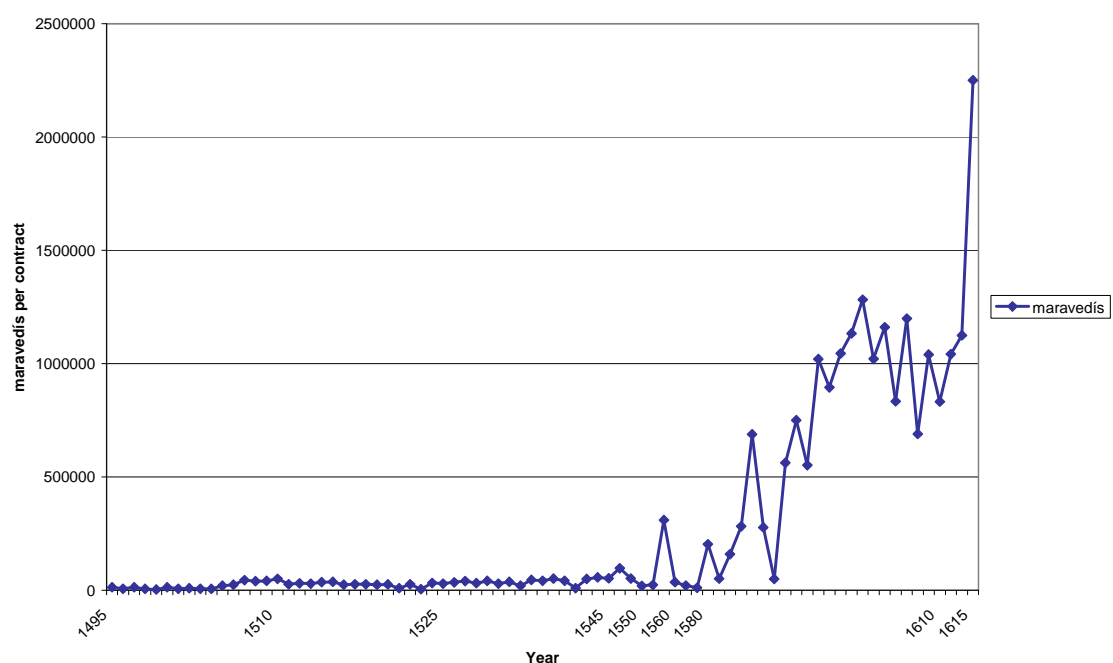
The figure shows the evolution of the previous magnitudes. The lines represent the annual proportion of lost and stolen ships and the green points the years with a confiscation of gold and silver. It was impossible to include in the series the

confiscations' value because this data is not available, at least not for all periods. For this reason I present this variable as a dummy.

To ask for a loan at the credit market can be considered an alternative strategy to buying merchandise on credit. In the Early Modern era the credit market was a very common resource. There is a wide literature on credit markets for different European cities. However, in the case of Seville the only analysis was advanced by Bernal (1992). In his book, the author highlights how since 1500 constant growth in the volume of credit consequently with the development of American markets. Unfortunately, this analysis is merely descriptive. With information from Bernal (1992), I introduce into the model a measure on the size of the credit market using averages from the series of loans.

Figure 5.14 represents the evolution in the average size of credits contracts per year for a long 16th century. Results show a very poor image of the credit market with contracts under 100000 maravedís until the end of the period.

Figure 5.14: Size of credit contracts



Source: Bernal (1992)

Finally, it would be very useful to have estimations about the monitoring cost for the principal. This information is missing and in contracts we find no data about debt-collectors' salaries. We have introduced the flow of people crossing the ocean as a proxy for the cost of finding a person to act as debt-collector.

The following table presents the hypotheses together and shows an expected sign in the regression. Note that the dependent variable is a dummy which measures the existence of control via debt-collector system.

Table 5.1: Hypotheses

Hyp. 1: MORAL HAZARD	Exp. Sign	Hyp. 1: MORAL HAZARD	Exp. Sign
<i>Reputation (Debtor)</i>		<i>Market</i>	
Institutions	-	Destination	-
News	-	Community	-
Contracts	-	Population	-
Profession	-		
Broken	+		
Hyp. 2: THE BUSINESS	Exp. Sign		
Size	+		
Duration	+		
Endorsement	-		
People	-		
Hyp. 3: ABILITY TO CONTROL	Exp. Sign	Hyp. 3: ABILITY TO CONTROL	Exp. Sign
<i>Reputation (Principal)</i>		<i>Reputation (Agent)</i>	
Institutions	-	Institutions	-
News	-	News	-
Contracts	-	Contracts	-
Hyp. 4: COST OF DEFAULT	Exp. Sign		
Stigma	+		
Garnishment_laws	-		
Court	-		
Hyp. 5: EC. ENVIRONMENT	Exp. Sign	Hyp. 5: EC. ENVIRONMENT	Exp. Sign
<i>General</i>		<i>Cost of debt-collector system</i>	
Confiscation	+	Emigrants	+
Stolen	+		
Lost	+		
Access to credit	-		

Summing up the results, the decision to send a debt-collector was made for several reasons. First, the suspect of possible opportunist behaviour could motivate

this control. The principal was provided with observable and unobservable information in order to estimate the possibility of default for every debtor. The observable information is related to personal reputation of the debtor, which has been approached through number of institutions, contracts signed and news. Second, monitoring was due to the magnitude of the business itself. Variables such as size of the contract, duration or number of people proxy are included to test this hypothesis. Third, the principal's ability to control has to be taken into account. The reputation of the principal also matters in the sense that more relevant traders had more possibilities to control debtors. Fourth, the cost of default could also affect those decisions, in periods of lower cost increasing the probability of default and also the number of debt-collectors sent. The number of bankruptcies, the garnishment laws and the efficiency of the Court system measures the total cost of being officially declared broken. Finally, variables regarding the economic situation could have an important part in this story.

5.5. To monitor or not to monitor: That is the question

This section contains the major analysis. We examine the different hypotheses running a set of regressions. The dependent variable is the existence of control via personal monitoring. In this case, the dependent variable defined as a dummy represents a choice between two options: send or not a debt-collector. The dependent variable $Y=0, 1$ with $y_i=1$ when the principal is sending a collector and $y_i=0$ otherwise. To explore which forces caused such decision I will introduce the different hypotheses offered in the previous sections, adding also a simple time trend.

The following table contains the results from the regression where the explanatory variables are grouped and presented in rows. Each column represents two different regressions using diverse specifications for the distribution of the dependent variable. In column one we assume a standard normal distribution (PROBIT model) and in column two a logistic distribution (LOGIT model). Results are presented after robustness tests.¹⁶⁷

¹⁶⁷ Several variables, such as the general price index or the volume of trade, have been dropped after running the co-integration test.

Table 5.2: Regression Results

	PROBIT	LOGIT
<i>Business</i>		
Lsize	0.257914*** (0.096353)	0.430193*** (0.167749)
Durat	0.000436 (0.000352)	0.000764 (0.000600)
Endorsement	-0.855982** (0.455446)	-1.384532** (0.760641)
People	0.744148 (0.338569)	1.187509 (0.565845)
<i>Moral Hazard</i>		
Di	-0.072411* (0.043701)	-0.146290 (0.114817)
Dn	-0.160367** (0.074330)	-0.263862** (0.135835)
Dc	-0.983257*** (0.246573)	-1.256783*** (0.823412)
Profession	0.041349 (0.286158)	0.094804 (0.471075)
Broken	0.048284 (0.714299)	0.160544 (1.241465)
<i>Market</i>		
Destination	-0.497892 (0.728523)	-1.091023 (1.242416)
Community	0.835609 (0.723961)	1.681911 (1.296364)
Population	-9.79E-06 (1.41E-05)	-1.69E-05 (2.41E-05)
<i>Ability to control</i>		
Pi	-0.030727 (0.167049)	-0.046244 (0.285810)
Pn	-0.043288 (0.150210)	-0.062190 (0.268145)
Pc	0.160070 (0.191298)	0.277679 (0.310147)
Ai	-0.903555 (0.704168)	-1.575918 (1.516875)
An	0.351934 (0.307936)	0.609773 (0.576816)
Ac	-0.076036 (0.090490)	-0.129734 (0.159819)
<i>Cost of default</i>		
Bankruptcy	-0.097965	-0.155352

	(0.122897)	(0.210707)
Garn_laws	0.276557 (0.754834)	0.503606 (1.282591)
Court	-0.005238 (0.009582)	-0.008652 (0.016274)
<i>Ec. Environment</i>		
Confiscation	0.600064 (0.772597)	0.951306 (1.352537)
Stolen	-73.14061 (113.7872)	-123.2558 (192.0385)
Credit	1.95E-07 (5.09E-06)	7.59E-07 (8.63E-06)
Lost	21.36734 (31.52501)	35.00050 (53.53317)
emigrants	0.000115 (0.000289)	0.000196 (0.000497)
time	-0.125050 (0.465112)	-0.215498 (0.791647)
Log likelihood	-155.8584	-154.4832
N	280	280

Standard Error in brackets

*Significant at 10%

**Significant at 5%

***Significant at 1%

Results show clear evidence of the existence of moral hazard. The variables Di, Dn and Dc measuring the degree of suspicious about the debtor are significant. All of them show a negative sign which means that there is an inverse correlation among the decision to send a debt-collector and the reputation of the debtor. In another words, debtors recognized as relevant traders were less controlled.

The variable measuring the size of the business is also positive and strongly significant. This result suggests that given a certain degree of suspicion about the debtors, principals will control larger contracts more intensively than smaller ones. Moreover, the variable endorsement is also significant but negative. That contracts with endorsement are going to be less monitored is quite obvious since there is no sense in assuming the costs of sending a debt-collector if principals could turn to the guarantor instead.

The next table presents the output from an additional regression, only this time with significant variables. Again we run two different regressions for PROBIT and LOGIT specifications respectively. As we can appreciate, the results are very similar:

Table 5.3: Significant variables

	PROBIT	LOGIT
<i>Business</i>		
Lsize	0.138870*** (0.055007)	0.221605*** (0.094904)
Endorsement	-0.810362** (0.426442)	-1.102651* (0.687503)
<i>Moral Hazard</i>		
Di	-0.063542* (0.037821)	---
Dn	-0.080752 (0.064144)	-0.227774*** (0.097518)
Dc	-0.875267*** (0.246573)	-1.031834*** (0.823412)
Log likelihood	-164.8177	-166.8945
N	280	280

Standard Error in brackets

*Significant at 10%

**Significant at 5%

***Significant at 1%

5.5.1. When was the right time?

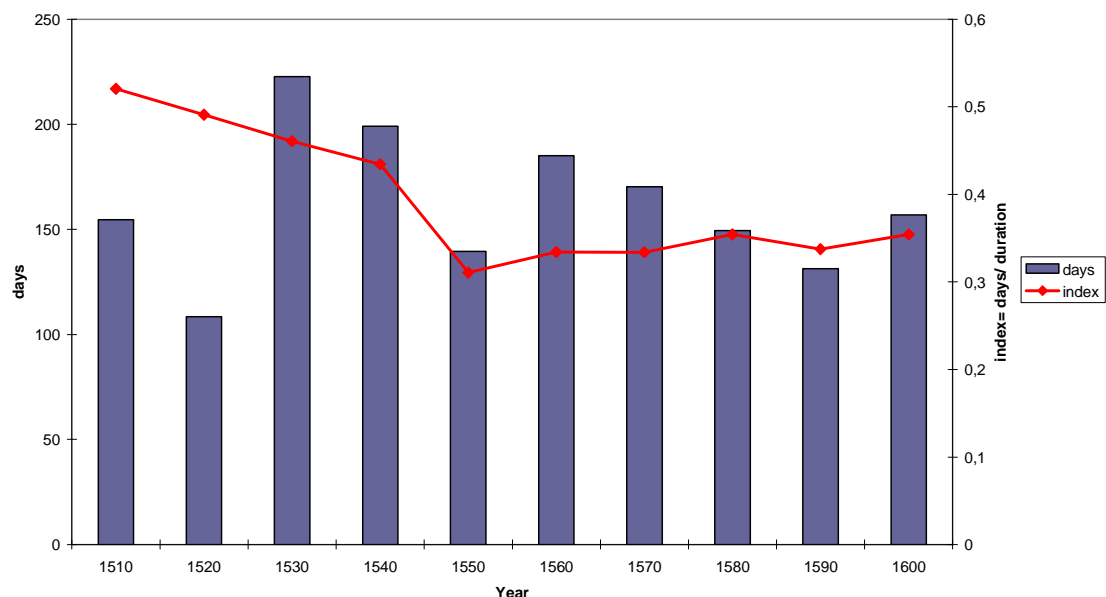
In the previous test the purpose was to analyse the decision to send a debt-collector. In this regard, results have shown clear evidence of moral hazard. The task is now to explore not only *why* but also *when* the decision to send a debt-collector was made. In another words, once the principal decided to monitor, when did he take such a decision? For this test I only use monitored contracts instead of the whole set of contracts. This represents a partial sample from the whole database.

According to the aim of this regression the dependent variable should account for the time interval between the signature of the main contract and the sending of the debt-collector. This variable also measures the degree of suspicion in the sense that higher values mean wider time interval before control, and thus less suspiciousness. On the contrary, lower values of the dependent variable represent a shorter period of time until monitoring, and in this case the degree of suspiciousness is higher.

An alternative to the previous variable is the construction of a control index. The idea is very simple: test the importance of the time to control but regarding the total duration of the contract. The variable (*monit.index*) has been obtained by dividing the number of days since the signature until the monitoring by the total duration of the contract. The index will take values between 0 and 1: higher values mean that the

control is carried out close to the end of the contract while lower values mean earlier control.

Figure 5.15: Time to monitoring



Source: Sample B

The line represents the values of the variable index of monitoring and the number of days until monitoring is shown in the bars. In 1510, for instance, merchants waited 150 days on average before sending a debt-collector. However, compared to the total duration of the contract this represented only 55%. In other words, they decided to control at approximately half of the repayment period. The opposite is the case in 1560, when the average time until send a debt-collector was higher, more specifically 185 days. Despite this, in terms of the total duration of the contract 185 days represented 33%. Comparing both periods we can check how the degree of suspiciousness was higher in the second case since the principal decided to control at an earlier stage (30% of the total repayment period compare to a 55%).

Table 5.4, which has the same structure as table 5.3, provides regression evidence using only monitored contracts. Every column presents a different regression using the two dependent variables mentioned previously. The explanatory variables are the same used in the previous regressions plus the time trend. As also in previous tests, results are presented after robustness.

Table 5.4: Additional Regression Results

	Days_monit	Index_monit
<i>Business</i>		
Lsize	4.080069 (8.892478)	0.011110 (0.019543)
Durat	0.246631*** (0.045146)	---
Endorsement	26.25982 (42.21636)	-0.023265 (0.083254)
People	-16.28267 (28.55169)	0.056103 (0.055719)
<i>Moral Hazard</i>		
Di	-1.500642 (1.721653)	-0.004790 (0.004078)
Dn	-5.796067 (8.273990)	-0.006626 (0.015545)
Dc	-6.142437 (12.57012)	-0.017693 (0.025009)
Profession	28.12628 (33.54282)	0.085850 (0.054734)
Broken	-67.99087 (55.23253)	-0.114231 (0.116587)
<i>Market</i>		
Destination	123.5393* (73.03827)	-0.026218 (0.142061)
Community	126.8053** (59.48595)	0.070623 (0.113887)
Population	-0.001575 (0.001491)	-2.83E-06 (2.63E-06)
<i>Ability to control</i>		
Pi	4.320300 (15.39703)	0.000885 (0.030237)
Pn	-13.53567 (16.25237)	-0.052611* (0.029874)
Pc	8.054809 (23.05780)	-0.041564 (0.038077)
Ai	58.27562** (27.48238)	0.086126 (0.065956)
An	8.957281 (16.21876)	0.012351 (0.030869)
Ac	0.971812 (10.39547)	0.006227 (0.017261)
<i>Cost of default</i>		

Bankruptcy	-1.070434 (8.863228)	-0.003512 (0.019107)
Garn_laws	146.0937* (79.67020)	0.200511 (0.146766)
Court	1.146414 (0.882604)	0.000748 (0.001734)
<i>Ec. Environment</i>		
Confiscation	20.98476 (52.32419)	0.013795 (0.122717)
Stolen	10254.60 (10113.91)	-4.243844 (20.21456)
Credit	-0.000285 (0.000592)	2.97E-07 (1.06E-06)
Lost	-1677.378 (2390.738)	0.249866 (5.037134)
emigrants	-0.002349 (0.023658)	1.27E-05 (4.83E-05)
time	41.04546 (45.13230)	0.015215 (0.086050)
R-squared	0.542072	0.352957
F-statistic	3.770462***	1.825303**
DW	1.777915	1.966420
N	280	280

Standard Error in bracket

*Significant at 10%

**Significant at 5%

***Significant at 1%

In the first column the duration of the contract is the most relevant of the explanatory variables. In fact, this is the only variable which is significant at 1%. The variable is positive, which means that contracts with longer repayment periods are likely to be controlled at a later stage. This is quite obvious since in longer contracts principals had more time to decide when to send the debt-collector.

Variables regarding the market selected in the contract as destination are also significant. More popular markets with a more developed merchant community are likely to be controlled later. The cost of default also matters since the variable garnishment-laws is significant at 10%. The coefficient is positive and equal to 146.0937, which means that an increment on legal regulation increases approximately by 146 days the time to monitoring. Finally, the last variable we should take into account is the reputation of the agent. The variable is significant and positive. More specifically, any increment in the reputation of the agent will increase by 58 the number of days until monitoring. This suggests that when the merchant hires the best agent he will use him later and solely in case of necessity.

The second column shows results from the second regression. The dependent variable is the monitoring index. Our results suggest that only P_n , which approaches the relevance of the principal as a trader, is slightly significant. This result means that once merchants decided to control the most relevant traders did it earlier. More specifically, insofar as the reputation of the merchant increases, the time to monitoring decreased by 5,26%.

Note that the R-squared coefficient decreases drastically from the first to the second column. This circumstance suggests that the omitted variable (duration of the contract) explains the major part of the variation of the dependent variable. In other words, once the principal decided to control the total duration of the repayment period determined the right time to send a debt-collector was.

Conclusions

This chapter presents a distinct explanation for long distance trade in an asymmetric information environment. In the absence of a strong state that enforces commercial agreements, the economic agents developed private tools to control investments. These tools were much more efficient than the conventional reputation argument to explain 16th century trade. Through an original data set from 16th century contracts this chapter tests what variables explain the adoption of these control tools.

A first lesson from the chapter is that control was carried out mainly to avoid moral hazard. Merchants discriminated among debtors according to the degree of risk of working with them. Consequently, only debtors of doubtful reputation were controlled through a process of personal monitoring. The second lesson is that in deciding when the right time for control was, the duration of the repayment period was the crucial factor. In this sense, longer commercial relationships sustained by long-length contracts are controlled later, whilst short-time partners are intensively monitored.

From a methodological point of view, one additional goal of the chapter is to conduct an empirical test on asymmetric information isolating the moral hazard phenomenon. We exclusively test *ex post* moral hazard produced by the natural asymmetric information in long-distance commercial exchange. The separation of this moral hazard conflict was done by testing the relationship between possible suspicious behaviour and personal monitoring.

Appendix

Dependent variables

Personal Reputation: The measures from reputation have followed triple criteria: institutions membership, news and contracts signed. I equally estimate reputation for debtors (Di, Dn, Dc), principals (Pi, Pn, Pc) and agents (Ai, An, Ac).

Information from institutions has been proxied with Schäfer (2003) Mariluz Urquijo (1998), and Heredia (1983). All these books contain list of members from different institutions related to trade. While Ernesto Schäfer analyses members of the Indies' Council and the House of Trade, Mariluz Urquijo collects information from local institutions such as the Town Council and Antonia Heredia includes list of merchants from the Consulate in Seville.

Among the wide historical literature to estimate the relevance of traders or news I distinguish between groups of merchants and trade in general. Regarding groups: see merchants from Burgos in Palenzuela (2001), Pike (1972) or Caunedo (1983); Genoese merchants in Otte (1961), Otte (1963) or Pike (1966); merchants from the Basque Country in García Fuentes (1991). Regarding trade in general: see Carande (1990), Otte (1996), Bernal (1992), Lorenzo Sanz (1986) or Dominguez Ortiz (1990).

Destination: The popularity of different destinations throughout the century has been proxied with data about the fleet system. For every year it was compulsory for ships to register their final destination with the House of Trade, data which has been collected by Chaunu (1955). I compare for every year the total destinations of the fleet with the destinations in the contracts from the sample, with this information I have created an index which measures the relative importance of every destination over the total. The variable destination will take values between 0 and 1, lower values will be interpreted as less popular markets while higher values means more popularity. For instance, if in 1540 55,69% of the ships in the fleet decided to go Mexico in the data base, contracts in 1540 with Mexico as destination have the value 0,5569.

Community: In order to determine the degree of development of merchant communities in America I built a proxy with information from merchant migratory flow. For every period I created an index measuring the preferences of merchants for the different destinations. I used data from Boyd-Bowman (1976) and (1985).

Population: Demand power was approached by the population with data from Mörner (1979), Friede (1951), Boyd-Bowman (1976) and (1985). In this estimation I have excluded indigenous population because only Europeans demanded products from Europe.

Stigma: Measure of the social cost of delinquency. It is calculated as the average bankruptcy per period according to the model by Fay, Hurst & White (1998) for the measurement of the bankruptcy's social cost in the States and with data from Lorenzo Sanz (1982).

Garnishment law (garn_law): Number of garnishment laws is taken from *Colección de documentos de Fernández de Navarrete* (1946) and *Cedulario Indiano* (1596).

Court Efficiency (court): The average duration for the previous decade waged by the number of lawsuits, extracted by the author from index of Section Consulado, Indies Archive, Seville.

Confiscation: For confiscation of gold and silver by the Crown I have consulted Lorenzo Sanz (1982).

Navigation: From Chaunu (1955) I have calculated the proportion of *stolen* and *lost* ships per decade. Similarly, the variable for *delays* of the fleet system was calculated, which was dropped after the cointegration test.

Emigrants: Data about people crossing the ocean was extracted from Boyd-Bowman (1976) and (1985).

Chapter 6: Testing Adverse Selection

In the American trade of 16th century Seville contracts were not self-enforcing. Certainly, traders frequently used the debt-collector system as an external enforcement mechanism. However, written contracts existed and in large numbers. In such circumstances, how can we explain the existence of written contracts? Why did people assume the cost of contracting? What was the role played by written contracts? What were they used for?

One typical reason for writing contracts is for them to be enforced in courts. Parties try to include in the document all sorts of provisions to be clearly verified by judges in case of conflict. Nevertheless, throughout this dissertation many references can be found of the inefficiency of the court system in 16th century Spain. This evidence renders difficult maintaining that traders assumed the cost of written contracts simply in case they have to be enforced in Courts.

Experts on historical official documents affirm that contracts simply legitimated the existence of the relationship and were used as credentials.¹⁶⁸ Indeed, the history proves that contracts, at least for the case of Spain, were written according to the custom of every kingdom.¹⁶⁹ In the 16th century for instance, many forms were published and used by notaries to design contracts.¹⁷⁰ According to that, we can consider contracts as the documental support for an economic relationship where provisions did not express the rules of the game. This would explain the existence of external enforcement mechanisms which completed contracts but would not explain why contracts were so personal. In other words, if contracts were simple credentials, why were they not identical? Why can we observe differences in terms of rights and duties?

¹⁶⁸ See Bono Huertas (1982) and Rojas García (2009).

¹⁶⁹ The medieval history of Spain is quite complex. Until the Catholic Kings – Isabel and Fernando - the territory was divided into kingdoms. The major ones were Aragon (including Catalonia and Mallorca) and Castile. All of them coexisted with the territory dominated by the Moors.

¹⁷⁰ The forms consisted on a list of legal provisions applicable to every type of business; this issue will be explained in depth in section 3.

Another possible explanation for the existence of contracts arises from the economic point of view, and it is supported by the literature on contracts as screening devices. In this sense, and in the case of the Atlantic trade, merchants may have used written contracts to screen among low and high risk debtors. I mainly follow the Stiglitz-Weiss model where high risk individuals are attracted by more adverse contracts.¹⁷¹ Stiglitz & Weiss (1981) formulated the model in terms of interest rates and debt-equity ratio; however, this information is not available in 16th century contracts.¹⁷² Instead I will use collateral and complexity of contracts in general as measured by the number of clauses. My hypothesis is that growth in collateral requirements and in the contracts' provisions in general attracted high risk debtors. For the model, I assume that most conditions in the contract are exogenous since it is the principal who designs the contract and the customer simply decides whether to accept it or not.¹⁷³

Connecting this hypothesis with the debt-collector system, the acceptance of adverse conditions in the contract can advise principals about debtors' potential behaviour and control them through personal monitoring. Although it is possible to connect results from this chapter with the debt-collector system, it should be noted that this is an adverse selection model and the test is run *ex ante*, the *ex post* moral hazard was tested in the previous chapter.

In the econometric tests I control using the existence of notaries' forms and the legal regulation on contracts in general. The interest at this point is to test if legal doctrine had an effect on the evolution of contracts' conditions from the empirical point of view. My interest with the variables *notaries' forms* and *regulation on contracts* is to check the degree of freedom on contracting in pre-industrial trade: did traders design contracts according to economic variables or did they simply accept documents predetermined by notaries and legal norms?

The chapter is organized as follows. The first section offers an overview of the theoretical debate on contracts as screening devices. Section 6.2 is devoted to the analysis of legal regulation of contracting during the 16th century including also a subsection on evolution of notaries' forms. Section 6.3 deals with data, and offers a description of the different clauses and their evolution throughout time. Section 6.4 explains the strategy for the regression and analyses the explanatory variables. Sections 6.5 and 6.6 present the econometric results. The final section contains the conclusions.

¹⁷¹ I will refer to this model as S-W model hereafter.

¹⁷² The debt-equity ratio is calculated with total liabilities divided by shareholders' equity.

¹⁷³ Indeed, the only decision in the contract made by the debtor was destination of merchandise.

6.1. Adverse Selection and contracts

The design of contracts is a hot topic in Contract Theory. During the last decades scholars have produced a considerable number of theoretical models trying to figure out whether the optimal contract already exists. The key importance of this debate derives from asymmetric information models where the general equilibrium is defined as a set of contracts such that it does not pay anyone to offer an alternative contract.¹⁷⁴

Special attention has been paid to adverse selection models and more specifically to the screening process. Since the publication in 1981 of a paper by Joseph Stiglitz and Andrew Weiss, the screening process has been focused on the use of contracts as solutions to asymmetric information problems. The S-W model was formulated to explain credit rationing in the marketplace but can be easily extrapolated to trade in general. In the model, banks have to distinguish among high and low risk borrowers using interest rates as screening devices. Following Stiglitz and Weiss, the increment on interest rates produces a double effect:

1) Changes on the pool of potential borrowers since at higher interest rates safer individuals no longer apply for loans. This is called adverse selection effect.

2) It affects the actions of borrowers in general inducing individuals to undertake projects with lower probability of success but higher returns when successful. This is called the incentive effect.

Models with similar results have been designed using wages for the job market [Greenwald (1979), Guash & Weiss (1980), Guash & Weiss (1982), Spence (1973)] rent for the land market [Braverman & Stiglitz (1982)] or prices in product markets [Stiglitz (1976), Wilson (1977)]. For an extreme case of asymmetric information, that of 16th century Atlantic trade, I cannot translate directly the model since information about prices or interest rates is not available. However, Stiglitz and Weiss state that “changes on other terms of the contract will also affect to the behaviour of economic agents”.¹⁷⁵ Following that reasoning I use collateral and clauses instead.

Collateral has also been an object of much analysis. Experts even affirm that a convincing theory of debt must consider the role of collateral.¹⁷⁶ Specially important is the evidence about the existence of a positive correlation between project risk and

¹⁷⁴ See Stiglitz (2003) or Hart & Moore (2008).

¹⁷⁵ Stiglitz & Weiss (1980), p. 393.

¹⁷⁶ See Coco (2000), p. 191.

collateral level shown by Orgler (1970), Leeth & Scott (1989), Booth (1992) or Berger & Udell (1990,1995). In this sense, collateral also has been seen as a signal of projects' quality [Besanko & Thakor (1987a, 1987b), Beaudry & Poitevin (1995)]. Models even deal with the role played by observable features of debtors such as initial wealth [Bester (1985, 1987)].

In this chapter I use collateral in the sense of Wette (1983), in which an increase of collateral requirement induces the exit from the market of customers with lower returns, who are the safest ones. This argument is explained using the expected profit function from the customers:

$$\Pi_i = p(R_i - (1 + r)L) - (1 - p)C$$

Where π_i is the expected profit of borrower i , p is the probability of success, R_i the returns of the project financed, L the total loan and C the collateral. A positive increment on C will decrease the expected profits and for a borrower with lower return projects it is worthless to ask for a loan.

I use this model to 16th century Atlantic trade, with customers instead of borrowers, and merchandise sold on credit instead of loans. In the model, I have used information about the different markets selected in America by the customers as destinations instead of a project to be financed by the bank. Note that for every destination it is possible to assign a different degree of risk in the sense that more popular destinations have stronger demand potential and thus the probability of success is higher. However, returns in these destinations are lower since the existence of competitors reduces expected profits. This is similar to the S-W model, where it is assumed that an indirect correlation between return of projects and probability of success exists. Therefore, projects with higher probability of success, which are safer projects, present lower returns.

In the model, it is assumed that principals perceived a certain degree of suspiciousness from every debtor but the probability of default is unknown. Besides, principals know information about destination selected. In this situation, an increase of the collateral requirement will produce two different effects:

1) An adverse selection effect, attracting a pool of people which has on average lower degree of risk aversion. In the model I proxy this effect through reputation assuming that low reputation people are less risk averse and relevant traders are more risk averse since their reputation depends on the repayment.

2) Incentive effect, encouraging people to select less popular markets where the number of competitors is lower and expected profits higher. This effect is proxy via destinations. We will expect an increment on the number of unpopular markets selected as destinations.

Apart from interest rate and collateral other features of credit contracts turn out to be of crucial importance. I additionally test the differences on contracts composition in terms of number of clauses. In other words, why do contracts for the same aim present differences in terms of obligations or penalties? This issue will be analysed *ex ante* as an adverse selection problem. The major hypothesis is that higher requirements in the contracts are directly correlated to suspiciousness about the debtor. Unfortunately, there are no relevant theoretical models for this issue. The major analysis of adverse selection and contracts has been focused on prices and collateral requirements.

Together with the adverse selection hypothesis, alternative explanations for the differential design of contracts in terms of clauses and collateral is introduced into the analysis from the legal regulation and the notaries' literature. My interest at that point is to check the degree of freedom of traders to design contracts according to economic criteria. The following section introduces information about this issue.

6.2. Regulation on contracts

The legal doctrine defines contracts as law among parties. In this sense, agents express their will in the different provisions. Parties, however, were not free to design contracts and documents had to fulfil some legal requirements. Throughout history governments have restricted the will of the parties and affected the design of contracts. In this sense, rulers have promulgated norms regulating the capacity to sign contracts, the elements in the contract, the minimum guarantees or prescription periods. In a hostile environment such as 16th century Atlantic Trade, were parties free to decide what provisions include in the contract? Did the degree of risk affect written contracts?

6.2.1. Legal norms

According to experts, Mercantile Law was developed during the Middle Ages. The previous Roman Law seemed to be insufficient to attend the necessities (read the needs) of the commercial revolution initiated with the fair system. During the fairs traders created specific instruments which gave raise to the new commercial law. The new corpus of norms, called *Lex Mercatoria*, lived on in the practices of the merchant guilds.

In the Spanish case the new legal system was born inside Consulates. That of Burgos was the most regulated, and indeed it served as a model for others such as those of Bilbao or Seville. In its protocol, we find behavioural rules such as not to sell merchandise for cash if they received it on credit or the prohibition to deliver merchandise during holidays.¹⁷⁷ Rules to prevent potential conflicts can also be found, for instance the need to gain consent of all members in a company to receive a new partner.¹⁷⁸

Consulates had power to solve conflicts but they did not regulate contract design.¹⁷⁹ Theoretically, the design of contracts was a private issue. Only economic agents that were part of the business had the power to include in the document all sort of provisions. In the Spanish case, however, the monarchy regulated several aspects of written contracts. The major regulation was the corpus of norms created by the Catholic Kings in 1503. The document collected the medieval tradition about the specification of every document and added new norms on the establishment of a fixed number of notary's offices for every city.¹⁸⁰ Besides, these norms affected to the notaries' verification in the obligation to register the full documents and not only an abstract.¹⁸¹

Throughout the 16th century this tendency to regulate formal aspects of contracts intensified. The *Leyes de Toro*, the *Leyes Nuevas* or the *Leyes de Medina del Campo* serve as examples of this tendency.¹⁸² Table 6.1 presents a summary of the regulation of contracts during the 16th century.

¹⁷⁷ García de Quevedo (1995), pp. 209-211.

¹⁷⁸ García de Quevedo (1995), p. 210.

¹⁷⁹ See Gacto Fernández (1971). For the case of Seville, Rehme (1941) clarifies that the Consulate only offered the arbitration process when both parties in the conflict were members of the institution, pp. 79-85.

¹⁸⁰ Bono & Ungueti (1986), p. 45.

¹⁸¹ Bono & Ungueti (1986), pp. 38-40.

¹⁸² All of them can be found at the National Library, Madrid.

Table 6.1: Regulation of contracts

Period	Years with at least one norm
1500-1525	4
1525-1550	5
1550-1575	5
1575-1600	8

Source: <http://www.mcu.es/archivos/lhe/>

Most of the norms are concentrated in the final quarter of the century. The intensification of commercial exchange and with this the increase of the volume of contracts demanded a greater attention by rulers. Nevertheless, these norms were aimed to regulate formal requirements such as signature, denomination of every contract or capacity to contract. The contents of a contract in terms of clauses were determined for the will of the parties and the legal literature at the notary office.

6.2.2. Forms

Since the Roman Empire economic agents had written contracts. The obstacle imposed by the high degree of illiteracy was avoided with the creation of professionals who, for a pre-established price, wrote all sorts of legal documents. These professionals called *tabellio* or *notarius* not only designed the document but also had the power to convert a private document into public.¹⁸³ This power called *fides publica* was conferred by the rulers and trespassed (transferred) to the contract through the signature.

To write the different documents or *instrumentum* the professionals had a pool of legal formulae which were introduced depending on the kind of document and the will of the parties.¹⁸⁴ Experts denominate forms to the pool of legal formulae used by notaries in the documents. These primitive forms consisted of a list of provisions in alphabetical order. During the Middle Ages some of these forms persisted inalterable while others evolved into more complex documents.

In the Spanish case we can observe two different traditions. On one hand, the forms in the kingdom of Catalonia-Aragon hardly evolved. Recently, scholars have published forms and even in the 16th century these were still written in Latin.¹⁸⁵ On the other hand, forms in the kingdom of Castile became real documents and were written

¹⁸³ See Bono Huertas (1982), Vol. 1.

¹⁸⁴ Regarding documents we can distinguish among contracts, testaments, inventories and even judicial documents as testimonies, see Bono Huertas (1982), Vol. 1, pp. 58-59.

¹⁸⁵ Carcel Ortí (1980), Gimeno Blay (1981) and Madurell i Marimón (1974).

in Spanish. The most complete form is included in the *Siete Partidas*.¹⁸⁶ This form was so highly developed that it is possible to find different models of documents, from wills, to purchase or company contracts. Even in the territories of the Iberian Peninsula that were dominated by the moors did notaries use forms to write contracts.¹⁸⁷

In the Early Modern period notaries wrote many forms, following the medieval tradition but based on their experience.¹⁸⁸ With the introduction of the press in Spain the notarial forms came to be printed, thereby further contributing to their widespread diffusion. The printers were professionals who had access to this new technology. These enterprises were vertically integrated, including among their activities not only the printing but also the commercialization of books.¹⁸⁹ In Seville, for instance, most of the professional printers came from Germany like the famous Jacob Cronenberg or the partners Meinard Ungut and Stanislaw Polono.¹⁹⁰ But locals also became printers, such as Martín Montesdeoca.¹⁹¹ By contrast with printers in other European cities, however, in Seville these professionals never were grouped in a guild.¹⁹²

For the 16th century, Bono (1980) stresses the differential evolution of printed forms. While in the first half of the century forms only offer a compilation of medieval tradition, in the second half they included legal notes and explanations about notaries' practices.¹⁹³ It was during the second half of the century when the first treaties about Notarial Law were edited.

In quantitative terms the production of forms printed and diffused for use by notaries was irregular. The following figure presents the evolution of printed forms throughout the century. The blue line represents the cumulative number of forms printed and the red line those that were reprinted.

¹⁸⁶ The book is a compilation of legal norms and was written by the king of Castile Alfonso the 10th between 1252 and 1284. See, *Las siete partidas del Rey don Alfonso el Sabio* (1972), 3 Vols.

¹⁸⁷ For the case of Cordoba see Al-Attar (2000) and Cano Ávila (1988) for Granada.

¹⁸⁸ For printed forms during the 16th century see Amezcua y Mayo (1950) and Bono Huertas (1982), Vol. 2.

¹⁸⁹ See Reyes Gomez (2000), Vol. II, pp. 1150-1159 and Marsá (1993), p. 90.

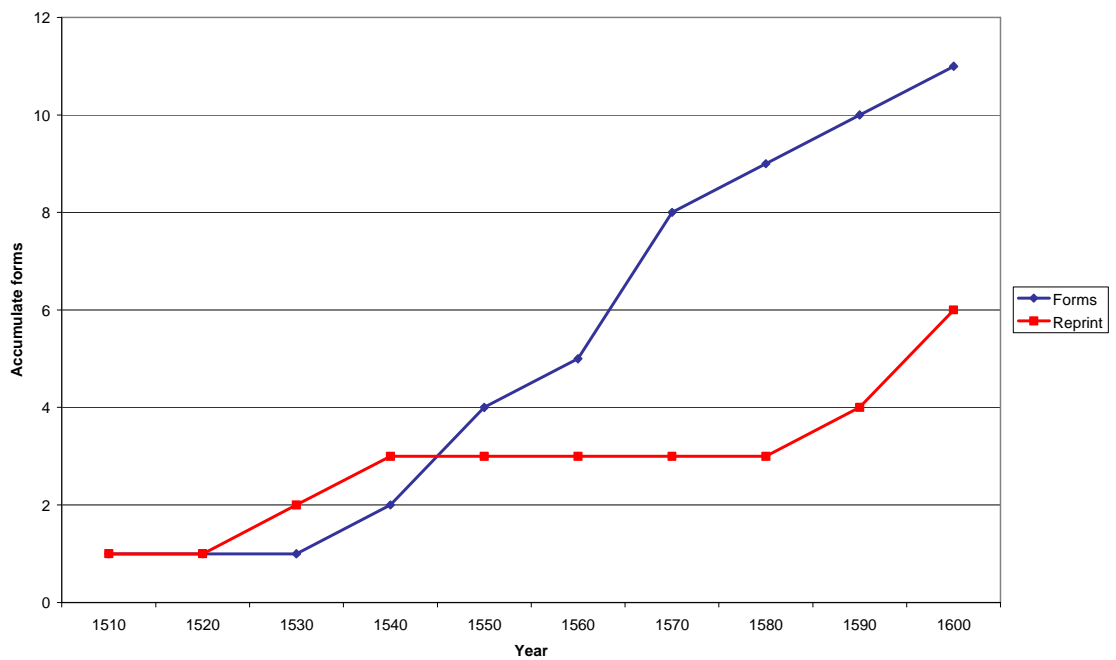
¹⁹⁰ Maillard Álvarez and Rueda Ramírez (2008), pp. 16-17.

¹⁹¹ The relevance of Martín Montesdeoca is analysed in Wagner (1982).

¹⁹² Álvarez Marquez (2007), pp. 112-115.

¹⁹³ Bono (1980), pp. 293-294.

Figure 6.1: Evolution of printed forms



Source: Bono (1980) and Amenzúa Mayo (1950)

The number of printed forms in the second half of the century nearly doubles. This fact is obviously a consequence of the rise in the activity of the notary's offices. Certainly, the trade intensified and notaries demanded simpler models to write contracts adapted to the Atlantic Trade.

The style in general of the literature in formal contracts did not change too much from one office to another. The notaries used to write documents based on the tradition of the city, and in Seville this tradition did not register alterations during the 16th century.

6.3. Data

Sample B constitutes the major source for this chapter. As it was already shown in chapter three, the sample was elaborated with hand-collected contracts from the notary's offices archive at Seville. This is a systematic sample which contains a total of 280 contracts, 28 contracts per decade. The original contracts have been completed with external information to proxy the economic situation.

Regarding the personal side of trade, the contracts contain data about both parties in the business. Information such as names, relationships between parties or residence can be found in original documents. However, some important data is still missing. In order to fill these gaps I have used historical literature as secondary

sources, mainly descriptions of merchant families. From these sources we can infer institutional memberships, and in general the relevance of the individual as a trader.

The resulting data set is homogeneous. All contracts are purchased on credit with a principal staying at Seville and a debtor going to America with merchandise. The documents are non-exclusive contracts. In other words, the buyer was free to contract with more merchants. Prices were established at Seville and did not depend on American market conditions. The major uncertainty that the principal faced was whether the debtor would repay on time.

6.3.1. Literature in the contract

The Spanish Civil Code affirms that a contract exists since two or more people consent in compelling themselves to give or to do something.¹⁹⁴ According to this legal corpus of norms, three elements should converge in a contract: consent, object, and cause.¹⁹⁵ In contracts from our data set the consent is given through the signature of the document, after both parties declared being legally of age. The data set is homogeneous and all documents analysed are purchase on credit and thus the object of the contract is the merchandise exchanged. Finally, the cause is the economic transaction that gave raise to the contract, in this case the sale of merchandise.

Contracts are very homogeneous in their structure. All of them start with the invocation which is the legal denomination of the contract, for the case of purchase contract the invocation was *compra*.¹⁹⁶ This initial classification is followed by a description of the parties.¹⁹⁷ Normally, the buyer is the first in the contract stressing that he is responsible for the execution of the written contract. Both parts have to fulfil all legal requirements to contract: being of age and mentally capable. In case of being a married woman she already needed the consent of the husband.

The object of the contract is the merchandise sold. Contracts reflected a description of such items, quantities, qualities and prices. On occasions, we even find a full inventory of products. There are some cases, however, in which this description is missing and they simply add their economic value. The object of the contract is completed with the final destination of the merchandise in America.

At the end of the contract we can find the validation by the signatures of both parties and the notary. Through this simple act the contract passes from private

¹⁹⁴ Díez-Picazo & Gullón (1995), p. 399.

¹⁹⁵ Díez-Picazo & Gullón (1995), p. 408.

¹⁹⁶ Basas Fernández (1960), p. 381.

¹⁹⁷ In the description of the parties we find names, origin, professions and personal relationship among them.

agreement to public document. Occasionally, this procedure was supported also by the signatures of a witness.

The will of both parties was expressed in the particular conditions of the business such as prices, merchandise or payment. The contract also comprised rights and duties for both parties reflected in the clauses. There were clauses that used to appear in all documents and some of them are variable.

6.3.2. Clauses

The Oxford Dictionary of Law defines contractual clauses as “any provision being part of a contract.”¹⁹⁸ The contract itself is considered law among parts and thus all clauses must be fulfilled. From an economic point of view, clauses are conditions which regulate transactions between two parties. In the data set object of analysis we find 22 different clauses. However, some of them have been dropped since they were present in nearly all contracts and thus were not representative as variables.

Depending on their nature, clauses have been classified into four different categories: Guarantee, Penalty, Payment and Obligation.¹⁹⁹ Table 6.2 shows a list of the different clauses for every group. I have preserved the original denomination as they appear in the contract.

Table 6.2: Clauses

Name	Group	Description
Hipoteca bienes	Guarantee	Mortgage over present and future goods
Fiador	Guarantee	A third person acting as guarantor
Cuenta	Obligation	Settlement of account prior to payment
Paradas	Obligation	Stops of the journey must be regulated in the contract
Puestas en Indias	Obligation	The principal is responsible for the delivery
Tornaviaje	Payment	Payment established in Seville when the ship come back from America
Aplazamiento	Payment	Payment in instalments is allowed by the principal
Pago en Indias	Payment	Payment established in America
Pena	Penalty	Monetary payment in case of non fulfilment
Costas	Penalty	Payment for all economic damages

Clauses in the group guarantee are mainly ex post procedures to ensure that the principal will receive the payment. Guarantee clauses constitute the collateral in

¹⁹⁸ Martin & Law (2006), p. 127.

¹⁹⁹ For this classification we follow the criteria used by notaries even nowadays, see Rojas García (2009).

these contracts. According to Chan & Kanatas (1985) this can be considered as outside collateral, because mortgages and endorsement are external elements to the purchase contract. In contrast, inside collateral is defined as a proportion of the sold items.

Obligation clauses can be considered in general as compulsory duties. All clauses in this group refer to duties for the debtor. With these additional tasks, the principal will try to monitor the debtor's behaviour, and we should expect a positive correlation between regulation and opportunism. Regarding the debtor, two different obligations have been identified: *cuenta* and *paradas*. The first one alludes to obligations before the payment; in this case, the debtor in person must settle account with the principal.²⁰⁰ The second obligation is related to the journey. As the purchase contract is bilateral, it generates an obligation to both parts and, as a consequence, we also detect duties for the principal. The only one included in the (my) analysis is *puestas en Indias*. This clause represents the obligation for the principal to contract the insurance and the transport service, since the merchandise will be delivered in America.

From the legal point of view, payment is the most important group of clauses. Since the repayment for the merchandise constitutes the object of the contract, these clauses are essential; in fact they define the contract as purchase.²⁰¹ Clauses in this group established when and where the payment had to be made. *Tornaviaje* and *pago en Indias* refer to the place for repayment while *Aplazamiento* and *alungamiento* are related to time. *Tornaviaje* and *pago en Indias* are mutually exclusive; the first one refers to a payment in Seville after the journey and the second establishes the destination in America as the place for repayment. The *aplazamiento* clause permits progressive payment on an instalments plan which is established at the contract in full detail. Finally, *alungamiento* refers to the termination of the contract.

Penalties basically consist of economic compensations for damage suffered. Following Schäfer & Cooter (2007), an effective contract commits people to do what they say they will do, and the certainty and severity of sanctions will determine the strength of the commitment.²⁰² For the case of Atlantic Trade, sanctions used to be established in the contract. Contrary to the present legal system, monetary punishments were determined by the parties and not by the judges. Only two clauses are included in this group: *pena* and *costas*. The first one consisted on payments

²⁰⁰ This clause came also from the Medieval Castilian legislation, see, as an example, Cuesta Rodríguez (1947), p. 109.

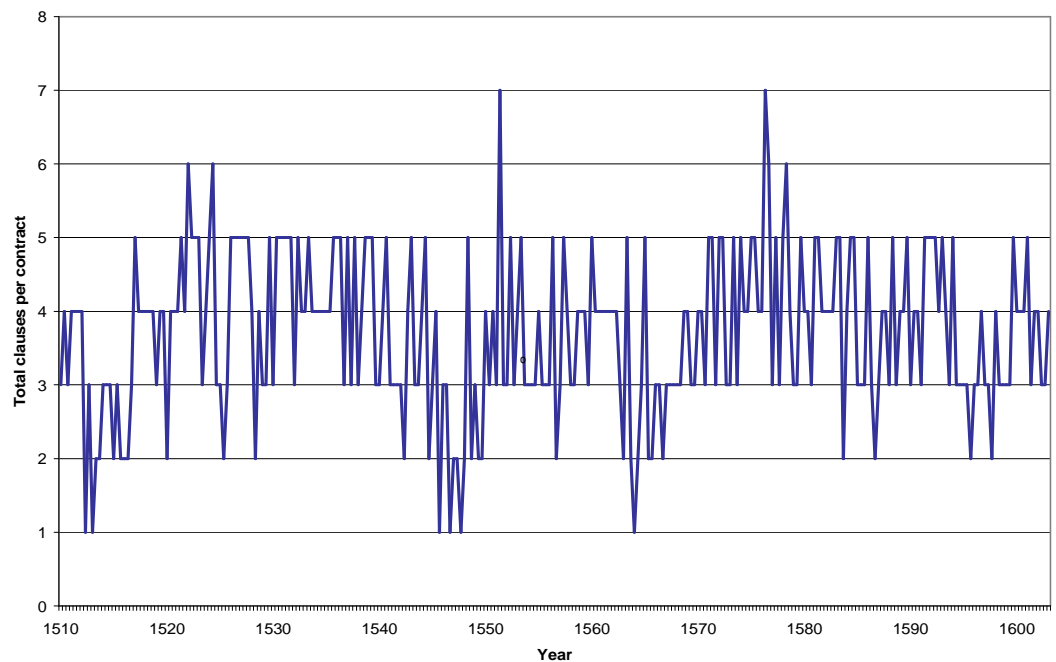
²⁰¹ Sánchez Calero & Sánchez-Calero Guirarte (2005), pp. 255-257.

²⁰² Schäfer & Law (2007), p. 3.

established in the local currency whilst the second is more generic.²⁰³ In the clause *costas*, the debtor is punished with the payment of all expenses the principal incurred while trying to obtain the repayment.²⁰⁴

For the data set nearly all contracts have among 2 and 5 clauses as shown in figure 6.2.

Figure 6.2: Total number of clauses per contract



Source: Own elaboration from sample B

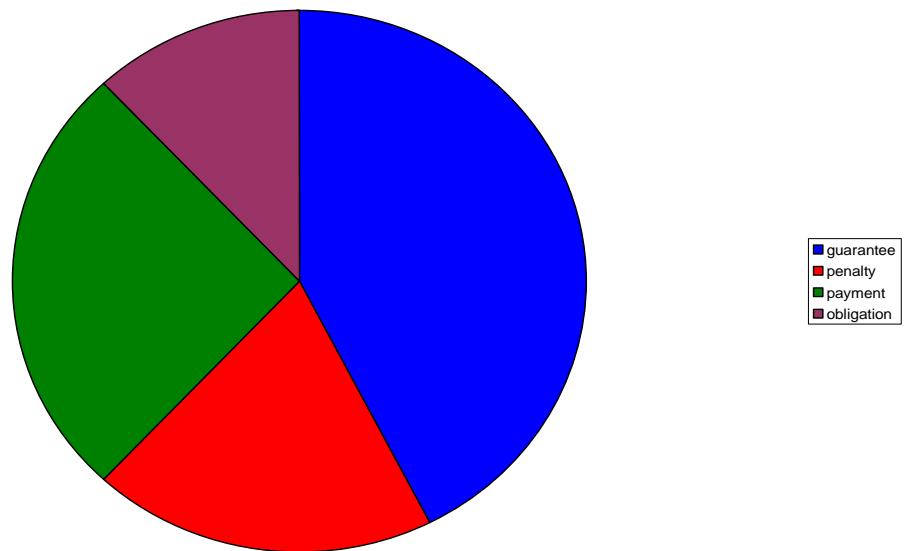
It is possible to distinguish three waves: a first one until 1550, a short second wave between 1550 and 1570 and a last wave from 1570 until the end of the period. In all of them, the distribution seems more or less homogeneous: an increase at the beginning which continues up to a maximum that is followed by a decline.

The next figure presents the results of clauses classified per group. The first one shows the participation of every group of contract provisions in the whole database and the second one illustrates the time dimension of clauses.

²⁰³ The *pena del doblo* was very popular since the Middle Ages. This penalty consisted of a payment for the double quantity in case of breach of contract. Examples from this penalty can be found in Cuesta Gutiérrez (1947), pp. 38-39.

²⁰⁴ Among the expenses were even included lawsuit costs.

Figure 6.3: Total number of clauses in Sample B



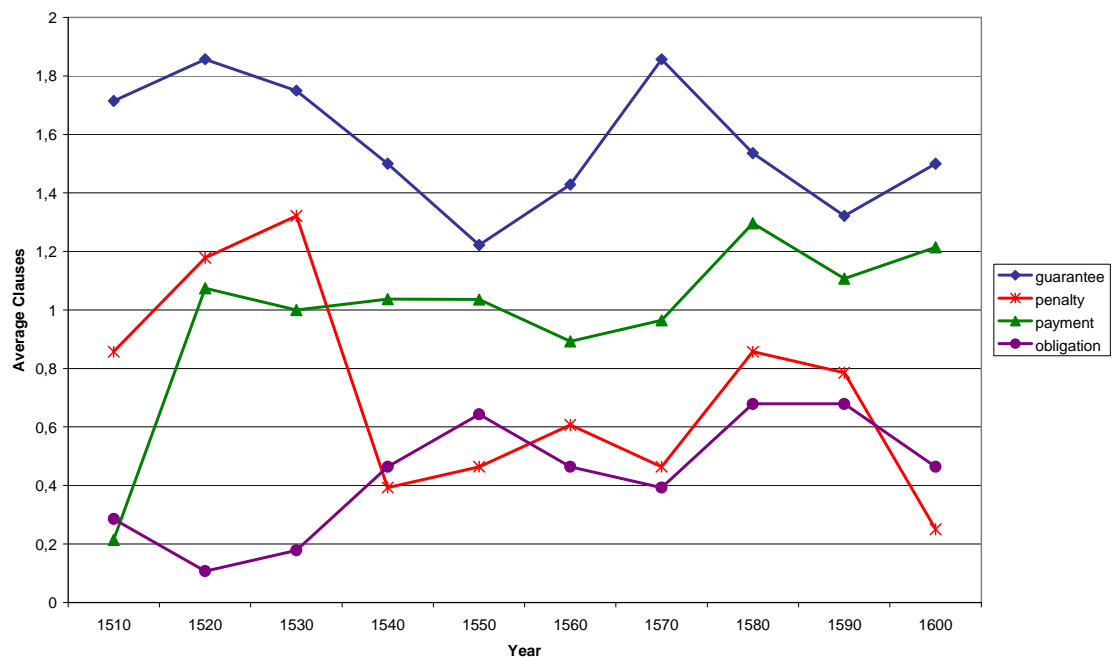
Source: Own elaboration with data from sample B

Comparing groups of clauses, collateral represents, in total terms, the greatest proportion. The guarantees offered in 16th century contracts in the form of goods and endorsement seemed to be very popular. This data perfectly supports the hypothesis of traders using collateral requirements to screen among debtors.

The second group in importance is payment, which is not surprising given the relevance of these clauses for contracts. Conditions of the repayment and finalization of the contract are well regulated in mostly all documents. Penalties are not so frequent and only represent a quarter of the total clauses. They are mainly specific economic penalties. With regard to this, *pena del doblo* became very popular. This penalty consisted of a repayment for the double value of the merchandise sold at the contract in case of delays. Finally, obligation seems to be the least important group. In fact, these clauses are more typical of agency and company contracts.

Given the historical nature of the data set, time plays an important role in the analysis. Taking into account time figure 6.4 shows the average number of clauses per group in every decade.

Figure 6.4: Average number of clauses per decade



Source: Own elaboration with data from sample B

There are some tendencies to the prior figure, even if they are very irregular. Guarantee and penalty clauses demonstrate a similar trend, a great rise during the first decades followed by a fall approximately in the mid-century and a slightly recovery until 1590. It is important to note that for all periods guarantee clauses represent the maximum in average terms. Payment clauses are also followed the trend previously exposed, but in this case the fall and subsequent recovery were not so pronounced.

Regulation in general increased drastically in the first century of trade. After that peak, the demand of conditions in contracts became less tough. Nevertheless, the second half of the century came with a rise of economic exchanges and, with this, piracy. The protection from pirates' attacks and other eventualities produced progressive increases in contract provisions.

Obligation clauses represented an opposite tendency. This category, reached its minimum at the beginning of the century, at the moment when the other categories presented their peaks. Between 1520 and 1550, obligations in contracts grew. However, from the middle of the century onwards, the evolution of obligation clauses was very similar to the other categories. From this parallel evolution during the second half of the century we can infer that the influence of trade, piracy and other factors had the same impact.

6.4. Econometric strategy

As it was pointed out in the introduction of this chapter, the major hypothesis is that principals designed contract provisions simply to screen debtors. I test this hypothesis in two different ways; using collateral requirements, and with provisions of the contract in general. The strategy for the regression will follow these steps:

1) Test adverse selection with collateral requirements. To this end, the dependent variable will be collateral in the contracts with $y_i=0, 1, 2$. The variable will take value 0 for contracts with no guarantee clauses, value 1 for contracts with only one guarantee clause which can be a mortgage on goods or simply endorsement, finally in contracts with $y_i=2$ we find both guarantees (endorsement and mortgages). As the variable Y is discrete and with finite values, I use a count data model assuming that this variable follows a normal distribution.²⁰⁵

2) Test adverse selection using clauses in general. Here, I will run a set of regressions. In the first one the dependent variable is discrete and measures the total number of clauses per contract with $y_i=1, 2, \dots, n$. In the regression I will use count data models, in this case the Akaike information criterion suggests a negative binomial distribution. For the rest of regressions I take into account every group of clauses. In other words I run four different regressions for guarantee, penalty, payment and obligation clauses respectively. For all these regressions, the vector of dependent variables is $Y=y_{ki}$ with k =guarantee, penalty, payment and obligation and $y_i=0, 1$. Note that the variables are defined as dummies with $y_k=1$ for at least one clause of type k .

6.4.1. Explanatory variables

Among the explanatory variables, the first group is a proxy for the adverse selection hypothesis. More specifically, these variables measure the degree of suspiciousness for every debtor. The variables measure the reputation of the debtor and his experience as a trader. The reputation is approximated with institution and news, while for experience we use the number of contracts signed and the official

²⁰⁵ For this assumption I follow the Akaike information criterium (lowest value).

declaration of being a merchant.²⁰⁶ Moreover, I add information about debtors' official declaration of bankruptcy prior to the signature of the contract.

Complementary to the major hypothesis the second group of explanatory variables proxies the principal's ability to control. The variables P_i , P_n and P_c proxy the relevance of the principal as a trader. These variables measure the number of institutions, news and contracts signed by the principal, respectively.²⁰⁷

General characteristics of the business have also been introduced in the analysis. With these variables I control whether the relevance of the commercial transaction has any impact on the design of the contract. I include in the group features such as size, duration and destination. Note that the variable size is defined as the total amount of money contracted and does not allude to the composition of the contract in terms of clauses. I deliberately dropped the variable people from this group. Although the number of people in the contract could be accepted as a proxy of the relevance of the business, the variable is related to the existence of an endorsement which is included in guarantee clauses.

In the introduction, I already pointed out the need to take into account not only the economic but also the legal approach. I introduce in the analysis three different variables that proxy aspects related to legal theory. The first variable measures the courts' efficiency to test whether contracts were designed to be enforced there.²⁰⁸ The second variable measures the impact of legal regulation on the design of contracts using data from the different legal norms promulgated during the 16th century. This variable is calculated as the average number of norms for every period.²⁰⁹ The last variable is taken into account the notaries' literature is built with information about forms printed during the 16th century.²¹⁰ With this variable we test the impact of notaries' literature on contract design.

I control with alternative factors from the economic environment in general such as trade, piracy or delays in the fleet system. Delays in the fleet system and piracy have been calculated in tons with data from Chaunu (1950). In both cases variables reflect the share of tons lost and stolen with respect to the total tons transported by the fleet in every period. The variable trade is measured here in economic value.²¹¹ In order to build this variable we used data from scholars who

²⁰⁶ All these variables are the same used at chapter five. For further information see the Appendix.

²⁰⁷ The variables P_i , P_n and P_c were defined also in chapter five, similarly to the variables regarding reputation and experience of the debtor, see Appendix.

²⁰⁸ This variable is the same used at chapter five. Here the efficiency is basically related to the length of the legal procedures to solve conflicts.

²⁰⁹ This information has been collected in a website from the Spanish Ministry of Culture, see <http://www.mcu.es/archivos/lhe/>.

²¹⁰ Information from Amenzúa Mayo (1950), Bono (1980) and Bono (1982), vol. 2.

²¹¹ I am avoiding potential multicollinearity problems with the variables piracy and delays.

analysed the taxes collected by the Spanish Crown.²¹² More specifically, the two major taxes regarding the Atlantic Trade – the *almojarifazgo de Indias* and the *avería* – are each taken into account.²¹³

It is necessary to introduce in the analysis information about the cost of written contracts. For the case of Seville, the prices of contracts were regulated by the *Pragmática de los Reyes Católicos* and did not register changes throughout the century.²¹⁴ Prices were considered as taxes by the monarchy, and for this reason they were proportional to the quantities contracted. I deliberately drop prices from the analysis in order to avoid multicollinearity problems.

The next table summarizes all the hypotheses and the explanatory variables for the different tests.²¹⁵ A time trend will be added to these variables.

Table 6.3: Explanatory variables

Hypotheses	Variables
Adverse Selection	Di Dn Dc Profession Bankrupt
Ability to control	Pi Pn Pc
Business	Size Duration Destination
Law	Court Regulation Printed Forms
Economic Environment	Trade Value Delays Piracy

²¹² Lorenzo Sanz (1982), vol. 2, pp. 101-106; Céspedes del Castillo (1945), pp. 155-156; García-Baquero (1992), pp. 120-128 and Chaunu (1950), vol. 6A. Unfortunately, the final series were not complete. To fill the gaps I used linear interpolation.

²¹³ The first one was a kind of tax for the circulation of merchandise and it was bi-directional, that is to say it was paid when merchandise was exported from Spain to America and when it was imported from America to Spain. In both cases, the payment was done at the port before the cargo was loaded. The second tax had a different nature: the *avería* was the contribution of private merchants to maintain the fleet system.

²¹⁴ For the case of Seville see Pardo Rodríguez (1998), and Ostos Salcedo (1998) for Cordoba.

²¹⁵ See the list of variables in the Appendix.

6.5. Collateral as a screening device

According to the economic literature previously reviewed, principals can use collateral requirements to screen customers ex ante. Economic models suggest that a rise of collateral will attract high-risk individuals. In this section, I check if this hypothesis can be extrapolated to the case of 16th century Atlantic trade.

The variable to explain is the collateral requirements in the contract, this is a discrete variable with $y_i=0, 1, 2$. I assume that Y is normally distributed with

$$f(y) = \frac{1}{\sigma\sqrt{2\pi}} e^{-\frac{1}{2}\left(\frac{y-\mu}{\sigma}\right)^2}$$

Where μ is the average of the dependent variable, and σ the standard deviation. Table 6.4 shows results from this regression, all of them presented after robustness tests.

Table 6.4: Collateral regression

	Y= Collateral Requirements
Adverse Selection	
Di	0.030543 (0.060738)
Dn	0.078802 (0.062749)
Dc	-0.102798*** (0.049412)
Profession	-0.038139 (0.107728)
Bankrupt	-0.447176 (0.449154)
Ability to control	
Pi	0.018777 (0.045239)
Pn	-0.019263 (0.019496)
Pc	0.002809 (0.007688)
Business	
Size	8.08E-09 (5.33E-08)
Duration	-0.000123 (0.112449)

Destination	-0.222868** (0.000133)
Law	
Court	0.002790 (0.002257)
Regulation	-0.053704 (0.035391)
Printed Forms	0.078117 (0.105502)
Economic Environment	
Trade Value	6.07E-06 (6.96E-05)
Delays	-11.07861 (16.35776)
Piracy	30.6820 (33.21982)
Time trend	0.046091 (0.129079)
R-Squared	0.139434
Log Likelihood	-324.9974
N	280

Standard Error in brackets
 *p ≤ 0.10 **p ≤ 0.05 ***p ≤ 0.01

Results confirm the S-W model. Certainly, rises in collateral requirements are directly correlated to suspiciousness. The variable Dc is negative and significant, for every additional collateral requirement in the major contract the professionalism of individuals accepting such agreement is decreasing by 0.102798. It should be remembered that the variable Dc is approaching the degree of professionalism through the total number of contracts signed. This variable supports the argument of an attraction of low-reputation individuals when the guarantees rise. The result prove the existence of an adverse selection effect *à la* Stiglitz & Weiss.

Besides, the increase of collateral produced an effect on the degree of risk of the projects financed. According to the incentive effect form the S-W model, an increase of collateral will push customers to select riskier projects. In the regression, the variable destination is significant and negative, which means that an increase of collateral induced individuals to select less popular destinations, trying to obtain higher profits via monopoly.

The adverse selection and incentive effects together indicate that merchants used collateral to screen debtors. They designed contracts with higher collateral requirements to attract high-risk debtors and used this information as a proxy for

personal monitoring. In this way, individuals suspicious of opportunism or those selecting riskier projects are willing to accept contracts with higher collateral levels. The acceptance of the contract would advise principals about suspicious behaviour, thereby producing an intensification of control through the debt-collector system.

Table 6.5 presents results from the regression with only significant variables; the dependent variable is collateral requirements as in the prior regression. It is possible to appreciate that the incentive effect becomes stronger since variable destination is now significant at 1%. The regression also evidences a small improvement in R-squared.

Table 6.5: Significant variables

	Y= Collateral requirements
Dc	-0.072242*** (0.030634)
Destination	-0.264329*** (0.000131)
R-Squared	0.198581
Log Likelihood	-328.3419
N	280

Standard Error in brackets

*p ≤ 0.10 **p ≤ 0.05 ***p ≤ 0.01

6.6. Explaining contracts' complexity

The second step in the regression strategy consisted in checking the adverse selection hypothesis using data from clauses in the contract. To this aim, I run a set of regressions. Firstly, measuring the complexity of contracts in total terms, that is to say taking into account just the total number of clauses per contract. Secondly, introducing a differentiation according to the nature of clauses. Four regressions will be run for guarantee, payment, penalty and obligation clauses, respectively.

Table 6.5 depicts the results from the first regression. In this case I simply test the complexity of contracts in terms of clauses. The dependent variable is discrete and measures the total number of clauses per contract with $y_i = 1, 2, \dots, n$. The Akaike information criterion suggests a binomial distribution. Results are robust.

Table 6.6: All clauses' regression

	Y= Number of clauses
<i>Adverse Selection</i>	
Di	0.008549 (0.042049)
Dn	0.007516 (0.035729)
Dc	-0.021442 (0.023284)
Profession	-0.025468 (0.069375)
Bankrupt	0.181742 (0.257007)
<i>Ability to control</i>	
Pi	0.031594 (0.032355)
Pn	0.000630 (0.012282)
Pc	-0.001871 (0.004135)
<i>Business</i>	
Size	-1.37E-08 (1.87E-08)
Duration	-0.000194** (8.46E-05)
Destination	0.064006 (0.069116)
<i>Law</i>	
Court	0.000517 (0.001443)
Regulation	-0.072517*** (0.022148)
Printed Forms	-0.110638 (0.072943)
<i>Economic Environment</i>	
Trade Value	-8.53E-05 (4.05E-05)
Delays	2.247478 (10.53552)
Piracy	-14.95746 (22.07746)
Time trend	0.346575*** (0.081807)

R-Squared	0.169370
N	280

Standard Error in parenthesis
 *p ≤ 0.10 **p ≤ 0.05 ***p ≤ 0.01

Results from this regression show no evidence of adverse selection. The only variable regarding the business itself which really matters is duration. Nevertheless, the variable presents a different sign from what was expected. The variable duration is strongly significant with a negative value. This means that contracts regulating longer economic relationships contained a lower number of conditions. More specifically, the number of clauses decreases by 0.000194 for every single day of the contract. This is counterintuitive, since longer businesses should be expected to be more controlled. However, this fact is related to the strength of economic relationships. Normally, stronger relationships were extended over time and longer contracts mean more trustworthiness or high reputation individuals.²¹⁶

What seems to be confirmed by the results are alternative explanations based on legal norms. Indeed, the variable regulation is significant and negative. Certainly, for every legal norm promulgated about contracts the number of clauses was reduced in 0.072517. It is possible to affirm that in total terms, legal requirements about contracts matter and economic agents were not totally free to design contracts.

Results also highlight the importance of time in the design of contracts. The variable time is strongly significant and positive. In every period, clauses per contract increase by 0.346575.

Except for an improvement in R-squared, results seem to be similar when running the prior regression with significant variables only, as noted in table 6.7.

²¹⁶ Note that in this chapter the major hypothesis is related to using contracts as screening devices *ex ante* and not to controlling individuals *ex post* through the debt-collector system. In chapter five, the *ex post* control was tested and results indicated that longer contracts were controlled later.

Table 6.7: Significant variables

	Y= Number of clauses
Duration	-0.000298*** (0.000101)
Regulation	-0.042068*** (0.008873)
Time	0.113262*** (0.023748)
R-Squared	0.185716
N	280

Standard Error in parenthesis
 *p ≤ 0.10 **p ≤ 0.05 ***p ≤ 0.01

6.6.1. Different clauses and different explanations

The next step will be to regress every group of clauses. In all cases, the dependent variable Y is always a dummy with value 1 in case of at least one clause of the group of interest. Being a binary variable, the OLS model seems inappropriate instead, I adopt the following specification:²¹⁷

$$P[y_i=1 / x_i, \beta] = 1 - \Phi(-x_i' \beta)$$

Where Y is the dependent variable, X the vector of explanatory variables, β the different slope coefficients in the regression and Φ the cumulative distribution function for the variable Y. I assume two different specifications for Φ standard normal and logistic, the first one is known as PROBIT model and the second is a LOGIT model. Consequently I will run two different regressions for every group of clauses although selecting a PROBIT or a LOGIT model have no impact on results. Results are presented after robustness tests.

²¹⁷ See Greene (2008).

Table 6.8: Guarantee regression

	D _{GUARANTEE} PROBIT	D _{GUARANTEE} LOGIT
<i>Adverse Selection</i>		
Di	0.169914 (0.250976)	0.158755 (0.485742)
Dn	0.130477 (0.160695)	0.223188 (0.290939)
Dc	-0.282954*** (0.120102)	-0.459979*** (0.210030)
Profession	-0.117871 (0.383906)	-0.147841 (0.723531)
Bankrupt	0.237054 (0.873371)	0.576029 (1.771476)
<i>Ability to control</i>		
Pi	0.312664 (0.232244)	0.383918 (0.480641)
Pn	-0.144718 (0.092337)	-0.267271 (0.169116)
Pc	0.011592 (0.045635)	-0.019333 (0.097136)
<i>Business</i>		
Size	8.75E-08 (8.39E-08)	1.64E-07 (1.45E-07)
Duration	-0.000627 (0.000422)	-0.001060 (0.000800)
Destination	-1.557510*** (0.558246)	-3.434374*** (1.337134)
<i>Law</i>		
Court	0.029510** (0.014469)	0.052548** (0.021644)
Regulation	-0.812047 (0.530372)	-1.206895 (0.688763)
Printed Forms	-0.924844 (0.508648)	-2.241009 (1.320196)
<i>Economic Environment</i>		
Trade Value	-0.000187 (0.000282)	-0.000278 (0.000385)
Delays	-218.3097 (123.9766)	-369.4410 (174.0017)
Piracy	550.6770** (310.8925)	939.6121** (416.7200)
Time trend	0.797723	-0.109035

	(1.291886)	(2.702863)
Log likelihood	-86.32091	-83.86735
N	280	280

Standard Error in parenthesis

*p ≤ 0.10 **p ≤ 0.05 ***p ≤ 0.01

The previous table tells a very different story for the case of guarantee clauses. It seems that principals took into account the reputation of the debtor when a guarantee was demanded. Indeed, the variable *Dc* is strongly significant and negative, which means that principals demanded less guarantees for individuals who showed more experience in trade in terms of contracts signed. This result proves that an adverse selection effect may not exist in general but just for the case of guarantee clauses.

Results also confirm the existence of an incentive effect. In the regression, destination is strongly significant and negative. In other words, contracts for debtors going to more popular destinations contained less guarantees. By contrast, more guarantees are required for unpopular and isolate destinations.

In addition, traders showed a lack of trust in legal enforcement. The variable *courts* is significant and positive, therefore increments on delays for conflicts' resolution were translated into more guarantees in contracts. Traders protected themselves with additional guarantees when the inefficiency of legal institutions increased. We should not forget that the variable *courts* is defined as the average time to solve a lawsuit weighted by the number of them.

Finally, the pirate threat also matters. Increases in pirates' attacks were registered in the contracts in the form of more guarantees.

Table 6.9: Penalty regression

	D _{PENALTY} PROBIT	D _{PENALTY} LOGIT
<i>Adverse Selection</i>		
<i>Di</i>	-0.367407** (0.184422)	-0.626555** (0.304263)
<i>Dn</i>	-0.195498 (0.180078)	-0.267632 (0.387464)
<i>Dc</i>	0.081576 (0.129194)	0.131133 (0.234375)
Profession	0.145927 (0.278341)	0.231376 (0.460427)
Bankrupt	-0.810469 (0.508569)	-1.376464 (0.807913)

<i>Ability to control</i>		
Pi	-0.109924 (0.169067)	-0.172041 (0.290466)
Pn	-0.031092 (0.067653)	-0.062321 (0.120316)
Pc	-0.004791 (0.021707)	-0.01209 (0.037042)
<i>Business</i>		
Size	-1.40E-07 (1.51E-07)	-2.99E-07 (4.51E-07)
Duration	-0.000411 (0.000364)	-0.000647 (0.000618)
Destination	0.320737 (0.344790)	0.656696 (0.637220)
<i>Law</i>		
Court	-0.013325 (0.007574)	-0.024355 (0.013664)
Regulation	-0.255685** (0.123688)	-0.405831** (0.227652)
Printed Forms	-0.864280*** (0.361613)	-1.540262*** (0.634831)
<i>Economic Environment</i>		
Trade Value	-0.000758 (0.000196)	-0.001290 (0.000336)
Delays	112.6807** (57.64690)	201.4980** (103.4598)
Piracy	-198.1532 (121.8383)	-358.8144 (222.3928)
Time trend	1.449630 (0.372461)	2.460667 (0.651192)
Log likelihood	-155.4091	-154.9823
N	280	280

Standard Error in parenthesis

*p ≤ 0.10 **p ≤ 0.05 ***p ≤ 0.01

Penalties also evidence an adverse selection problem. On this occasion the significant variable proxy reputation via institutions. To contract with members of relevant institutions meant fewer penalties. Relevant merchants were punished in a different way, probably not with economic penalties but with damages on their reputation. By contrast, economic penalties were the most popular punishment for people who did not care about reputation.

Despite the previous result, legal regulation and printed forms also affected penalties to some extent. In general terms, the increase of norms and handbooks on legal formulas used by notaries decreased the number of penalties in the contract.

Penalties in the contract also changed due to delays in the fleet system. In the table, the variable *delays* is significant and positive. Just recall that the variable *delays* is calculated as the average from the previous period. Therefore, it can be stated that delays produced in previous fleets acted as a warning and thus increased penalties in future contracts.

Table 6.10: Payment regression

	D _{PAYMENT} PROBIT	D _{PAYMENT} LOGIT
<i>Adverse Selection</i>		
Di	0.497766 (0.286358)	0.978829 (0.560301)
Dn	-0.241209 (0.202519)	-0.437756 (0.414238)
Dc	0.213764 (0.182952)	0.426991 (0.410135)
Profession	-0.511562 (0.489723)	-1.155361 (0.993124)
Bankrupt	0.374731 (0.970926)	0.738601 (2.153393)
<i>Ability to control</i>		
Pi	0.084022 (0.185607)	0.084192 (0.348754)
Pn	-0.031911 (0.089786)	-0.041799 (0.174431)
Pc	-0.008036 (0.029493)	-0.017155 (0.057647)
<i>Business</i>		
Size	-3.84E-08 (1.52E-07)	-9.61E-08 (3.50E-07)
Duration	-0.002023*** (0.000526)	-0.003658*** (0.001153)
Destination	0.566612 (0.421415)	0.844130 (0.809651)
<i>Law</i>		
Court	0.005437 (0.009093)	0.013737 (0.019443)
Regulation	-0.548220*** (0.183253)	-1.047474** (0.451232)

Printed Forms	-0.222319 (0.427341)	-0.166312 (0.836609)
<i>Economic Environment</i>		
Trade Value	5.38E-06 (0.000282)	0.000117 (0.000650)
Delays	-113.4579 (69.53715)	-246.8500 (141.5168)
Piracy	217.4777* (135.9152)	479.7106* (273.5278)
Time trend	1.837958*** (0.558649)	3.169087*** (1.341868)
Log likelihood	-76.59410	-77.18222
N	280	280

Standard Error in parenthesis
 *p ≤ 0.10 **p ≤ 0.05 ***p ≤ 0.01

In purchase contracts payment clauses are essential; this is true in the 16th century and also for nowadays. Indeed, the regulation of conditions for the repayment of the merchandise sold constitutes the object of the contract. Nevertheless, results show that for the Atlantic Trade this regulation was not an adverse selection problem. This does not mean that economic assessments did not matter. In fact, the variable duration is strongly significant and negative. Similarly to the regression with all clauses, this result indicates that repayment is less regulated in longer economic relationships what confirms the argument by Berger & Udell (1995). In the paper, the authors prove that the use of collateral decreases significantly with the length of the relationship between the borrower and the bank.

The legal regulation about contract design also had an impact on payment conditions. The increase of norms promulgated by the Crown simplified the conditions for repayment in contracts *ceteris paribus*.

As happened with guarantee clauses, the pirate threat affected repayment conditions. The result was predictable since payment was made in silver and transported to Spain. Growth in piracy made the transport more insecure and insurances only covered a minimum part of the losses.

Time also exerted a positive influence on repayment conditions and the linear time trend is strongly significant.

Table 6.11: Obligation regression

	D _{OBLIGATION} PROBIT	D _{OBLIGATION} LOGIT
<i>Adverse Selection</i>		
Di	0.175839 (0.213198)	0.347627 (0.360838)
Dn	-0.209093 (0.157109)	-0.319119 (0.270958)
Dc	-0.238935** (0.118336)	-0.371265** (0.197057)
Profession	-0.174032 (0.320633)	-0.309647 (0.541633)
Bankrupt	9.021044*** (0.428293)	37.11700*** (1.043719)
<i>Ability to control</i>		
Pi	-0.004985 (0.172450)	-0.001401 (0.303508)
Pn	0.022336 (0.069213)	0.058608 (0.122266)
Pc	0.012739 (0.025304)	0.035239 (0.045918)
<i>Business</i>		
Size	3.53E-09 (1.03E-07)	3.91E-09 (1.94E-07)
Duration	0.000193 (0.000390)	0.000258 (0.000676)
Destination	-1.597982*** (0.384072)	-2.973009*** (0.769487)
<i>Law</i>		
Court	0.002002 (0.008283)	0.005286 (0.014312)
Regulation	0.028684 (0.131424)	0.029712 (0.229709)
Printed Forms	0.222797 (0.405524)	0.434937 (0.701405)
<i>Economic Environment</i>		
Trade Value	0.000168 (0.000207)	0.000347 (0.000353)
Delays	-38.50082 (64.04761)	-77.16169 (110.2581)
Piracy	45.73656 (135.5869)	101.3666 (234.7013)
Time trend	-0.290015 (0.397136)	-0.463498 (0.697621)

Log likelihood	-135.8357	-135.1788
N	280	280

Standard Error in parenthesis
 *p ≤ 0.10 **p ≤ 0.05 ***p ≤ 0.01

In this last regression we can clearly appreciate the impact of adverse selection. The variables *Dc* and *bankrupt* are significant at 1%. Partners who had been officially declared bankrupt and with a limited experience on trade accepted more complex contracts in terms of duties. By contrast, contracts for more experienced traders contained fewer obligations. The result confirms the application of the Stiglitz-Weiss model for the case of obligations, since opportunistic individuals will be attracted by more complete contracts.

The result from variable destination confirms also the existence of an incentive effect; the increase in obligations in the contract forced debtors to select riskier projects. People who selected more popular destinations accepted contracts with fewer obligations, and debtors going to more distant markets preferred more complex contracts.

Table 6.12 presents results from the previous regressions altogether. In this occasion I use the LOGIT specification.²¹⁸

Table 6.12: Guarantee, Penalty, Payment and Obligation

	D _{GUARANTEE}	D _{PENALTY}	D _{PAYMENT}	D _{OBLIGATION}
<i>Adverse Selection</i>				
Di	0.158755 (0.485742)	-0.626555** (0.304263)	0.978829 (0.560301)	0.347627 (0.360838)
Dn	0.223188 (0.290939)	-0.267632 (0.387464)	-0.437756 (0.414238)	-0.319119 (0.270958)
Dc	-0.459979*** (0.210030)	0.131133 (0.234375)	0.426991 (0.410135)	-0.371265** (0.197057)
Profession	-0.147841 (0.723531)	0.231376 (0.460427)	-1.155361 (0.993124)	-0.309647 (0.541633)
Bankrupt	0.576029 (1.771476)	-1.376464 (0.807913)	0.738601 (2.153393)	37.11700*** (1.043719)
<i>Ability to control</i>				
Pi	0.383918 (0.480641)	-0.172041 (0.290466)	0.084192 (0.348754)	-0.001401 (0.303508)
Pn	-0.267271 (0.169116)	-0.062321 (0.120316)	-0.041799 (0.174431)	0.058608 (0.122266)

²¹⁸ Although results from LOGIT and PROBIT models are very similar, the LOGIT regression presents a slightly lower value for the Akaike information criteria.

Pc	-0.019333 (0.097136)	-0.012309 (0.037042)	-0.017155 (0.057647)	0.035239 (0.045918)
<i>Business</i>				
Size	1.64E-07 (1.45E-07)	-2.99E-07 (4.51E-07)	-9.61E-08 (3.50E-07)	3.91E-09 (1.94E-07)
Duration	-0.001060 (0.000800)	-0.000647 (0.000618)	-0.003658*** (0.001153)	0.000258 (0.000676)
Destination	-3.434374*** (1.337134)	0.656696 (0.637220)	0.844130 (0.809651)	-2.973009*** (0.769487)
<i>Law</i>				
Court	0.052548** (0.021644)	-0.024355 (0.013664)	0.013737 (0.019443)	0.005286 (0.014312)
Regulation	-1.206895 (0.688763)	-0.405831** (0.227652)	-1.047474** (0.451232)	0.029712 (0.229709)
Printed Forms	-2.241009 (1.320196)	-1.540262*** (0.634831)	-0.166312 (0.836609)	0.434937 (0.701405)
<i>Economic Environment</i>				
Trade Value	-0.000278 (0.000385)	-0.001290 (0.000336)	0.000117 (0.000650)	0.000347 (0.000353)
Delays	-369.4410 (174.0017)	201.4980** (103.4598)	-246.8500 (141.5168)	-77.16169 (110.2581)
Piracy	939.6121** (416.7200)	-358.8144 (222.3928)	479.7106* (273.5278)	101.3666 (234.7013)
Time trend	-0.109035 (2.702863)	2.460667 (0.651192)	3.169087*** (1.341868)	-0.463498 (0.697621)
Log likelihood	-83.86735	-154.9823	-77.18222	-135.1788
N	280	280	280	280

Conclusions

The implications of differences among contracts regarding design have been discussed at great length within economics. The multiplicity of theoretical debates about definition of terms, methodology or focus in the analysis offers us an idea about the importance of such issues. Unfortunately, the proliferation of theoretical papers and the development of mathematical models contrast with the lack of interest about empirical analysis. This chapter aims to fill the gap between theory and reality.

In the chapter, following the S-W model, I tested the hypothesis that 16th century merchants used contracts for the Atlantic trade as screening devices. The hypothesis was controlled for using factors such as legal regulation on contracts, the

relevance of the business or the economic environment. For the test, I used collateral requirements and the complexity of contracts, as measured by the number of clauses.

Regarding collateral, I detect an adverse selection effect since suspicious individuals are willing to accept higher collateral requirements. Results also show an incentive effect and the increment of collateral will, in general, drive individuals in general to select riskier destinations with higher expected profits.

Additionally, the complexity of contracts was tested through clauses running a set of regressions: one for the total number of clauses in general and others for every type of clause. In total terms, and despite the influence exerted by legal norms, results highlight that duration was a crucial element in the design of the contract. According to this, stronger economic relationships were less regulated while for business deals, principals introduced more provisions in the contract.

The whole story changes when distinguishing among clauses. For guarantee, penalties and obligations, principals had more authority to introduce specific provisions which were used to screen among debtors. In all these regressions, results evidence an adverse selection effect. The payment conditions, however, seem to be more legally regulated. The explanation lies in the importance of such conditions which are essential for the contract from the legal point of view.

Appendix

Variables in the regression

Dependent Variables

Collateral: The degree of collateral requirements per contract

All clauses: Total number of clauses per contract

Guarantee: Dummy variable which takes value 1 for at least one guarantee clause per contract and 0 otherwise.

Penalty: Dummy with value 1 for at least one penalty clause per contract

Payment: Dummy similar to penalty.

Obligation: Dummy variable defined as penalty.

Explanatory variables

Personal Reputation: The measures from reputation have followed triple criteria: institutions membership, news and contracts signed. I equally estimate reputation for debtors (D_i , D_n , D_c), and principals (P_i , P_n , P_c).

Information from institutions has been proxied with Schäfer (2003) Mariluz Urquijo (1998), and Heredia (1983). All these books contain list of members from different institutions related to trade. While Ernesto Schäfer analyses members of the Indies' Council and the House of Trade, Mariluz Urquijo collects information from local institutions as the Town Council and Antonia Heredia includes list of merchants from the Consulate in Seville.

Among the wide historical literature to estimate the relevance of traders or news I distinguish between groups of merchants and trade in general. Regarding groups: merchants from Burgos in Palenzuela (2001), Pike (1972) or Caunedo (1983); Genoese merchants in Otte (1961), Otte (1963) or Pike (1966); merchants from the Basque Country in García Fuentes (1991). Regarding trade in general: Carande (1990), Otte (1996), Bernal (1992), Lorenzo Sanz (1986) or Dominguez Ortiz (1990).

Size and *Duration* are calculated using information from contracts. The first variable approaches the monetary value of the contract in maravedís and has been corrected by the Hamilton price index. The second variable is measured in days.

Destination: The popularity of different destinations throughout the century has been proxied with data about the fleet system. For every year it was compulsory for ships to register their final destination with the House of Trade, data which has been collected by Chaunu (1955). I compare for every year the total destinations of the fleet with the destinations in the contracts from the sample, with this information I have elaborate an index which measures the relative importance of every destination over the total. The variable destination will take values between 0 and 1, lower values will be interpreted as less popular markets while higher values means more popularity. For instance, if in 1540 55.69% of the ships in the fleet decided to go Mexico in the database, contracts in 1540 with Mexico as destination have the value 0,5569.

Court Efficiency (court): The average duration for the previous decade waged by the number of lawsuits, extracted by the author from index of Section Consulado, Indies Archive, Seville.

Regulation: The average norms regulating contract per decade with information from the Spanish Ministry of Culture's website, <http://www.mcu.es/archivos/lhe/>.

Notarial Forms (Forms): Average number of printed forms per decade from Bono (1980) and Amenzúa y Mayo (1950).

Navigation: From Chaunu (1955) I have calculated the proportion of *delays* per ship per decade. Also *piracy* is estimated with the rich information from the fleet system.

Trade Value: Information about taxes is fragmentary and has been collected from very different sources Sanz Eufemio (1982), Vol. 2, Céspedes del Castillo (1945), García-Baquero (1992), Chaunu (1955), Vol. 6A.

General Conclusions

An important part of microeconomic research has focused on the analysis of economic behaviour under uncertainty, and within this field, the study of decisions taken by economic agents in asymmetric information environments has been particularly relevant. As North states “how individuals make choices under conditions of uncertainty and ambiguity are fundamental questions that we must address in order to make further progress in the social sciences”.²¹⁹ This has been precisely my aim in this thesis, which has analysed in depth the investment decisions of individuals in the hostile environment of 16th century Atlantic trade. More specifically, I have posed here the question: how, in an adverse institutional framework, trading over long distances and with severe communication problems, did investors in Atlantic trade actually succeed?

Traditional explanations for economic transactions in high-risk scenarios rely on diversification, reputation and personal relationships to explain successful trading outcomes. These studies usually also emphasize the role played by family links, community ties and individual friendships. However, explanations based on reputation or portfolio diversification are only applicable to individuals belonging to high social statuses, yet this is a very narrow perspective from which to view a global phenomenon such as Atlantic trade. By contrast, I argue that traders’ use of alternative market institutions to control investments is essential for understanding their subsequent success at trade. These institutions included the use of an adapted medieval debt-collector system to the Atlantic trade and the use of contracts as screening devices.

²¹⁹ North (1991), p. 23.

The institutional framework designed by the Spanish Crown for the trade with America has frequently been cited as an example of inefficiency. Indeed, the Spanish state was certainly weak and changed the rules of the game according to interests of powerful groups and vested personal interests. Moreover, the organization of the Atlantic trade as a royal monopoly apparently restricted the volume of trade, and the court system performed inefficiently and delays in solving conflicts were the norm. Finally, the absolute monarch had the power to confiscate goods coming from America. These factors together should have significantly discouraged investment. Together with the sheer distance traders had to cover, it is surprising that trade was strong, sustained, and growing throughout the 16th century.

In order to make this case, in chapter four of this thesis I tested the validity of traditional arguments explaining trade. More specifically, the chapter aimed to assess the role played by trust in commercial transactions. To this end, I introduced into the analysis trust measures based on personal relationships, reputation and repeated transactions, assessing all of them as explanatory factors for investments decisions. Alternative instruments for enforcing contracts were also introduced into the analysis. In the econometric test, I controlled for the debt-collector system and endorsement. Contracts show clear evidence that merchants adopted the medieval debt-collector system in trade in America. Such documents are not entirely new for historians; a number of experts have mentioned them previously. What is new, however, is the explanation of the role of these contracts in increasing trade participation.

The results of my analysis highlight that control tools seem to perform better as explanatory variables for trade than do the traditionally focussed upon reasons. The control was carried out in a different way according to the kind of transaction. For debts and purchases contracts control was based on personal monitoring together with endorsement. By contrast, the special nature of company and agency contracts forced participants to use personal guarantees such as reputation or repeated interactions.

In addition, contracts were tested according to the economic importance of the transactions by using quantile regression models. Results show how small contracts were controlled through endorsement and institutions. For larger contracts endorsement was also frequently used together with the level of experience individuals had in trade, proxied by the average number of contracts they had signed previously.

Once the importance of the debt-collector system as an explanatory factor for trade had been recognised, my attention then turned to the nature of this control tool. In chapter five, therefore, I sought to prove that the debt-collector system was used as a solution for the moral hazard problem. Merchants discriminated among debtors according to the degree of risk involved. Consequently, only debtors of doubtful

reputation were controlled out through a personal monitoring. Concerning the decision about the most appropriate and effective time to control, the duration of the repayment period was discovered to have been the crucial factor. In this sense, longer commercial relationships sustained by long-length contracts were controlled later, whilst short-time partners were much more intensively monitored.

Interestingly, traders controlled their partners not only *ex post* but also *ex ante*. Indeed, chapter six is devoted to this issue. In this chapter I tested the hypothesis that 16th century merchants used contracts in the Atlantic trade as screening devices. I controlled for this by using factors such as legal regulation on contracts, the relevance of the business or the economic environment. I also used collateral requirements and the complexity of contracts as measured by the number of clauses as part of the test. Regarding collateral, I detected an adverse selection effect: suspicious individuals are willing to accept higher collateral requirements. Results also show an incentive effect: the increment of collateral will, in general, drive individuals to select riskier destinations with higher expected profits.

Additionally, the complexity of contracts was tested for by running a set of regressions related to the number of clauses in the contract. In particular, one regression was run for each of the total number of clauses and for every specific type of clause. With this aim in mind clauses were grouped into four categories: guarantee, penalty, payment condition and obligations. In total, and despite the influence exerted by legal norms, the results highlight that duration was a crucial element in the design of the contract. Accordingly, stronger economic relationships were less well-regulated while for business deals, principals introduced more provisions into the contract. The whole story changes when distinguishing among clauses. For guarantee, penalties and obligations, principals had more authority to introduce specific provisions which were used to screen among debtors. The payment conditions, however, seem to be more heavily legally regulated. The explanation for this lies in the importance of such conditions as are essential for the contract from the legal point of view.

Is the use of institutions working at the market level such as the debt-collector system or the use of contracts as screening devices what justifies a different model of trade in the case of 16th century Spanish Atlantic trade? Contracts analysed in the Seville archive prove that for the Spanish case a considerable proportion of the population participated in trade. America represented huge potential profits and people from different social status aspired to have a piece of the transatlantic cake. Scholars working in Atlantic trade have ignored this fact and reduced the analysis to trade inside groups of relevant merchants. Although well-known merchants monopolized a large

part of this trade we cannot restrict the object of analysis to a single group of people in this instance.

Finally, an additional goal of this dissertation has been to analyze trade in a very broad sense. I describe and analyze instruments used to control and monitor investments which allowed non-professional merchants to participate in trade in a way not usually acknowledged by economists and economic historians. In the Spanish Atlantic trade of the 16th century, the use of institutions such as the debt-collector system explains the shape of commercial relationships among individuals from different origins, occupation or social positions, relationships which allowed trade to flourish.

References

Acemoglu, D. , Johnson, S. & Robinson, J. (2002): "Reversal of Fortune: Geography and Institutions in the Making of the Modern World Income Distribution", *Quarterly Journal of Economics*, Vol. 117, N. 4, pp. 1231-1294.

Acemoglu, D. , Johnson, S. & Robinson, J. (2005): "The Rise of Europe: Atlantic Trade, Institutional Change, and Economic Growth", *The American Economic Review*, Vol. 95, N. 3, pp. 546-579.

Akerberg, D. & Botticini, M. (2000): "The Choice of Agrarian Contracts in Early Renaissance: Risk Sharing, Moral Hazard or Capital Market Imperfections?", *Explorations in Economic History*, Vol. 37, pp. 241-257.

Akerlof, G. A. (2001): "Behavioral Macroeconomics and Macroeconomic Behaviour", *Nobel Prize Lecture*, pp. 365-394.

Akerlof, G. A. (1970): "The Market for Lemons: Quality, Uncertainty and the Market Mechanism", *Quarterly Journal of Economics*, Vol. 84, pp. 488-500.

Al-Attar, Ibn (2000): *Formulario Notarial y Judicial Andalusí del Alfaquí y Notario Cordobés 399/1009*, Madrid.

Aleem, I. (1990): "Imperfect Information, Screening, and the Cost of Informal Lending: A Study of Rural Credit Market in Pakistan", *The World Bank Economic Review*, Vol. 4, N. 3, pp. 329-349.

Allen, Douglas & Lueck, Dean (1995): "Risk Preferences and Economics of Contracts", *The American Economic Review*, Vol. 85, N. 2, pp. 447-451.

Allen, R. (2003): "Progress and Poverty in Early Modern Europe", *Economic History Review*, Vol. 56, N. 3, pp. 403-443.

Álvarez Marquez, C. (2007): *La impresión y el comercio de libros en Sevilla. Siglo XVI*, Seville.

Álvarez-Nogal, C. & Prados de la Escosura, L. (2007): "The decline of Spain (1500-1850): conjectural estimates", *European Review of Economic History*, Vol. 2, pp. 319-366.

Amezúa y Mayo, A. (1950): *La vida privada española en el protocolo notarial. Selección de documentos de los siglos XVI, XVII y XVIII del Archivo Notarial de Madrid*, Madrid.

Ausubel, Lawrence W. (1999): "Adverse Selection in the Credit Card Market", University of Maryland Working Paper Series.

Ausubel, L. W. & Dawsey, A. E. (2004): "Informal Bankruptcy", University of Maryland Working Paper Series.

Bairoch, P., Batou, J. & Chèvre, Pierre (1988): *The population of European Cities. Data Bank and Short Summary of Results*, Genève.

Barbour, V. (1950): *Capitalism in Amsterdam in the Seventeenth Century*, Baltimore.

Basas Fernández, M. (1957): "Contribución al estudio del seguro marítimo en el siglo XVI", *Revista de Derecho Mercantil*, Vol. 66, pp. 307-347.

Basas Fernández, M. (1960): "Contratos de compañías mercantiles castellanas en el siglo XVI", *Revista de Derecho Mercantil*, Vol. 78, pp. 375-394.

Basas Fernández, M. (1963): *El Consulado de Burgos en el siglo XVI*, Madrid.

Basas Fernández, M. (1985): "La función del Consulado de Burgos en el apogeo económico de Castilla", *La Ciudad de Burgos. Actas del Congreso de Historia de Burgos*, Burgos, pp. 233-246.

Beaudry, P. & Poitevin, M. (1995): "Competitive screening in financial markets when borrowers can recontract", *Review of Economic Studies*, Vol. 62, pp. 401-423.

Bernal, A. M. (1992): *La financiación de la Carrera de Indias*, Seville.

Bernal, A. M. (1994): "Sobre los seguros marítimos en la Carrera de Indias, siglo XVI", *Actas del V Centenario del Consulado de Burgos (1494-1994)*, pp. 499-527.

Berg, J., Dickhaut, J. & McCabe, K. (1991): "Trust, reciprocity and Social History", *Games and Economic Behaviour*, pp. 122-142.

Berger, A. N. & Udell, G. F. (1990): "Collateral, loan quality, and bank risk", *Journal of Monetary Economics*, Vol. 25, N. 1, pp. 21-42.

Berger, A. N. & Udell, G. F. (1995): "Relationship lending and lines of credit in small firms finance", *Journal of Business*, Vol. 68, N. 3, pp. 351-381.

Besanko, D. & Thakor, A. V. (1987a): "Collateral and rationing: sorting equilibria in monopolistic and competitive credit markets", *International Economic Review*, Vol. 28, N. 2, pp. 671-689.

Besanko, D. & Thakor, A. V. (1987b): "Competitive equilibrium in the credit market under asymmetric information", *Journal of Economic Theory*, Vol. 42, pp. 167-182.

Bester, H. (1985): "Screening vs. rationing in credit markets with imperfect information", *American Economic Review*, Vol. 75, N. 4, pp. 850-855.

Bester, H. (1987): "The role of collateral in credit markets with imperfect information", *European Economic Review*, Vol. 31, pp. 887-899.

Bisin, A. & Guaitoli, D. (2004): "Moral Hazard with Non-Exclusive Contracts", *Rand Journal of Economics*, Vol. 35, N. 2, pp. 306-328.

Bono Huertas, J. (1980): "Los formularios notariales españoles en los siglos XVI, XVII y XVIII", *Anales de la Academia Matritense de Notariado*, Vol. 22, pp. 289-317.

Bono Huertas, J. (1982): *Historia del Derecho Notarial Español*, 2 Vols, Madrid.

Bono Huertas, J. & Ungueti Bono, C. (1986): *Los protocolos sevillanos en la época del Descubrimiento*, Seville.

Booth, J. R. (1992): "Contract cost, bank loans, and the cross-monitoring hypothesis", *Journal of Financial Economics*, Vol. 31, N. 1, pp. 25-42.

Borah, W. & Cook, S. F. (1963): "The aboriginal population of Central Mexico on the eve of Spanish Conquest", *Iberoamericana*, vol. 45, pp. 12-35

Borah, W. & Cook, S. F. (1974): *Essays in Population History*, University of California Press, Berkeley

Bose, Walter B. (1942): "Organización del Correo en España y en las Indias Occidentales", *Revista de Correos y Telégrafos*, n. 60, pp. 1556-1557.

Botazzi, L. , Da Rin, M. & Hellmann, T. (2006): "The Importance of Trust for Investment. Evidence from Venture Capital",

Boyd-Bowman, P. (1976): "Patterns of Spanish Emigration to the Indies until 1600", *The Hispanic America Historical Review*, Vol. 56, N. 4, pp. 580-604.

Boyd-Bowman, P. (1985): *Indice geobiográfico de más de 56 mil pobladores de la América hispánica (1493-1519)*, Mexico.

Brading, D. (1971): *Miners and merchants in Bourbon Mexico*, Cambridge.

Braverman, A. & Stiglitz, J. E. (1989): "Credit Rationing, Tenancy, Productivity, and the Dynamics of Inequality", *Working Papers on Policy, Planning and Research*, Agricultural Policy Series, The World Bank.

Campioni, E. (2007): "Monitoring and default in non-exclusive credit markets", *SSRN Working Paper Series*.

Cantera Burgos, F. (1952): *Alvar García de Santa María. Historia de la Judería de Burgos y de sus Conversos más Egregios*, Instituto Arias Montano, Madrid

Carande, R. (1990): *Carlos V y sus banqueros*, Barcelona.

Cano Ávila, P. (1988): "Contratos de compraventa en el Reino Nazarí de Granada, según el tratado notarial de Ibn Salmún", *Al-Qantara, Revista de Estudios Árabes*, Vol. 9, pp. 323-351.

Carcel Ortí, M. (1980): "Un formulario notarial del siglo XVI en la abadía de Valencia", *Estudis Historics i Documents del Arxiu de Protocols*, Vol. VIII, pp. 7-61.

Carlo, A. (1992): "Principal-Agent Problems in Early Trading Companies: A Tale of Two Firms", *American Economic Review*, Vol. 82, N. 2, pp. 140-145.

Carreras, A. (2003): "Modern Spain" in *The Oxford Encyclopaedia of Economic History* edited by Mokyr, J. , Vol. 4, pp. 546-553.

Carretero Zamora, J. (2000): "Liquidez, deuda y obtención de recursos extraordinarios (en torno a los servicios de las cortes en la época de Carlos V)" in *Carlos V y la quiebra del humanismo político en Europa (1530-1558)* edited by José Martínez Millán, pp. 443-461.

Catálogo de los Fondos Americanos del Archivo de Protocolos de Sevilla (1986), edited by Fundación de Estudios Hispano-Cubanos, 11 Vols, Seville.

Caunedo del Potro, B. (1983): *Mercaderes Castellanos en el Golfo de Vizcaya, 1475-1492*, Madrid.

Céspedes del Castillo, G. (1945): *La avería en el Comercio de Indias*, EEHA, CSIC, Seville.

Céspedes del Castillo, G. (1948): "Seguros marítimos en la Carrera de Indias" in *Anuario de Historia del Derecho Español*, Vol. XIX, pp. 61-88.

Chan, Y. & Kanatas, G. (1985): "Asymmetric valuations and the role of collateral in loan agreements", *Journal of Money, Credit, and Banking*, Vol. 17, N. 1, pp. 84-95.

Chaudhuri, K. N. (1978): *The trading world of Asia and the English East Indian Company, 1660-1760*, Cambridge

Chaudhuri, K. N. (1991): "Reflections on the organizing of pre-modern trade" in *The Political Economy of Merchant Empires* edited by James Tracy, pp. 421-442.

Chaunu, P. & Chaunu, H. (1955): *Seville et l' Atlantique, 1504-1650*, 11 Vols, Paris.

Chiappori, P. A. (2000): "Econometric Models of Insurance under Asymmetric Information", *Handbook of Insurances* edited by George Dionne, pp.

Chiappori, P. A. & Salaniè, B. (1996): "Empirical Contract Theory: The Case of Insurance Data", CREST Centre de Recherche en Economie e Statistique, Working papers series.

Chiappori, P. A. & Salaniè, B. (2000a): "Testing for Asymmetric Information in Insurance Markets", *Journal of Political Economy*, Vol. 108, N. 1, pp. 56-78.

Chiappori, P. A. & Salaniè, B. (2002): "Testing Contract Theory: A Survey of Some Recent Work", *CeSifo Working Paper Series*, N.738.

Clark, G. (2005): "The condition of the working class in England, 1209-2004", *Journal of Political Economy*, Vol. 103, N. 6, pp. 1307-1340.

Clark, G. (2007): "The long march of history: farm wages, population and economic growth, England 1209-1869", *Economic History Review*, Vol. 60, N. 1, pp. 97-135.

Clark, G. & Hamilton, G. (2006): "Survival of the richest. The Malthusian mechanism in pre-industrial England", *Journal of Economic History*, Vol. 66, N. 3, pp. 214-236.

Clark, G., O'Rourke, K. & Taylor, A. (2008): "Made in America? The New World, the Old, and the Industrial Revolution", NBER Working Papers, N. 14077.

Coco, G. (2000): "On the use of collateral", *Journal of Economic Surveys*, Vol. 14, N. 2, pp. 191-214.

Colección de documentos de Fernández de Navarrete que posee el Museo Naval edited in 1946 by Instituto Histórico de Marina, Madrid, 30 Vols.

Cook, Sherburne F. & Simpson, L. B. (1948): *The population of Central Mexico in the 16th century*, University of California Press

Crespo Solana, A. (2001): *Entre Cádiz y los Países Bajos: una comunidad mercantil en la ciudad de la Ilustración*, Cádiz.

Crespo Solana, A. (2009): "Geostrategy of a System? Merchant Societies and Exchange Networks as connection centres in the Spanish trade in the First Global Age", in *Commodities and Cultures in Circulation, 1400-1800*, special number of the *Indian Historical Review*, Vol. 36, N. 2, forthcoming.

Cruz Barney, O. (1998): *El riesgo en el comercio hispano-indiano: Préstamos y seguros marítimos durante los siglos XVI a XIX*, Mexico.

Cuesta Rodríguez, L. (1947): *Formulario notarial castellano del siglo XV*, Madrid.

Daudin, G. (2007): "Traders, Intercontinental Trade and Growth Before the Industrial Revolution", *Economic History Papers*, Universidad Carlos III de Madrid.

Davis, R. (1962): *The Rise of English Shipping Industry in the Seventeenth and Eighteenth centuries*, London.

De Carlos Morales, C. J. (2000): "Carlos V en una Encrucijada Financiera: Las relaciones entre Mercaderes-banqueros Alemanes, Genoveses y Españoles en los Asientos de 1529-1533" in *Carlos V y la quiebra del humanismo político en Europa (1530-1558)* edited by José Martínez Millán, pp. 405-429.

Deschamps, H. (1956): *Piratas y filibusteros*, Barcelona.

Dessí, R. (2009): "Contractual Execution, Strategic Incompleteness and Venture Capital", Mimeo.

De Vries, J. (1974): *The Dutch Rural Economy in the Golden Age, 1500-1700*, London.

De Vries, J. (1987): *La urbanización de Europa, 1500-1800*, Barcelona.

Dickson, P. (1967): *The Financial Revolution in England: A Study in the Development of Public Credit, 1688-1756*, New York.

Dougnac Rodríguez, A. (2004): "Las Audiencias Indianas y su Trasplante desde la Metrópoli" in *El Gobierno de un Mundo. Virreinos y Audiencias en la América Hispánica* edited by Feliciano Barrios, Cuenca, Ediciones de Castilla-La Mancha.

Durlauf, S. & Fafchamps, M. (2006): "Social Capital", in *Handbook of Economic Growth*, edited by Steven Durlauf and Philippe Aghion, Forthcoming.

Eaton, J. & Gersovitz, M. (1981): "Debt with Potential Repudiation: Theoretical and Empirical Analysis", *The Review of Economic Studies*, Vol. 48, N. 2, pp. 289-309.

Edelberg, W. (2001): "Using Observable Default Risk to Explain Interest Rate Variation in Consumer Loan Markets", Working Paper Series Federal Reserve Board.

Edelberg, W. (2004): "Testing for Adverse Selection and Moral Hazard in Consumer Loan Markets", Working Paper Series Federal Reserve Board.

Edwards, J. & Ogilvie, S. (2008): "Contract Enforcement, Institutions and Social Capital: The Maghribi Traders Reappraised", *CESifo Working Paper Series*, N. 2254.

Fafchamps, M. (1996): "The enforcement of commercial contracts in Ghana", *World Development*, Vol. 24, N. 3, pp. 427-448.

Fay, S., Hurst, E. & White, M. J. (1998): "The Bankruptcy decision: Does Stigma Matter?", University of Michigan Working Paper.

Fernández Duro, C. (1970): *Armada española desde la unión de los reinos de Castilla y de Aragón*, Museo Naval, Madrid, 9 vols.

Fernández Navarrete, M. (1954): *Colección de los viajes y descubrimientos que hicieron por mar los españoles desde fines del siglo XV*, Madrid.

Fernández Pérez, P. (1997): *El rostro familiar de la metrópolis: Redes de parentesco y lazos mercantiles en Cádiz, 1700-1812*, Madrid.

Fisher, F. J. (1940): "Commercial Trends and Policy in Sixteenth-Century England", *The Economic History Review*, Vol. 10, N. 2, pp. 95-117.

Flynn, D. & Giraldez, A. (2004): "Path dependence, time lags and the birth of globalisation: a critique of O'Rourke and Williamson", *European Review of Economic History*, Vol. 8, pp. 81-108.

Friede, J. (1951): "The *Catálogo de Pasajeros* and the Spanish Emigration to America to 1550", *The Hispanic America Historical Review*, Vol. 31, N. 2, pp. 333-348.

Friede, J. (1961): *Los Welser en la Conquista de Venezuela*, Caracas.

Fushimi, T. (2003): "El comercio ilegal de Campeche en el siglo XVII", *Revista Histórica de la Universidad Michoacana de San Nicolás de Hidalgo*, Vol. 56, pp. 114-136.

Gacto Fernández, E. (1971): *Historia de la Jurisdicción Mercantil en España*, Seville.

Garay Unibaso, F. (1989): *Correos Marítimos Españoles a la America Española*, Ediciones mensajero, Bilbao.

García-Baquero González, A. (1986): *Andalucía y la Carrera de Indias (1492-1824)*, Seville.

García-Baquero Gonzalez, A. (1992): *La Carrera de Indias: Suma de Contratación y Océano de Negocios*, Algaida, Seville.

García-Baquero González, A. & Collantes de Terán, A. & Bernal, A. M. (1992): *Sevilla*, Seville.

García de Quevedo y Concellón, E. (1995): *Ordenanzas del Consulado de Burgos de 1538*, Burgos.

García Fuentes, L. (1980): *El Comercio Español con América (1650-1700)*, Seville.

Gaynor, M. & Gertler, P. (1995): "Moral Hazard and Risk Spreading in Partnerships", *The RAND Journal of Economics*, Vol. 26, N. 4, pp. 591-613.

Ghosh, P. & Ray, D. (2001): "Information and Enforcement in Informal Credit Markets", Mimeo.

Gil, M. (2004): "Institutions and the event of the eleventh century mirrored in Geniza letters (part I)", *Bulletin of the School of Oriental and African Studies*, Vol. 6, N. 2, pp. 151-167.

Gimeno Blay, F. (1981): "Un formulario notarial del siglo XVI. Archivo Municipal de Segorbe", *Estudis Històrics i Documents del Arxiu de Protocols*, Vol. IX, pp. 263-275.

Glaeser, E. L., Laporta, R., Lopez-de-Silanes, F., Shleifer, A. (2004): "Do Institutions caused growth?", *Journal of Economic Growth*, Vol. 9, N. 3, pp. 271-303.

Glaeser, E. L. , Laibson, D. I. , Scheinkman, J. A. & Soutter, C. L. (2000): "Measuring trust", *Quarterly Journal of Economics*, August, pp. 811-846.

González de Lara, Y. (2002): "Institutions for contract enforcement and risk sharing: From the sea loan to the *commenda* in Late Medieval Venice", *European Review of Economic History*, Vol. 6, pp. 257-262.

Greene, W. (2008): *Econometric Analysis*, 6th Edition, New York.

Greenwald, B. (1979): *Adverse Selection in the Labor Market*, New York.

Greif, A. (1989): "Reputation and Coalitions in Medieval Trade: Evidence on the Maghribi Traders", *The Journal of Economic History*, Vol. 49, N. 4, pp. 857-882.

Greif, A. (1993): "Contract Enforceability and Economic Institutions in Early Trade: The Maghribi Traders' Coalition", *The American Economic Review*, Vol. 83, N. 3, pp. 525-548.

Greif, A. (1994): "On the Political Foundations of the Late Medieval Commercial Revolution: Genoa During the 12th and 13th Centuries", *Journal of Economic History*, Vol. 54, N. 2, pp. 271-287.

Greif, A. (1998): "Historical and Comparative Institutional Analysis", *American Economic Review*, Vol. 88, N. 2, pp. 80-84.

Greif, A. (2006): *Institutions and the Path to the Modern Economy*, Cambridge.

Greif, A., Milgrom, P. & Weingast, B. (1994): "Coordination, commitment and enforcement: The case of the merchant guild", *Journal of Political Economy*, Vol. 102, pp. 745-776.

Gropp, R., Scholz, J. K. & White, M. J. (1997): "Personal Bankruptcy and Credit Supply and Demand", *The Quarterly Journal of Economics*, Vol. 112, N. 1, pp. 217-251.

Guash, J. L. & Weiss, A. (1980): "Wages as sorting mechanisms: A theory of testing", *Review of Economic Studies*, Vol. 47, pp. 653-665.

Guash, J. L. & Weiss, A. (1982): "Self-Selection in the Labor Market", *American Economic Review*, pp. 132-161.

Hamilton, E. J. (1975): *El Tesoro Americano y la Revolución de los Precios en España, 1501-1650*, Ariel, Barcelona

Haring, C. H. (1925): "El Origen del Gobierno Real en las Indias Españolas", *Boletín del Instituto de Investigaciones Históricas*, Vol. 24, pp. 297-356.

Haring, C. H. (1947): *The Spanish Empire in America*, Oxford.

Haring, C. H. (1979): *Comercio y Navegación Entre España y las Indias*, México.

Harlaftis, G. & Kardasis, V. (2000): International shipping in the Eastern Mediterranean and the Black Sea: Istanbul as a Maritime centre, in *Globalisation Challenge and Economic Response in the Mediterranean before 1950*, edited by Pamuk & Williamson, London.

Harley, C. K. (1988): "Ocean freight rates and productivity, 1740-1913: the primacy of mechanical invention reaffirmed, *Journal of Economic History*, Vol. 48, pp. 851-876.

Hart, O. (2003): "Incomplete contracts and public ownership: Remarks and an application to public-private partnerships", *The Economic Journal*, Vol. 113, pp. C69-C76.

Hart, O. & Moore, J. (1988): "Incomplete Contracts and Renegotiation", *Econometrica*, Vol. 56, N. 4, pp. 755-785.

Hart, O. & Moore, J. (1998): "Default and Renegotiation: A Dynamic model of Debt", *Quarterly Journal of Economics*, Vol. 113, N. 1, pp. 1-41.

Hart, O. & Moore, J. (2007): "Incomplete contracts and ownerships: Some new thoughts", *American Economic Review*, Vol. 97, N. 2, pp. 182-186.

Hart, O. & Moore, J. (2008): "Contracts as reference points", *Quarterly Journal of Economics*, forthcoming.

Hausberger, B. & Ibarra, A. (2003): *Comercio y poder en la América colonial: Los Consulados de Comerciantes, siglos XVII-XIX*, Madrid.

Hatfield, J. & Milgrom, P. (2006): "Matching with contracts", *American Economic Review*, Vol. 95, N. 4, pp. 913-935.

Hejeebu, S. (2005): "Contract Enforcement in the English East India Company", *The Journal of Economic History*, Vol. 62, N. 2, pp. 496-523.

Heredia Herrera, A. (1983): "Historia de un depósito documental: El Archivo del Consulado de Cargadores de Sevilla", *Andalucía y América en el siglo XVI. Actas de las Segundas Jornadas de Andalucía y América*, Vol. I, pp. 485-499.

Herst, J. & Voth, H. J. (2009): "Colonial goods and the rise of European living standards", *SSRN Working Paper Series*, N. 1443730.

Hierro Anibarro, S. (1998): *El Origen de la Sociedad Anónima en España*, Tecnos, Madrid.

Hirshleifer, J. (1971): "The private and the social value of information and the reward to inventive activity", *American Economic Review*, Vol. 61, pp. 561-571.

Hoff, K. & Stiglitz, J. E. (1990): "Imperfect Information and Rural Credit Markets—Puzzles and Policy Perspectives", *The World Bank Economic Review*, Vol. 4, N. 3, pp. 235-250.

Hoff, K. & Stiglitz, J. E. (1994): "Some Surprising Analytics of Rural Credit Subsidies", *Center for Institutional Reform and the Informal Sector*, University of Maryland and College Park, Working Paper N. 132.

Ibarra, A. & del Valle Pavón, G. (2007): *Redes sociales e instituciones comerciales en el Imperio Español*, Mexico.

Jacks, D. (2004): "Market integration in the North and Baltic Seas, 1500-1800", *Journal of European Economic History*, Vol. 33, N. 3, pp. 285-329.

Johnson, S. , McMillan, J. & Woodruff, C. (2002): "Courts and Relational Contracts", *Journal of Law, Economics, and Organization*, Vol. 18, N. 1, pp. 221-272.

Karlan, D. & Zinman, J. (2007): "Observing Unobservables: Identifying Information Asymmetries with a Consumer Credit Field Experiment", Mimeo.

Kellenbenz, H. (1991): "La factoría de los Fugger en Sevilla", *Sevilla en el Imperio de Carlos V: Encrucijada entre dos Mundos y dos Épocas*, edited by Pedro Piñero Ramírez and Christian Wentzlaff-Eggebert, Seville, pp. 59-76.

Khaldun, I. (1967): *The Muqaddimah*, Princeton.

Khalil, F., Martimort, D. & Parigi, B. (2007): "Monitoring a Common Agent: Implications for Financial Contracts", *Journal of Economic Theory*, Vol. 135, N. 1, pp. 135-167.

Knack, S. & Keefer, P. (1997): "Does Social Capital Have an Economic Payoff? A Cross-Country Investigation", *The Quarterly Journal of Economic*, Vol. 112, N. 2, pp. 1251-1288.

La Ferrara, E. (2003): "Kin groups and reciprocity: A model of credit transactions in Ghana", *The American Economic Review*, Vol. 93, N. 5, pp. 1730-1751.

Laporta, R. , López de Silanes, F. , Shleifer, A. & Vishny, R. W. (1997): "Trust in Large Organizations", *The American Economic Review*, Vol. 87, N. 2, pp. 333-338.

Leeth, J. D. & Scott, J. A. (1989): "The incidence of secured debt: Evidence from the small business community", *Journal of Financial and Quantitative Analysis*, Vol. 24, N. 3, pp. 379-394.

Leffler, K. & Rucker, R. (1991): "Transaction Cost and the Organization of Production: Evidence from Timber Sales Contracts", *Journal of Political Economy*, Vol. 99, N. 5, pp. 1060-1087.

Llopis, E., Torras, J. & Yun, B. (2003): "El consumo en la España pre-industrial", special number of *Revista de Historia Económica*, Año XXI.

Lobo Cabrera, M. (1982): *La esclavitud en las Canarias Orientales en el siglo XVI (negros, moros y moriscos)*, Tenerife.

Lopez, Robert S. (1971): *The Commercial Revolution of the Middle Ages, 950-1350*, New Jersey.

López de Velasco, J. (1575): *Geografía y descripción universal de las Indias*, edited by Marcos Jimenez de la Espada, Madrid, 1971

Lorenzo Sanz, E. (1982): *Comercio de España con América en la época de Felipe II*, Vol. 1 “Los Mercaderes y el Tráfico Indiano”, Vol. 2 “La Navegación, los Tesoros y las Perlas”, Institución Cultural Simancas, Valladolid.

Lorenzo Sanz, E. (1986): “Los Ruiz Embito en el Comercio con Sevilla y América”, *Historia de Medina del Campo y su Tierra*, Vol. II, pp. 393-436

Lyons, B. R. (1996): “Empirical Relevance of Efficient Contract Theory: Inter-firms Contracts”, *Oxford Review of Economic Policy*, Vol. 12, N. 4, pp. 27-52.

Maddison, A. (2001): *The World Economy: A Millennial Perspective*, Paris, OECD.

Maddison, A. (2003): *The World Economy: Historical Statistics*, Paris, OECD.

Maddurell i Marimón, J. M. (1974): “Formulario notarial del siglo XVI”, *Estudis Historics i Documents del Arxiu de Protocols*, Vol. IV, pp. 9-27.

Maillard Álvarez, N. and Rueda Ramirez, P. (2008): “Sevilla en el mercado tipográfico (siglos XV-XVIII): De papeles y relaciones”, in *Relaciones de sucesos en la biblioteca de la Universidad de Sevilla*, Seville, pp. 13-25.

Mariluz Urquijo, J. M. (1998): *El agente de la Administración Pública en Indias*, Buenos Aires.

Marsá, M. (1993): *La imprenta en los siglos de oro*, Madrid.

Martiré, E. (2005): *Las Audiencias y la Administración de Justicia en Indias*, Madrid, UAM Ediciones.

Martz, L. (2003): *A Network of Converso Families in Early Modern Toledo. Assimilating a Minority*, Ann Arbor Institute, Michigan

McMillan, J. & Woodruff, C. (1999): “Interfirm relationships and informal credits in Vietnam”, *The Quarterly Journal of Economics*, Vol. III, N. 4, pp. 1285-1320.

Menard, Russell R. (1991): "Transport Costs and Long-Range Trade, 1300-1800: Was There an European 'Transport Revolution' in Early Modern Era?" in *The Political Economy of Merchant Empires* edited by James Tracy, pp. 228-275.

Mercado, T. de (1977): *Suma de tratos y contratos*, edited by Nicolás Sánchez Albornoz, Madrid.

Molho, Anthony & Curto, Diogo (2002): "Commercial Networks in the Early Modern World", *EUI Working Paper*, HEC, N. 2002/2.

Montoto, S. (1911): *Sevilla en el Imperio (Siglo XVI)*, Seville.

Mörner, Magnus (1979): *Evolución Demográfica de Hispanoamérica durante el Periodo Colonial*, Stockholm.

Neace, M. B. (1999): "Entrepreneurs in Emerging Economies: Creating Trust, Social Capital, and Civil Society", *Institutions, Contracts and Organizations: Perspectives from New Institutional Economics*, London, pp. 125-146.

North, D. C. (1981): *Structure and Change in Economic History*, New York.

North, D. C. (1990): *Institutions, Institutional Change, and Economic Performance*, London.

North, D. C. (1991): "Institutions, Transaction Costs, and the Rise of Merchant Empires" in *The Political Economy of Merchant Empires* edited by James Tracy, pp. 22-40.

North, D. C. & Thomas, R. P. (1976): *The Rise of the Western World. A New Economic History*, Cambridge.

North, D. C. & Weingast, B. R. (1989): "Constitutions and Commitments: evolution of Institutions governing public choice in 17th century England", *Journal of Economic History*, Vol. 49, pp. 803-832.

North, D. C., Milgrom, P. R., Weingast, B. R. (1990): "The role of institutions in the revival of trade: The medieval Law Merchant, private judges and the Champagne Fairs", *Economics and Politics*, Vol. 12, N. 2, pp. 1-23.

Oliva Melgar, J. M. (1992): "Puerto y puerta de las Indias", *Sevilla, siglo XVI, el corazón de las riquezas del mundo*, edited by Carlos Martínez Shaw, Madrid, pp. 93-109.

Oliva Melgar, J. M. (2004): *El Monopolio de Indias en el siglo XVII y la Economía Andaluza: La Oportunidad que Nunca Existió*, Huelva.

O'Brien, P. (1982): "European Economic Development: The Contribution of the Periphery", *The Economic History Review*, Vol. 35, N. 1, pp. 1-18.

O'Rourke, K. & Williamson, J. (2002a): "After Columbus: Explaining Europe's Overseas Trade boom, 1500-1800", *The Journal of Economic History*, Vol. 62, N. 2, pp. 417-456.

O'Rourke, K. & Williamson, J. (2002b): "When did globalization begin?", *European Review of Economic History*, Vol. 6, pp. 23-50.

Orgler, Y. E. (1970): "A credit scoring model for commercial loans", *Journal of Money, credit, and banking*, pp. 435-455.

Ostos Salcedo, P. (1998): "Aranceles notariales de Córdoba", *Historia, Instituciones, Documentos*, Vol. 25, pp. 503-523.

Otte, E. (1957): "Gonzalo Fernandez de Oviedo y los Genoveses en el Primer Registro de Tierra Firme", pp. 515-519.

Otte, E. (1963): "Empresarios Españoles y Genoveses en los Comienzos del Comercio Atlántico: La Avería de 1507", *Revista de Indias*, vols. 93-94, pp. 519-530.

Otte, E. (1996): *Sevilla y sus mercaderes a fines de la Edad Media*, Seville.

Palenzuela Domínguez, N. (2003): *Los Mercaderes Burgaleses en Sevilla a Fines de la Edad Media*, Universidad de Sevilla, Sevilla

Pamuk, S. (2008): *Ottoman Empire and its institutions*, Istanbul.

Pardo Rodríguez, L. (1998): "Aranceles de escribanos públicos en Sevilla", *Historia, Instituciones, Documentos*, Vol. 25, pp. 525-536.

Pérez-Mallaina, P. E. & Gil-Bermejo García, J. (1985): "Andaluces en la navegación trasatlántica: Vida y muerte en la Carrera de Indias", *Andalucía y América en el siglo XVIII*, Vol. 1, pp. 271-296.

Pomeranz, K. (2000): *The Great Divergence: China, Europe and the Making of the World Economy*, Princeton.

Prendergast, C. (1999): "The provision of Incentives in Firms", *Journal of Economic Literature*, Vol. 37, N. 1, pp. 7-63.

Phelps Brow, E. H. & Hopkins, S. V. (1956): "Seven Centuries of the Prices of Consumables, compare with the Builders' Wage-Rate", *Economica*, Vol. 23, N. 92, pp. 296-314.

Pike, R. (1966): *Enterprise and Adventure: The Genoese in Seville and the Opening of the New World*, London, Cornell University Press

Pike, R. (1972): *Aristocrats and Traders. Sevillian Society in the 16th Century*, London, Cornell University Press.

Polanyi, K. (1957): "Evolution of the market pattern" in *The Great Transformation*, Boston.

Prendergast, C. (1999): "The Provision of Incentives in Firms", *Journal of Economic Literature*, Vol. 37, N. 1, pp. 7-63.

Ramos Palencia, F. (2001): "Pautas de Consumo Familiar en la Castilla Preindustrial: Palencia, 1750-1850", *Revista de Historia Económica*, Año XIX, pp. 37-60.

Rauch, J. E. (2001): "Business and social networks in international trade", *Journal of Economic Literature*, Vol. XXXIX, pp. 1177-1203.

Rehme, P. (1941): *Historia Universal de Derecho Mercantil*, Madrid.

Rei, Claudia (2009): "Labour Compensation in the Portuguese and Dutch Merchant Empires", Working Paper, Vanderbilt University.

Rei, Claudia (2009b): "The Organization of Merchant Empires: Portugal, England and the Netherlands", Working Paper, Department of Economics, Boston University.

Reyes Gomez, F. (2000): *El libro en España y América. Legislación y censura (siglos XV-XVIII)*, Madrid.

Rojas García, R. (2009): *La institución notarial en Sevilla durante el reinado de Carlos V*, Unpublished PhD dissertation, University of Seville.

Rönnbäck, K. (2009): "Integration of global commodity markets in the early modern era", *European Review of Economic History*, Vol. 13, pp. 95-120.

Roth, A. & Rothblum, U. (1999): "Truncation strategies in matching markets – in search of advice for participants", *Econometrica*, Vol. 67, pp. 21-43.

Roth, A. & Sotomayor, M. (1990): *Two-Sided Matching, A Study in Game Theoretical Model Analysis*, Cambridge.

Rothschild, M. & Stiglitz, J. E. (1976): "Equilibrium in competitive insurance markets: an Essay on the Economics of the Imperfect Information", *Quarterly Journal of Economics*, pp. 629-49.

Salaniè, B. (2005): *The economics of contracts*, 2nd edition, 1st edition in 1997

Schäfer, E. (2003): *El Consejo Real y Supremo de las Indias*, Barcelona, Marcial Pons.

Sánchez-Albornoz, N. (1973): *La población de América Latina. Desde los tiempos precolombinos hasta el año 2000*, Alianza Universidad, Madrid

Serfes, K. (2005): "Risk sharing versus incentives: Contract design under two-sided heterogeneity", *Economics Letters*, 88, pp. 343-349.

Siamwalla, A. and others (1990): "The Thai Rural Credit System: Public Subsidies, Private Information, and Segmented Markets", *The World Bank Economic Review*, Vol. 4, N. 3, pp. 271-295.

Slade, M. (1996): "Multitask Agency and Contract Choice: An Empirical Exploration", *International Economic Review*, Vol. 37, N. 2, pp. 465-486.

Spence, M. A. (1973): "Job market signaling", *Quarterly Journal of Economics*, Vol. 87, N. 3, pp. 355-374.

Spence, M. A. (2001): "Signaling in Retrospect and the Informational Structure of Markets", *Nobel Prize Lecture*, pp. 407-444.

Spier, K. E. (1992): "Incomplete contracts and signaling", *RAND Journal of Economics*, Vol. 23, N. 3, pp. 432-443.

Stiglitz, J. E. (1974): "Incentives and Risk Sharing in Sharecropping", *Review of Economic Studies*, Vol. 41, N. 2, pp. 219-255.

Stiglitz, J. E. (1976): "Prices and queues as screening devices in competitive markets", *IMSS Technical Report*, N. 212, Stanford University.

Stiglitz, J. E. (1990): "Peer Monitoring and Credit Markets", *The World Bank Economic Review*, Vol. 4, N. 3, pp. 351-366.

Stiglitz, J. E. (2001): "Information and the Change in the Paradigm in Economics", *Nobel Prize Lecture*, pp. 472-540.

Stiglitz, J. E. & Weiss, A. (1981): "Credit Rationing in Markets with Imperfect Information", *American Economic Review*, Vol. 71, N. 3, pp. 393-410.

Temple, J. & Johnson, P. (1998): "Social Capability and Economic Growth", *The Quarterly Journal of Economic*, Vol. 113, N. 3, pp. 965-990.

Tau Anzoátegui, V. (2000): *El poder de la costumbre. Estudios sobre el derecho consuetudinario en la América hispana hasta la emancipación*, Buenos Aires.

Tirole, J. (2008): "Cognition and Incomplete Contracts", forthcoming, *American Economic Review*.

Townsend, R. M. (1979): "Optimal Contracts and Competitive Markets with Costly State Verification", *Journal of Economic Theory*, Vol. 21, pp. 265-193.

Tracy, J. D. (1991): *The Political Economy of Merchant Empires*, Cambridge.

Tracy, J. D. (1993): *The Rise of Merchant Empires: Long-distance Trade in the Early Modern World, 1350-1750*, Cambridge.

Trivellato, F. (2009): *The familiarity of Strangers: The Sephardic Diaspora, Livorno, and Cross-Cultural Trade in Early Modern Period*, New York.

Udry, C. (1990): "Credit Markets in Northern Nigeria: Credit as Insurance in a Rural Economy", *The World Bank Economic Review*, Vol. 4, N. 3, pp. 251-269.

Vallejo García-Hevia, J. M. (1998): "Los Navíos de Aviso y los Correos Marítimos a Indias", *Ius Fugit*, Vol. 7, pp. 197-263.

Van Zanden, J. L. (2005): "Una estimación del crecimiento económico en la Edad Moderna", *Investigaciones de Historia Económica*, N. 2, pp. 9-38.

Vas Mingo, M. del & Luque Talaván, M. (2004): *El Laberinto Comercial Naval. La Avería en el Tráfico Mercantil Indiano*, Universidad de Valladolid, Valladolid.

Vila Vilar, E. (1991): *Los Corzo y los Mañara: Tipos y arquetipos del mercader con Indias*, Seville.

Voigtländer, N. & Voth, H. J. (2008): „The Three Horsemen of Growth: Plague, War and Urbanization in Early Modern Europe", *SSRN Working Paper Series*, N. 1029347.

Wagner, K. (1982): *Martín Montesdeoca y su prensa: Contribución al estudio de la imprenta y de la bibliografía sevillana del siglo XVI*, Seville.

Wette, H. (1983): "Collateral and credit rationing in markets with imperfect information", *American Economic Review*, Vol. 73, N. 3, pp. 442-445.

Wilson, C. (1977): "A model for insurance markets with incomplete information", *Journal of Economic Theory*, Vol. 16, pp. 167-207.

Yasuba, Y. (1978): "Freight rates and productivity in the ocean transportation from Japan, 1875-1943", *Explorations in Economic History*, Vol. 15, pp. 11-39.

Yun Casalilla, B. (1994): "Proposals to quantify long-term performance in the Kingdom of Castile, 1550-1800", in *Economic Growth and Structural Change: Comparative Approaches over the Long Run*, edited by A. Maddison and H. van der Wee, Milan.

Yun Casalilla, B. (2009): *Las redes del Imperio: Élités sociales en la articulación de la Monarquía Hispánica, 1492-1714*, Madrid.

Yun Casailla, B. (2004): *Marte contra Minerva: El precio del Imperio Español, 1450-1600*, Madrid.

Yun Casalilla, B. & Torras, J. (1999): *Consumo, Condiciones de Vida y Comercialización. Cataluña y Castilla: Siglos XVII-XX*, Valladolid.

Zack, P. & Knack, S. (2001): "Trust and Growth", *Economic Journal*, Vol. 111, pp. 295-321.