

CHAPTER SIX

TRADE NETWORKS
IN THE FIRST GLOBAL AGE:
THE CASE STUDY OF SIMÓN RUIZ COMPANY:
VISUALIZATION METHODS
AND SPATIAL PROJECTIONS

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1. Theory and Methodology

The strategy and work plan of DynCoopNet were centred on the study of co-operative networks linking various locations and agents during the Early Modern age. The main goal was to study the historical mechanisms of co-operation among self-organized trade networks during the period between 1400 and 1800. The project set out to prove that, in the period from the 15th to the 18th centuries, the world economy was increasingly characterized by widespread collaboration that went beyond the boundaries of countries and continents. It was made possible by new means of global communication and the building not only of formal but also of informal networks, frequently multinational. The main assumptions of this project were that co-operation tied together several self-organizing networks, and that the world economy became, at this period, a dynamic, open, complex, non-linear system. Thirdly, it was assumed that the history of any place could not be understood without examining how it was connected to other locations and to the system as a whole.³

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³ Extracted from *DynCoopNet Project Proposal* submitted to EUROCORES - TECT program (European Science Foundation). See also Owens, 2008.

According to DynCoopNet, co-operative self-organizing networks were characterized by a diffusion of authority; they served as a source for the creativity and innovation necessary to respond flexibly to the disruptions in commodity, information, and capital flows. DynCoopNet's strategy and work plan eventually would allow a reevaluation of worldwide dynamics from a new perspective, centred not on the structures, not on the systems, but on the agents.

Co-operation refers, precisely, to interpersonal exchange. Co-operation exists when an individual assumes a costly behaviour which brings him and others a bigger benefit (Hamilton, 1964a, 1964b). It is "a behaviour that provides a benefit to another individual (recipient), and the evolution of which has been dependent on its beneficial effect for the recipient" (West, 2011: 232). Accepting these definitions means to understand co-operation as an oriented interaction to achieve a certain goal, through a certain strategy at a specific moment. It is an arithmetical puzzle of costs and benefits, beliefs, expectations and motivations, between collective and individual interests.

Economists' definitions of co-operation focus on two fundamental characteristics. The first defines co-operation as a collective action of individuals who aim to share a certain task, lucrative for all partners (Jesus, 2009: 80). The second understands co-operation as a social process where individuals, groups and institutions act in a concerted way to reach common goals. Economic approaches, in this sense, focus not only on economic characteristics of co-operative relations (cost *vs* benefit), but also on the social characteristics of partners and their relations. Co-operative behaviour is thus driven by goals, expectations, and motivations which imply a collective or dyadic interaction between individuals and between these and the systems within which they interact over time (Axelrod, 1984: 6). In this sense, co-operation implies a social structure conditioned by historical time and space (Ribeiro, 2011: 10–14). History provides thus an excellent field to debate evolutionary models of co-operation.

Besides the theories of co-operation, self-organization theories became also a useful tool for a more accurate understanding of the dynamics under scrutiny. Self-organization is seen as a process where some form, order, or co-ordination arises out of the interactions between the components of an initially disordered system. This process is assumed to be spontaneous: it is not directed or controlled by any agent or subsystem inside or outside the system. Self-organization occurs and it can be studied in a variety of physical, chemical, biological, social, and cognitive systems. One of the most detached authors to connect the principles of self-organization with

world systems functioning is the political scientist George Modelski. He stresses the connection of the dynamics of self-organization with the concept and the dynamism of world system evolution (Modelski, 1990; Modelski, 2008). According to him “Dynamic physical, biological, and social systems evolve in such ways that order increases so that several parts are mutually adapted in what are evolutionary processes” (Modelski, 2004). The large-scale processes of the world system, as well as the social organization of humanity – which are evolutionary – may also be seen as self-organizing. Powered by a set of influential mechanisms, self-organization is thus seen as a critical feature of the world system (Jantschs, 1980). According to this understanding, one needs to highlight not only the features of disruption and unsettlement that occur in stressful periods, but also the creative and positive aspects of reorganization and the greater inclusiveness of larger harmonies. They are seen by Modelski as a necessary component of the world system, and a factor to take into consideration for its functioning. One could apply the same theoretical principles to the world system of the First Global Age.

Both theoretical approaches require the use of concepts and methodologies frequently imported from other sciences rather than history. We could mention the concept of networks; the very concepts of co-operation and self-organization or, in the methodological field, the social network analysis and the agent-based analytical approach. Abundant secondary literature has been produced on these subjects by a wide range of disciplines – sociology, economics, mathematics, and anthropology.⁴ As for network analysis, it is consensually accepted that social network theory views social relationships in terms of nodes and ties. Nodes are the individual actors within the networks, and ties are the relationships between the actors. There can be many kinds of ties between the nodes. In its most simple form, a social network is a map of all of the relevant ties between the nodes that are being studied.

Taking this as a theoretical premise, the understanding of a system depends, to a great extent, on the configuration of these complex networks. Starting from the position of the individual agents in a network and looking at their connections, one can characterize and understand the system, e.g., understand the functioning of a given social phenomenon.

⁴ For network theories, see for instance: Watts, 2006; Latham, 2002; Carrington, 2005; Knoke, 2008; Barabasi, 2003. For the economic approach on this subject see Grabher, 2006; Hill, 2002; Jackson, 2003. For the concept of co-operation and the models of analysis, cf. the accurate panorama provided by the international conference *Evolution of Cooperation – Models and Theories* (Luxemburg, 15–18 September 2009).

Following Wasserman and Faust, it is possible to accept that “network models conceptualize structures (social, economic and so forth) as lasting patterns of relations among authors” (Wasserman, 1999: 5). It means that the unit of analysis is not, in fact, the individual, but the entity consisting of an assortment of individuals and the existing links between them. According to these assumptions, the positioning of individual agents in networks (whether political, economic, or social) is an essential procedure to understand the functioning of the system as a whole. If one is to apply these assumptions to our analysis, which is centred on self-organized networks, the actor network theory principles⁵ or, more accurately, the agent-based modeling theories also reveal themselves as a useful tool (Wasserman, 1999; Haythornthwaite, 1996). In fact, agent-based modelling is required when individual behaviour is non-linear; when agent interactions are heterogeneous and when middling will not work, because the system is generally unstable (Bonabeau, 2001) – which are all conditions recognized in the historical reality under study.

On the scope of the research program of DynCoopNet, social network theories and methods became thus crucial, when trying to understand the functioning of the global system of the First Global Age as based on self-organized networks. The perception that a spatial representation was as well essential in order to highlight the dynamic complexity of the commercial and financial networks active on the ground arose concomitantly. One of the project’s underlying assumptions was that “networks happen not only in socially, economically and historically defined spheres, but also in geographically determined areas” (Schulte-Beerbühl, 2004: 17). Moreover, the first element of the acronym of DynCoopNet, *Dynamic*, asks for a space/time approach. As stated by Yuan, “some disciplines, such as geography and landscape ecology, emphasize the spatial dimension of world knowledge, and other disciplines, such as history and climatology, take timecentric approaches to organize evidences of reality. However, it is the space-time integration that provides the explanatory power to understand and predict reality. Dynamics is by definition an integration of space and time” (Yuan, 2008).

Geography provides the spatial framing for network building and dissemination (Owens, 2009; Polonia and Owens, 2010). In the last years, social sciences have launched new research questions based on a new way of understanding space, at the same time that geography is playing an important role in historical research. However, this “spatial turn” cannot be seen as a true novelty, but instead as a rediscovery of space and its

⁵ About actor-network theory, see: Serker, 2006; Law, 1999; Latour, 2005; Murdoch, 1998.

relation with people. Many of the classic histories of the last half-century and more – since Fernand Braudel's *Mediterranean World* – were spatial in the sense that the spatial relations are those that best explain the patterns of change over time (White, 2010; Braudel, 1983).

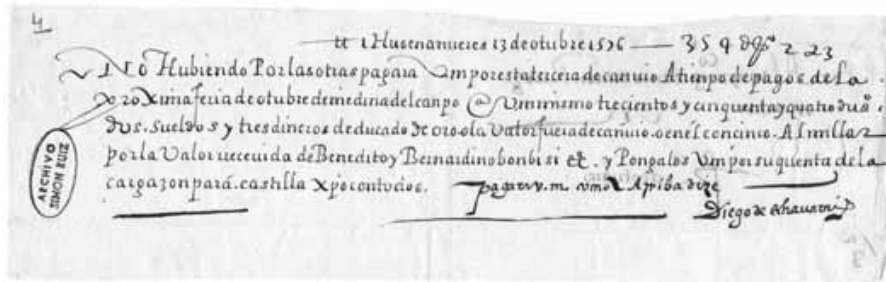
Additionally, new perspectives have emerged in historical sciences thanks to the massive databases that have become available. Nowadays social sciences are familiar with statistics and graphics. Databases are being built by historians to gather a large number of data sources and therefore allow this information to be analysed with new computational tools. In fact, the trend within the humanities and social sciences towards digital visualization tools reflects the fact that nearly all historical data have some spatial component associated with them (Torget and Wilson, 2009). Visualization methods and spatial projections became, thus, essential tools to pursue DynCoopNet's main scientific goals.

In order to experiment with a real application of this theoretical and methodological framework, the Portuguese team of DynCoopNet (from now on DynCoopNet-Pt) initiated research based on the trade and financial network of Simón Ruiz. Simón Ruiz was a new-Christian merchant, centre of a commercial and financial company operating from 1553 to 1607 which extended its influence all over Europe and overseas. Simón Ruiz and his company seem to be an excellent case study. He was born in the Castilian village of Belorado, in 1525 or 1526. He began his commercial activity around the age of 25, i.e. in the mid-16th century, as an agent of Yvon Roncaz from Nantes, in the trade of textiles in the trade fairs of Medina del Campo. These fairs were considered focal points in the circulation of people, goods and credit (Braudel, 1985: 502; Casado Alonso, 2011), encouraging Ruiz to participate in successive trade partnerships. The first of these involved him with Juan de Orbea, treasurer of Aragon, his brother André Ruiz in Nantes, and Ochoa Lanier in Bilbao (Lapeyre, 1955: 60–62). Trying to improve his profits in olive oil, spices, indigo, salt, and wheat trade, Simón Ruiz started to place trustworthy agents in places of vital geographical importance to his business. He also fostered an informants' network in places with international relevance in the world of trade and finance – Lisbon, Genoa, Rouen, Rome, Venice, or Lyon (González Torga, 2005; Casado Alonso, 2008: 54). Simón Ruiz's company was not only important for its trade. Medina del Campo was also an important exchange place, and the merchant soon became a banker. Between 1576 and 1588 he was one of the main creditors and *asientista* of the Spanish king, Philip II. In many ways, this man matched the portrait of the archetypal 16th-century merchant banker. Simón Ruiz's key role in central places in the European economy transformed him into a model, not

only within the Iberian peninsula, but also on a European level. In this sense, the potential scope of Simón Ruiz's business network and the variety and heterogeneity of his partners justified the DynCoopNet-Pt choice of his trade and financial network as a representative case study of the functioning of the mechanisms of co-operation in the second half of the 16th century (Ribeiro, 2011).

The documentary inheritance left by his company makes it possible to describe the co-operative relationships the team was looking for. On the other hand, they displayed how this agent network was built, showing how his partners, representatives, collaborators, or informants took position in an evolving network. The archive of the company, belonging to a private foundation, is now available at the Valladolid Provincial Archive, allowing DynCoopNet-Pt to use serial data sources. The team choice was oriented towards bills of exchange (about 9000 out of about a total of 21,000 were analysed), and commercial letters (as a sample, about 300 commercial letters were examined, addressed to Portuguese merchants, out of a total of about 15,000, Portuguese and non-Portuguese).

Bills of exchange appeared as a mercantile credit paper in order to solve the risks and difficulties of cash transportation. In the 15th and 16th centuries, bills of exchange became a method of payment, as well as the most frequent way of obtaining loans. Medina del Campo became a pivotal place in Europe as the place of well known financial fairs, as a centre of acceptance for exchanges, payments, and liquidations other Castilian fairs made with foreign commercial centres. Medina became the most important financial centre of the Castilian crown, attracting the most important European bankers and financial brokers of that time. To understand how DynCoopNet-Pt shaped its empirical work, it is important to understand the nature and the functioning of these data sources. Bills of exchange may engage four different players: the deliverer (who previously advances the money to the taker); the taker (the one who writes the letter of exchange and orders the payment); the beneficiary (who receives the final payment); and the guarantor (the one who pays the money).

Figure 1. Example of a bill of exchange⁶

With this basic structure, bills of exchange permit the identification of the name and the attributes of the agents; their spatial location; their relationship and connections; the circuit of money and, sometimes, the trade that motivates the respective payments. As some of these agents used legal representatives, some letters of exchange may involve more than eight agents. They may also refer to their location, professional and social status, titles of honour, or even family relationships. This information allowed the team to identify the main agents of single or repeated transactions and to reconstruct the networks that sustained such commercial transactions. It also allowed us to identify the evolving status of each agent in a network and to point out some criteria that sustained the constitution of the networks.

Figure 2. Example of a merchant letter⁷

⁶ Source: Bill of exchange, AHPV, ASR -01.1576.004.

⁷ Source: AHPV, ARS-020.1573.224.

On the other hand, merchant correspondence was one of the most important features of 16th-century trade activity. It became vital for the spatial enlargement and agent dissemination across the most important points of business. Formally, the letters do not have a standard structure. They present themselves as a more complex and richer universe of information. Extracting data from them to feed a standard database becomes a major problem. Besides the individual characteristics of the agents, this source allows the researcher to establish relationships among the commercial partners, as it gives information about the business world: prices of goods; trade circuits; features relating to insurance, freight, and freight rates; exchange rates; qualitative and quantitative information about goods; international, regional, and local markets; weights and measurement units. Merchant correspondence also enables us to identify certain events and conjunctures which conditioned the set-up and the evolution of the network: news on political crises, rise of new dynasties, wars, international conflicts, peace treaties, climate changes, calamities, market flows and investment opportunities as well as business risks could be mentioned.

This data source brought to light details about relations between agents who sustained the ties of co-operation. They indicate why some were able to influence both the functioning of markets and the behaviour of other agents, particularly those connected to co-operation mechanisms: friendships, help, trusts, and reputation are some of the elements which can be extracted from these sources. They also provide data which indicate the intensity, direction, and durability of co-operation relations, as well as the typology of the existing relationships. The data related to the geographic location of the agents were used to allow geo-analysis and the use of geo-visualization methods.

A database of the information gathered, based on Timelink software⁸ designed to support multilevel research, is now available online⁹ and a lexicon, together with a thesaurus of the levels and the mechanisms of co-operation, is available to be applied to other themes under the scope of analysis of cooperation (Polonia, 2010a, 2012). From this research resulted two PhD dissertations: *Mechanisms and Criteria of Cooperation in Trading Networks of the First Global Age. The case study of Simón Ruiz network, 1557–1606* (Ribeiro, 2011) was the result of a study focused on the mechanisms of co-operation, based on network analysis. Simultaneously, the location of the agents and the relations between places in Simón Ruiz's spatial network enabled Sara Pinto to understand the

⁸ For more information on the software please access <http://timelink.fl.uc.pt>.

⁹ The database is available in <http://timelink.dyncoopnet-pt.org/mhk>.

spatial configuration of this merchant company network, and its evolution over time during the company's existence (1557–1606) (Pinto, 2012). *The Simón Ruiz Company: Spatial analysis of a mercantile company in the 16th century* was the result of this data exploitation and visualization.

The analytical results of the project's empirical work thus ranged from the constitution and reconstitution of networks and their evolution, projected in space/time representations, to the appraisal of network models: network topology, connectivity, and density, and the appraisal of the relative positioning of each individual in the network. Besides that, the research allowed us to identify categories of partners involved in networks; the identification of variables which interfere with the model; the identification of contextual conditions which interfere with the network constitution and evolution; the identification of variables which influenced the constitution of the networks (risk patterns, risk sharing, rivalry, expectations, motivations, personal memories); the identification of the value of trust and reputation for co-operation; the categorization of co-operative behaviours; and the identification of the mechanisms of co-operation, including punishment or reward.

The following points, directly connected with the two PhD theses mentioned above (Ribeiro, 2011; Pinto, 2012), intend to provide evidence of the paths and the outcomes of the DynCoopNet-Pt research project.

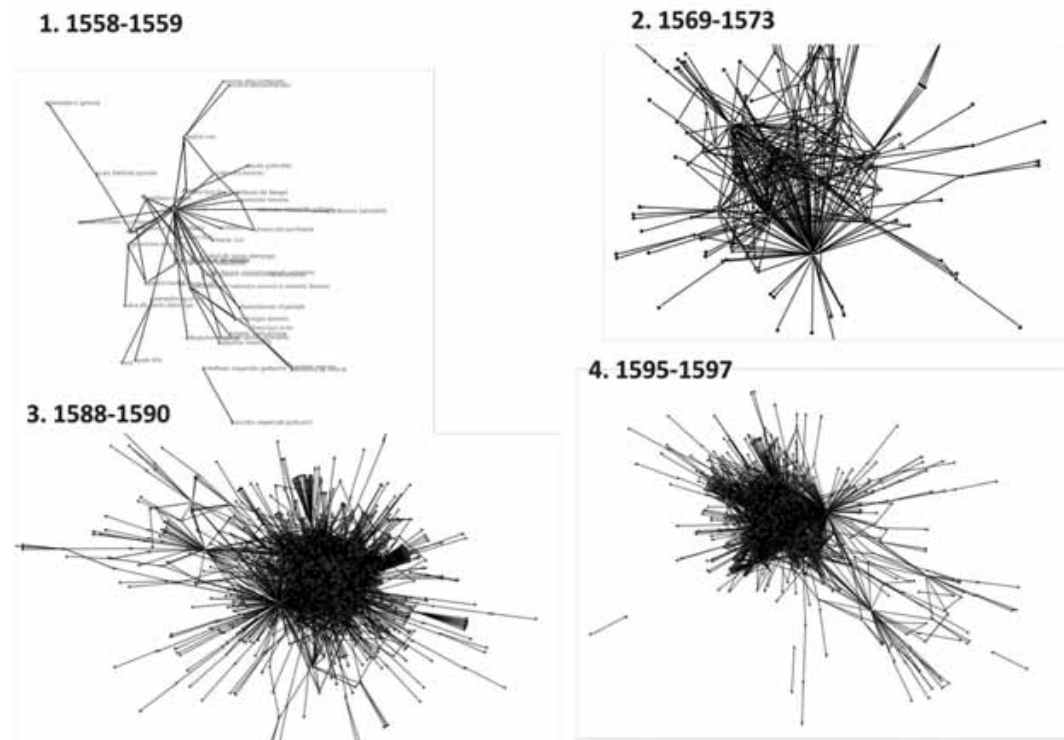
2. Network Functioning

To increase the efficiency of long-distance trade, co-operation among merchants and businessmen like Simón Ruiz emerged as a means to satisfy the needs of different agents who, alone, could not invest in such a costly and complex venture. The structured network of Simón Ruiz persisted and evolved dynamically from 1553 to the beginning of the 17th century. Inside that structure, and applying the theory of network analysis, rules of functioning evolved to sustain the health of trading and financing among partners from different nationalities, religious beliefs and socio-cultural backgrounds. Which network characteristics allowed the most profitable and efficient functioning of different trading and financial realities?

This network had its life cycle and evolved through time. Active for more than 40 years, different types of relations were fostered within this network, important for the success of business operations. Most of the links established between individuals in this case study were based on financial issues (credit, creditor/debtor, exchange partners, etc.) and commercial operations (selling/buying). However, kinship, friendship,

sociability (acquaintance, living with), trust (formal or informal representation or intermediation) and distrust (suspicion statements), cooperation (brief or lasting business partnerships), defection (refusal to cooperate) and cheating (deliberate deceiving) relations were also revealed in this research, showing that Early Modern business comprised multiple overlapping types of links to build up a set of fruitful connections.

Figure 3. Simón Ruiz network visualization



These representations indicate the variability of the number of agents and links over time in Ruiz's business network. Still, its configuration is similar throughout the second half of the 16th century. It is a star-shaped representation, due to the excessive centrality of Simón Ruiz. Since the research is based on his company's archive, he is mentioned in almost every documented act. These visualization outcomes are sketches from a partial reality. This limits the following results, as an "ego-network" consists in the existence of a focal node (such as Simón Ruiz), who is directly linked to most other agents present in the network (Knox, 2006). The (mis)representation of reality could give the impression Ruiz was determinant for contact between relevant individuals. However, the probability of direct links between those agents should be considered, as each of the individuals involved in the network had their own network neighbours who do not figure in this sample.

If the first years of Ruiz's independent business activity show a very centralized structure, that image is diluted as time goes by. The emergence of star-shaped sub-graphs of smaller dimensions reflects a strong position of certain individuals in the network. Those individuals are not only those who were linked to a great number of other agents but they also perform a central role in the network structure. They provide intermediate contacts and business between important or less important individuals in the company activity and if they were not present a significant part of the network would be disconnected. These smaller centres vary according to different time periods, which also show the degree of variability in the network's hierarchy.

Between 1565 and 1568, Simón Ruiz and the Bonvisi of Lyon are two central hubs which are not only directly connected, but use other agents placed in Lisbon, Medina del Campo, or Antwerp to facilitate their relationship. These were António Gomes de Elvas, Fernando de Morales, Diego de la Torre, Luis Gomes de Elvas, Andrés Ruiz, Francisco de Mariaca, and Francisco de la Presa. The latter dominated contacts with Spanish merchants, who after the bankruptcy of 1557 were invited to participate in the financial life of the kingdom. Through their collaboration, these merchants took advantage of the Ruiz-Bonvisi circuit to reach the large European trading houses in places like Lyon and Antwerp. Giovan de Ugalde was an important piece in this puzzle since he was the extension of Simón Ruiz in the northern Biscay region, from which the trade to Antwerp departed. The Bonvisi sent him money to forward to Antwerp where it was needed. In this case, the circulation of money was something like Simón Ruiz – Bonvisi – Giovan de Ugalde – Fernando de Frias Ceballos.

The other network axis, towards Lyon, by Agustin Spínola and other Genoese bankers in Medina del Campo and Seville, was dependent upon Genoese like Stefano Lercaro (Medina), Juan Battista Spínola (Lyon), Nicolo Grimaldo (Medina), or Lazaro Doria (Medina). They acted as commissioners in the transfers from Simón Ruiz and other Castilians to Lyon, but the final destination was to the heirs of Buenaventura Micheli and Geronimo de Arnolfini. Two central Castilian agents played such a role: Diego de Castro and Geronimo de Salamanca. The former controlled the connections with Lyon and from Lyon to Antwerp.¹⁰ Gerónimo de Salamanca appears during 1566 connecting Simón Ruiz to other Genoese houses in Madrid and in Lyon as their debtor. And houses like Lercaro and

¹⁰ Bills of exchange AHPV, ASR-01.1564.040 and ASR-01.1566.046.

Sauli are intermediating and conducting Simón Ruiz money to the Bonvisi beneficiaries.¹¹

In the period of greater expansion, 1574–1580, the relations between agents became more focused on Simón Ruiz himself, as the density of the network decreased, even if it had never been high at any period of the firm's activity. Only 1.68% of the agents were connected to more than 20 neighbours (Ribeiro, 2011: 100). Ruiz's privileged trading partners were the Portuguese Gomes de Elvas, not only allowing Ruiz to be part of the distribution of oriental spice in Castile, but also as valuable partners to the redistribution of spices in Antwerp. Luis and António Gomes, Manuel Gomes de Elvas, and António Fernandes de Elvas were also related, as well as Simón Ruiz, with other agents in Antwerp who were in touch with the most connected agents such as Filipe Jorge, Rui Nunes, or Nicolau Rodrigues de Evora. Other central figures were the Bonvisi of Lyon, linked directly to Simón Ruiz, and some representatives of Simón in Spain, such as Lope de Arciniega in Madrid, Hernando Correa de Velasco (also in Madrid, but dealing directly in and with the court), and Antonio Vasquez, a banker. In conclusion, the Simón Ruiz network was, at this point, centred on the axes Lisbon-Madrid-Antwerp and Madrid-Lyon.

Bankers were key individuals, when comparing the number of connections agents had with their occupational attributes. The Bonvisi, Antonio Vasquez, or Nicolau Rodrigues de Évora were essential to avoid the collapse of part of the network. In this period, banking activity was indispensable for the participation of the Ruiz firm in the *asientos* business, not only financing but also being able to place the money in turbulent Antwerp. They were also vital to the banking activity of Simón Ruiz himself, when he acted as payer or taker, mainly in conjunction with other Castilian agents. In these cases, important banking figures such as Gaspar Suarez, Juan Ortega de la Torre, or Francisco de Bobadilla act as intermediaries in the payment of bills of exchange to the beneficiary or the deposit of a certain amount from the donor to the taker. For example, on 5 February 1579 Simón Ruiz was sending 413 écus to the Portuguese Fernão Mendes de Sá and Diego Aleman, who were in Lyon. For that he made a deposit in the bank of Juan Ortega de la Torre from where the taker, in this case, Ventura de Marriega, picked up the amount in question.¹² In 1574, Simón Ruiz acted as a payer of a bill of exchange in Medina del Campo, but he did not pay it directly to the beneficiary, João Fernandes de Castro. Instead, he did it through a deposit in the bank of Gaspar Sanchez. The

¹¹ Vide e.g. AHPV, ASR-01.1566.009.

¹² Bill of exchange AHPV, ASR-02.1579.198.

beneficiary went to the bank and raised the amount from Simón Ruiz's account.¹³

The centrality of bankers in this network activity enhances the relevance of credit as an essential dimension of long distance trade in the Early Modern period. Credit was the sustenance of these men's activities when the investments in a journey delayed liquid profits or when there was a need of active capital for the supply of goods, freight, or insurance. The last period reflected in the sources was a time for handover and renewal of the company. From 1592 onwards, Simón, already old and ill, decided to definitely associate his nephew to his businesses, even the financial activities, creating the company of Simón y Cosme Ruiz (Lapeyre, 1955: 73). They are the hubs of the main star in the graph above. If Simón Ruiz had 94 different partners in the network, Cosme Ruiz Embito amounts to 90 partners. However, they are not the only ones. Considering that the total number of nodes between 1595 and 1597 was 643, it means that Simón and Cosme were only directly linked to a relatively small number of partners, accounting for about 14 per cent.

They are linked with two smaller stars, centred on Teutónio Nunes and Hieronimo da Fonseca, both placed in Rome. In the centre of the graph there is a dense nebula. A network topology like this implies a stronger interaction between partners, which strengthened the network activity and the collaboration between agents. Regarding the importance for the network resilience, older established partners are the ones with greater numbers of contacts.

Out of all the agents apart from Simón and Cosme Ruiz, those with more than 20 connections per node constituted a group of only 12 individuals (1.9%), and only two of them were new partners in the network. One of them was Paolo Bonvisi, the first family representative of the Bonvisi of Lyon in Spain. He was acting as a beneficiary and payer in Madrid and Medina, associated with Simón and Cosme Ruiz. Benedetto Bonvisi had died and Paolo was now the new partner of Estevan, Antonio, and Bernardino Bonvisi in Iberian affairs. The revenues from the Castilian finances were of major importance, since the decline of the Lyon fairs had forced the firm to leave that city, and they had begun to exchange in Piacenza, where Bernardino, Antonio, and Estevan were based at this time. The other new agent with significant linking was the Castilian Christoval de Aldana, with 47 connections with different agents. He had a partnership in banking with the Genoese Carlos Velutti (with a total of 43 links). They ensured the capital transfers between Simón and Cosme Ruiz and Portuguese partners in the *asientos*, such as the Veiga and Rodrigues de

¹³ Bill of exchange AHPV, ASR-01.1574.023.

Évora, or the Jorges in Lisbon.¹⁴ In the years 1595 and 1596, Aldana participated in 458 acts.

Antonio de San Roman, also in Lisbon and ensuring the same kind of operations with almost the same protagonists, was part of this group.¹⁵ Juan Battista Gallo and Juan Luis de Vitoria were the agents best positioned to ensure the opposite circuit from Medina or Madrid to Lisbon, also linking the Portuguese capital to Simón Ruiz's company.¹⁶ These top agents performed the roles of takers and payers in numerous exchange acts. The circulation of money seems to have been privileged between Castile and Lisbon. On the one hand, the main partners of Simón Ruiz's *asientos* seem to have been the Portuguese. It was important to transfer money from all partners, and Lisbon did not have a direct means to send capital to Antwerp. In such ways, merchants and bankers transferred money first to Medina or Madrid and from there to Antwerp. The profits of such operations were also transferred from Medina to Portugal. On the other hand, Lisbon was the main door to reach Portuguese colonial markets, either by buying colonial products and reselling them in other European markets, or for ensuring European goods to meet the demand of the European population overseas. In this sense, it was important to have trustworthy and successful agents like the ones identified to ensure such circulation.

Comparing the evolution of the number of acts described in the records and the number of nodes (individuals identified as operating in the network), two evolving rhythms were identified – before and after 1574 – despite the tendency for a regular increase in the number of agents in the network.

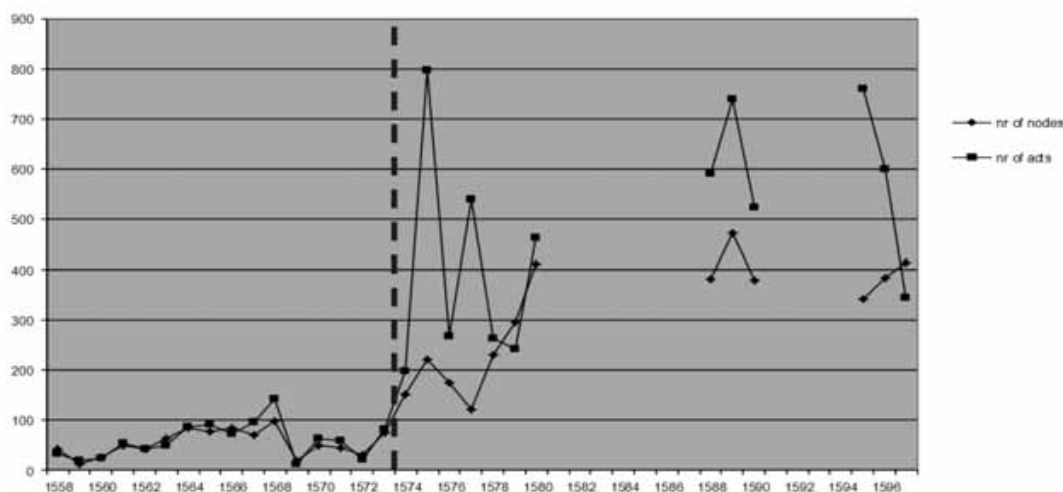
Simón Ruiz's network, in the first years of his autonomous activity as businessman, began with few partners. This scene of gradual and slow growth of the network was maintained until 1568–1569. In the first half of the 1570s the tendency was for instability, reflected in lower levels of partners and activity. After 1574, the network clearly expanded and apart from some short-term disturbances, it never went back to the previous number of nodes. After 1580 it reached a number of nodes between 300 and 400, with the exception of 1589, when the number of agents in the network exceeded 450 members.

¹⁴ Bill of exchange AHPV, ASR-05.1595.403.

¹⁵ Bill of exchange AHPV, ASR-05.1596.118.

¹⁶ For example, Bill of exchange AHPV, ASR-05.1595.195 or bill of exchange AHPV, ASR-05.1596.125.

Figure 4. Comparative evolution of the number of acts and the number of network nodes per year, 1558–1597



1574 was a key year in Simón Ruiz's business activity. For the first time, the Castilian merchant was formally part of the Castilian public debt deal in exchange for silver and rent revenues. Until then, trade was the primary activity of Ruiz. After 1574, the network witnessed a growth boom and began to be more and more dependent on financial businesses. In 1575, the number of transactions reached 800, while the number of partners did not grow on the same scale. This tendency was maintained until the end of Simón Ruiz's life. It seems that the change to banking and public loans had enforced the expansion of the network, but not in the same proportion as the number of trade or financial acts registered. Among the types of business in which Simón Ruiz was involved, the financial ones and the *asientos* were riskier. The amounts invested were equally larger and implied the danger of bigger losses. Diversifying the partners' network was designed to minimize the risks. This strategy gains visibility in two ways. First, the amount in debt or to credit was split in several bills of exchange addressed to the same beneficiary(ies), using different takers and different payers. For instance, between 26 and 31 July 1578, Simón Ruiz sent ten bills of exchange from Madrid to Lyon, to pay to Benedetto and Bernardino Bonvisi. However, the amounts in each bill are different, as are the takers and the payers, to increase the probability of success in the payment of those bills of exchange.¹⁷ The second strategy highlighting the growing number of agents is particularly prominent in the firm's activities after 1580. When Ruiz had become a well-known banker in the Spanish court he began to finance not just other merchants or the monarch

¹⁷ AHPV, ASR-01.1578.233 or AHPV, ASR-01.1578.236.

but any individual needing credit. However, the values were split among bills of exchange of really small value, usually less than 50 *reales* (Ribeiro, 2012).

According to some management specialists, a firm using this strategy acquires a set of unique information which helps it take decisions on a firm basis and reduces the level of trust placed with a small number of agents. The firm becomes less dependent upon individual agents (Beckman, 2004). At the same time, the predominant type of activity within the network seems to determine the frequency of contacts with strategic partners.

The evolution and predominant business strategy of the network is profoundly dependent on exogenous political, military, economic, and financial events. Margrit Schulte-Beerbühl also invokes this explanation in order to explain the expansion and failure of German commercial houses in London (Schulte-Beerbühl, 2007: 307–347). Unstable periods, such as the bankruptcies of 1575–1576 and 1596–1597, generated a trend of instability in network activity. In those periods, the number of partners was also affected. In the period between 1575 and 1577, the number of nodes shows a continuously decrease, whereas in 1596 and 1597, regarding the same contraction in the network activity, the number of partners grew. This differential behaviour is obviously related to the network's resilience to the crisis itself. In the first period, the firm's past activities were not profoundly embedded in financial affairs. The network structure, based on trading partners, had proved to be resistant to trade fluctuations and did not suffer extremely with the financial crisis. The answer of reducing the number of partners is marked not by the firm's health, but by an external market uncertainty. It was the reason for reinforcing existing relationships whose quality was already known. One can understand that, since "organizations seek stability and trust in inter-partner relationship" (Beckman, 2004: 262). Even so, in the overall period the network saw a great expansion in the number of partners.

Instead, in 1595–1597, the causes of the crisis derived directly from business activity in which the network was implicated, like the Spanish public debt. The reduction of the number of partners was not immediate, as in 1575, but it was a tendency from 1590 onwards. Levels of activity decreased significantly, but the number of partners rose, dividing risk among a multiple set of agents, exchanging smaller values. In 1597, the higher values circulating in the network in each act reached around 3000 *scudi*, but only appear three times in 345 acts. In 1580, at a time of network expansion and opportunities (Ribeiro, 2011: 97–110), 24 out of

432 bills of exchange had surpassed the value of 3000 *scudi*, reaching a maximum of more than 8000 *scudi*.

Table 1. Normalized exchanged values distribution in Simón Ruiz's network – 1580 and 1597 (in *maravedies*)¹⁸

Values	1580 %	1597 %
Less than 50,000	5.7	19
50,001–100,000	8.2	13.6
100,001–500,000	55.4	54.8
500,001–1 million	19.5	10.6
1 million–2 million	8.3	1.5
2 million–5 million	2.2	0.5
More than 7 million	0.7	
Total	100	100

On the other hand, comparison of the value distribution indicates an overall decrease in the values circulating in the network in 1597. The percentage of bills of exchange of less than 100,000 *maravedies* increased while letters above one million *maravedies* almost disappeared. Times of no financial disruption in the firm's activity, like 1580, favoured bills of exchange of greater value since there was less risk of investment loss or non-acceptance of bills. Levels of risk, within or outside this population, influenced the evolution of this social structure and configuration. However, it shows a quick and strong adaptability.

Figure 5. Variability of partners in different periods of Simón Ruiz's network

		Periods						
		1	2	3	4	5	6	7
Periods	1	35	9	8	2	4	2	1
	2	9	124	41	16	20	10	3
	3	8	41	209	37	46	25	17
	4	2	16	37	120	45	15	9
	5	4	20	46	45	606	143	81
	6	2	10	25	15	143	658	163
	7	1	3	17	9	81	163	787

Periods:
 1- 1557-1559
 2- 1560-1564
 3- 1565-1568
 4- 1569-1573
 5- 1574-1580
 6- 1588-1590
 7- 1595-1597

¹⁸ Source: Bills of exchange of the Fondo Simón Ruiz, AHPV.

The darker squares in the figure above represent the total number of nodes in the network during a certain period of time. The other fields indicate how many of the former agents remained in the network in previous or later periods. Ruiz changed his partners frequently and the percentage of newcomers is never less than 70 per cent in any of the periods analysed. This is a costly strategy, but, according to rational choice theory in microeconomics, strongly rational, since contact with newcomers was perceived as the best way for new gains and business opportunities (Granovetter, 2005; Allingham, 2002). On the other hand, by varying partners as much as possible Ruiz could reduce levels of uncertainty, since new and possibly contradictory sources of information could be precious in a world where information circulation determined success in long-distance trade affairs. Comparing historiographical approaches based on institutional economy, these results are surprising, as transaction costs could be reduced by long-term partnerships where trust should be easily enforced by mutual understanding and well-known predictable business practices (North, 1985; Schulte-Beerbühl, 2008). If this strategy was prevalent in the whole chronology, the behaviour of these agents in stressful periods requires further explanation. The number of older partners was bigger in those times (periods of 1569–1573 and 1595–1597), helping to reduce risks by strengthening ties with former partners, whose past collaboration had been well recorded. When the network was living prosperous moments the number of older partners significantly decreased relative to the newcomers.

The evolution of the network depended strongly on endogenous strategies, as well as on the exogenous dynamics which conditioned partners' choice. The end of the 1560s and beginning of the 1570s was a tumultuous time in historical conjuncture. War spread all over Europe, conditioning financial and commercial operations. The Antwerp market stagnated, mostly due to the rebel's blockage of the Scheldt and British corsair attacks in the North Sea (Van der Wee, 1962, II: 251–252). The conflict not only disturbed and delayed valuable cargos such as spices, but also interfered with textile production and devalued money by 70 per cent due to silver abduction by Spaniards and Rebels (Vasquez de Prada, n.d.: 125). Castilian fairs suffered from successive delays and cancellations, and money was short in Medina del Campo and Seville for trade reinvestment and financial revenues (Ruiz Martin, 1986: 278). Between 1568 and 1577 was the period of the great number of private companies' defaults in Medina del Campo and Burgos (Abed Al-Hussein, 1986: 237). Lyon had lost its regularity, followed by money disorder and speculation (Gascon, 1971: 669). In this adverse scenario for the company's business, Ruiz tried

to assure business, even at minimum levels, since his preferential markets were almost stationary and liquidity jeopardized. He chose to rely on Francisco de la Presa, the Bonvisi of Lyon, António Gomes de Elvas, Hernando de Morales, Luis Gomes de Elvas, Francisco de Maluenda, Agustín Spínola, Nicolau Grimaldo, and Fernando de Frias Ceballos to maintain a presence in Lisbon, Antwerp and Lyon.

In the 1590s the problem came from within the structure, but the strategy was also to enlarge the number of former partners. On 29 November 1596 a new bankruptcy was declared by Philip II. The king cancelled the debts he had been repaying, suspended the guarantees made by the Hacienda and dictated the end of interest for every contracted debt. Simón Ruiz was profoundly embedded in these financial operations. The answer to this demanding situation in terms of liquidity seems to have been the focus on trustworthy partners, with whom the company had enjoyed repeated trading and financial contacts. The period between 1595 and 1597 registered the greatest percentage (26%) of former partners still being active in the network – the Bonvisi, the Veiga, the Rodrigues de Évora, or the Jorges from Lisbon, for instance, relevant partners in the *asientos*.

Still, being compulsorily and permanently tied only to these agents would not only represent a cut-off in future business revenue growth, but also total dependence on the same agents, any one of which in case of default would seriously compromise Ruiz's activity. A stable yet rigid structure would not be able to adapt to new business opportunities in such troubled times as the second half of the 16th century. However, he combined novelty with solid trust in his chosen partners.

Table 2. Network Characteristics¹⁹

	Merchant Period (1553–1573)	Banker Period (1574–1598)	Entire Period (1553–1598)
Number of Nodes	648	3675	4160
Number of Edges	2132	17,282	19,226
Diameter	6	6	6
Max Degree (Simón Ruiz)	376	2060	2336
Average Degree	6.20	9.41	9.24
Cluster Coefficient	0.326	0.440	0.426
Average Path Length	2.68	2.72	2.997

The table above reveals the physical characteristics of the Simón Ruiz network, comparing the same features between the periods in which the

¹⁹ Co-authored with Flávio Pinheiro – ATP Group.

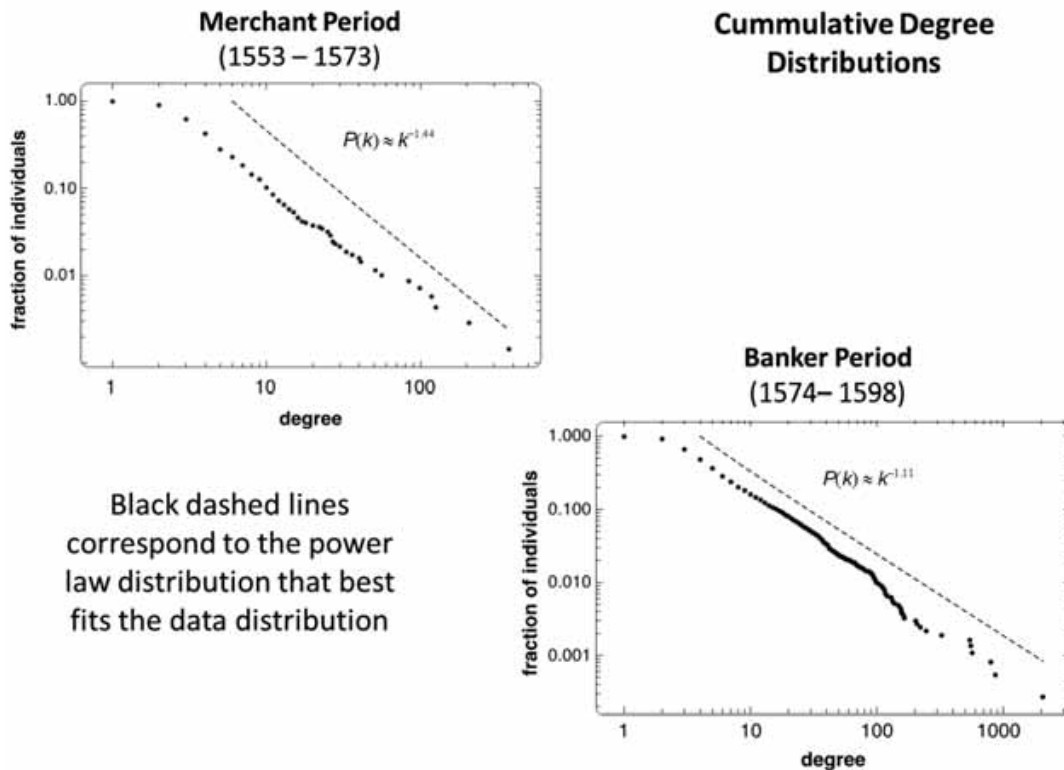
attention of the merchant was divided between two different spheres of activity. As described before, in a similar period of 20 years, the network saw considerable enlargement after 1574. However, measuring the distance from individuals in the centre of the network to agents on its fringes – the network diameter – it remains the same. Each individual is at a maximum six steps apart from any other connected individual within this population, no matter what the number of the agents involved. It not only occurs in both trading and financing periods, but also in an overall perspective of the network. This is a small distance. In this sense, agents easily connected with each other, directly or through the contacts of someone else's neighbour, even though the network density was never too high (Barabasi, 2003: 25–53).

This feature compensates to some extent for the average number of neighbours per node being not very high. However, it rises during the financial period, as financial affairs usually resulted from a chain of credit and partnerships consisting of several agents. In the late 1570s, *asientos* made by Simón Ruiz involved partnerships with a large number of agents: the Bonvisi, Francisco de la Presa, Luis Gomes de Elvas, Tomás Ximenes, Rui Lopes de Évora, António Gomes de Évora, Manuel Gomes de Évora, António Fernandes de Elvas, Carlos Nunes.²⁰ A greater overall connectivity helps to divide risk, strengthens the structure, and enhances flexibility to respond rapidly to constant changes in business conditions.

Cluster coefficient measures the probability of one's neighbour also being somebody else's neighbour. This characteristic is important to evaluate the way in which people are connected, whether in small interconnected groups or in a random and disconnected way. In both periods, the Simón Ruiz network showed a high cluster coefficient, but a short average path length. On average, people are closely linked to each other at a distance of two or three steps. This combination is characteristic of a small world network. In this model, there is always a relative proximity of agents, no matter whether there are few or many nodes (Watts, 2004, 2003). This local structure, where people are close to each other and well interconnected within smaller groups, was maintained despite the main activity of Ruiz's business.

Besides the high variability of agents entering and leaving the network, the maintenance and stability of this business social structure favours a strong adaptability which allowed Ruiz's business activity to survive adverse circumstances and partners' defaults.

²⁰ Letter sent by António Fernandes de Elvas to Simon Ruiz 30 March 1576 – AHPV, ASR-034.1576.014.

Figure 6. Cumulative Degree Distributions²¹

Before, we described this network’s connectivity in detail and with an emphasis on the agents. However, a quantitative approach to this feature can also contribute to characterizing how this population interacted. Figure 6 shows the frequency with which an individual is connected to one or more agents.

Almost everyone in this population was connected to at least two neighbours, but most of the agents had few neighbours and only a small number had many. These individuals were the same who were the centre of the smaller stars in the network snapshots visualization in Figure 3.

Again this characteristic is independent of the preferential business activity of Simón Ruiz and of the different individuals who were involved in it. The degree distribution of Simón Ruiz’s network reveals a scale-free structure, in which the connection of the individuals is organized not randomly but through an attraction mechanism. The number of future partners increased with the number of connections he already had. This is what is called “preferential attachment” (Newman, 2010: 487–490), a magnetic effect which affects agents’ popularity. It is a strongly hierarchized structure and the power-law distribution points to this

²¹ Co-authored with Flávio Pinheiro – ATP Group.

heterogeneity. These features characterize this past network as a “scale-free” network: heterogeneous, hierarchical and adaptive since the structure and connectivity patterns are maintained, despite the number of nodes (Barabási, 1999; Ravasz, 2003).

In a turbulent and demanding economic and financial scenario Simón Ruiz and his partners chose to vary as much as possible their contacts. However, agents with a higher connectivity became small hubs which were changing over time, according to important strategic functions displayed in specific circumstances, in a combination of financial solvency and strategic geographic locations. This flexibility allowed for quick mutations. This feature was the key mechanism to respond to demanding times. The system balances stability and flexibility, which also prevails in other biological and economic adaptive complex systems (Dopfer, 2004; Kauffman, 1993).

Nevertheless, if agents and key characters changed so rapidly, the structure and the way agents’ interactions were organized became stable throughout the second half of the 16th century. This is characteristic of an emergent phenomenon (Holland, 1998, 225–231). The interaction between individuals creates structures which persist when the agents who produced them disappear and are replaced by others. Even if they owe their existence to a certain group of individuals, once they are created they determine the actions of the new individuals (Carvalho, 1999: 639).

This resilience was based on a quantitative and qualitative heterogeneity and hierarchy, where most of the agents were linked to a short number of neighbours while the main part of information, goods, and credit exchanges were concentrated in a few agents. Those were the same hubs of other small stars, other than Ruiz’s himself, which means that main interactions were concentrated on the links between these star-shaped sub-graphs hubs. They controlled information, goods and credit from within their contacts, which was then spread to the other few hubs in this population. This strong hierarchy was also sustained by the short social distance between individuals fostered by a strong interconnectivity, which made the structure local to its agents. Merchants tried to be connected to important individuals so they could reduce distance to future partners. In long-distance trade this strategy enhanced the performance of the business. Whatever the dimension or the people belonging to this population, the structure of the network remains the same.

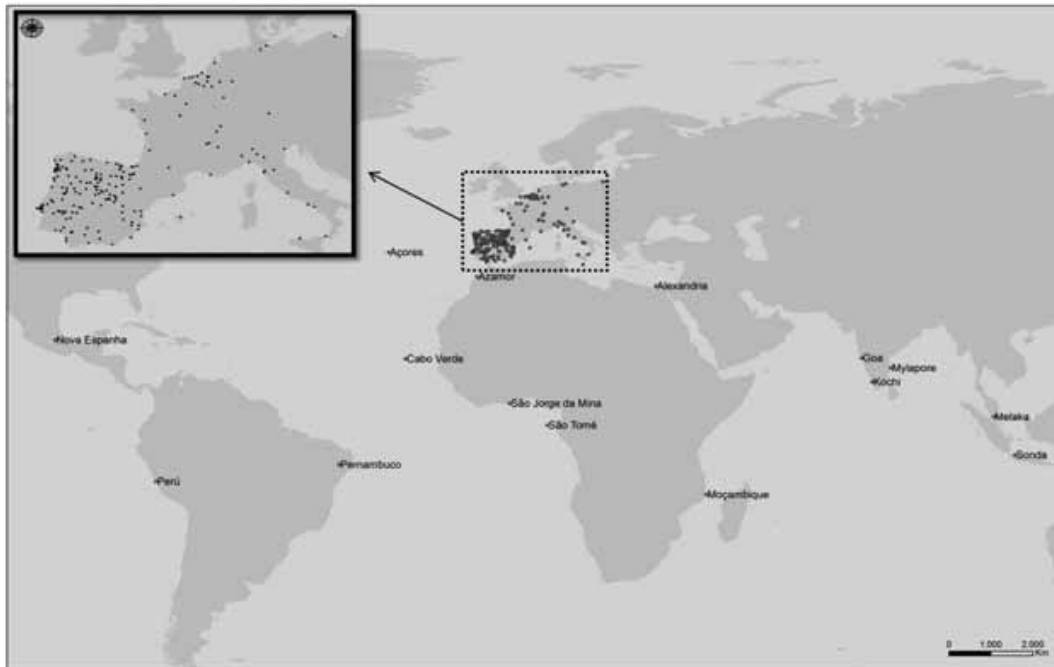
Even if these association strategies were not randomly executed, they were not imposed by a central authority or institution. The Simón Ruiz network was self-organized. Even if deeply embedded in the Iberian trading monopolies and in the policies of Spanish public debt, the

connections of business partners in it were not conditioned by the states or guilds but by the emergence of an internal organization.

3. Spatial Analysis

A spatial analysis of Simón Ruiz's trade network was developed in order to evaluate the role of space in the dynamic complexity of commercial networks, in the First Global Age. This research was (*presumably*) organized pre-eminently within the theoretical framework of spatial history, aiming to highlight the role of space in the assessment of historical phenomena.

Figure 7. Simón Ruiz's business geography: a "space-movement"



“The merchant’s catchment area was a section of one or several national territories at any given period. In a period of growth, the merchant’s trading surface might quickly expand, especially if he had access to the big business of the time – bills of exchange, currency, precious metals, ‘royal merchandise’ (like pepper, spices and silk).” (Braudel, 1983: 186).

The map in Figure 5, showing all locations mentioned in the company’s documentation, perfectly illustrates Braudel’s assumption. In fact, even if we did not know the kind of business that implies such geography, or even its volume, its world dimension illustrates by itself the importance of this trade company, including the way it is incorporated into

the global economy of the 16th century. The geographic locations are scattered worldwide, with prominence given to the three economic spaces that early modern economic historiography has defined as the most important: the Atlantic, the Mediterranean, and overseas European settlements. In Europe, the map shows the most important fairs: Poligny, Namur, Mons, Besançon, Lyon, Cologne, Antwerp, and Piacenza. The bills of exchange flow among these financial centres, as a result of the connections of Simón Ruiz with foreign commercial houses. We can also observe the Italian cities of Salerno, Naples, Rome, Pisa, and Milan, testifying to the business relations established with the powerful Italian bankers.

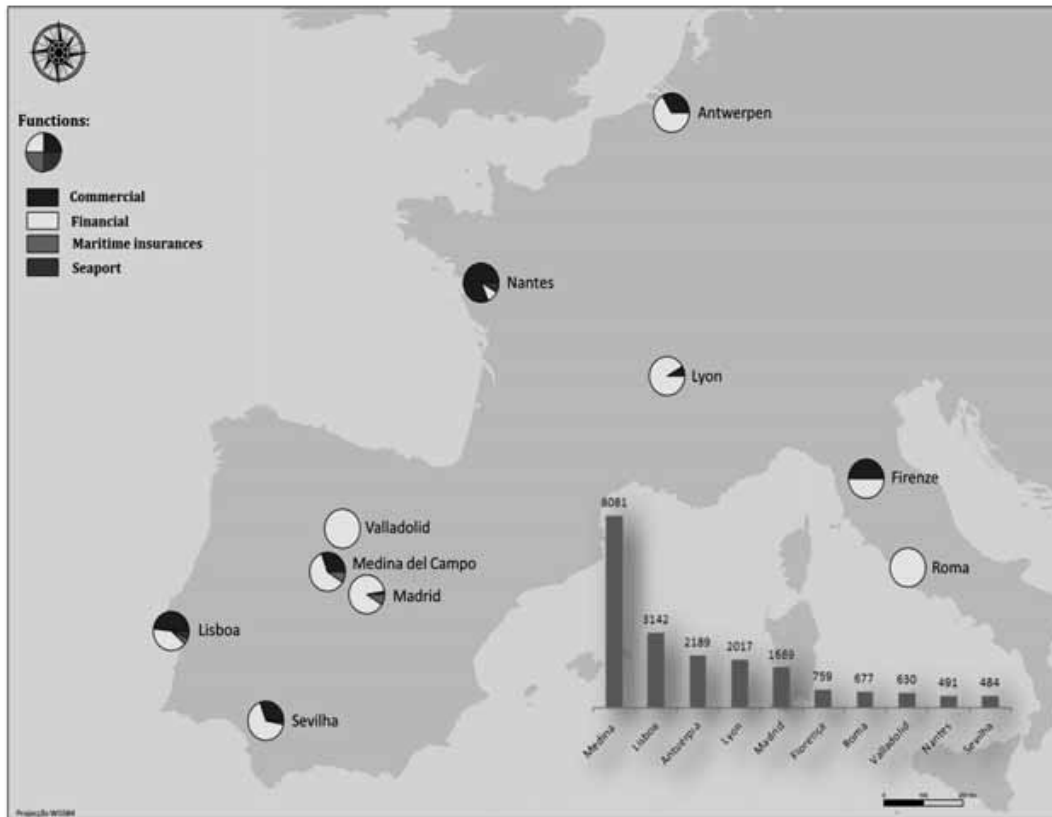
The commercial correspondence completes this geography with references to the colonial space. Its analysis reveals how the capital flows were deeply engaged, and moreover were nourished, by the overseas trade. This is particularly important considering that Simón Ruiz's company operated within the Iberian empires, having privileged access to both Spanish and Portuguese colonies. That explains the presence of the Azores, the Americas with Mexico, Brazil and Peru; Africa with Cape Verde, Mina, São Tomé and Mozambique; and Asia, with India and Southeast Asia. Moreover, the commercial correspondence also attests to the European maritime connections with overseas territories – from seaports such as Dantzig, Hamburg, Dunkerque, Le Havre, La Rochelle, Cádiz, Barcelona, or Leghorn.

We can also identify a dense cluster of places in the Iberian peninsula, especially around Castile. This gathering is explained not only by the flows of bills of exchange between Iberian cities, but particularly by the fact that many of the agents mentioned in the bills – payers, beneficiaries, or even givers – are located here. To comprehend this, we must realize that the value expressed in a bill of exchange issued, for instance, in Antwerp and paid in Lyon, can in fact be a debt of a Castilian merchant. This allows us to deeply understand the origin of the money and credit circulation in the main European centres.

Figure 8 presents the ten places most often referred in the data sources, the big nodes of the Simón Ruiz spatial network. The timeline of their appearance in the data source reveals that nearly all of them, except for Florence and Rome, are present from the beginning of the company's activities. Moreover, these places, although suffering variations over time in the density or typology of their functions, continued to perform some kind of role during the fifty years of the company's operation. One of the strongest relations was established between Medina del Campo and Lisbon. Although very fragile in the first years, this connection becomes,

especially in the 1570s, the main power source of the company's business. The associations between Simón Ruiz and the Portuguese merchants evolved from mercantile partnerships to limited companies for financial business, e.g. the *asientos*.

Figure 8. Functions performed by the most (*I think*) important places



Financially, Lisbon is the payment location of many of the bills of exchange issued in Medina. Many of them represent payment for merchandise, but they also result from interest games played by bankers with the rates of exchange. Lisbon frequently suffered from the irregularities of the financial market, balancing between money overflows (*largueza*) and periods of metal scarcity (*estreiteza*). This situation frequently blocked business opportunities, and the complaints of Portuguese correspondents are frequent.²² For example, in January 1575, Hernando de Morales complains about the one-year delay of the India and Mina armadas, and warned Lisbon of dire times if the gold from Mina did not arrive soon.²³

²² AHPV, ASR-020.1573.215 (29 December 1573).

²³ AHPV, ASR-028.1575.047 (14 January 1575).

However, reciprocity plays an important role in this relationship. Simón Ruiz represents, to the Portuguese merchants, the opportunity to take part in the world of high finance, namely in the *asientos*. In fact, from the 1580s onwards, Simón Ruiz starts to be truly harassed by Portuguese merchants offering their money to form short-term partnerships.

In this geography, a third place performs an important role in the dynamics of the goods and capital circuits – Antwerp. Here, the most important merchant families have their agents, like the Bonvisi, Spinola, Balbani, Maluenda, or Ximenes. The role of Lyon is also defined by the flow of bills of exchange. However, although Lisbon and Antwerp were the main centres where the bills were issued, Lyon was the place where they were sent to be paid. What we believe is that the Lyon fairs were mainly used as a middle place to assist the circulation of credit, benefiting from the direct correspondence with the Medina fairs. This means that Lyon allowed merchants to respond to the payment of a bill of exchange by issuing a new bill, maintaining the credit flow. In these circuits, the main agents were the Bonvisi family members, which frequently acted as Andrés Ruiz's commissionaires. Madrid appears in this scenario during the 1570s. After 1566 the Genoese *asientistas* arrived in Madrid, financing the crown and receiving *licenças de saca* (royal authorizations for exporting coin). This is the time of the creation of Madrid as political capital. By this time, another place assumed its role in the company's activities – Florence, establishing close connections with Medina and Madrid. Its role was essentially financial and related to the issuing of bills of exchange. In this Italian city there were no relevant relations with the Portuguese merchants who could receive the payments of their pepper cargoes sent to Italy through Medina. Later on, Rome takes its place in this geography. Bills of exchange were issued there from 1574, and testify to the financing of the church institutions, especially concerning payment of rents in the Spanish kingdom. Simón Ruiz also acts as a middle man between Rome and Lisbon, transferring funds.

After Medina, the place that receives more bills of exchange from Rome is Valladolid. The relation between these places, both privileged markets for merchant-bankers, proves the creditor action of Simón Ruiz. Valladolid, where Vitores Ruiz, Simón's brother, operated and where Simón lived after 1580, was the place of the power, the bureaucracy, the elite, the people that supplied the market of *juros* (interests) and *censos* (rents). An individual identification of all the payers reveals that Valladolid presents the higher results for agents with honorary titles and important roles in administration and justice. It even overtakes Medina del Campo, which has the biggest number of identified agents. The presence

of ecclesiastics seems also relevant, especially in examples that also include Rome. In fact, the majority of the bills of exchange paid in Valladolid were sent from Rome. They refer to loans made by Simón Ruiz's correspondents in this Italian city. As to the management of the company, the most important place, almost equal to Medina, is Nantes. Despite the geography provided by the bills of exchange, Nantes is almost irrelevant in the commercial correspondence. But it appears as the main centre in the former data source, managing the goods that circulate between the north (Antwerp) and the south (Seville). From the very beginning of his activities, Simón Ruiz benefits from the advantageous position, in Nantes, of his brother Andrés Ruiz who managed to have a royal privilege to trade between Nantes and Castile. To the south, in the Mediterranean, Seville was an open gate to the New World. Being an extremely unstable market, Seville required constant supervision and control. Here, the bankers played with their clients' funds which, together with the delays of the fleets, caused numerous bankruptcies. In 1567, after severe bank crises, Simón Ruiz was advised by his partners to abandon business in Seville.

Figure 9. Credit flows (1553–1606)



In the early 16th century an international banking system had emerged which linked the Spanish monarchy with the main European cities. This

system was supported by the involvement of private agents, merchants, and bankers, organized in networks, in which private and public interests were merged (Alonso García, 2006: 98–101). Until 1551, German bankers, namely the Fugger, were the main creditors of Charles V. However, during the following years, Genoese businessmen reinforced their position, being responsible for half of the financial contracts made between 1552 and 1556 (Carlos Morales, 2006: 330).

By this time, Castile was the main stage of the international financial scene, nourished by the treasures that continually arrived in Seville. The businessmen established here, especially Genoese, had as their primary goal to obtain the precious metal and export it. Even before the 1566 royal permissions to export money (the *licenças de saca*), the Genoese used a mercantile strategy, shipping high value goods and transferring the profits. These were golden times for the Castilian fairs – Medina del Campo, Rioseco and Villalón – and the time of growth of Burgos, Valladolid, Segóvia, and Seville (Ruiz Martin, 1970: 16–17).

The business activities of the Simón Ruiz company developed against this background, so that the first partnerships were mainly mercantile. In fact, until 1566, the main credit circuits were those connecting the Castilian fairs to Lyon and Seville. The inside circuit, Medina-Seville, had operated regularly until the Sevillian market showed its fragilities. Lyon had also assumed the role performed until then by Besançon, and was the middle place between Medina and Nantes (Lapeyre, 1953: 22). As we have seen, the concession of the *licenças de saca* to the Genoese caused structural changes, converting the Italians into specialized bankers gathered in the new capital of the kingdom, Madrid. A new financial centre arose and became the big promoter of the *asientos*. At this time, most *asientos* served to provide Flanders with money funds. This task was particularly difficult from 1568, because of the privateering menaces, especially by the English and then the Dutch. Therefore, apart from some periods of financial liquidity following the arrival of American treasure, the Spanish crown was repeatedly forced to appeal to the *asientistas* (Lapeyre, 1953: 15–16).

From 1575, the connection between Antwerp and Medina intensified. Actually, the connections between Antwerp and the Castilian fairs had always been very close. On the one hand, as the balance of trade remained in favour of Spain, Antwerp merchants were forced to send bills of exchange to Castilian fairs. On the other hand, the prominent Portuguese merchant group settled in Flanders regularly used this connection. As a consequence, bills of exchange circulating directly between Lisbon and Antwerp were very rare, and transfers of funds between Portugal and

Castile were very common. This meant that the axis formed by these three centres – Lisbon, Medina, and Antwerp – was the most vital in the geography of the Simón Ruiz company. This becomes especially true following the 1580s, when credit activity became the power source of the company. Through partnerships involving Portuguese merchants, Simón Ruiz acted as creditor of the Spanish crown. Often he would not even participate directly in the *asientos*, acting instead as a fund raiser collecting money to provide the large amounts necessary to supply the crown. The returns of these loans, paid in the Genoese exchange fairs, or in the cities of Rome and Florence, were delivered to Simón Ruiz, increased by interest and capitalizing the merchant banker (Ruiz Martin, 1986: 294).

After 1595 the times were hard for the Medina fairs, which suffered several interruptions. For example, news of the Indian fleet's delay in October 1594 caused disruptions in the following May fairs. This began a time of scarcity in Castile compromising the payments to the army fighting in Flanders. Once more, the Spanish king appealed to the bankers in Madrid (Silva, 1956: 31–40). In 1596, failure to repay their loans resulted in a new disruption in the fairs. The last decades of the 16th century were harsh for the businessmen. The decreased supply of precious metal, the disturbances in the manufacture of some colonial products such as sugar, the disruption of the exchange fairs system, the closing of many commercial houses, all together blocked the credit market (Silva, 1956: 5–9). By this time, the company itself had suffered a setback with the death of Simón Ruiz, in 1597. To be correct, the management of the company had been in the hands of Simón's nephew, Cosme Ruiz Embito. His action was mainly based on the partnerships established with the Portuguese *asientistas*, such as the black slave merchant Pedro Gomes Reinel. In 1604, Cosme committed himself to a payment to Reinel of 300,000 ducats, and the next year he offered to provide galleys for Philip III. At the March fair in 1606, his bills of exchange were all refused, which caused the company to go bankrupt (Lorenzo Sanz, 1986b: 420).

Figure 10. Commercial flows: places selling goods

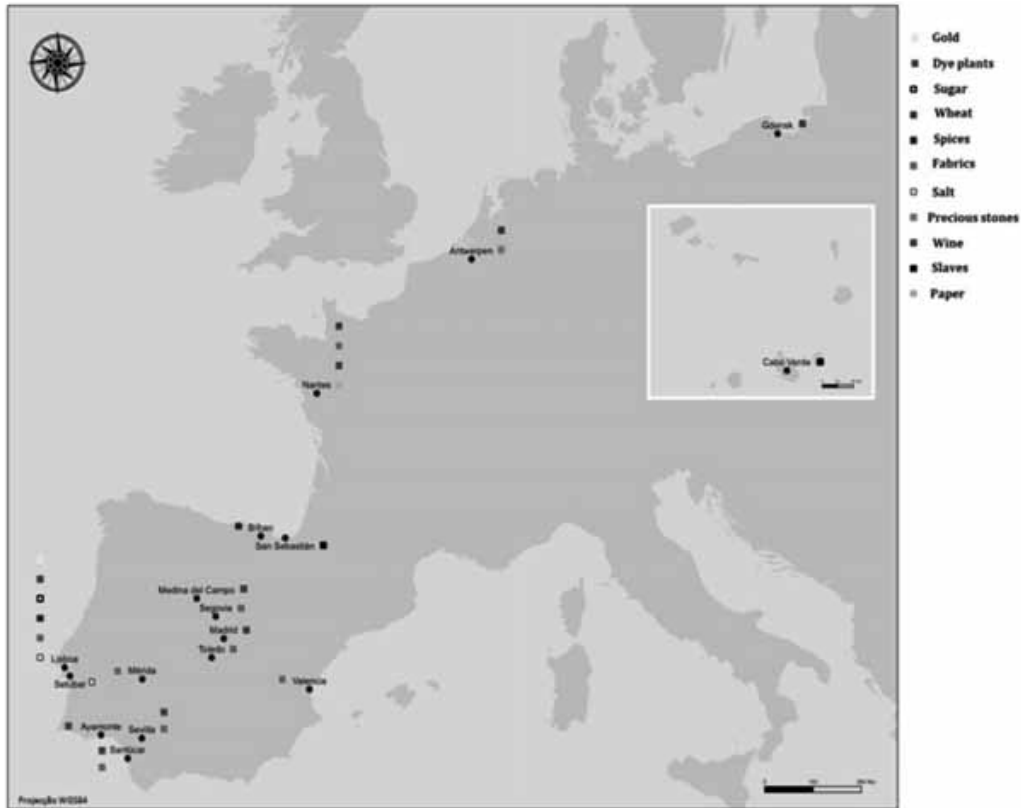
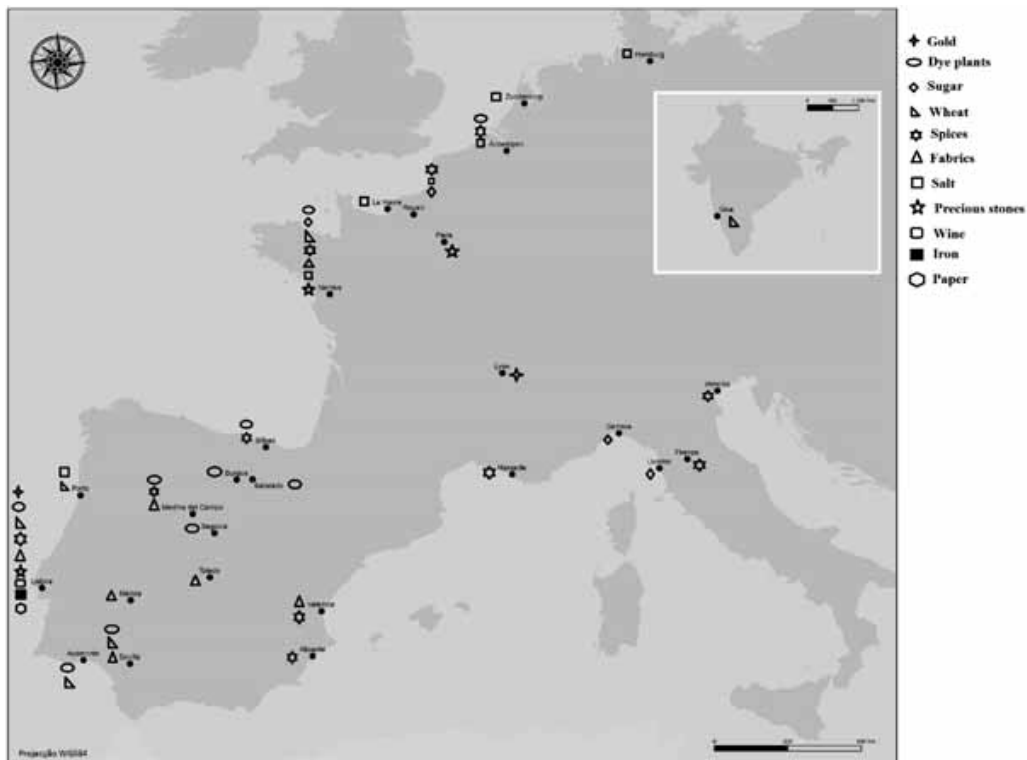


Figure 11. Commercial flows: places buying goods



The commercial correspondence exchanged between the Portuguese agents and Simón Ruiz allows us to identify goods flows and trade routes, and to obtain some qualitative information concerning the mercantile activity, like prices and capacities. The maps in Figures 8 and 9 represent the places mentioned in the data source concerning the buying or selling of goods.

From its very beginning, one of the most important businesses of the company was the textiles trade. This had two features: the distribution of the French and Spanish fabrics and supplying the textile manufactures with the dye plants coming from the overseas. The main circuit connected Nantes, Medina, and Lisbon. Two routes were used: the maritime route linking the seaports of Nantes, Bilbao, and Lisbon; and the inland route, passing through the dry port of Badajoz. Both served important textile markets, among them Segóvia, Toledo, Valência, and Medina del Campo. Other locations such as Mérida and Ayamonte were used as places where the Portuguese merchants exchanged their cargoes of dye plants for manufactured fabrics.

In equally extreme demand was salt especially that produced in Setúbal, Alcochete, and Aveiro. The bigger importers were the French seaports like Nantes and Rouen, where the Portuguese merchants sent regular cargoes. Also very common in the letters were the orders for cereals, particularly wheat, for which there was always a demand in the Portuguese market. The main suppliers were France, Flanders, and Germany. For example, in March 1567, António Gomes sold Simón Ruiz's wheat in Lisbon and even rationed it to increase prices. Not being warned by Andrés Ruiz in Nantes, he was deeply affected by the sudden arrival of Breton boats loaded with wheat.²⁴ The high price of this cereal allowed it to be the bargaining chip for the pepper sent to Europe. In both markets – salt and wheat – the Portuguese suffered from French rivalry. The cereals arriving in Lisbon were sent to other Portuguese markets such as Porto, and even overseas, as in 1571, when a cargo was sent to Goa.²⁵ Regarding suppliers we also identify a purchase of wheat in Dantzic in the Baltic.

In their letters, the Portuguese merchants reported the coming and going of the India fleets, and informed about its sightings in the Azores, or, in bad scenarios, their delays or losses. Correspondents also informed Simón Ruiz about the price of spices like pepper, cinnamon, or even ginger, referred to as “the new drug from São Tomé”.²⁶ The pepper

²⁴ AHPV, ASR-006.1567.94 (22 March 1567).

²⁵ AHPV, ASR-015.1571.27 (16 April 1571).

²⁶ AHPV, ASR-028.1575.47 (14 January 1575).

business was, however, restricted to some commercial groups, into which Simón Ruiz agents were eager to gain entry. In 1574, one of them reported a plentiful amount of pepper arriving in Lisbon, which had, however, already been chartered. He also complained that some spices, such as cinnamon, could only be bought for cash, so that he failed to do any business for the upcoming fair.²⁷ Another problem in this trade was its high transportation risk which led to a rise in insurance prices. In 1570, the Turkish threat put an end to the Portuguese merchants' attempts to send pepper to France.²⁸ However, the French market was always clamouring for this commodity and in 1575 the Portuguese agents successfully sent a cargo, using the hulks (*urcas*) usually employed in the salt trade.²⁹ Other consumer markets were Antwerp and the Italian cities. Although we found a cargo sent to Venice, in Italy the Portuguese faced strong competition from the Alexandria route. The partnerships between Simón Ruiz and the Portuguese were also an opportunity for the Castilians to gain access to other highly valuable commodities, among them silk, precious stones, sugar, and even black slaves. The connections between key places like Lisbon, Antwerp, or Medina, and the financial and mercantile routes, were strongly supported by another, secondary but equally essential, set of places. These included the seaports, the exchange fairs, or even the inland itineraries. They functioned as network systems promoting the circulation of money, goods, and men.

In Figure 12 we can see the most important exchange fairs where bills were sent. Medina del Campo exchange fairs operated twice a year, once in May, and again in October, each lasting 50 days. In the 16th century these fairs had connections with the ones held in Medina de Rioseco at Easter and in August, and with that of Villalón in Lent. The bills of exchange issued in the Medina May fair could also be paid during the September fair in Antwerp. There was also a correlation between the payments of August in Rioseco, and the Flemish Christmas fair; as also between the October fair in Medina and the Resurrection fair (Rodríguez González, 1995: 21). By the end of the 15th century, Medina del Campo fairs already had a privileged position among the Castilian fairs. During the 16th century their importance increased, and they absorbed the other Castilian fairs that became restricted to the commodities trade (Ruiz Martin, 1986: 290). During the reign of Charles V, the Medina fairs underwent a structural change, reinforcing their influence on state and

²⁷ AHPV, ASR-023.1574.215 (25 November 1574).

²⁸ AHPV, ASR-012.1570.238 (1 August 1570).

²⁹ AHPV, ARS-028.1575.29 (30 October 1575).

public funding (Rodriguez Gonzalez, 1995: 23). These exchange fairs provided for the merger between private money and state.

Figure 12. Exchange fairs

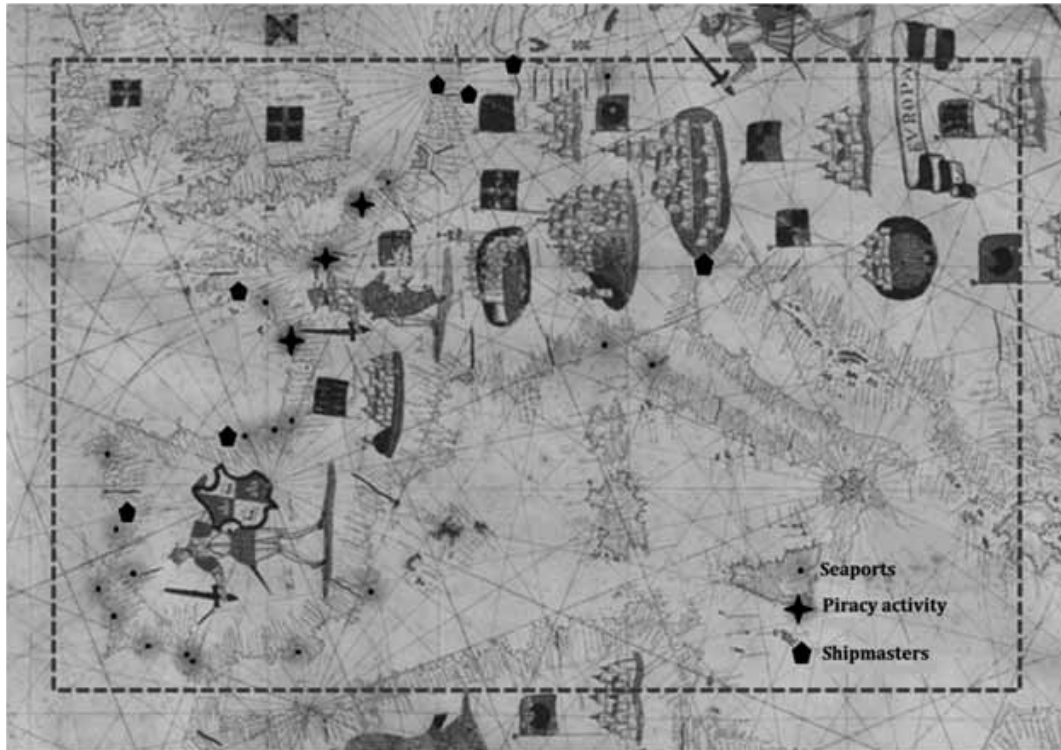


The Genoese fairs reached their peak in the very early 17th century, at which time all the large international transfers were conducted in Piaceza. Here, the Genoese bankers raised funds to supply the vast loans demanded by the Spanish crown, and appealed to various investors to diminish the associated risk. In fact, the volume of transactions produced by the state public debt, as well as by the main Genoese and Florentine groups' financial speculation, exceeded that produced by the international commercial trade (Marsilio, 2009).

In Figure 13 we spotted all the seaports mentioned in the data source in a portolan (a chart where seaports are represented).³⁰ Those seaports were mentioned in three different contexts: trade routes, privateering activity, or boat location. In the portolan we can observe the strong presence of the ports that assembled the two main movement spaces in the modern ages: the North Atlantic and the Mediterranean.

³⁰ Extract from the portolan of Joan Rizo Oliva, [1555]. *Yale University. General Collection, Beinecke Rare Book and Manuscript Library.*

Figure 13. Seaports



Among the various fields of historical research, port history has contributed most to the development of concepts such as complementarity, hierarchies, systems, and networking (Polonia, 2010b, 2011), as well as to the use of the time feature as an analytical tool. In fact, nowadays even the works regarding a small port or a specific maritime community explore its integration and context against a larger and profound regional, national, or even global background (Mauro, 1997; Jackson, 2001). Accordingly, the research about the Spanish empire and its overseas colonies acknowledges the Atlantic as a networked system whose nodal points were the seaports. In this perspective, the port cities represented the connections for the unification of a maritime-based “spatial economy” (Crespo Solana, 2012).

The time period we are discussing, the second half of the 16th century, is especially rich in political and religious conflicts, strains, and tensions that often materialized in the open seas, particularly through privateering. The Turkish menace, the Flemish wars, the religious wars in France, as well as the unceasing attacks between Spain and England, resulted in continuous international commercial blockades. This was the challenging scene in which Simón Ruiz developed his business activities, suffering many times from the failure of freight boats, the rise of maritime insurance, or even the capture of cargoes. The routes that we have described, after analysing the documentation produced by the Simón Ruiz

company, overlap the maritime spaces considered in Michel Mollat's works (Jourdin, 1995). The European circuits discussed are those connecting the French coast to the Iberian Peninsula, and those linking the big ports in the north, such as Rouen and Nantes, with the ports in the south, such as Lisbon and Cadiz. However, this framework of commercial centres, the seaports, the privateering activities, and maritime insurance, reveals a larger geography that reaches out to the Baltic in the north, to the Mediterranean in the south, and overseas both in the east and the west. The search for commodities and markets drove the company to transcend the Atlantic circuit trade. Salt and wheat took Simón Ruiz's company to the Baltic, just as spices and sugar took it to the Mediterranean, to Alicante, Valencia, Marseilles, Genoa, and Leghorn.

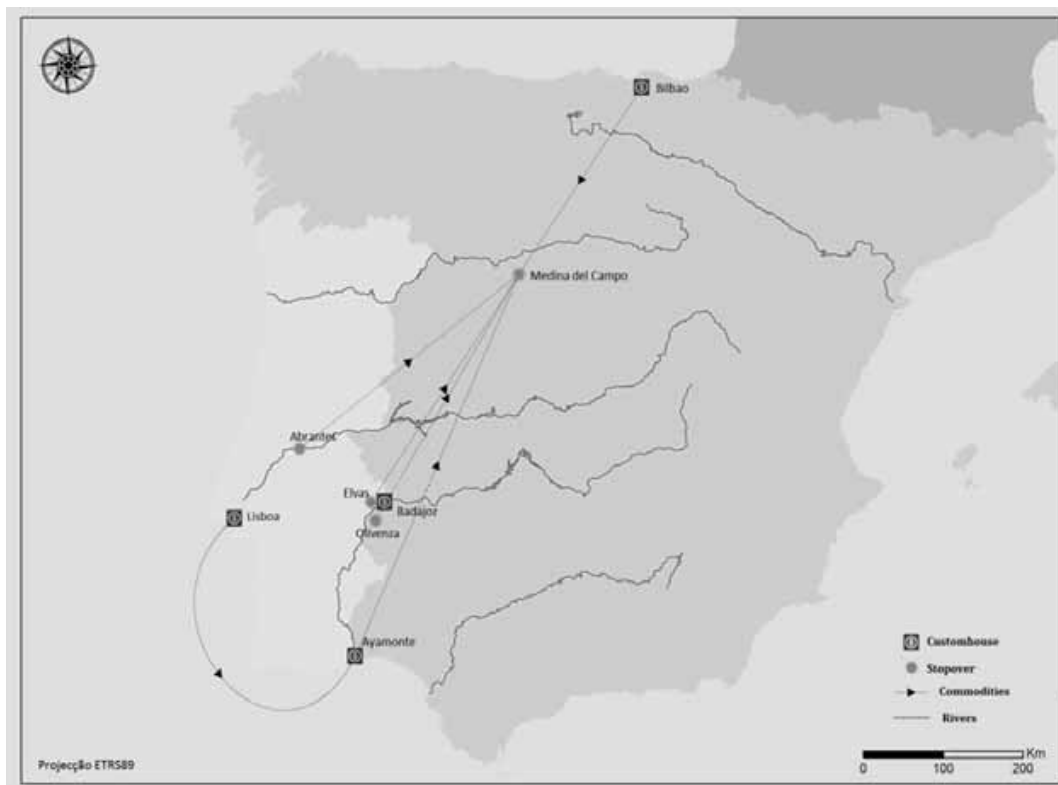
In addition to drawing conclusions about business trends, or classifying the merchant activities of the company, the spatial framework outlined reveals a deep sense of opportunity. In fact, we observe that ships freighted were Spanish, French, or even Flemish, according merely to freight opportunities, ship availability, sea danger scenarios, etc. Even so, the merchant strategies did not depend on their attachment to a specific market or commodity, but, instead, on the use of the various markets, places, and conjunctures, with a single purpose: to capitalize the operations and investments of the company.

The commodity circuits were composed, not only of the origin and destination locations, but also of intermediate places such as custom houses and stopovers. Often located between the manufacturer and the consumer market, these places were the backup structures of the commercial flows. In Figure 14 we can see how the commodities, after arriving at the seaports, were conducted to the peninsula hinterland. Regarding these itineraries, the commercial correspondence has plenty of episodes of tax fraud and corruption, especially regarding customs officers.

Although we have outlined Simón Ruiz's business geography in a very large spatial range, with locations scattered worldwide, we must acknowledge that most of the action took place within a triangular spatial framework: Antwerp – Medina del Campo – Lisbon. We have also shown that the places more relevant to the activities of the company were those with a multifunctional profile and the ones that established more connections with other places. Another crucial feature was the complementarity between locations. This can be exemplified by the relation between Medina and Lisbon. Medina exchange fairs assisted and supported the capital flows between Lisbon and the Portuguese merchants settled in Antwerp. In our research work we comprehend how the spatial

dynamics were a result of the interaction between the different functions of each place, as well as of the flows created and promoted by the spatial network. These dynamics were an important feature in the strategies of Simón Ruiz's business network.

Figure 14. Iberian Peninsula inland itineraries



However, the operation of this system can only be verified in the framework of this network's interaction with other merchant networks. An accurate analysis of the Simón Ruiz business allows us to depict geography, its own geography, which may or may not be a path applying to other networks. The history and geography of Simón Ruiz's business also show how the conditions and variations suffered by the cities over time must be explained accordingly to flexibility, reorganization and complementarity phenomena, rather than failure, decay, or submission scenarios. E.g., Fernand Braudel interprets the redirection of the capital flows to Paris after 1570 as the end of the Lyon exchange fairs. However, studies by Henri Lapeyre and Françoise Bayard verified the vitality of the French fairs until the late 16th century. Similarly, Felipe Ruiz Martín attributed the decay of the Medina fairs to the rise of Madrid as the new financial centre. Still, as reported in our dissertation, Medina del Campo remained one of the main payment locations for bills of exchange

throughout the 1580s, with some difficulties arising only in the 1590s. Even Seville resisted the banking crises around 1565, maintaining its financial centre status. In fact, Seville is the paradigm in the dichotomy of risk and opportunity that places represent to a mercantile company business strategy. It is remarkable how the risks and the restrictions presented to the trade activity are often simply surpassed and even ignored. We could easily point out privateering, war or high customs duties as mandatory reasons to exclude markets. These factors were undeniably considered by the merchants, but it can be shown that they did not overrule other considerations. The analysis of Simón Ruiz data source has also shown how the Atlantic trade between the French and Spanish coast was maintained by means of arrangements with the privateers. The connections between seaports and inland routes also allowed reorganizations of the shipments in order to avoid piracy risk (Pinto, 2012: 211–215). Finally, mercantile and financial flows were supported by a spatial network structured by central and border places. These border places include inland ports and seaports, resource centres, stopovers, custom houses – backup structures essential to the company activities. They also include cities like Rome and Florence that even if they did not constitute big nodes of capital flows, were crucial to the gathering of funds.

4. Summary and Conclusion

In conclusion, the functions performed by a specific place can be enhanced through its co-operation with another place, and by creating a relation of complementarity, resulting in an outcome to the functioning and success of the network. The spatial analysis and visualization of Simón Ruiz's spatial network turned out to be essential in order to understand how the placement of agents in specific locations and their mobility over time, how the building-up of places as economic, financial and political entities interacted with the dynamic evolution of a business company and contributed to the success or failure of a business network, and vice versa, as the use of Social Network Analysis (SNA) enabled us to understand how the network functioned when facing the challenges of an overall historical context. Using Social Network Analysis methodology historians are able to understand the action of individual agents within a certain structure which is much more than the sum of individual agents' choices and actions. In this case study, the way early modern merchants' relationships and organization were displayed illustrates strategies for making the exchange of goods, money, or information more efficient.

Even if early modern historiography has been attentive to the constitution of early modern trade networks, the social characteristics of its actors and preferential partner choice attributes,³¹ it has focused far less on the mechanisms of connection and association of individuals from a complex perspective, in which the system is much more than the sum of individuals' actions. Unfortunately, the absence of similar case studies, based on the same methodologies and questions, for the same period, but also for previous periods, does not allow a comparative and evolutionary approach. Trends in business linking strategies help to quantify hierarchical characteristics of the individuals, as well as to identify key individuals in business circuits. It permits us to relativize an individual's position rather than just describe his or her actions. Understanding the internal organization of a merchant population can explain unexpected partner choice. In this case study, not only the social attributes of the agents are relevant for linking individuals. The possibility of increasing a person's social efficiency by being well connected was no less relevant than choices based on the acquaintance of someone's good reputation or wealth.

On the whole, the DynCoopNet-Pt experience gave us the opportunity of sharing historical epistemological focus and methodologies with other disciplines and sciences, as it happens with GIS and the spatial history approach. In terms of analytical focus our research went from the analysis of events and the weaving of individual biographies to the analysis of historical dynamics; from methodologies based on source criticism to those based on statistical calculations, categorizing and modelling, including mathematic modelling;³² from monodisciplinarity to interdisciplinarity (or even transdisciplinarity). The DynCoopNet-Pt experience proved that crossing frontiers of knowledge is not only possible, but may be the only way to build new paths of knowledge, without artificial borders or unacceptable hierarchies. As historians, we learned that multidisciplinary and multimethodological approaches can improve the understanding of history, and that history can provide data and frameworks of analysis which in turn can present, by their complexity and awareness, challenges to other sciences, even those considered as hard sciences. Crossing frontiers is, in fact, not only possible, but essential to building a new paradigm of knowledge.

³¹ Subrahmanyam, 1996; Curto, 2002; Priotti, 2004; Schulte-Beerbühl, 2007; Roitman, 2008; Antunes, 2009; Trivellato, 2009; Lamikiz, 2010.

³² A contribution from Jorge Pacheco and the ATP Group has to be acknowledged as an important input to DynCoopNet-Pt. For more information on this team and its research see: <http://www.ciul.ul.pt/~ATP/>.