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World cities before globalisation: the European city network, A.D. 1300–1600

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World cities before globalisation
The European city network, A.D. 1300-1600

by

Raf Verbruggen

Submitted in partial fulfilment of the requirements
for the award of
Doctoral thesis of Loughborough University

3 June 2011

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Abstract

This dissertation is a quantitative study of the spatial business strategies of 130 late medieval and 16th-century European commercial and banking firms, the business networks of which have been put together for a structural analysis of the European city network between ca. 1300 and ca. 1600. Concretely this investigation has been carried out through the application of an interlocking network model – specifically developed for the study of the present-day global city network produced by the office networks of business service firms – to this historical case study, in order to challenge predominantly hierarchical conceptualisations of city networks which are often influenced by central place theory. After a methodological section, in which solutions are designed for reconciling the geographical model with the particularities of historical research, a first part of the analysis focuses on agency within the network, identifying and reconstructing the multiple spatial strategies used by the different agents. In a second part the overall structure and dynamics in the network are investigated, revealing the operation of Christaller's traffic principle, as well as a cyclical variation in emphasis on continental and maritime nodes within the European city network. More generally, this study demonstrates that the functioning of dynamic transnational networks based upon complementarity and cooperation rather than competition is not limited to our contemporary globalised world, but can also be found in particular historical societies.

Keywords: city networks, world cities, long-distance trade, merchant-bankers, Europe, late Middle Ages, early modern period

Preface

Being a historian as well as a geographer, with this PhD project I was provided with a wonderful opportunity to combine insights from both scientific disciplines in a truly interdisciplinary study. During the past four years I have learned a lot, although I will probably never become a specialist in all the different facets of such a wide ranging research topic as the 'European city network between A.D. 1300 and 1600'.

Although (or perhaps because) Loughborough is not really what can be called a world city, I found here a very friendly and supportive environment for working and living. Above all, I am very much indebted here to my supervisors Peter Taylor and Michael Hoyler not only for the expertise they offered me, but also for the veritable enthusiasm and interest they never ceased to show for my project, as well as for the freedom they gave me to develop my own course. More generally, the Loughborough Geography Department has always been a very welcoming place to me, filled with nice people many of whom have become friends.

Cities are always fascinating places to investigate and discover, and attendance at various conferences and workshops has allowed me to visit a number of contemporary and historical world cities in the United Kingdom and beyond, as well as to engage in interesting discussions with fellow researchers. The organisation of a student conference on 'World cities and history' – together with Julia Groβpietsch – was an enriching experience. As a visiting academic, first at the University of Ghent and later in Antwerp, I established valuable connections with geographers and historians alike. At Ghent, I owe a thank you to Ben Derudder, Frank Witlox, and everyone else at the Social and Economic Geography research unit, as well as to Eric Vanhaute, Michael Limberger and Bart Lambert in the history department. At Antwerp, I would like to thank Bruno Blondé, Peter Stabel, and especially Jeroen Puttevils, as well as other members of the Centre for Urban History. Finally, I received valuable feedback from my examiners Robert Kloosterman (University of Amsterdam) and Heike Jöns (Loughborough University).

Being an international student obviously involves much more than 'just' the research experience. Living in a different country has been a life-changing experience which very much broadened my horizons. The particular microcosm of Loughborough was perhaps and at least in some aspects not entirely different from the cosmopolitan atmosphere in which the late medieval and 16th-century businessmen – who were the principal agents producing the network I have been studying in this dissertation – operated. Many thanks to all the great new

friends I have made in Loughborough and beyond during the last four years, as well as to the 'old' friends at home in Belgium. Most importantly, I owe a lot to my family and especially my parents who supported me in everything I did from the beginning to the end, and who provided me with the tranquil environment needed to bring this project to a good end during the last months of writing up.

Raf Verbruggen, 13 October 2010

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Chapter 1
Introduction

Towns and cities cannot be understood when studied in isolation from their environment. Since their early origins, urban settlements have been characterised by the existence of various interactions with a wider world. This is *a priori* the case for so-called world cities, which are characterised by their mutual connections within a world city network. This dissertation studies a particular instance of such a world city network, notably a European-wide network existing between A.D. 1300 and 1600.

After a short introduction to the term world city as an historically meaningful concept, in this chapter an overview will be given of the systematic research on the external relations of urban settlements by social scientists and historians up to now. Hereby, a case will be made for the interlocking network model, which until so far only has been used for the study of the contemporary global city network. The last two sections of this chapter contain a presentation and delineation of the particular case study upon which the interlocking network model will be applied, and an outline of the further structure of this dissertation.

1.1. World cities before globalisation?

As can be inferred from its title, this study claims to investigate late medieval and 16th-century world cities. However, in most social scientific research world or global cities are – implicitly or explicitly – assumed to be pre-eminently present-day phenomena, especially through the linking of world/global cities with globalisation. Consequently, in order to justify the historical use of the term world city, the concepts globalisation and world/global city will need to be looked at somewhat more in detail.

In the description of our present-day society by social scientists and geographers, the term ‘globalisation’ seems to be omnipresent. Hereby, globalisation incorporates a variety of interrelated processes, ranging from the world becoming a global village to the demise of the modern state and the rise of supranational institutions. These different processes are often linked to a recent revolution in the development of information and communication technologies (Castells, 2000). Accordingly, many social scientists have stressed the unique character of contemporary globalisation. However, although the recent developments in ICT themselves are undoubtedly unique and unprecedented, many of the current globalisation processes are arguably not so new. Hence, there is an urgent need to develop a more

historically grounded understanding of so-called globalisation (Findlay & O'Rourke, 2007, xvi).

As has been stressed by several historians since the late 1990s, globalisation can be seen as a container term incorporating a whole set of processes of transformation leading to increasing interactions between different parts of the world. Some of these processes go back far in time, which does not mean however that a linear evolution from less to more globalisation can be observed. However, despite analogies with historical globalisation processes some of which are continued into the present, contemporary globalisation at the same time definitely is a unique process, which can be acknowledged through the use of concepts such as proto-globalisation for instance (Limberger, 2008, 83, 86)[1].

One of the manifestations of the recent social scientific interest in globalisation is the study of global/world cities. Being the main centres of control and command of global flows of various nature (economic, cultural, social,…) global cities are the main *loci* through which globalisation processes take place. Much attention has especially been paid to the role of global cities in our present-day world economy, which operates increasingly as a world city network, linking different global cities via transnational flows of capital, information, labour, etc. Saskia Sassen (2001) has stressed the crucial importance of globally operating business service firms in the creation and organisation of this world city network.

According to Sassen's global city model (Ibid., xix-xxii) management and coordination in the world economy become increasingly important as a result of the world wide dispersal of mutually integrated economic activities due to globalisation. These central functions of management and coordination are partly outsourced by transnationally operating business firms to specialised service firms (accountancy companies, law and management consultancy firms, banks, insurance companies, etc.), which are subject to agglomeration economies because of their need for very specific and context-dependent forms of information that are only produced and exchanged in cities. Consequently, while most business corporations due to globalisation and the outsourcing of part of their central functions to service firms become more free in choosing a location for their headquarters, the business service firms themselves are strongly tied to particular cities in which they become the key sector.

[1] Others have distinguished between 'soft' and 'hard' definitions of globalisation, the former focusing rather generally upon "increases in contact, interaction, and exchange that reduce previously existing barriers", and the latter upon measurable outcomes of such an increase in contact, such as commodity price convergence between different parts of the world (De Vries, 2010). Since in this study the focus will be upon the geographical configuration rather than the size of flows, a 'hard' definition of globalisation will definitely not be investigated here.

Moreover, because of the global scale of operation of many of their clients, business service firms need a global network of offices, affiliates, etc. in order to be able to provide a global service to these clients. The development of these global office networks results in a strengthening of the transnational connections between cities in which these business service firms are concentrated, and which accordingly are called global cities, since "the economic fortunes of these cities become increasingly disconnected from their broader hinterlands or even their national economies" (Ibid., xxi). Empirical research on the transnational organisation of business service firms has clearly demonstrated the existence of a strongly integrated world city network (e.g. Taylor, 2004; Taylor *et al*., 2010d).

It will be clear that Sassen's interpretation of global city formation is a very time- and context-specific process, and Sassen (2001, xxii, 4-5) herself several times has stressed the unique character of this phenomenon[2]. However, it can be argued that cities always have been connected with each other in one way or another, and that transnational city networks are not unique for the contemporary globalised society. This is the position of Taylor *et al*. (2010b), who have stressed that the existence of external relations with other places – both long-distance inter-city relations and local town-hinterland relations – is generic to cities in all times and world regions. According to Jane Jacobs (1970) such network externalities (the incorporation of cities in city networks) are – in combination with processes of diversification of the division of labour within cities – the source of economic expansion which occurs through cities, especially as a result of a process called import replacement[3]. Such a broader conceptualisation of world cities as nodes in non-local city networks is much more suitable for implementation in historical contexts. Not surprisingly, the global city concept begins to gain a foothold in the historical literature as well[4]. However, in order to avoid anachronisms I will use the term 'global city' only for the specific contemporary phenomenon described by Sassen and others, while the broader concept 'world city' will be used also in historical contexts (for this conceptual distinction, see Sassen, 2001, xviii-xix). Moreover, from a

[2] "Over the centuries cities have been at the cross-roads of major, often worldwide processes. What is different today is the intensity, complexity and global span of these networks, the extent to which significant portions of economies are now dematerialized and digitalized and hence the extent to which they can travel at great speeds through some of these networks, and, thirdly, the number of cities that are part of cross-border networks operating at vast geographic scales" (Sassen, 2001, xxii).

[3] About Jane Jacobs, see also Taylor (2006).

[4] 'Global cities' was one of the two main themes of the annual conference of the World History Association held in London in 2008 for instance (see http://www.thewha.org/annual_conference_archive.php). Another example of the breakthrough of world city studies in history is the volume edited by Pierre-Yves Saunier and Shane Ewen in 2008, about the transnational activities of urban governments between the middle of the 19th and the end of the 20th century, titled *Another global city*. However, the term 'world city' has been used by historians for a much longer time already, see e.g. the study of Hans Von Zwiedineck-Südenhorst – dating from 1899 – about Venice, which was titled *Venedig als Weltmacht und Weltstadt*.

world-systems point of view, the term 'world' in world city and world city network can be related to the scale of a world-system and not to the global scale. As such it is possible to meaningfully use the concepts world city and world city network in relation to geohistorical periods in which global processes (spanning the whole world) were absent or weak

Through the investigation of a transnational city network in Europe in the late Middle Ages and the beginning of the early modern period (ca. 1300 – ca. 1600), my doctoral research wants to illustrate the generic character of transnational connections between cities, and to contribute to the development of a more historically grounded debate on globalisation and world cities[5]. The emphasis in this study of a network of historical world cities will be upon 'network' rather than upon 'world city'. Since a network does not imply just two or three cities, but a large number of nodes, this study wants to tell 'a tale of many cities'.

1.2. The external relations of towns and cities

Urban external relations have been investigated by geographers and historians in a variety of ways. An overview of the existing research will allow to theoretically clarify the different processes behind the external relations of cities and towns, and to suggest strategies for my own research by exposing some of the strengths and weaknesses of the geographical and historical studies undertaken so far. Although developments in geography (and social science in general) often influenced subsequent historical research on the subject, both disciplines will be treated separately in what follows.

1.2.1. The geography of urban external relations

There is a long tradition of structural research on the external relations between towns and cities in human geography. Until now, the geography of urban hierarchies and networks is being influenced by central place theory, as developed by Walter Christaller (1966, originally 1933) and others. Basically, central place theory – and more specifically Christaller's market principle – provides a model for the description of local and hierarchical relations between towns and their hinterlands, whereby a town offers central goods and services to the settlements (including other towns) in this hinterland.

[5] It should be stressed that – although this study illustrates the existence of a transnational city network in a particular geo-historical context before present-day globalisation – I do not aim to demonstrate here the generic nature of urban external relations, since this would require a transhistorical approach. For such a transhistorical approach I refer to Taylor (2007a), as well as to Peter Taylor's forthcoming book which will be titled 'Extraordinary cities'.

From the late 1950s to the early 1980s, a national urban systems research school developed in human geography and regional science, which studied the relations between cities in a national framework (Taylor, 2004, 15-20; Id., 2007b; Id., 2007c, 134). Under the influence of central place theory, these relations were conceived as producing national urban hierarchies (e.g. Bourne & Simmons, 1978). Although state power clearly influences the configuration of urban hierarchies and networks, Taylor (2004, 15-20, 49-51; Id., 2007b) has argued national economies to be a myth, upheld by a state-centric social science. As a result of the growing attention for globalisation processes in the social sciences, the national scope of national urban systems research was criticised, and replaced by a global scale of analysis. This world cities research originally interpreted the connections between global cities in a hierarchical sense as well (e.g. Friedmann, 1986; see Taylor, 2007b).

However, hierarchy is only one of the ways in which to conceive the relations between cities (Taylor, 2007d; Taylor *et al*., 2010b). Hierarchy is especially characteristic for town-hinterland relations that are produced by a generic process (*town-ness*) linking central places to their hinterlands through the offering of central goods and services. Town-ness operates on a local scale in bounded territories (the hinterlands), and generates vertical relations between central places and their service areas (a *hierarchy*). The best-known model of town-ness is central place theory (Ibid.).

On the other hand, cities also are connected to each other in a non-hierarchical way by a distinctively different process called *city-ness*. This is a generic process as well, linking different cities with each other beyond their hinterlands. City-ness is a non-local (unbounded) process, generating horizontal rather than unequal relations between cities by means of a mutual exchange of goods, capital, etc. (a *network*). In contrast to town-ness, city-ness cannot be described adequately by central place theory, and requires a ‘central flow’ theory instead. While town-ness is a rather stable and static process, city-ness is much more dynamic and prone to change. Being processes, city-ness and town-ness are not mutually exclusive but can and do occur in one and the same place at the same time. Consequently, both processes are present in towns as well as in cities, although one can expect that city-ness is proportionally more important to understand the economies of large cities than those of small towns and vice versa (Ibid.). Despite the co-existence of town-ness and city-ness, not much attention has been paid yet to the interaction between them. However, this historical analysis of the European city network will allow to somewhat elucidate this relationship between both (see later).

City networks in globalisation have been generally investigated in two different ways (Derudder, 2008)[6]. A first approach focuses upon the communication and transport infrastructures linking places to each other, such as airline networks, the internet, etc., while a second strand of literature studies the geography of global corporate organisations, e.g. of business service firms and their networks. Although studies of infrastructures yield valuable descriptions of the configuration of the external relations of towns and cities, Ben Derudder (Ibid.) has argued that they are deficient in explaining the mechanisms of network formation. Infrastructures tend to stabilise the external relations of urban settlements rather than creating them. The corporate organisation approach on the other hand often explicitly focuses upon particular agents playing a key role in world city network formation (e.g. business service firms).

This distinction between infrastructural and corporate organisation approaches has been influenced by Manuel Castells' (2000) conceptualisation of our contemporary society as a network society, in which a space of flows metageography increasingly replaces the older space of places metageography. Castells' has described this space of flows as a combination of layers of material support for social practices of a flow-character. Three of these layers can be seen as important (see also Taylor, 2004, 26). A first layer constitutes the infrastructural support for the organisation of flows (airline networks, the internet,…). The second layer is the space of the social practices that define society itself. It consists of agents connecting different places while carrying out economic, cultural and political functions, hereby using the infrastructural network. The present-day world city network generated by business service firms belongs to this second layer. The third important layer is constituted by the spatial organisation of economic elites, such as exclusive restaurants where transnational businessmen meet.

1.2.2. Historical research on urbanisation patterns, urban hierarchies and networks[7]

Analogously to geographers, historians have been investigating the external relations of urban settlements for a long time. Strikingly, evolutions in this historical research were largely parallel to, and often inspired by, developments in geography. Especially interesting are some of the recent trends in this historical research. Based on a case study focusing chiefly on the

[6] Transnational spatial relations in globalisation are not only the subject of the world city network literature, but also of a global commodity chains literature. I have only discussed the former here. For the relationship between both literatures, see Brown *et al*., 2010; Derudder & Witlox, 2010.
[7] The discussion in this paragraph is largely based upon Verbruggen (2008) (see also Verbruggen, 2007).

literature on urban networks in the Low Countries, distinctions can be made between (1) comparative research and the study of connections between places; (2) the study of local relations between towns and their hinterlands and the study of non-local inter-city relations; and (3) an approach focusing on agency versus an infrastructural approach to external urban relations.

A first important distinction has to be drawn between comparative analyses of towns and cities and network analyses of connections between places. In comparative research, different urban settlements are ranked according to one or more variables, especially population size. Although such rankings describe formal relations of similarity and dissimilarity between urban settlements, they cannot procure direct information about substantial relations of connection and interaction between towns and cities (Sayer, 1992, 88). Ranking lists of urban settlements can describe settlement or urbanisation patterns for a certain area, but they do not prove the existence of an urban network or hierarchy[8] since these require the presence of substantial relations. Therefore, the study of urban networks implies the collection and analysis of relational data about flows between towns and cities instead of attribute data about them (Derudder, 2008; Taylor, 1997, 324-325).

However, because of a lack of relational data (Lesger, 1990a, 137), many studies of so-called urban 'networks' and/or urban 'hierarchies' have necessarily been confined to rankings of attribute data. In some cases this has led to a confusion of networks with rankings of statistical data, despite repeated warnings against such confusions by scholars like Blockmans (1992, 245-247), Bruneel (1992, 95-101), and Prevenier *et al*. (1992, 158). Accordingly, many historians have been investigating flows between urban settlements through the analysis of relational data. Among others, attention has been paid to migration patterns, flows of commodities, and dispersal patterns of innovations (Kooij, 1992, 514).

Secondly, in most cases the systematic historical study of the external relations of towns and cities has been confined to the investigation of urban hierarchies, focusing on the town-ness relations between urban settlements. Hereby historians often applied Christaller's central place theory as an analytical tool (e.g. Lesger, 1990a). For the explanation of urban settlement patterns, central place theory has its shortcomings however. Firstly, central place theory only explains hierarchical relations between urban settlements whereby a central place of higher order offers central goods and services to the central places of lower order situated

[8] The term 'hierarchy' is ambiguous since it can be used (according to the Oxford Dictionary) both as a synonym for ranking, as well as in the sense of a system in which unequal substantial relations exist between the different levels. I will use 'hierarchy' in the latter sense.

in its hinterland. For the explanation of relations between central places of the same level, another process is needed. Secondly, many historians have stressed the importance of non-local relations between cities for the explanation of urban settlement patterns, especially in export-oriented environments such as the Low Countries (Lesger, 1990a, 142-144). When the scale of analysis becomes larger, the external relations of urban settlements become more determined by city-ness than by town-ness. Finally, being a rather stable process, town-ness is not able to explain the dynamics of urban networks.

As a result, many historians started to distinguish between local and non-local urban relations. According to Hohenberg and Lees (1995, 47-73), on the one hand cities and towns belong to a central place system, while on the other hand they are part of a larger network system. This dual model of urbanisation is similar to Taylor's (2007d; Taylor *et al.*, 2010b) distinction between town-ness and city-ness, the fundamental difference being that the latter are processes instead of systems. Lesger's (1990b) investigation of the evolution of Hoorn's position in its network system and its central place system in the late Middle Ages and the early modern period illustrates the applicability of Hohenberg and Lees' theory very well. However, studies such as Lesger's were still limited to the analysis of the network from the perspective of individual gateway cities (Kooij, 1992, 514-517), focusing upon their role as intermediaries between an extra-local city network and a local central place hierarchy. Only recently and undoubtedly under the influence of present-day globalisation processes, historians have been showing more and more interest in the study of transnational city networks as a whole (e.g. Harreld, 2004, 95-100).

At the same time, Clé Lesger (2006) has questioned the hierarchical character of inter-city relations in his study of the urban network of the United Provinces between ca. 1550 and ca. 1630. According to Lesger (Ibid., 261-262), "trade was organized in flexible network-like structures. This applies both to the flows of goods and to the participants. Contrary to what one might expect from research into the spatial structure of trade, the nodal points in the network system were not fixed in permanent hierarchies of staple places, with a dominant centre at the summit of the hierarchy. On the contrary, although the location of the gateways was, of course, fixed, their relative positions and importance in the hierarchy were impermanent and prone to constant change. The participants also formed parts of network-like structures, with partners, factors and subordinates in the various gateways, and a great deal of travelling to profit from the specialization and locational advantages of specific nodal points."

Another critique that deserves more attention is Blockmans' (1992, 245) assertion that the unit of analysis should be the network itself, as defined by the intensity and the nature of

the relations between the components. Town-ness operates at the scale of hinterlands, which vary in extent according to the central goods or services offered. City-ness on the other hand is not bounded by hinterlands or territories, and results in transnational rather than national city networks. Consequently, the size of hinterlands and networks should not be taken for granted, but has to be determined empirically through the investigation of the flows linking towns and cities with each other or with their surrounding area, implying the need for relational data rather than attribute data. However, often administrative and political boundaries have been used to define hinterlands as well as networks, a practice that is defensible when analysing administrative central functions or networks, but not for other – especially economic – relations (Klep, 1992, 204).

In particular the scale of the state has been very popular as a scale of analysis for urban hierarchies and networks. Sometimes inspired by the geographical research on national urban systems, historians have investigated the urban networks and central place hierarchies of pre-modern principalities such as the county of Flanders (Prevenier *et al*., 1992; Stabel, 1997) or modern nation-states such as the Netherlands (Kooij, 1988). This 'false' scale of the state has led to a confusion between networks and hierarchies, biasing the research towards a search for national urban hierarchies (Taylor *et al*., 2010b). Accordingly, only recent transnational studies of city networks have duly stressed the horizontal character of relations between cities (e.g. Lesger, 2006).

Finally, historical urban hierarchies and networks often have been studied through an infrastructural approach focusing upon the reconstruction of road or canal networks, mail services, etc. Since many of these infrastructures were typically produced by states (at least in the early modern period), the historical study of infrastructural networks often tends to attract the attention towards national instead of transnational networks. More recently however, historians such as James Murray (2000, 3) and Donald Harreld (2004) have called for an agent-based approach to urban networks and hierarchies. Harreld (2006, 8) for instance observed that "it is the merchants we must follow not the products if we are to understand how merchants structured their trade. Rather than looking at product flows, another way to reconstruct merchant networks might be to examine which cities merchants gravitated to when they conducted their business". Focusing on the agents of town-ness and city-ness formation (in the economic sphere respectively retailers and consumers, and transnationally operating wholesalers and financiers for instance), allows to gain a better understanding of the way in which urban networks and hierarchies develop. Moreover, such an approach avoids the problem of reifying cities and towns.

In conclusion, although the critical attitude of historians in their use of geographical theories of external relations has resulted in a varied historical urban networks research field, as far as I know historians have not been undertaking any systematic empirical research on large transnational city networks as a whole. Studies such as De Vries' (1984) *European urbanisation*, although European in scale, are based upon population data (i.e. attribute data) and as such focus upon urbanisation patterns rather than connections between cities. This lack may result from a lack of appropriate source material as well as from the fact that until recently no real geographical theories existed for the study of such transnational city networks, while the current world cities research has not found much breeding ground in history yet. My systematic investigation of the European city network in the late Middle Ages and the 16th century attempts to contribute to filling this gap in the historical literature.

1.3. The interlocking network model

The above overview of geographical and historical literature has shown that different approaches exist towards the systematic and empirical study of the external relations of cities. Depending on the particular research aims, some of these approaches will be more appropriate and suitable than others. For my investigation of the late medieval and 16th-century European city network, I have chosen an approach that focuses on (1) relations between cities rather than patterns of urbanisation; (2) city-ness instead of town-ness; and (3) agency rather than infrastructure (although on several occasions data about transport and communication infrastructures will be used to complement the agency-based data).

One model that adheres to these three criteria is the interlocking network model[9], developed by researchers in *GaWC* (the Globalization and World Cities research network, see http://www.lboro.ac.uk/gawc) in order to analyse and measure the connections between cities in the world city network in the framework of a corporate organisation approach (Taylor, 2001; Id., 2004). This model until now has only been applied to the current world city network, but Taylor *et al*. (2010b) recently have formulated the hypothesis that it can be applied to historical city networks as well. One of the main objectives of my thesis is to test this hypothesis by applying the interlocking network model to a transnational city network in late medieval and early modern Europe (ca. 1300 - ca. 1600).

An interlocking network is a network that is not produced by the nodes (in this case the cities) themselves, but by a subnodal level of actors (Taylor, 2004, 60-61). In the case of a

[9] It should be stressed that this interlocking network model actually makes use of attribute data rather than relational data to measure flows between cities (see below).

world city network, the actors are transnationally operating organisations creating flows between cities, such as multinational corporations, NGO's, etc. This agency-based approach avoids a structuralist reification of cities, because it demonstrates how the structure of a world city network is shaped (and consequently also can be changed) by human activities[10].

The interlocking network model has especially been applied upon a particular world city network shaped by the intra-firm flows between the different offices (headquarters, regional headquarters, local branches, etc.) of business service firms (Sassen's motors of world city formation). This network has been reconstructed by weighing the presence (or absence) of offices for a large number of firms in more than 300 cities, implying the existence of flows (information, capital, business travel, etc.) between the different offices of a firm. The resulting firm-city matrix has been the basis for the investigation of the specific role of – and the connections between – different cities and clusters of cities in the network.

The application of this geographical model to a historical case study implies a strong interdisciplinary approach combining insights from the social sciences with those from historical scholarship. Obvious research questions resulting from such an interdisciplinary approach are for instance: 'Can the past teach us something about how (contemporary) world cities work?', 'Can the concepts and research on world cities help us understanding cities in the past?', 'Can methods developed for the study of the contemporary world city network be useful for historical research as well?'

1.4. The interlocking city network in Europe, A.D. 1300-1600

The specific interlocking city network that will be investigated in this dissertation is a network generated by the activities of long-distance merchants and merchant-banking firms in western Christian Europe in the late Middle Ages and the 16th century. The three defining elements of this case study in terms of space (western Christian Europe), time (A.D. 1300-1600) and agency (merchants and merchant-bankers) should be looked at somewhat more in detail.

[10] Such a reification of cities should be eschewed. Contrary to the individuals and institutions within a city (such as business firms, urban governments,…), cities themselves do not have the capacity to act. When sometimes in the text cities appear to have been treated as actors, this should be considered metaphoric language. In fact, I investigate social relations between human beings (merchants and their representatives abroad,…), which are aggregated to a higher level of intercity flows. Nevertheless, cities do matter in this research. When establishing business contacts with merchants in other cities, sending a factor overseas,… location was a crucial factor in the choice of such interpersonal contacts. Consequently, although cities do not have the power to act, they posses a certain power of attraction. As a result it is not enough to investigate the flows between the actors (social network analysis), but also to look at the location of these actors.

The geographical delineation of a network should take into account the – at first sight obvious – assertion of Wim Blockmans (1992, 245) that the unit of analysis should be the network itself as defined by the scope and intensity of flows within the network (see above)., By definition, the network level of a world city network is a world-system or world-economy (Taylor, 2004, 60-61). World-systems, like city networks, are delineated by presence/absence of connections. According to Fernand Braudel (1984, 22), a world-system (or what he himself called a world-economy) is "an economically autonomous section of the planet able to provide for most of its own needs, a section to which its internal links and exchanges give a certain organic unity". The frontiers of such a world-system are quiet zones "which it is only worth crossing […] *in exceptional circumstances*" (Ibid., 26, italics in original). Consequently, the limits of the world-system can be identified through the absence of flows, while the density of flows in the world-system itself is much higher. In other words, a world-system is characterised by the existence of flows, and as such it can be defined as a network. Or as Braudel (Ibid., 96) put it: "[t]here could be no world economy until there was a dense enough urban network with trade of sufficient volume and regularity to breathe life into a central or core zone".

This leads us into the field of world-systems analysis. Late medieval and especially 16th-century Europe is generally considered to be the cradle of what is called the modern world-system. However, following Giovanni Arrighi (1994, 11-12, 31-32, 80-84) the history of this modern world-system traditionally has been written as a space of places metageography, not taking into account its network character. This space of places consists of a system of territorial states. States, as political and military institutions, are central to the space of places. The dominant process in this political space is territorialism, the creation of mutually exclusive territories by states. The rise of a system of territorial states in Europe during the long 16th century has traditionally been conceived as the origin of the modern world-system. Due to the political fragmentation of the world-system in different states and the ensuing competition, states had to compete for capital, because in contrast with the situation in world-empires (i.e. world-systems characterised by political unity), capital was able to move between different political entities. This specific combination of state and capital has led to the explosive expansion of the modern world-system.

Central to the working of this space of places were the actions of hegemonic states. World hegemony is the power of a state to exercise functions of leadership and governance over a system of sovereign states. In the modern world-system, phases of inter-state competition and the absence of hegemonies have alternated with phases of inter-state

cooperation in which the modern world-system was reconstructed and enlarged under the guidance of a hegemonic state. Until now, three hegemonic phases have been distinguished: Dutch hegemony in the 17th century, British hegemony in the 19th century, and US hegemony after World War II (Arrighi, 1994, 27-74).

Such a space of places genealogy of the modern world-system has not much to offer to the study of the European city network between 1300 and 1600. Firstly, cities and the flows between them are largely absent from this particular metageography of the modern world-system. Secondly, the modern world-system according to a space of places logic only emerged in the long 16th century, towards the end of the period under investigation here.

However, strongly influenced by the ideas of Braudel, Giovanni Arrighi has discerned another, less visible metageography of the modern world-system in terms of a space of flows. The space of flows consists of transnational flows of capital between cities. This space of flows is an economic space, and central to this space is a process of capital accumulation.

Arrighi explained the expansion of the world-system via a succession of systemic cycles of accumulation in the space of flows. Central to these long term cycles is the ability of capitalism to choose: capitalists are able to choose whether they want to invest in industry, trade, finance, or land (Braudel, 1984, 621-622). During phases of material expansion of the world-economy, investment of capital in industry or trade (commodity capital) was profitable, while in phases of financial expansion, capital investment in trade or industry yielded less profits than investment in pure financial transactions (money capital). Arrighi described the history of the world-economy as a succession of phases of material (MC) and financial (CM') expansion. The combination of one MC-phase with the consecutive CM'-phase forms a systemic cycle of accumulation (MCM') (Arrighi, 1994, 5-8).

During phases of material expansion, the world-economy grows along a single developmental path. Change is continuous. Periods of financial expansion on the other hand are characterised by discontinuous change, radical restructuring and reorganisation of the world-system. During such a CM'-phase, an actual cessation of the expansion of the world-economy occurs (Ibid., 8-9, 228-235). MC-phases are linked with the concentration of power in hands of a hegemonic state, and with cooperation between cities, while CM'-phases show an intensification of inter-state and inter-capitalist competition. In other words, phases of financial expansion are transition-periods in which the world-economy changes its course. The existing capitalist agencies and structures perish and create space for a new regime (Ibid., 12-14, 214-215). Four systemic cycles of accumulation have been distinguished, each led by

another group of capitalists: a Genoese (ca. 1450 – ca. 1640), a Dutch (ca. 1640 – ca. 1780), a British (ca. 1780 – ca. 1940), and a US cycle (from ca. 1940) (Ibid., 6-7, 86-87, 364).

This space of flows approach is much more appropriate for the study of the late medieval and 16th-century city network in Europe than Wallerstein's space of places approach. In the first place, it draws the attention towards cities and the flows of capital between them, as well as to a particular group of agents, notably transnationally operating capitalist elites, who in their search for capital accumulation were instrumental in producing an expansion and consolidation of the modern world-system. In the second place, Giovanni Arrighi began his genealogy of the modern world-system in the 13th rather than the long 16th century, for he saw a preliminary cycle between ca. 1250 and ca. 1450 (which was not dominated by one and the same group of capitalists, and as such was not a full-fledged systemic cycle of accumulation yet).

Arrighi clearly followed Braudel here, who suggested that "the first world-economy ever to take shape in Europe [appeared] between the eleventh and thirteenth centuries [when] countless towns sprang up or revived wherever there was a crossroads of trade […]. Europe was suddenly covered with towns" (Braudel, 1984, 92-93. See also Clark, 2009, 29-34). In other words, according to Braudel the motor behind the early development of the European world-system as well as behind city formation within this world-system was trade. This revival of trade in western Europe has to a large extent been attributed to an increase in commercial and other exchanges with the more developed and urbanised economies of the Near East as a result of the crusades (Abu-Lughod, 1989, 43-49).

This brings us to agency again. Although other processes played an important role in urban development in Europe as well, international trade definitely was a crucial factor[11]. Consequently, just like business service firms are the motors of Saskia Sassen's global city formation (see above), long-distance merchants and merchant-bankers can be considered to have played a central role in the development of cities in medieval Europe. They were the producers of city-ness (Taylor, 2007d). Hence the focus upon transnationally operating merchants and financiers as the subnodal level of agents producing the late medieval and 16th-century European interlocking city network.

Trade and finance of course were not the only factors promoting a stronger integration between different parts of Europe in this period. The power and influence of religion and of an expanding Latin Christian Church with moral authority over most parts of western and

[11] The link between the development of cities in Europe and international trade has in the first place been formulated by Henri Pirenne (1925). For a discussion of his theory for the Low Countries, see Verhulst (1989).

central Europe should not be underestimated for instance. The Church had the disposal of a well-organised and European-wide network of functionaries, the study of which could produce a valuable reconstruction of the medieval and early modern European city network as well[12]. As such the network of trade and finance investigated here forms just one very specific aspect of an overall transnational network in the production of which a variety of agents and processes (economic, political, social, cultural, religious,…) were involved (for a European urban network generated by the mobile career paths of scientists between 1500 and 1900, see Taylor *et al.*, 2008).

The core function of wholesale merchants and transnational bankers was the production and organisation of flows of goods and/or capital from places where they were in abundance to places where they were lacking, making their profit in the price difference between these places. However, more generally merchants and bankers fulfilled an important logistic role in enabling the functioning of the overall network. In order to transfer papal revenues from all over the western Christian world to the Camera Apostolica in Rome (or Avignon), the Church by the 14th century made use of the services of merchant-bankers (e.g. Guidi Bruscoli, 2007; Renouard, 1941), and states as well regularly appealed to transnational financiers for paying their armies abroad for instance (e.g. Lapeyre, 1953).

In other words, Sassen's (2001, xxii) observation that "the capabilities for global operation, coordination and control […] need to be produced" and that as a result the existence of a transnational economic system is not a given, applies to the European world-economy in the late Middle Ages and 16th century as well, and perhaps even more, since distance was much more a barrier then than now. The transnational merchants and bankers with their important network capital (knowledge of foreign languages, access to insurance and international means of payment such as bills of exchange,…) played a central role in the production of these capabilities for transnational organisation (for the concept 'network capital', see Urry, 2007).

For a temporal delineation of the network, I refer once again to Braudel's (1984, 92-93) assertion that the European world-economy originated between the 11th and the 13th century. It took some time however to form a well integrated European network: "especially after the thirteenth century […] the towns were beginning to tower above their rural surroundings and

[12] Jacques Le Goff for instance studied the dispersal of convents of the mendicant orders (which were typically linked to urban environments) in France in order to reconstruct the urbanisation pattern (Le Goff, 1968; Id., 1970).

to look beyond their immediate horizons" (Ibid., 94). The origins of this world-economy go back to two core zones, northern Italy and the Low Countries. The rise of the Champagne fairs in the early 13th century integrated both cores in a coherent, bipolar zone (Abu-Lughod, 1989, 51-101; Braudel, 1984, 96-115). This was not a real city network yet however: the Champagne fairs were located in temporary nodes that were small market towns instead of cities. A strongly integrated European city network only appeared when direct links between northern Italy and the Low Countries were created by Genoese ships sailing to Bruges at the end of the 13th century and by opening up the eastern Alpine passes establishing a link between Italy and southern Germany and from there to central Europe and via the Rhineland to the Low Countries (Taylor, 2007b).

It is the reconfiguration of the European city network at the end of the 13th century that constitutes the starting point of my analysis. This restructuring was accompanied and made possible by a new way of organising international trade which developed in Italy in the course of the 13th century. The 13th-century commercial revolution meant a transition from the travelling merchant (accompanying his merchandise) to the sedentary merchant (using representatives abroad), resulting into a more efficient organisation of long-distance commerce in Europe (De Roover, 1942; Spufford, 2002, 12-59; see also next chapter).

A strong impulse for this commercial revolution was given by improvements in transport and communication, especially over land, where a veritable road revolution took place in the course of the 13th century (Spufford, 2002, 175-227). Although one should beware of anachronisms, two interesting parallels can be drawn with contemporary globalisation: a revolution in the organisation of transport and communication (respectively a road revolution and an ICT-revolution) and a reorganisation of particular key agents becoming the motors of city network formation (respectively long-distance trade and banking firms and business service firms).

Although the commercial revolution (which also formed the starting point for Arrighi's (1994, 87-88) antecedent systemic cycle of accumulation) was situated in the 13th century, I begin my analysis of the European city network only at the very end of that century, when the achievements of the commercial revolution had become an established fact (at least in the Italian business world). Moreover, the commercial revolution was accompanied by improved methods of bookkeeping and an increasing importance of correspondence with representatives established abroad (De Roover, 1942). As a result, more abundant source material is available for the reconstruction of the networks of transnational business organisations from the late 13th century.

The end-point of my analysis of the European city network has been dictated by a reorganisation of long-distance commerce and banking as well. The creation of the first joint-stock companies at the end of the 16th century in England and the northern Low Countries initiated a new era for business in Europe. These joint-stock companies with their monopolies over trade with a particular geographical area differed fundamentally from the business organisations of the 14th to 16th centuries which had their roots in the 13th-century commercial revolution. Moreover, it is only with the rise of the joint-stock companies that European trade truly surpassed the European space (Arrighi, 1994, 137-140; Brulez, 1959, 369-370; Hunt & Murray, 1999, 226; Jeannin, 1963a, 83-84; see also next chapter). Above, the persistent centralisation of the state, which started in Europe in the late Middle Ages, but continued more forcefully in the early modern period, resulted in the development of strong national economies pursued by mercantilist policies. This might have led to a transformation of transnational flows between more or less autonomous cities towards intranational flows in developing national urban hierarchies in the course of the long 16th century (Arrighi, 1994, 11-12; Taylor, 2007d).

Generally speaking, the period of investigation spans more or less the Genoese systemic cycle of accumulation from the middle of the 15th century until the early 17th century, as well as the antecedent cycle of the mid-13th to the mid-15th century. The principal changes within the European network during these two cycles (and after) have been described by Braudel (1984, 27-35) who observed a succession of dominant capitalist cities – Venice, Antwerp, Genoa, Amsterdam and London – at the centre of the European world-economy between the late 14th century and the end of the 18th century, taking it in turns to lead the expansion of this world-economy (this succession has strongly influenced Arrighi in the development of his theory of systemic cycles of accumulation).

In Braudel's (1984, 116-206) view, the bipolar structure of the European world-economy was maintained for another century after the decline of the Champagne fairs, with Bruges the principal node in the north, and Venice the dominant city in the south. Only at the end of the 14th century Venice became the sole centre at the core of the European world-economy. However, as a result of the discovery of a sea route to Asia via the African coast at the end of the 15th century, the Portuguese Atlantic spice trade became an important competitor to the Venetian trade in spices imported from the Levant. The establishment of a monopoly at Antwerp by the Portuguese resulted in the shift of the centre of the European world-economy from Venice in the Mediterranean to Antwerp in the Atlantic around 1500. Already in the second half of the 16th century it moved back to the Mediterranean, to Genoa

this time, whose bankers came to dominate European finance. Only in the 17th century supremacy shifted permanently to the Atlantic with Amsterdam and later London becoming the new dominant capitalist cities of the world-economy.

Although the above account of Braudel's conceptualisations is obviously reductive, it will be clear that he developed a very mono-centric view of the European city network. The role attributed to the other cities in the world-economy is as follows: "[a]t varying and respectful distances around the centre, will be found other towns, sometimes playing the role of associate or accomplice, but more usually resigned to their second-class role. Their activities are governed by those of the metropolis: they stand guard around it, direct the flow of business toward it, redistribute or pass on the goods it sends them, live off its credit or suffer its rule" (Braudel, 1984, 27).

Consequently, according to Braudel, the European and later world city network are characterised by a very hierarchical structure: the world-system is seen as the hinterland of one world city (for similar remarks see Limberger, 2001, 41; Taylor, 2004, 13-15). His dominant cities can be seen as the counterpart of the hegemonic states of the space of places. But analogously to the operation of these hegemonic states in a larger framework consisting of a system of territorial states, it can be argued that the dominant capitalist centres of Braudel are part of a space of flows which consists of a world city network, generated through transnational capital flows linking a large number of world cities with each other.

The identification of transnationally operating merchants and merchant-bankers as the agents producing the interlocking city network under investigation allows to refine the geographical delineation of this network. As has been argued by Janet Abu-Lughod (1989), Europe was connected – especially since the crusades – via long-distance trade circuits with the Levant, northern Africa, the Middle East and China. Consequently, already around 1250 a network of trade existed that spanned large parts of Eurasia and Africa. Moreover, from the end of the 15th century, connections in this network intensified and expanded to the New World due to the discovery of new maritime routes. Europe between 1300 and 1600 was definitely not an isolated world region.

However, as opposed to present-day global firms, the activity range of individual business firms in the period between 1300 and 1600 did not span all the parts of the network: European merchants for example did only exceptionally trade directly with China, and in most cases the links between China and Europe were organised indirectly via different Muslim intermediaries (De Vries, 2010; Spufford, 2002, 310, 313, 318). This has led Janet

Abu-Lughod (1989) to distinguish eight overlapping subsystems or commercial circuits in the Eurasian trade network between ca. 1250 and ca. 1350, one of which was confined to the area occupied by western Christendom (see also Findley & O'Rourke, 2007, xxi-xxii, who divide Eurasia in seven world regions, one of which being western Christian Europe).

It is this interlocking network produced by the activities of businessmen from Latin Christian Europe (also including western and central European Jews however) that forms the core-subject of this thesis[13]. The common religious background of this varied set of traders and bankers generated a certain form of trust as a result of which business transactions concluded within this group differed in nature from those concluded with outsiders (Russians, Byzantines, Muslims,…) (Hunt & Murray, 1999, 1-2). More concretely, I have limited the sample of agents to those originating from cities located in the territories of the present-day countries of Scandinavia (including Finland and Denmark), the British Isles, the Low Countries, France, the Iberian peninsula, Italy, central Europe (Germany, Poland, Czech Republic, Slovakia, Switzerland, Austria, Slovenia and Hungary), and the Baltic states (as well as Kaliningrad). In practice however, and as will be clear from the next chapters, the places of origin of the firms included in the analysis are very unequally spread over this western Christian area. Merchants from the Balkans – an area that was largely conquered by the Ottomans by the middle of the 15th century – have been omitted[14].

However, the networks of many of these firms were not limited to western and central Europe, but stretched as far as Novgorod, Caffa, Constantinople, Cairo, Tunis, etc., and from the 16th century also to the New World, the African Coast and the Indian Ocean. Although 16th-century agents who were chiefly involved in transcontinental rather than European trade have not been included in the analysis, the network under investigation as a consequence spanned a much larger area than western Christian Europe[15].

It will be clear that both the spatial and temporal frame chosen for this particular research are large to standards of historical research. This choice entails a number of practical

[13] The choice for the western European subsystem, instead of one of the Middle Eastern or Chinese trade circuits is not inspired by some kind of Eurocentrism, but by practical and methodological considerations: my personal background in European history and knowledge of western European languages make the investigation of a western European city network more feasible. However, it has to be stressed that western Europe in the centuries between 1300 and 1600 was not the economically most advanced region of the world.

[14] Although Croatia, and especially the Dalmatian Coast, remained mostly outside of direct Turkish control, I have decided to exempt Croatian firms (including merchants from Ragusa) from the analysis. For an almost identical delineation of Latin Christian Europe (not including Slovenia however), see De Vries (1984, 19).

[15] It is important to realise that the choice for an interlocking network approach has considerable implications. The use of a commodity chains approach (focusing upon flows of particular goods rather than upon flows produced by particular agents) for instance would have resulted in the study of much larger networks stretching all the way from China to western Europe (for silk, spices,…).

difficulties (see next chapter), but has the advantage that it allows to study large scale and long-term historical processes, the investigation of which is often neglected (Findlay & O'Rourke, 2007, xvii).

1.5. Structure of the dissertation

As the reader will realise, the structure of this dissertation is somewhat imbalanced in the sense that it is constituted of two very large chapters sandwiched between two much smaller sections. The chapter directly following this theoretical and introductory chapter mainly consists of a methodological outline of the data collection and the production of data matrices. A pertinent question is whether or not it is possible to copy the quantitative methodology applied by GaWC for the analysis of the contemporary world city network, and to translate it towards an historical case. Moreover, the chapter contains a description of the organisation of late medieval and 16th-century business enterprises (the middle layer of Castells' space of flows), as well as of the transport and communication infrastructures used by these firms during their day-to-day activities (Castells' infrastructural layer). A basic notion of the working of these two layers is needed in order to be able to quantify the historical information into data that are comparable across firms.

Following the collection of the data and the finalisation of the data matrices, these matrices will be analysed and interpreted in chapters three and four. To allow for a better insight in the data, descriptive statistics (e.g. principal components analysis, calculation of connectivities between cities[16], etc.) will be used. These have no real explanatory power however; rather, they are tools that allow to describe the relations between cities in the city network in a certain way and to isolate some of the latter's characteristics. At the same time, the observed model has to be explained, on the one hand through a structural analysis of the mechanisms (e.g. city-ness and town-ness) responsible for the external relations of cities, on the other hand through a geo-historical explanation focusing upon elements in the spatial and temporal context in which the city network operated[17].

Chapter three focuses upon the agents producing the network. The principal research question that will be investigated here is whether a homogeneously organised European network existed between 1300 and 1600, or whether multiple overlapping networks co-existed, produced by different groups of agents with different spatial strategies. These spatial

[16] Connectivities indicate the degree of integration of each city in the network. They can be considered as measures of city-ness (see later).
[17] For an introduction to this critical realist approach, see Sayer, 1992.

strategies will be identified through principal components analysis. The main part of this chapter consists of a detailed analysis of the strategies observed via the interpretation of component scores, connectivities and total business values (see later for an introduction to these statistical terms), as well as of a confrontation of the outcomes of these analyses with the historical literature, allowing a contextualisation of the observed patterns.

Chapter four on the other hand moves on from agency towards structure. In this chapter it is the network in its totality that becomes the main focus. Overall connectivities calculated for each of the three centuries between 1300 and 1600 will be analysed in order to reconstruct the principal configuration as well as the dynamics within the network. Questions that will be investigated are: 'Was the network hierarchically structured, or rather horizontally?', 'Can a particular spatial pattern be observed in the network?', 'Was the European city network rather static or were there major changes between 1300 and 1600?', 'Was there a linear evolution towards more (or less) integration between cities, or was the evolution rather cyclical?', 'What were the effects of economic cycles of growth and stagnation, or of systemic cycles of accumulation on the overall structure of the network?' Finally – and by means of a case study – 14th-century connectivities will be confronted with urban population data through standard least squares regression analysis, not only in order to identify some of the biases in the data, but also to investigate the relationship between city-ness and urban demographic development. Anomalies (large cities with a small measure of connectivity, or vice versa) will have to be explained. In the conclusion, the principal outcomes of the different analyses will be summarised.

Chapter 2
Measuring the network: Quantification, data collection, and the organisation of the space of flows

In the previous chapter I have given an overview of the different approaches towards the empirical study of the external relations of urban settlements. I have also made a case for the interlocking network model developed by GaWC. However, this model has been developed inductively and empirically for the study of a very particular world city network produced by business service firms at the end of the 20th and the beginning of the 21st century. Consequently, it is not automatically possible to apply this model deductively to other cases. When using the interlocking network model for the investigation of historical city networks, a serious risk for anachronisms should be taken into consideration (Prevenier, 1998, 143). One should refrain from looking at medieval and early modern cities in terms of pre-given standards of contemporary world city-ness[18]. Medieval merchants and financiers are not the same as present-day insurance companies and global banks[19], historical source material contains data from a very different quality than the information that can be found on the websites of business service firms, etc. In other words, a city network can not be abstracted from its specific spatial and temporal context (Hopkins, 1982, 148-149, 154-155; Sayer, 1992, 145). As a result, for this study the GaWC methodology had to be adapted and reconciled to the specific 'laws' and limits of historical research. Nevertheless, inasmuch as possible I have attempted to stick to the quantitative language of the interlocking network approach to facilitate the communication of the results of this historical study to an audience of urban geographers to whom they are intended in the first place, and to promote comparison with the contemporary global city network.

In order to tailor the interlocking network model to the specificities of the European city network as it existed between ca. 1300 and ca. 1600, a basic insight into the organisation of this particular space of flows is necessary. Consequently, this chapter does not only provide a methodological framework for the study of the late medieval and 16th-century European city network, but also a contextual description of the organisation of the infrastructural and the

[18] The same applies when studying contemporary cities outside the west in a largely western world city framework. A common characteristic of late medieval and 16th-century western European business and present-day Islamic financial services for instance is the importance of religious ideology, respectively Christian and Islamic (e.g. Bassens *et al*., 2010).

[19] "La pratique des affaires était au XVIe siècle très différente de ce qu'elle est aujourd'hui. Il faut donc se défier de l'anachronisme." (Lapeyre, 1955, 109).

central layer of the space of flows as defined by Castells (see above), and of the nature of the flows constituting this particular space. However, let us have a closer look at the interlocking network model first.

2.1. Measurement of the interlocking city network

GaWC's interlocking network model describes the world city network as a service value matrix V, consisting of (1) a set of business service firms j (the column headings), (2) a set of cities i (the row headings), and (3) service values v_{ij} (the cells of the matrix), representing the importance of a city i to the office network of a firm j. Such service value matrices have been produced successively in three rounds of data collection for the years 2000, 2004 and 2008 (Taylor, 2001; Id., 2004, 65; Taylor *et al*., 2010c). Analogously, I formally specify a European city network between 1300 and 1600 as a business value matrix B comprising of (1) a set of transnational trade and banking firms j, (2) a set of cities i, and (3) business values b_{ij}, representing the importance of a city i to the business network of a firm j.

A fundamental difference between the service value matrices produced for the present-day world city network and the business value matrix describing the European city network between 1300 and 1600 is that the former encompass a period of one year each, while the latter spans a time interval of 300 years. While for reasons of analysis one can uphold the fiction that a city network does not change fundamentally in a year's time, such a position is absolutely untenable for a period of 300 years. In order to be able to track changes in the network, the matrix for 1300-1600 has been subdivided in three matrices representing shorter time-spans of one century each (respectively 1300-1400, 1400-1500 and 1500-1600). These should be seen as crude century averages of a continuously changing network.

The different components of the business value matrix – firms, cities and business values – deserve some more attention.

2.1.1. The firms

Before summing up the different criteria which a firm needs to satisfy for inclusion in the matrix, the concept firm itself should be defined. The word firm is a somewhat anachronistic term for the period under consideration. Nevertheless, since it can be found in the historical literature on late medieval and 16th-century business (e.g. Hunt & Murray, 1999), I will keep on using this expression as a synonym for business organisation. In the period from the commercial revolution of the 13th century until the end of the 16th century, the business

organisations of long-distance merchants and merchant-bankers ranged from individual entrepreneurs and informal family enterprises over single-venture partnerships to long-term and more formalised companies and even consortia. The family was the basic unit of the medieval and 16th-century firm, although several companies contained partners from different families (Hunt & Murray, 1999, 32-33, 57-58, 62). Only at the end of the 16th century the rise of joint-stock companies announced a new era for business (Arrighi, 1994, 137-140; Jeannin, 1963a, 83-84; Lapeyre, 1955, 598-599; Loades, 2000, 116-118; Prak, 2005, 120; Van der Wee, 1963, 326).

Often two or more business organisations were not mutually exclusive and they frequently overlapped each other. The Hanseatic merchant Hildebrand Veckinchusen (ca. 1370-1426) for example carried out business on his own account as well as in partnership with his brother Sievert. At the same time, Hildebrand and Sievert were members of a number of other partnerships of various duration, the most important of which was the Venedische Gesellschaft (1407-ca. 1415), originally consisting of five different groups of partners (Dollinger, 1970, 173-176; Irsigler, 1973, 308, 312; Id., 1985, 84-86; Lesnikov, 1974, 40-45; Seifert, 2000, 49-50). In this particular case the merchant Hildebrand Veckinchusen, the partnership between Hildebrand and Sievert, and the Venedische Gesellschaft all can be considered as business organisations.

As a result of the high level of informality, especially of family-based enterprises such as the partnership between Hildebrand and Sievert Veckinchusen (although in many cases formal partnership contracts were concluded), and the overlap between different forms of organisations, it is often difficult to clearly define a firm[20]. Depending on the nature of the source material and the focus of the historical literature on a particular firm, either an individual merchant (carrying out business for his own account and through various short- and long-term partnerships with other merchants), a family enterprise (several family members who formally and/or informally conducted trade together as well as on their own or with outsiders), or a long-term company (with partners belonging to one or several families) has been taken as a unit for inclusion in the business value matrix. In the Veckinchusen case, I have opted for the merchant Hildebrand as the unit of analysis, since several of his account books and letters have been preserved (and not those of his brother or partners), allowing a

[20] Problems of delineating firms were also encountered when collecting data on the present-day world city network. Many business service firms form alliances in order to compete with larger firms, while take-over activities sometimes lead to rather complex corporate structures (Taylor *et al*., 2002b, 2369).

reconstruction of his personal business network. The inclusion of such a variety of definitions of business organisations makes comparison across firms somewhat problematic.

There is a second problem of delineation. Firms have ambiguous lifetimes. Individual or family enterprises before the death of their founder(s) can either be considered as the same or different organisations from the continuation of the business by one or more of the heirs. Partnership contracts were normally concluded for a limited number of years, but more often than not they were renewed (with or without adaptations to the terms of the contract), sometimes over a period of more than a century. Merchants could go bankrupt, but begin a new business again after a lapse of time.

To give an illustration, a company was founded by members of the Peruzzi family of Florence in 1274. More than once, this company was dissolved, the accounts were closed, and immediately a new company was established (often with a modification in the composition of the partners and the capital) which continued the business of the previous company. This succession of companies can be followed in the sources from 1292: consecutive Peruzzi companies of varying duration existed for 1292-1296, 1296-1300, 1300-1308, 1308-1310, 1310-1312, 1312-1324, 1324-1331, etc., until the Peruzzi company finally went bankrupt in 1343, after which year it was not renewed anymore. A major reorganisation took place in 1300, and although earlier companies had existed, the company of 1300-1308 was nevertheless called the first company, indicating that the reorganisation was seen as a new start (Hunt, 1994; Renouard, 1941, 43-46). It is unclear what should be considered as unit of analysis here: the Peruzzi firm from its foundation in 1274 until the bankruptcy in 1343 as a whole, the firms before and after the reorganisation of 1300 as two separate entities, or each of the many successive Peruzzi companies on their own?

Again, a pragmatic approach has been taken here. For the Peruzzi company the business network is especially known for the period after 1300. Since one can expect that important changes occurred in the spatial organisation of the firm at the reorganisation of 1300, the state of affairs after 1300 was probably not representative for an earlier period. On the other hand the data are too discursive to allow a complete reconstruction of the Peruzzi network for any of the successive companies between 1300 and 1343. As a result, the Peruzzi firm of 1300-1343 as a whole has been taken as a unit of analysis.

An additional problem is highlighted by the business of the Strozzi, another of the great patrician families of Florence. The Strozzi are known to have been active in banking already at the end of the 13th century, and several Strozzi companies existed in the fourteenth to the sixteenth century. One of these was a company founded in Naples by the brothers

Filippo (il vecchio) and Lorenzo di Matteo Strozzi sometime before 1466. This company was liquidated after the death of Filippo il vecchio in 1491, since at that time his sons Lorenzo and Filippo il giovane were still too young to continue their father's business. However, in 1510 the sons established their own company which was dissolved after the death of Filippo il giovane in 1538. Several account books of the firm of Filippo il vecchio as well as of the company of his sons have been preserved, and consequently the business network of both companies can be reconstructed[21]. Because of the lack of continuity between both firms (with a gap of almost twenty years) and the differences in spatial organisation (headquarters in Naples and branches in Florence and Rome under Filippo il vecchio, headquarters in Florence and later in Rome, and branches in Lyon, Naples and probably Venice under Filippo il giovane) I have judged them to be two separate enterprises (Bullard, 1980; Goldthwaite, 1968, 31-107; Id., 1998, 475-476, 489, 532-536).

Since the networks of these two Strozzi firms are known, both can potentially be included in the business value matrix. This entails some kind of risk of double counting however: although they established their own company, the sons largely operated in the same markets as their father (especially Florence, Rome and Naples) where they could appeal to the connections of their family. In such instances of possible double counting only one of the firms has been included with its network in the business value matrix[22], unless they operated in different centuries such as the above Strozzi firms[23], in which case each of them has been incorporated in a different century matrix.

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[21] Data also exist about other Strozzi firms such as the companies of Carlo Strozzi and his sons in the fourteenth century (which I have not investigated), and the firm of Niccolò, Jacopo and Filippo di Leonardo Strozzi from the 1420s to the 1460s (for which I have reconstructed the network but which did not fulfil the criteria for inclusion in the business value matrix).

[22] Enterprises that have been omitted in order to avoid double counting are the Ankenreute and Mötteli companies, both split off from the Grosse Ravensburger Gesellschaft; Johann Kampferbeke, who worked very closely together with Willem Amsinck; Bonavontura Von Bodeck, father of the better known merchant Johann Von Bodeck; Teramo Brignole, brother of Antonio Brignole; Jacob della Faille the elder, who split off from the della Faille company; Horatio Palavicino, son of the Genoese merchant Tobias Pallavicino; Andrea de' Pazzi, father of Jacopo de' Pazzi; the company of Johan de Torralba and Johan de Manariello, which preceded the business activities of Johan de Torralba with his son-in-law Johan de Sabastida; the Viatis-Forst-Lang company, predecessor of the Viatis-Peller company; Cosme Ruiz, nephew and heir of Simon Ruiz; and Christoph Manlich and brothers, cousins and close associates of Matthias Manlich. In a number of other cases in which the risk for double counting has been considered low I have decided to include more than one firm of the same family (often these firms clearly belonged to different branches of the family): the Augsburg Welser and Nürnberg Welser; the brothers Matthias and Melchior Manlich; the brothers Simon and André Ruiz; the Borromei of Milan and of Venice; the Fugger vom Reh and the Fugger von der Lilie (the famous Fugger firm); and Giovanni de' Medici and successors (the Medici company) and Averardo de' Medici.

[23] In addition to the two Strozzi companies, two companies were included for the Alberti family of Florence (Alberti company of 1302-1346 in the 14th-century matrix, and Alberti antichi company of 1346-1439 in the 15th-century matrix. For the Alberti antichi company two networks have been reconstructed, one for the period before ca. 1377, the other for ca. 1377/88-1439. Only the latter network has been used since it is more representative for the 15th century), the Centurione family of Genoa (15th century: Filippo and Federigo

Selection criteria for firms

GaWC's criteria for the selection of firms to be included in the service value matrices have changed in the course of the successive data collections for the years 2000 to 2008. The 2000 matrix contains 100 business service firms which all needed to have offices in at least 15 different cities including one or more cities in each of the three principal arenas of present-day globalisation (northern America, western Europe and Pacific Asia)[24]. Firms were selected rather pragmatically on the basis of availability of information about their office network. For the data collection of 2004 the same set of firms was used to enable comparisons, but as a result of corporate reorganisations and other changes between 2000 and 2004 only 80 firms could be retained in the 2004 matrix (Taylor, 2004, 65; Taylor *et al*., 2002b, 2369; Id., 2010c). Selection criteria were revised and improved for the 2008 exercise. Firms were not selected anymore on the basis of the location of their offices or the quality of the data, but they were simply chosen by their size: the top 75 firms in the sector financial services and the top 25 firms in the categories accountancy, advertising, law and management consultancy (according to the list in Forbes 2000 for the year 2006) were included in the 2008 matrix, which thus contained a total of 175 corporations (Taylor *et al*., 2010c; Id., 2010d). I consider the incorporation of a size criterion as a crucial advance since it provides some sort of guarantee for the representativity of the sample of firms for the network as a whole[25]. As will be demonstrated below, representativity is a critical problem when applying the interlocking network model to a historical case study.

Centurione; 16th century: Gaspare Centurione), the Stromer of Nürnberg (14th century: Stromer firm of ca. 1340-1406/07; 15th century: Gruber-Podmer-Stromer firm of 1427/33-ca. 1472. The Stromer-Ortlieb firm of 1406/07-1430/34 has not been included in the analysis for risk of double counting with the better known Gruber-Podmer-Stromer firm), and the Welser of Augsburg (15th century: Welser company before the fusion with the Vöhlin company in 1496/98; 16th century: company of the Augsburg Welser after the fusion with the Vöhlin company. For this 16th-century company two networks have been reconstructed, respectively for the period before and after ca. 1586. Only the former has been inserted in the matrix. In the 16th century also a company of the Nürnberg Welser existed, founded in 1517 by a younger brother of the head of the Augsburg Welser. Since the company of the Nürnberg Welser was in hands of another branch of the family, it has been considered as a separate company and has been included in the 16th-century matrix; see also previous footnote).

[24] One of the criticisms against GaWC's procedure of firm selection is that it results in a dataset dominated by business service firms with western origins (Bassens *et al*., 2010).

[25] It should be stressed however that one cannot assume unconditionally that the office networks of the largest firms together cover the world economy proportionally to the network as a whole. On the contrary, for the European city network in the late Middle Ages and the 16th century this was definitely not the case: small Venetian and Genoese companies for instance were largely responsible for European trade with the Levant and the Black Sea (see later). A similar observation may well apply to the present-day world city network. See e.g. Bassens *et al*. (2010) for the role of Islamic financial services in interlocking Gulf cities in the world city network.

Procedures for firm selection for the matrix describing the European city network between 1300 and 1600 have been drafted in a different way from those applied for the current world city network. Referring back to the first chapter, only business organisations from western Christian Europe, and only those firms that were involved in long-distance wholesale trade and/or international finance have been included in the matrix. Local and regional traders, such as artisans selling their own products, professional middlemen (e.g. drapers in the textile industry), peddlers visiting customers on the countryside, local money-changers or deposit-bankers, and pawnbrokers (Hunt & Murray, 1999, 52) are outside the framework of this study.

The principal criterion had a very pragmatic use: only those firms were chosen for which more or less good data were available, allowing a reliable reconstruction of the business network. Data have been entirely collected from historical literature (see later), and priority has been given to firms that have been the subject of one or more particular studies (monographs, articles or source editions) in which the business network of the firm is treated more or less extensively. Consequently, the availability of adequate literature has been the leading criterion for the selection of firms, and had a large impact on the composition of the matrix (moreover, some of the literature is in languages that I am not (very) familiar with, and this has somewhat influenced the firm selection as well).

However, far from all firms have received the same consideration in the scientific literature. For the very large majority of late medieval and 16th-century business organisations, no or only very fragmented source material is available, and such firms have – almost by definition – been neglected in the literature (Jeannin, 1963a, 49-51). Another risk is that outstanding merchants and firms have attracted more attention from historians than more ordinary trade organisations. One can wonder how representative such individuals and enterprises were for the business world as a whole (Kermode, 1998, 3).

Secondly, firms needed to be involved in business in at least ten different cities[26] (with a business value of score 2 or more according to the nine-point coding scale, see below). However, this criterion has not been applied to Venetian and English firms, nor to Low Countries firms of the 14th and 15th centuries, since almost no firms in these categories satisfying the above condition could be found[27].

[26] Less precise regional entities (islands, political principalities,... see below) did not count.

[27] The eight firms not fulfilling this criterion are Thomas Betson, the Cely, John Goldbeter, Gilbert Maghfeld (English), Andrea Berengo, Michele da Lezze, the Pisani (Venetian), and the Despars company (Flemish). These were all relatively small firms for which nevertheless relatively good data were available, and they all had at least five different cities in their network with a business value of two or more (nine-point scale).

Thirdly, firms needed to be involved in transnational business activities. Although I am fully aware about the fact that terms such as 'transnational' or 'international' are anachronisms in this historical context, I have decided to retain them for lack of better concepts describing phenomena or processes operating beyond the scale of a political entity. According to Hunt & Murray (1999, 58) "'international' in medieval Europe would have meant any trade outside a town's immediate vicinity. Thus Milan, Siena, and Pisa for example, would have been 'foreign' to Florence – and, indeed, each had its own currency." Nevertheless, I have given priority to firms that conducted trade on a larger scale. As a criterion for inclusion in the matrix firms were required to be active in at least two of the following seven regions (with a business value of 3 or more (nine-point scale)): Italy, the Iberian Peninsula, France, the Low Countries, England, the Hanseatic zone, and central Europe (excluding the Hanseatic area)[28].

A firm-size criterion has only been used up to a certain level. On the one hand, it is impossible to draft a list of the largest or most important commercial and banking firms of late medieval and 16th-century Europe. For most firms the size is not even or only vaguely known (Jeannin, 1963a, 52-54, 90). Even when firm-size data are available, comparisons between firms cannot usually be made: sometimes the amount of capital invested by the partners (the *corpo*) is known, while for other firms we have data about the total assets and/or liabilities, about the amount of employees, or about the personal wealth of the partners, all of which are hard to relate to each other. Moreover, several large companies have not left enough traces in the source material to allow a reconstruction of their business network (see criterion on availability of data). On the other hand, a firm-size criterion is not desirable, since several parts of the network were typically serviced by relatively small firms: Venetian, Genoese and Hanseatic trade for example were taken care of by rather modestly sized organisations (see e.g. Renouard, 1941, 107-109). Nevertheless, the largest companies have – inasmuch as data were available – been included in the matrix (e.g. Bardi, Peruzzi, Acciaiuoli and Scali of Florence for the 14th century, Medici for the 15th century, Fugger and Welser of Augsburg for the 16th century). Additionally, region by region, and century by century,

[28] Two firms, the Gapaillon and Collard van Marke, did not fulfil this condition. The former was a family of merchants of Lyon who were active at the fairs of Lyon during the 16th century (Gascon, 1952). The latter was a 14th-century Bruges money-changer (Murray, 2005, 249-258). Both were nevertheless taken up in the matrix because they had an international client base for which the geographical composition is very well-known. A number of other firms satisfied the criterion, although most of their activities were limited to a regional scale: the Corsi, Vicko von Geldersen, the Panse, the Popplau, Ott Ruland, and a number of English firms trading exclusively between England and the Low Countries.

priority has been given to large firms over small firms, although again one could wonder whether large and small firms operated in the same markets.

Lastly, I have attempted to make up a diverse matrix with firms ranging as much as possible – and proportionally to the volume of business (although it is impossible to quantify this) – across the whole period from 1300 to 1600 and across the whole of western Christian Europe in order to obtain a more or less representative sample. Due to the unequal availability of data on firms from century to century and from region to region, this has only been possible to a certain extent however. This has important implications for the representativity of the matrix.

A proportional representation of different economic sectors, such as for the present-day matrices (accountancy, advertising, law consultancy, management consultancy, financial services), has not been a requirement. As the term 'merchant-banker' suggests, long-distance trade and transnational finance were no separate sectors yet, and all international bankers were involved in commercial activities as well (but not vice versa). Wholesalers did not regularly specialise in the trade of one particular type of merchandise, but instead dealt in whichever good that could yield a profit. Moreover, many merchants and long-distance bankers were also active in retail trade, local banking (deposit banking, money changing, loans), industry (textile production, sugar refining, mining and metallurgy, printing,…), transport (as members of shipping companies for example), maritime insurance, tax farming, and even agricultural production (Hunt & Murray, 1999, 195; Jeannin, 1963a, 75-77; Lapeyre, 1955, 109-111; for Genoese merchants and bankers, see Heers, 1961, 91-93; for Florentine companies, Renouard, 1941, 63-73; for Dutch merchants ca. 1600, Christensen, 1941, 188). As a result of this striking absence of specialisation a categorisation of firms in different sectors does not make much sense.

Selection of firms and representativity

There is not such a thing as a comprehensive list of the top European firms for the 14th, 15th and 16th centuries (such as Forbes 2000 for present-day corporations). Consequently, I had to draft myself a preliminary list of potentially suitable firms for which literature can be found. This inventory has been based on overview works, including bibliographies, on late medieval and early modern business history (e.g. Sapori, 1952; Spufford, 2002), and has been compiled with help from historians at the Centre for Urban History in the University of Antwerp. The

list of firms has been continually and organically refined and extended in the course of the data collection exercise[29].

Currently, I have compiled a very incomplete list of about 530 firms for which information can be found in the literature. I have investigated the business networks of ca. 400 of these firms, but for about 85 of them additional literature needs to be consulted to allow a more reliable or detailed reconstruction of the network. Of the remaining ca. 315 business organisations, about 185 firms do not fulfil the selection criteria, most often as a consequence of a lack of data. This leaves a total of 130 firms which have been included in the 1300-1600 matrix (see table 2.1).

Table 2.1
List of firms included in the business value matrix 1300-1600

Origin	**14th century**	**15th century**	**16th century**
Central Europe (excl. Hanse)	Kamerer-Seiler* Runtinger*	Hirschvogel** Tucher**	
	Stromer	Diesbach-Watt Fugger vom Reh G. Ravensburger Gesellschaft Gruber-Podmer-Stromer Praun (Hans) Ruland (Ott) Starck (Ulrich) Welser (15th c.)	Cromberger Fugger (von d. Lilie) Haug-Langn.-Linck Imhoff Manlich (Matthias) Manlich (Melchior) Oesterreicher Paler-Weiss Popplau Viatis-Peller Welser (Augsburg) Welser (Nürnberg)
England	De la Pole (William) Goldbeter (John) Maghfeld (Gilbert)	Betson (Thomas) Cely	Myddelton (Thomas)
France		Coeur (Jacques)	Gapaillon Hermite Panse
Hanse	Teutonic Order* Von Geldersen (Vicko) Wittenborg (Johann)	Rinck Veckinchusen	Amsinck (Willem) Beckmann Berens (Hans) Carstens & partners Von Holsten (Wolter) Loitz
Iberian Peninsula			
Aragón			Daza Lopez de Villanueva
Castile		De Soria (Diego)	Bernuy De Castro Civille Espinosa Quintanadueñas

[29] Very fruitful in this perspective were a number of contacts with historians at meetings such as the conference on "Long-distance communication between cities and towns" in Lecce, 11-14 September 2008, and the "World Economic History Conference" in Utrecht, 3-7 August 2009.

Table 2.1 (continued)
List of firms included in the business value matrix 1300-1600

Origin	14th century	15th century	16th century
Castile (continued)			Ruiz (André) Ruiz (Simon) Salamanca
Catalonia	Mitjavila & partners	Llobera-Junyent Torralba-Sabastida	
Portugal			Caldeira (Luis A.) Mendes Nunes (Estevão) Rodrigues d'Evora Ximenes
Italy			
Genoa		Centurione (Filippo & Federigo) Lomellini (Marco) Piccamiglio (Giovanni) Da Pontremoli (Giovanni)	Brignole (Antonio) Centurione (Gasp.) Fornari (Gio Batta) Grimaldi Di Negro (Franc.) Pallavicino (Tobias)
Lombardy			Affaitadi Vertema
Tuscany			
- Florence	Acciaiuoli Alberti Bardi Buonaccorsi Guardi Peruzzi Scali Soderini Datini (Francesco)* Medici (Averardo)**	Alberti antichi Banchi (Andrea) Borromei (Milan) Borromei (Venice) Medici Pazzi (Jacopo) Spinelli Strozzi (Filippo il vecchio)	Botti Corsi Guicciardini Olivieri Rocca Salviati Strozzi (F.i. giovane)
- Lucca	Guinigi Rapondi Spifame		Balbani Bonvisi
- Pistoia	Company of Pistoia		
Venice		Barbarigo (Andrea) Bembo Querini (Guglielmo)	Berengo (Andrea) Da Lezze (Michele) Pisani
Low Countries	Van Marke (Collard)	Despars	Van Adrichem (Ni.) Von Bodeck (Joh.) Cunertorf-Snel Della Faille De Groote (Ni.) Van Immerseel (Jan) Van der Meulen Van der Molen Poulle Resteau (Jean) Schetz Thijs (Hans) Van Tweenhuysen Van Uffele

* Same data for both centuries.
** Different data for each century.

For each of these 130 firms data fiches have been produced, which contain a short general description of the firm, a reference list (I have also mentioned the literature that I have not been able to consult[30]), an overview of the principal source material on the firm, information about the size and the principal activities (commerce, finance, industry,…) of the enterprise, and finally a description of the business network (see appendix 1 for an example of a data fiche). Because of the large volume, these data fiches have not been printed out. Draft versions can be found in appendix 2 (see CD-rom). I intend to publish the data fishes in edited form on the GaWC website (http://www.lboro.ac.uk/gawc).

The 130 selected firms have been grouped century by century. It was not possible to limit the sample to business organisations active in or around specific sample years (e.g. 1350, 1450, 1550), which would have allowed the reconstruction of several cross sections of the European city network rather than more artificial century-averages. Instead, the selected enterprises and their business networks are scattered over the whole 300 year period from 1300 to 1600. It goes without saying that firms did not automatically go bankrupt or were dissolved at the end of a century, and the period of existence of many of the firms in the matrix straddled two (or even more) centuries. Nevertheless, for most firms the data have been collected as such that they reflect the state of affairs in one particular century. However, for four companies (Datini, Kamerer-Seiler, Runtinger and Teutonic Order) the data reproduce the situation at the turn of the century when these firms experienced their apogee, and consequently they have been included in the matrices for two centuries. Another three firms (Averardo de' Medici, Hirschvogel and Tucher) could not be attributed to one particular century either, but since changes occurred in their business networks around the transition from one century to another[31], somewhat different data have been used in each century-matrix[32]. As a result of this, the matrices for the 14th, 15th and 16th centuries respectively

[30] For each of the firms included in the matrix, I have searched Web of Knowledge, Google Scholar and Google for available literature.

[31] The Tucher for example only became active in Antwerp in the early 16th century (Grote, 1961, 36-39). Consequently, Antwerp has been included in the Tucher network in the 1500-1600 matrix, but not in the 1400-1500 matrix.

[32] The business values of these three firms in the 1300-1600 matrix represent an average situation of their respective business networks and do not take into account this subdivision into centuries. For the Grosse Ravensburger Handelsgesellschaft, a firm for which data exist about the business network for ca. 1420-1530, specific data on the state of affairs during the 16th century have only been included in the 1300-1600 matrix, but have been left out in the matrix for the 15th century. For all other firms, data in the century matrices and the 1300-1600 matrix are identical.

contain 25, 39 and 73 firms, the total of which is more than the number of firms (130) in the 1300-1600 matrix[33].

The large differences in the numbers of firms for each of the three centuries probably partly reflect an increase in the volume of trade and finance at a European scale between 1300 and 1600, and perhaps also a 'democratisation' of long-distance trade (Brulez, 1959, 369-370, 502; Van der Wee, 1963, 321-323) but even more they are a result of an unequal availability of data. The further one goes back in time, the smaller the chance that source material has been preserved or even produced (increasing use of writing by businessmen with the development and spread of accountancy techniques, etc) (Prevenier, 1998, 37-40). This has implications for the representativity of the data, which is an even more pertinent issue for the 14th and 15th centuries than for the 16th century.

More will be said about the places of origin of firms later, but from table 2.1. can already be inferred that not all regions are equally represented in the matrix. Up to a certain extent this reflects an uneven development of business from region to region, but in a large measure this is again the result of the data situation. Not only have historical contingencies such as war or fires caused a smaller amount of sources to have been preserved in one part of Europe than in another (Prevenier, 1998, 37-40), but there were also regional differences in the use of writing in business. Moreover, it can be expected that for particular groups of merchants (such as Jews) which for religious or other reasons had to operate surreptitiously, less sources have been preserved or even produced.

Catalan trade for example was highly important in the 14th and 15th centuries (e.g. Spufford, 2002, 376-386). Nevertheless only 3 Catalan firms have been included in the matrix, since not much literature (moreover all in Spanish, Catalan or Italian) on particular Catalan business organisations is available, which in its turn reflects the lack of archival source material. This imbalance between firms from different origins is larger for the 14th and 15th centuries than for the 16th century.

A remark has to be made about the amount of firms finally included in the matrix. 130 firms is a small number for a period of 300 years. Clearly, this research should be seen as a work in progress. Various firms for which sufficient data exist probably remain outside the sample. Additional research could yield several more suitable business networks, not only for the ca. 130 firms in my provisional list which have not been investigated yet, or the ca. 85

[33] The Alberti antichi company, which existed from 1346 to 1439 (network reconstructed for ca. 1377-1439), has only been included in the 1400-1500 matrix to avoid double counting with its predecessor, the Alberti company (1302-1346), which has been included in the 1300-1400 matrix (see also above).

enterprises for which extra literature needs to be consulted (however, most of these were firms from the 16th century and/or from regions which are already well represented in the matrix. Including these enterprises would increase rather than alleviate the geographical and temporal biases in the matrix), but also for the many firms that I have not even come across yet.

On the other hand, completeness in whichever sense is not realisable: the amount of literature on late medieval and 16th-century European business history is inexhaustible, and much is in Italian, Spanish, Catalan and other languages that I am not very familiar with (with again a bias in the firm selection as a result). Moreover, one needs to keep in mind that data collection on the business networks of these late medieval and early modern business organisations is a time consuming labour and is as such hardly comparable to the more extensive data collection on the office networks of contemporary business service firms. In the framework of a PhD research project not much more could have been done. A reduction of the temporal and/or geographical reach of the case study under investigation would have allowed to conduct a more detailed and in depth study, with a larger relative sample size. However, this would have put at risk the transnational approach and long-term perspective, both of which are considered central to this research.

In conclusion, two factors are responsible for the fact that the city network that can be derived from an aggregation of the business networks of the selected sample of 130 enterprises is not representative for the European city network that existed between 1300 and 1600. Firstly, the selection of firms has been guided almost entirely by availability of data, and this has only partly been neutralised by meaningful criteria such as the size of enterprises or a proportional geographical (across cities/regions of origin) or temporal (across centuries) spread of the selected firms. Consequently, there is definitely a bias in the business value matrices which can hardly be accounted for, since it is impossible to know exactly in which direction and how strong the available data are biased. Secondly, a sample of 130 firms is somewhat small to draw general conclusions for an area as large as Europe and for a period of 300 years. Due to these problems the final selected sample of firms is not representative for the total existing network, and consequently the business networks of the enterprises in each of the century-matrices cannot be simply counted together.

The problem of representativity is characteristic for historical research on the pre-statistical period (Prevenier, 1998, 70-71)[34]. It can be somewhat mitigated by utilising many

[34] According to Frederic C. Lane (1944a, 4), eminent historian of the Venetian Republic, "[t]here is no hope of discovering the personal records of enough merchants of Venice so that the historian can claim he has observed

different sorts of data. However, the interlocking network model itself is characterised by a one-sided focus on a particular type of information – the spatial networks of business organisations – which inhibits the application of this model in historical research. To meet these objections I will complement the quantified firm data (the business value matrices) in the results chapters with additional (but not quantified) data on the spatial organisation of merchant nations, transport networks, etc. Moreover, rather than directly deriving the overall structure of the European city network from the matrices, several subsamples will be investigated separately in order to obtain a better picture of the different biases in the data. Only in the final sections these subnetworks will be brought together again.

On the other hand, even if it had been possible to reproduce a representative sample of firms, the city network reconstructed for a particular period in time and geographical area on the basis of such a sample could not have been generalised to the network based on all firms for this period and area (and certainly not to networks in other times and/or geographical areas). This is a result of the fact that a city network is an open system, in which no regularity is necessarily produced (Sayer, 1992, 121-125). It is important to realise (1) that the city network that will be reconstructed should be seen as a concrete social structure in a fixed spatial and temporal context from which cannot be abstracted (see Hopkins, 1982, 148-149; Sayer, 1992, 145); (2) that no claim of generalisation to other firms can be made, even if a so-called "representative" sample of firms would be used (Sayer, 1992, 99-103). Rather than attempting to reconstruct a representative picture of the network, the focus will be upon an investigation of the functioning of this city network.

2.1.2. The cities

For the selection of cities, which form the row-headings of the business value matrix, I have used a different approach from the one applied for the GaWC data collections for 2000, 2004 and 2008. For 2000 and 2004, the offices of business services were traced across 315 cities, consisting of almost all national capitals plus a number of other important economic centres. For the data collection of 2008 the number of cities was increased to 525, including many new cities from emerging markets (Taylor, 2004, 66; Taylor *et al*., 2002b, 2369; Id., 2010c; Id., 2010d).

For the historical business value matrices, no selection of cities was made prior to the data collection. Instead, all cities appearing in any of the business networks of the 130

an adequate random sample of merchants and so can reach a statistical conclusion. In describing the distant past the historian must use methods which are not statistical; he must give another meaning to the word typical."

selected firms have been included in the 1300-1600 matrix. This has been possible because the recreated networks of most firms included only a limited amount of nodes (only three business networks with more than 100 nodes have been reconstructed).

Taken together, the 130 firms are known to have been involved in business in a total of 1337 places. Of these, 1205 were distinct human settlements – especially cities and towns, but also including a number of smaller places. The remaining 132 places are less precise geographical designations: geographical regions (ranging in size from the Cotswolds or Calabria to Asia or Barbary), political entities (Flanders, England,…), islands (Mallorca, Canary Islands, Cyprus,…), etc. These had to be used when more specific locations could not be found in the literature, either as a result of a lack of precision in the historical literature itself, or because the information preserved in the source material did not allow to give a more precise indication[35].

In itself, this does not have to be a problem as long as the region, island, or political entity does not contain within its boundaries one or more of the 1205 cities or towns included in the business value matrix, since in that case there are no risks for overlapping spatial categories. Between 1561 and 1568 for example, the hanseatic Loitz company held a monopoly from the Danish king for the export of sulphur from Iceland (Papritz, 1956, 86-87). Nowhere a specification is given of (an) Icelandic harbour(s) or cit(y)(ies) wherefrom the sulphur was exported. As a result, Iceland itself had to be added as a row in the business value matrix. Since the matrix does not contain any Icelandic cities (no other firms were involved in trade with Iceland), we do not need to worry about a potential overlap between rows in the matrix. This applies for 40 of the 132 less precise designations, which have simply been added to the matrix.

Almost all of these 40 locations were either not very well-known regions outside of Europe whereto typically expeditions were sent (Angola, Brazil, the Moluccas, the North Pole region,…), European regions characterised by a low degree of urbanisation from which rural, mining or forest products were imported (Albania, Bosnia, the Jablunkov Pass, Masovia, Wales,…), or islands with strategic importance or a concentration of rural production (often sugar) but again lacking important urban settlements (Azores, Canary Islands, Cape Verde Islands, Iceland, Ireland, Malta, Oléron,…). The popping up of these place names in the

[35] Descriptions such as “fairs of Champagne” have been replaced by place names (in this example Troyes, Provins, Bar-sur-Aube, and Lagny-sur-Marne). Only once, this has not been feasible. According to Hermann Kellenbenz (1954, 263-264) the Vertema firm, an Italian company established in Nürnberg around 1600, had strong connections with the Habsburg Court. However, it is not clear whether this was the Habsburg Court in Spain or in the Holy Roman Empire (or both). Consequently, I have kept the vague description “Habsburg Court” in the matrix.

matrix indicates that the networks of transnationally operating European businessmen were not restricted to urban settlements but also infiltrated in rural and sparsely populated areas, often overseas. However, apparently these were not prominent in the network at all: most appear only in one or two of the 130 business networks (respectively 26 and 9 out of the 40 locations), with only the Canary Islands (9) and Brazil (6) surfacing in more than five different business networks.

The remaining 92 regional place names are more problematic. A typical example is Sicily. On the one hand, several firms are known to have been represented in particular Sicilian cities and towns such as Palermo, Catania, Messina, Siracusa, Agrigento, Lentini, Mazara del Vallo, Modica, Sciacca, Trapani, Alcamo, Noto, etc. On the other hand, for several firms active in Sicily the literature does not mention the specific Sicilian cit(y)(ies) in which they were represented, but only refers to the island in general. As a result, the importance of several Sicilian cities in the city network is possibly underestimated. Ideally, the business values of Sicily should be divided among different Sicilian cities and towns (not only those in which other firms are known to have been active, but perhaps also other settlements which are absent from the matrix), but the question is among which cities and in which proportion. Luckily, in most cases the underestimations are small and can be neglected (47 of the 92 imprecise indications only appear in the network of one firm for example, and another 13 only turn up in two networks, while none are present in more than 10 firm networks). When they are more important, biases in the analyses resulting from these underestimates will be indicated. Contrary to the previous category, these overlapping regional designations do not only contain sparsely urbanised areas such as Calabria, Norway, and Scotland, but also regions with a high density of cities such as Brabant, Flanders and Lombardy.

Looking at each of the centuries separately, the picture is as follows: the reconstructed networks of the 25 firms of the 14th century contain a total of 595 different nodes (560 of which were cities/towns, 7 were distinct regional descriptions, and 28 were overlapping regional designations), the 39 fifteenth-century companies are known to have been represented in 766 different places (respectively 715, 9 and 42), and the 73 business organisations of the 16th century have been found to have been involved in business in 709 locations (respectively 619, 30 and 60). The relatively high numbers of cities for the 14th and 15th centuries – especially in light of the smaller amount of firms – can be largely ascribed to the network of the Datini company (included in both the matrices for the 14th and 15th century), which is known in very great detail (267 places) (but see also footnote 36).

For several analyses, the number of cities will need to be restricted however. Since all places appearing in the business network of any of the firms have been included, the resulting matrices are very sparsely populated (containing many zero values). Of the total of 1337 places in the 1300-1600 matrix, 804 can be found in the network of just one firm, while another 202 places belong to only two firm networks[36]. Consequently, solely 331 places appear in 3 or more networks. It goes without saying that places showing up with a low frequency should be excluded from most analyses (exclusion rules will be discussed for each analysis separately).

2.1.3. The business value of a city to a firm – Organisation of the central and infrastructural layers of the space of flows

The business value of a city for a late medieval or 16th-century business organisation is a quantitative measure for the importance of that city in the business network of the particular firm. Business values are the counterparts of service values, which describe the importance of a city in the office network of a business service firm in the present-day global city network. The service value of a city for a business service firm depends upon the size of a firm's presence in a city, which can be measured through the number of employees or offices of a firm in a city, and upon the presence of extra-locational functions (headquarters, subsidiary or regional headquarters, etc.) of a firm in a city (Taylor, 2004, 66; Taylor *et al.*, 2002b, 2369; Id., 2010c).

Service values are expressed quantitatively according to a certain scoring system. In the GaWC-approach, service values are coded on a scale ranging from 0 (a firm having no offices in a city) to 5 (a city containing the headquarters of a firm). The score for standard offices is 2, while minor and major offices respectively are given a code 1 and 3. Finally, a score 4 is attributed to exceptionally important offices such as regional headquarters. This scoring system has been kept relatively simple in order to be able to code not only office networks that are known in great detail, but also those for which not that much information is available. Moreover, an uncomplicated scoring system alleviates up to a certain degree the problem of subjectivity (the fact that two people using the same information will not always decide on the same score for each office). The same scoring system has been applied to the

[36] For the 1300-1400 matrix, these numbers are respectively 439 and 90 (of a total of 595), for the 15th-century matrix 559 and 97 (of 766), and for the 1500-1600 matrix 376 and 132 (of 709). Consequently, the 14th-, 15th- and 16th-century matrices respectively contain 66, 110 and 201 places appearing in the business networks of more than two firms.

data collections of 2000, 2004 and 2008 (Taylor, 2004, 66-67; Taylor *et al*., 2002b, 2370-2371; Id., 2010c).

Consequently, the interlocking network model does in fact not directly study flow data between cities, but instead makes use of attribute data on the presence of offices of firms in cities. The conjecture behind this is that flows are produced between the offices of each corporation as a result of the day-to-day working of the firm, and hereby more important offices are assumed to generate more flows. These so-called potential working flows are used as indirect measures for the connection of different cities in the office network of the firm (Taylor, 2004, 61-64; Taylor *et al*., 2010c).

Through their daily working activities, late medieval and 16th-century long-distance wholesale merchants and transnational bankers produced inter-city flows as well. The organisational structure of these firms was very different from the institutional make-up of contemporary business service firms. Although several merchant-banking firms had a network of branches spread across different cities, a range of other organisational arrangements was at the disposal of these firms in order to carry out their transnational business activities. Before being able to draft a scoring system, a closer look at the organisation of late medieval and 16th-century transnational business – part of the middle layer of Castells' (2000) space of flows (see chapter one) – is needed.

The organisation of business enterprise in late medieval and 16th-century Europe

The most straightforward way for a long-distance merchant to carry out his business was to purchase goods in a certain place and then to travel with these goods to another place where they could be sold. It is according to this system that the fairs of Champagne were organised in the 12th and 13th centuries. In a simplified picture trade at the Champagne fairs can be described as follows: Flemish merchants travelled with their famous cloth to the fairs where they exchanged their wares with Italian merchants who came from Italy to Champagne with spices, silk and other luxuries from the Levant. During the second half of the 13th century however, important changes took place in the organisation of business enterprise, which resulted from a transition from the travelling merchant to the sedentary merchant. This so-called commercial revolution first occurred in Italy, where merchants increasingly felt the need to stay home in order to play a role in local city politics, but subsequently these Italian innovations spread across the rest of Europe. In the Baltic, an analogous process of sedentarisation of the Hanseatic merchant took place since the middle of the 13th century (for

the commercial revolution in general, but with a strong focus on Italy, see De Roover, 1942, 34-37; Hunt & Murray, 1999, 55-56; Spufford, 2002, 12, 16-19, 148. Specifically for Venice, see Lane, 1973, 137-138; for Genoa, Heers, 1961, 193; for Barcelona, Aurell, 2001, 202-207; Aurell i Cardona, 1996, 98-100; for the Hanse, Dollinger, 1970, 163-164; Rörig, 1971b, 216-218; for the spread of the new techniques to the Low Countries in the 16th century, see Stols, 1971, 254-255).

Nevertheless travel remained very important in late medieval and 16th-century trade, not in the least in those areas, such as England, where the novelties of the commercial revolution were only adopted much later, but also among Catalan, Castilian and even Italian merchants,... The transformation from travelling to sedentary merchants was much less clear in Genoa, where merchants had no access to the highest public offices, than in Tuscany for example. Merchants often made use of travel for trade to regions with which no regular connections existed, or to explore new trade directions (in general, see Brulez, 1959, 365; Spufford, 2002, 46-47; for Catalan merchants, Aurell, 2001, 207-210; Aurell i Cardona, 1996, 100-107; Carrère, 1967, 146-147; for Castilian traders, Fagel, 1996, 8-10, 17-19; Id., 2000; for Genoese merchants, Heers, 1961, 195-197; for travelling foreign merchants in Bruges, Murray, 2000, 3-5).

The need for capital (or the need for investment opportunities) induced the conclusion of partnerships between travelling merchants and investors. Already before the 13th century, in the Mediterranean harbours of Italy, France and Catalonia single-venture partnerships were arranged between an investing partner who stayed at home and a travelling partner who accompanied the goods overseas. Different types of these single-venture partnerships existed, the best known of which were the *societas maris* and the *commenda* (*colleganza* in Venice). In the *societas maris* the investor and the travelling partner respectively provided two thirds and one third of the money and received fifty percent of the profit each, while in the *commenda* all the money came from the investing partner, who received three quarters of the profits (or losses). Another variant was the sea loan, whereby an investor lent capital to a travelling merchant for the duration of one venture. However, the loan, as well as a set premium, only had to be paid back to the investor on the safe arrival of the cargo. Consequently, the sea loan was a combination of a loan and an insurance policy, whereby the money-lender assumed the risk of shipwreck or piracy.

In practice, these single-venture partnerships and loan contracts existed in a large variety of forms. Investors often had put out money in several partnerships at the same time, and also travelling partners concluded partnerships with a number of investors to finance one

and the same venture. Moreover, a merchant could be investing partner in one contract and travelling partner in another (Abu-Lughod, 1989, 116-117; Hunt & Murray, 1999, 61; Renouard, 1941, 40-41, 107; Spufford, 2002, 23; for the Venetian *colleganza*, see Lane, 1944a, 94; Id., 1973, 138-140; Luzzatto, 1937, 40; for Genoa, Heers, 1961, 198-200; for Barcelona, Sayous, 1933, 209-210, 215). Such single-venture partnerships remained in existence after the 13th century, especially for journeys to relatively unknown territory. Sea loans for instance were commonly used in the trade between Sevilla and the New World in the 16th century. By the 15th century several *commenda* contracts were concluded for longer periods rather than for a single venture (Heers, 1961, 199; Hunt & Murray, 1999, 57; Jeannin, 1963a, 55-56; Lane, 1973, 138-139; Pike, 1966, 49; Spufford, 2002, 46-47).

A similar, but independently evolved, type of association was the Hanseatic *Widerlegung* (or *wedderlegginge*), a single-venture partnership between a substantial merchant (*Herr*) who supplied the capital, and a beginning merchant, often the *Diener* (a sort of employee) of the former, carrying out the labour and the travelling. Profits and losses were shared equally. More often however, both partners invested an equal amount of capital. The *Widerlegung* was still in use in Lübeck at the end of the 16th century (Mollwo, 1901, li-liii; Pelus, 1981, 34 n. 60). Also Dutch trade in the Baltic during most of the 16th century was typically in hands of travelling merchant-shippers, who financed their ventures through bottomry loans (a sort of sea loans) (Christensen, 1941, 177-183).

Although travel remained important in late medieval and 16th-century commerce, the 13th century saw the rise of the sedentary merchant. The new business techniques developed during the commercial revolution could vary from one city to another, and even within a particular city sedentary merchants had different institutions at their disposal. This diversity cannot easily be accounted for without strong simplifications. An interesting comparative perspective is offered by the New Institutional Economics however. The New Institutional Economics is a relatively new school in economic science, represented for example by the works of Nobel Prize winner Douglass C. North and Avner Greif. With the introduction of concepts such as transaction costs and property rights, the New Institutional Economics supplements and corrects the traditional neoclassical models of economic exchange. In recent years New Institutional Economics, which frequently makes use of historical examples and case studies, has become fairly popular among economic historians (Munro, 2001, 405-407; Selzer & Ewert, 2005, 18-29).

According to the New Institutional Economics merchants had three institutional devices at their disposal to govern their transactions: hierarchies, networks and markets[37]. Typically, late medieval and early modern businessmen did not limit themselves to the use of only one of these solutions but relied on a combination of all three institutions (Gelderblom, 2003, 606-609).

In hierarchies – or firms – hierarchical relationships exist between employers and employees which allow to enforce contracts. In a hierarchy the services of employees residing or travelling abroad can be used to carry out business transactions and other functions in foreign cities (Ibid., 608; Harreld, 2007, 65). Business service firms with their office networks are typical hierarchies for example.

The prototypical hierarchy in late medieval and 16th-century trade and banking was the long-term multi-branch company, developed in Italy in the course of the 13th-century commercial revolution. Such long-term partnerships were not concluded for a single business venture but for several years, and they were regularly renewed. Each partner, who was personally liable in case of bankruptcy, contributed a specific amount of money to the capital (*corpo*) of the company and shared accordingly in the profits or losses. Moreover, additional capital (*sopracorpo*), on which interests were paid, was raised from partners, employees and external investors. Most partners played an active role in the company, for example as branch managers. Sometimes the partners all belonged to the same family while in other cases shareholders from other families were included (in the 16th century, non-family partnerships became more frequent). The company was typically named after the founding family, who also delivered the chairman who headed the business from the headquarters. These firms varied in size from small to very large organisations. Many long-term partnerships did not have the means to establish branches abroad, instead using less costly institutions for engaging in long-distance trade (see later) (in general and for Tuscany, see De Roover, 1942, 35; Id., 1948b, 31-32, 40-42; Id., 1963, 100-107; Hunt, 1994, 76; Hunt & Murray, 1999, 62, 105-106; Jeannin, 1963a, 81-84; Renouard, 1941, 41-49, 57-60; Spufford, 2002, 22-25, 46-47; Vazquez de Prada, 1960, 181-182; for Italian companies in Lyon, Gascon, 1971, 280-282, 285-286; for southern German companies, Harreld, 2004, 81-83; for Antwerp, Brulez, 1959, 363-365. About the Catalan *companyia de mercaderia*, which was somewhat differently organised, see Carrère, 1967, 158-165; Sayous, 1933, 211-215; Id., 1934).

[37] Consequently not only cities (the nodes in the interlocking network model) are organised in hierarchies and networks (see chapter one), but also the merchants (the subnodal level of the interlocking network).

Larger companies – especially found in Tuscany and Lombardy, in southern Germany since the 14th century, and from the 16th century also in Antwerp for example (although even in these places small merchants were a majority) – established branches with several employees in one or more important commercial centres abroad. Very exceptionally, large and hierarchically structured multi-branch companies could be found in the Hanseatic zone as well. Examples are the Teutonic Order or the Loitz firm of Szczecin. But among Hanseatic merchants, small and decentralised associations were the rule (Dollinger, 1970, 167-168; Irsigler, 1985, 79-80).

The centre of the network of a late medieval or 16th-century company was formed by its headquarters. Here, the head of the company as well as a number of partners and personnel (principal cashier, general secretary, etc.) were located. The headquarters, from or to which orders, information, merchandise, and employees were sent or converged, consisted of shops, warehouses, office space, etc. (Renouard, 1941, 61).

The other branches were headed either by a partner (who received a share in the profits or losses) or a factor (who worked for a salary). Branch managers were provided with a general power of attorney. In addition to the manager, the branches also counted a limited number of other employees (bookkeeper, salesperson,…). In order to enhance trust, often family members (by blood or marriage) or at least fellow citizens of the city of origin of the company were chosen as representatives in the branches. While the factors of Italian companies were prohibited to compete with the mother company, factors working in the foreign branches (called *Faktorei* or *Gelieger*) of southern German firms apparently carried out business not only for the company but also for their own account. The branches were normally located in rented (rather than company-owned) rooms or buildings (for Italian companies, see De Roover, 1948b, 32-34, 37; Id., 1963, 79-81; Hunt & Murray, 1999, 56-58, 100, 107-109, 111; Renouard, 1941, 49, 52-55, 62-63; Spufford, 2002, 46-47; for southern German firms, Eikenberg, 1976, 173, 173 n. 21; Harreld, 2004, 83; Kellenbenz, 1990, 165-166; for Antwerp, Brulez, 1959, 365-366).

Originally, the Italian multi-branch companies were unitary organisations whereby all the branches depended directly from the headquarters. Towards the late 14th century these formally centralised companies were largely displaced by the so-called partnership system: instead of establishing one partnership from which all branches depended, different legally autonomous partnerships were concluded for each branch between a single controlling partner (or in the case of a holding company a small number of partners assembled in a controlling partnership) and his branch managers in different locations. The advantage was that the assets

of a branch were protected in case of bankruptcy of one of the other branches. The partnership system was originally a particular Florentine invention, but spread from here to the other inland cities of Italy. The southern German business world maintained the system of legally unitary companies however (Bauer, 1936, 33-36, 89-91; De Roover, 1948b, 31-35; Id., 1963, 77-78; Gascon, 1971, 281; Jeannin, 1963a, 84-89; Kellenbenz, 1990, 166; Lapeyre, 1955, 143; Padgett & McLean, 2006, 1465-1466; Spufford, 2002, 24; Vazquez de Prada, 1960, 181).

A further Italian invention was the limited liability partnership or *accomanda*, in which the investing partners assumed responsibility only up to the amount of their original investment. *Accomanda* investments were recognised by Florentine law since 1408. However, these never became so successful as the partnership system (De Roover, 1963, 38-39, 89; Goldthwaite, 1987, 14; Padgett & McLean, 2006, 1466-1467 n. 6).

Somewhat similar to the multi-branch company was the Genoese *societas a carati*. In such an association, a large number of partners was brought together in order to increase the capital base. Each partner obtained one (or sometimes only 1/3 or 1/4) or several shares or *carati* in the partnership, which was typically divided in 24 *carati*. Shares were negotiable, although sometimes restrictions applied, and sales were recorded before a notary. The direction of the *societas a carati* was in hands of a small number of governors (mostly two or three) who were chosen among the principal partners. Like the multi-branch company, the *societas a carati* was a stable and long-term organisation. The fundamental difference however was that the activities of the latter were limited to the exploitation and trade of one single good (e.g. alum, mercury, coral, salt, cork,…), with tendencies to monopolisation and vertical concentration: exploitation, industrial transformation, warehousing, transport and sale of the product on foreign markets were all controlled by one and the same *societas a carati*. Moreover, the members of a *societas a carati* were allowed to carry out business on their own account or via other associations as well, and for most Genoese merchants, purchase of shares in a *societas a carati* was only one of many investments (Heers, 1961, 200-205).

A *societas a carati* can be seen as a sort of consortium or cartel. Such consortia were formed for a variety of reasons. In Venice, cartels were created for making large purchases abroad (e.g. of spices from the soldan of Egypt), for bidding on the galleys in order to obtain control over a certain galley route, etc. (Lane, 1944b, 186-194; Id., 1973, 138, 144-146). During the 16th century, important consortia were organised to control the European pepper trade. The members of these consortia, mostly consisting of southern German, Italian and Portuguese merchants, pooled their capital together in order to purchase from the Portuguese

king all the pepper and other spices imported through Lisbon. Districts and quotas were assigned to the different members for the sale of the pepper, and through this system they managed to cover a large part of the European market (Jeannin, 1963a, 70-71; Kalus, 2009; Lane, 1973, 293-294). Other consortia were formed among the so-called *asentistas*, bankers who carried out large exchange transactions for the Spanish kings during the 16th century, or between the big southern German copper merchants (Jeannin, 1963a, 72-73; Lapeyre, 1953, 19-20).

A final type of hierarchical business organisation, the joint-stock company[38], only came into existence by the far end of the period under investigation, especially in England and the United Provinces, and increasingly replaced the family firm. Joint-stock companies were monopolistic and privileged enterprises controlling the trade with a particular geographical region, and became especially important in intercontinental trade. Investors could purchase shares in a joint-stock company, which were negotiable on the stock exchange (Arrighi, 1994, 137-140; Brulez, 1959, 369-370; Jeannin, 1963a, 83-84; for the Dutch joint-stock companies, see Gelderblom, 2000, 235-238; Prak, 2005, 111-121; for England: Loades, 2000, 116-118).

Contrary to the large hierarchical companies of inland Italy and southern Germany, trade in the harbours of the Mediterranean, Atlantic, North Sea and Baltic was in hands of more network-like institutions. In such networks, personal relations between merchants and with their agents, suppliers, customers and creditors played a crucial role. Through commercial networks contracts were enforced and information was gathered. Trust was generated by family ties, shared cultural beliefs, or the prospect of new transactions in the future (Gelderblom, 2003, 606-607; Harreld, 2007, 65). Such network-based institutions, especially those of the Hanse, have often been characterised as backward or inferior (e.g. by De Roover, 1942, 36-37) because they are more different from present-day business organisations (such as contemporary business service firms) than the hierarchical firms described above. However, trade based on personal relations was well suited to the particular possibilities and challenges of these maritime environments and should not be seen as archaic at all (Hunt & Murray, 1999, 57; Selzer & Ewert, 2005, 26).

A first type of network institutions were a sort of informal partnerships, often family-based, whereby different partners were established in different cities or harbours, and regularly sent each other shipments of merchandise. Partnerships of this kind were very

[38] Certain similarities can be observed between the Genoese *societas a carati* and the joint-stock company (cfr. Arrighi, 1994, 137-140).

common in Venice – often between brothers – whereby one brother resided in Venice while the others stayed abroad, and whereby each brother was fully liable for his brothers' debts. Especially among the rich patrician families of Venice, at the death of a father his sons became automatically members of such a *fraterna*. Although one partner sometimes dominated the others if he had sufficient force and personality, all brothers had equal legal rights, and as a result these family partnerships were rather decentralised and loose organisations. By 1300 such partnerships were even concluded between merchants belonging to different families. Again these were long-term partnerships concluded for a number of years, but they never included more than a handful of partners (Lane, 1944a, 85-88; Id., 1944b, 178-185; Id., 1973, 138).

The same could be found in Genoa, where small family enterprises were the foundation of the economy. Such family associations did not rest upon formal contracts. Brothers lived in the same house, or went, each in their turn, abroad to represent the family business. Accounts, expenses, etc., were held in common, and profits were added to the family patrimony rather than divided between the members. Genoese banks as well were often family associations rather than individual enterprises (Heers, 1961, 93-94; 204). Family partnerships also existed among Castilian merchants, with at least one of the family partners resident abroad, often establishing himself and his children as leading citizens of the adopted city. After the death of one of the partners, these partnerships were not always renewed, since family relationships became more distant (Brunelle, 1989, 205; Mathers, 1988, 367, 372, 390).

A similar form of organisation was the Hanseatic *Ferngesellschaft auf Gegenseitigkeit*, an association of merchants (often relatives or friends) established in different places, whereby merchandise was regularly exchanged between these merchants. Each partner normally brought in an equal part of the capital and the labour, resulting in an equal repartition of profits, risks and responsibilities. Such Hanseatic companies were typically small organisations, and rarely contained more than two to four partners, but at the same time almost every Hanseatic merchant was simultaneously a member of several of these partnerships in order to cover the widest possible commercial space. The *Ferngesellschaft auf Gegenseitigkeit* was the dominant form of organisation in Hanseatic trade in the 14th and 15th centuries (Dollinger, 1970, 166-168; Irsigler, 1985, 79-80; Jeannin, 1963a, 56; Pelus, 1981, 138-139; Selzer & Ewert, 2005, 24-25). Network-like partnerships with equal partners were even concluded among southern German merchants (Harreld, 2004, 82-83).

A large number of late medieval and early modern businessmen never established long-term partnerships however, but instead operated individually. About one of these merchants, the Venetian Andrea Barbarigo, Frederic C. Lane (1944a, 85) wrote: "He and many merchants like him did not need to build business concerns in which a number of employees were trained to work together to make something or perform some specialized type of service. They were more like middlemen who operate on many markets without being tied down by an organization." Individual enterprise was very common among Genoese merchants for example, and although they usually worked together with other merchants on a regular basis, often they did not conclude long-term partnership agreements among each other (Court, 2004, 988, 1002-1003; Pike, 1966, 50, 80-81; Renouard, 1941, 107-109; about individual Hanseatic merchants, see Dollinger, 1970, 166).

Individual merchants or small companies did not have the financial means to establish foreign branches or to conclude long-term partnerships with merchants established elsewhere. Such merchants had to resort to other techniques to be able to carry out business transactions abroad. Individual merchants and small enterprises, but also the large multi-branch companies and family partnerships discussed before, made an intensive use of the services of a network of foreign representatives or agents (Spufford, 2002, 46-47; for Italian companies, see De Roover, 1948b, 30; for merchants in Amsterdam, Gelderblom, 2000, 164-165; Lesger, 2006, 261-262). These agents purchased and sold commodities, made payments, collected debts and transferred funds, arranged for shipping and insurance, and sent information about local market conditions as well as about the broader political situation (Court, 2004, 994; Gelderblom, 2000, 164-165; Hunt & Murray, 1999, 148-149; Kermode, 1998, 207-208). Again, relationships with agents could be hierarchical (when the representative was an employee) or network-based.

A typically hierarchical solution was the use of factors. A factor was a salaried employee (although sometimes he also was entitled to a share in the profits)[39], who could be sent abroad as an agent of a firm (Abu-Lughod, 1989, 117; Brulez, 1959, 374-375; De Roover, 1963, 79; Edler, 1934, 117; Eikenberg, 1976, 167; Jeannin, 1963a, 55, 84; Lapeyre, 1955, 152, 155-158; Renouard, 1941, 49-50; Vazquez de Prada, 1960, 182). A distinction can be made between travelling factors and resident factors, the latter being established for a certain period in a fixed location (e.g. in a foreign branch of a company). Influenced by Italian business techniques, merchants in the Low Countries became increasingly sedentary from the

[39] Sometimes the term factor was also used as a synonym for commission agent (e.g. Winkelman, 1981, ix).

late 15th century for example. They installed their own representatives, who were paid a fixed salary and given far-reaching orders, in the principal commercial centres. These factors were regularly chosen among the relatives of the head of the firm. Several Antwerp companies in the 16th century were organised according to this type of structure (Stols, 1971, 254-255; for salaried foreign agents of English merchant houses, see Carus-Wilson, 1954, 82; Kermode, 1998, 207-208; for Hamburg, Kellenbenz, 1954, 287-288; for Dutch business houses from the end of the 16th century, Veluwenkamp, 1996, 141, 147, 150, 154; for Catalonia, see Sayous, 1933, 212-213; for Genoa, Heers, 1961, 195). While the factors of Italian companies were mere employees, the factors of several Flemish companies apparently worked for several companies at the same time (Puttevils, 2007, 309).

During the 16th century, Dutch merchants often employed shipmasters rather than factors as their representatives abroad. Dutch maritime commerce in this period was strongly interwoven with the shipping trade. Merchants who were part-owners of the same ship formed shipping companies for exploitation of the ship[40]. The ships belonging to these shipping companies were either freighted by (partners of) the shipping companies themselves, or chartered by other merchants (or a combination of both). The shipmaster, who could be an employee of the shipping company or one of the partners, took care of the transactions in the foreign harbours. Increasingly however, this system of representation by shipmasters who were always on the move was replaced by a system of representation by resident factors. Simultaneously, commerce and shipping became more and more separated activities (Christensen, 1941, 153-154, 176-183). Hanseatic merchants, e.g. from Hamburg, also made use of the services of shippers when they did not have a permanent correspondent in a particular city. In the Atlantic salt ports Hanseatic merchants often did not have an agent, and consequently it was the shipper who took care of the loading of the salt (Kellenbenz, 1954, 287-288, 292).

Again, it was rather expensive to maintain permanent factors at a large number of places, especially in periods when business was weak. A more flexible and cheap solution was to make use of temporary agents on an *ad hoc* basis. Such temporary agents freed a merchant from the need to travel to a foreign city or to have permanent representatives wherever he conducted business (for Genoese merchants, see Court, 2004, 994, 1002-1003; for Antwerp

[40] Shipping companies existed also elsewhere, e.g. in Genoa and Venice (Heers, 1961, 288-291; Hunt & Murray, 1999, 49; Luzzatto, 1937, 42-43).

merchants, Stols, 1971, 256-261). Among the most successful of these network-based institutions were commission and participation.

In the Mediterranean, commission was one of the new techniques developed during the commercial revolution. In the 14th century, as a result of the transition from travelling merchants to sedentary merchants, Venetian businessmen for example increasingly began to make use of resident commission agents established in foreign harbours rather than single-venture *colleganza* contracts. By the 16th century commission had become very popular in large parts of Europe (Brulez, 1959, 367-368; Gascon, 1971, 214; Harreld, 2004, 83; Lane, 1944a, 85-86, 94-98; Id., 1973, 139-140).

The principal difference between factors and commissionaries is that the latter were no employees of a company and as such did not receive a fixed salary. Commission agents carried out one or more individual business operations for a company and in return were paid a fixed percentage of the total turnover they handled. They purchased and sold for the account of those who sent them merchandise to sell and instructions to buy, and they were bound to act according to the orders sent them. Trade in commission was carried out by specialised commission agents as well as by merchants and companies (or their branches) who also traded on their own account. Commission had the advantage that commissionaries were often very well informed about the market in which they operated (Abu-Lughod, 1989, 117; Brulez, 1959, 367-375; Edler, 1934, 80; Eikenberg, 1976, 167, 191-192; Lane, 1973, 139-140; Lapeyre, 1955, 152, 157-158; Van der Wee, 1963, 325-326; Vazquez de Prada, 1960, 182).

The Hanseatic *Sendeve* appears to have been a mixture between factorship and commission. In a *Sendeve* a merchant entrusted a foreign agent with goods or money and ordered him to make sales or purchases abroad. The agent could either be an employee (*Diener*) who was paid a salary, or a correspondent in another town who was normally paid in reciprocal commission services (in the Hanseatic world a fixed percentage was paid to a commission agent only from the middle of the 16th century) (Dollinger, 1970, 166; Mollwo, 1901, lv-lxv; Pelus, 1981, 150-151).

A particular kind of agents were innkeepers. Inns played a key role in the transport of wares along the European overland trade routes during the late Middle Ages. Innkeepers provided lodging, warehousing, and financing, but they also represented the interests of merchants during their absence. In Bruges, innkeepers were important agents, for example of Hanseatic merchants (Jeannin, 1963a, 55; Lapeyre, 1955, 158; Renouard, 1941, 51-52; for Bruges, see Greve, 2000; Hunt & Murray, 1999, 162-164; Murray, 2000, 5-6, 11-13; Stabel,

2001, 198). Notaries also could operate as commission agents for merchants, in Genoa for example (Heers, 1961, 550).

Participation (or trade via a joint venture) was another *ad hoc* tool for conducting long-distance trade. Participation consisted of joint ownership of a consignment of merchandise, whereby the profits were shared between the participants after the goods were sold. Often, the associates in a participation resided in different cities, whereby one of the participants took care of the purchase of the goods, and the other of the sale. In many other cases, one or several participants only supplied a part of the investment and further took no active role in the venture. Participation was a highly flexible and often informal form of association. It was very successful in the 16th century, but existed already before, e.g. in Venice and Genoa (Brulez, 1959, 366-367; Court, 2004, 989-990, 997 (Genoa); Gascon, 1971, 287-288; Hunt & Murray, 1999, 234-235; Lane, 1944a, 91 (Venice)).

A third institution, next to hierarchies and networks, at the disposal of late medieval merchants and bankers for the organisation of their transnational activities were markets. In markets, either periodic fairs like those in Frankfurt am Main or permanent markets in commercial centres such as 16th-century Antwerp, merchants could transact business without personally knowing the party with whom they were dealing (Gelderblom, 2003, 607-608). Merchants active in important international marketplaces could establish transnational contacts with clients and suppliers coming from large parts of Europe without the need to maintain representatives abroad.

Quantification of the business values

It is obvious that for this complex mixture of tools for business organisation, several of which were used simultaneously by one and the same firm, GaWC's six-point scoring system cannot simply be copied. Late medieval and 16th-century business organisation was too different from the multi-office structure of contemporary business service firms. Consequently, a whole new scoring system needs to be developed.

I have designed a nine-point scale (see table 2.2) for coding the networks of the 130 business enterprises. Scores vary from 0 (no connections of the firm) to 8 (headquarters of the firm). The 'standard' score is 3: when it is known that a firm was represented in a city, but

when nothing is known about the nature of this representation (branch, factor, commission agent,…), a score 3 has been given[41].

Table 2.2
9-point scoring system for business values

Score	Description
8	**Headquarters**
7	**Branch** or long-term resident **partner** of **higher importance** (regional headquarters; more than average number of staff;…)
6	**'Normal' branch** or long-term resident **partner** (average number of staff;…)
5	**Branch** or long-term resident **partner** of **lesser importance** (branch dependent upon another branch; less than average number of staff; *accomanda*;…); regular destination of a travelling branch or partner
4	**Resident factor** or ***Diener*** (*Sendeve*) or other **important agent** (family member as agent; important commission agent;…)
3	**'Normal' agent** (commission agent; innkeeper;…); **regular** trade in **participation**; regular trade in commission for (an)other firm(s); **regular** trade via **single-venture partnerships** (*societas maris*; *commenda*; *colleganza*; sea loan; *Widerlegung*;…); **regular** representation by **shipmaster**
2	**Agent** of **lesser importance** (very sporadic or once-only use of an agent, participation, single-venture partnership, or shipmaster; indirect contact with an agent via another agent;…); several **clients** and/or **suppliers** from a certain city; **shares** in a **joint-stock company** trading with a certain region
1	**Single client/supplier** from a certain city
0	**No activity**

The principal assumption behind the nine-point scoring system is that connections with branches (either directly dependent or legally independent) and long-term partners (e.g. in a *fraterna* or other family partnership, in a *Ferngesellschaft auf Gegenseitigkeit*) were stronger than with agents. According to Brulez (1959, 367-368) branches were only established in those cities where the firm carried out very considerable business, while commission agents were used to maintain connections in centres which were of less importance to the company. Several early 15th-century Florentine companies for example firstly made use of correspondents for their business in north-western Europe, and only after a while decided to open their own branches there (Guidi Bruscoli, 2006). Marie-Louise Pelus

[41] When representation was *probable* but not entirely certain a score 2 is given. When a firm was *possibly* represented in a city according to a particular study, only a code 1 has been attributed. The latter score has also been applied when a company prospected for business in a city, but in the end never carried out business there.

(1981, 148) observed that Lübeck companies in the second half of the 16th century made use of commission when they wanted to explore a new trade direction. When this new trade axis was successful, commission was replaced by association in a *Ferngesellschaft auf Gegenseitigkeit* (often the old commissionary became partner). However, when after a while business became weak, commission was reinstated (see also Mollwo, 1901, lv-lxv, who noted the same for a Lübeck firm in the 14th century). Consequently, the scores 5, 6 and 7 are reserved for branches and long-term partners, 2, 3 and 4 for agents.

The standard score attributed to a branch or long-term partner is 6[42]. In a number of cases, a distinction can be made between more and less considerable branches however. Some branches were exceptionally important and almost became second headquarters[43], while others assumed the role of regional headquarters (Jeannin, 1963a, 85)[44]. Such branches have been given a score 7. Other branches did not depend directly from the headquarters, but were subordinated to another branch. For these sub-branches, as well as for branches in which a company had invested only *in accomandita*, the score 5 has been used[45]. Since in an *accomanda* the names of the investing partners were not mentioned and responsibility was only assumed up to the amount of the original investment, it constituted a more careful investment suitable for less secure markets (Guidi Bruscoli, 2006; Hurtubise, 1985, 221). Sometimes it is also possible to differentiate between branches according to their size or according to the status of the branch manager (partner or factor, salary of the manager,…)[46].

Some branches or partners did not reside permanently in a particular city but travelled regularly between a number of locations. Typical examples are branches following a travelling court, such as those following the royal court of Spain, which moved regularly between Valladolid, Madrid, Toledo, etc. during most of the 16th century, before being established permanently in Madrid by Philip II (Kellenbenz, 1990, 169). Another example were the *mercatores romanam curiam sequentes*, or 'merchants following the papal court'.

[42] When a firm was active in a particular city and *perhaps* had a branch in this city, code 4 has been used.
[43] Examples are the Nürnberg branch of the Fugger under Anton Fugger (Von Stromer, 2002, 216), or the Lyon branch of the Bonvisi company of Lucca, which became the *de facto* headquarters (Bayard, 1971).
[44] The *Hauptfaktorei* or central branch of the Fugger in Spain, from which the other Spanish branches depended, was located at the Spanish court (Kellenbenz, 1990, 169). The Viatis-Peller company of Nürnberg had an *Oberfaktorei* in Gryfów Śląski (German: Greiffenberg), which controlled the other branches in the linen producing region of east central Germany, notably the *Unterfaktoreien* in Bautzen, Görlitz and Swidnica (German: Schweidnitz) (Seibold, 1977b, 321-323, 327-329).
[45] The London branch of several Florentine firms in the 15th century depended from their Bruges branch for example (Guidi Bruscoli, 2006).
[46] Examples are the Bardi company where managers received a different salary according to the size of the branch in which they worked (200 fl. for a large branch, 120 fl. for a small branch) (Renouard, 1941, 50), or the Peruzzi company in which politically sensitive branches were headed by partners while the other branches were managed by factors (Hunt, 1994, 85-87).

Although the Roman Curia returned from Avignon to Rome in 1378, the papal court, with the papal bankers following in its footsteps, remained somewhat itinerant until the middle of the 15th century. Between 1402 and 1413 for example, the Curia travelled between Rome, Florence and Pisa (Bullard, 1980, 93; Guidi Bruscoli, 2007, xv, 5; Jacks & Caferro, 2001, 34-36). Partners of a company could be itinerant as well. The English merchants John Goldbeter and Thomas Betson for example regularly travelled from England respectively to Bruges and Calais (Murray, 2005, 218; Power, 1924). Regular and/or more or less long-term destinations of travelling branches or partners have been attributed a score 5[47]. The underlying assumption is that permanent representation generated stronger connections than temporary representation.

For agents the standard score is 3. Consequently, when the sources or literature only use rather vague descriptions such as 'agent', 'correspondent', or 'attorney' this standard score has been attributed. But again, in several cases different types of agents can be distinguished. Connections with permanently employed factors or *Diener* (via *Sendeve*) (score 4) can be expected to be stronger than with more flexible commissionaries or other agents (such as innkeepers) who were paid separately by the firm for each operation they carried out (score 3) (Stols, 1971, 254-261). Regular trade in participation with or in commission for a merchant or firm in another city likewise has been scored 3. In general, agents of more than average importance (such as sons or brothers of the head of the company) have been given a score 4, while agents whose services were used only very sporadically have been attributed a score 2. Also for an agent whom a firm made solely indirectly use of through another agent, a code 2 has been applied[48].

In a city where a firm did not have a resident representative, business nevertheless could be conducted via single-venture operations in which an employee (e.g. a shipmaster) or a short-term associate (in *commenda*, *colleganza*, *societas maris*) was sent to this particular city with merchandise. Places that were once-only or very sporadic destinations of such single-ventures have been given a score 2, but when journeys to a particular city were rather regular a score 3 has been used[49].

Finally, markets allowed to conduct international commerce and banking without the need to pay for representatives abroad. In a marketplace business transactions could be concluded with suppliers and clients coming from elsewhere. Depending upon the amount of

[47] Exceptional destinations have been scored 2, unless also a permanent agent was located here (code 4).
[48] Two firms with headquarters in different cities, but which used one or more factors in common, have also been considered as indirect contacts (score 2).
[49] These scores also apply to representatives sent along with large overseas expeditions.

clients and suppliers of a firm coming from a particular city, a score 1 (one client or supplier) or 2 (more than one client/supplier) has been attributed.

With the rise of joint-stock companies at the end of the 16th century, businessmen had the opportunity to purchase shares in these companies and their overseas trade on a particular type of market, notably on the stock exchange. Such investments in commerce to a particular region have been given a score 2.

Flows and their quantification

In the first chapter I have argued that the rise and growth of cities in medieval Europe was strongly stimulated by the development of long-distance trade. Merchants operating beyond the limits of political territories established fluid connections between different commercial centres that were linked to each other by flows of all kinds. But what was the specific nature of the flows generated by medieval merchants and bankers, and how were they organised?

As argued before, the interlocking network model does in fact not directly study flow data between cities, but instead makes use of attribute data on the presence of branches, partners, or agents of firms in cities. In several cases however, direct data about the flows produced by a particular firm are available which can be used as complementary information for reconstruction of the business network of a firm, especially when data about the organisational structure of the firm are missing. In addition, the existence of such flow data allows to examine the conjecture that flows were indeed generated between different cities by the representatives (branches, partners, factors, agents,…) of late medieval and 16th-century business enterprises, which were in proportion to the size or importance of this representation (this assumption has not been tested yet for contemporary business service firms). Consequently, let us have a closer look at the flows produced by 14th- to 16th-century long-distance merchants and bankers.

In 1995, Smith and Timberlake constructed a typology of inter-city linkages based upon the form and function of flows. They distinguished economic, political, cultural and social flows (function), and human, material, and information flows (form) (see also Taylor, 1997). Although merchants and bankers also generated political (e.g. when carrying out diplomatic missions), cultural (as investors in art,…) and social flows (in their personal contacts with family members abroad for example), most flows initiated by these agents can be characterised as economic.

More interesting is the form of the flows. Human flows have been treated already in the previous sections, where I have stressed the importance of travel in late medieval and 16th-century trade. But the movement of people was not limited to travelling merchants or the travelling branches, factors and other agents of commercial and financial enterprises. Even in sedentary business organisations a great deal of travel was needed to guarantee the day-to-day functionality of the firm. Often personnel was sent along to accompany trade goods, especially when reliable transport networks (based on innkeepers,…) were absent (Hunt & Murray, 1999, 56-57). But there were many other incentives for travel. The composition of the staff in the branches of 14th-century Florentine multi-branch companies was not very stable for instance: factors were regularly transferred from one branch to another, on average staying not longer than four or five years in the same place, perhaps in order to avoid too cosy relationships with local clients (Renouard, 1941, 63). Auditing of (the accounts of) the branches required travel as well. The branch managers of the Medici company had to travel yearly (for Italian branches) or every two years (for branches beyond the Alps) to the headquarters in Florence, where the balance sheets were thoroughly scrutinised by the general manager of the company. The Fugger and Welser companies of Augsburg on the other hand made use of travelling auditors who regularly visited the foreign branches of their firms (De Roover, 1963, 85, 100).

Managers and staff established in the headquarters or a branch of a company, as well as resident factors and agents did not stay permanently in the city or town in which they were based. They frequently travelled around in a more or less wider area to visit fairs and other markets, production regions, harbours, etc. for the purchase or sale of goods, the dispatch or receipt of merchandise, the collection of debts and various other reasons. According to a partnership contract (1455) of the Bruges branch of the Medici company, the branch manager in Bruges was not allowed to leave Flanders, except in order to visit the fairs of Antwerp and Bergen-op-Zoom, the Zeeland harbours (such as Arnemuiden and Middelburg), Calais and even London (De Roover, 1963, 88; Renouard, 1941, 62-63). Different cities had different but complementary functions, and consequently merchants were not tied to a single place, but included various cities in their networks in a rather flexible way.

Such visits of cities, fairs or regions by representatives of a firm operating from a fixed seat have been coded as follows: regular visits by the head of the company, by partners or factors (e.g. from the headquarters or a branch)[50], or by commission agents or other

[50] When a partner or a factor theoretically was authorised to visit a particular site, but when it is not known whether or not he actually went there, a code 2 has been given.

correspondents respectively have been attributed a score 4, 3 and 2, while exceptional visits or travel through a place always have been coded 1[51] (see also table 2.4 below).

It can be argued that the production of material flows was the prime function of international wholesalers: they purchased goods at one place and sold them – ideally with a certain profit – at another place. Among the principal goods traded by late medieval and 16th-century merchants were foodstuffs (grain, salt, sugar, spices, fish, oxen, oil, beer, wine,…), textiles (woollens, linens, silks, fustians, cottons, tapestries and carpets,…) and raw materials for the textile industry (wool, silk, flax, cotton, hemp, leather, furs, alum, dye-stuffs,…), metals (copper, iron, mercury, tin, silver, gold,…) and metal wares (arms and armour, brass-ware,…), and a variety of other goods such as wood (for fuel and construction), wax, paper, soap, pottery, glass, mirrors, gemstones and pearls, jewels, ivory, art, books, horses, and slaves (the latter belonging to the category of human flows). Consequently, late medieval and 16th-century long-distance merchants were involved in the trade in bulk wares as well as piece-goods, low value products as well as luxuries, raw materials as well as manufactured goods (Spufford, 2002, 228-341).

The need for means to pay for goods purchased elsewhere as well as for a variety of transaction costs (wages or commissions, customs duties and other taxes, transport costs,…) generated flows of capital. Payment could either be in the form of barter, cash or credit. Although material transport of coins or bullion – which was risky and expensive – was avoided as much as possible, it was far from non-existent in the European late medieval and 16th-century business world, especially between regions with a trade imbalance, with places lacking the financial infrastructures needed to support transactions in bills of exchange or other credit instruments, or beyond the western Christian sphere (Abu-Lughod, 1989, 15-16; Brulez, 1959, 379-385; Hunt & Murray, 1999, 58-60; 63-64; Spufford, 2002, 37-38).

In many cases however, businessmen avoided the material shipment of coins or bullion through the use of credit instruments, the most successful of which was the bill of exchange. A very clear description of what a bill of exchange is has been given by Frederic Lane (1973, 146-147): “Essentially, the bill of exchange was an order to pay in one place in one kind of money because of a payment received in a different place in a different kind of money. There was always a time lag between receipt and payment (for example, sixty days on bills between Venice and Bruges), so that one of the parties was extending credit to the other

[51] Score 1 has also been used when we are informed about the presence of a partner, factor or agent in a city for a period of less than one month, or when an agent is known to have made one sale or purchase in a particular city. Presence for a period of less than a year (but more than a month) has been given code 2.

in the meantime. If a merchant in Venice had sufficiently good standing with an agent in Bruges […] and if he was hard up for cash, the Venetian partner might draw a bill on his partner in Bruges. He would sell that bill for cash to someone in Venice who would send it to Bruges for collection. When the bill arrived in Bruges, the partner there, in order to get the money to pay it, might sell in Bruges a new bill drawn on Venice. When that new bill arrived in Venice, the Venetian partner had to pay considerably more than he had received by selling the first bill, but he had the use of the money for 120 days in the meantime". The example shows that an exchange transaction via bill of exchange was a combination of a transfer of capital from one place to another (i.e. a flow) and from one currency to another over a certain period of time, while at the same time being a credit operation, with the interest being hidden in the difference between the exchange rates in the two places. Such a concealment of interest was necessary to escape the prohibition of the Church against usury (see also De Roover, 1942, 35; Hunt & Murray, 1999, 65-66, 70-74; Jeannin, 1963a, 63-67).

Most long-distance merchants made use of the bill of exchange as a tool for obtaining credit or making payments abroad. As a result the geography of flows of bills of exchange largely reflected the underlying networks of the trade in goods (for 16th-century Lyon, see Gascon, 1971, 271-272)[52]. For an elite of large bankers however, the conclusion of exchange transactions itself was the principal activity and the main source of profit. Bills of exchange were the pre-eminent field of the transnational banker, and before the rise of the joint-stock company, it were exchange (and associated loan) transactions rather than trade in shares that were carried out at the late medieval and 16th-century bourses (De Roover, 1948b, 30; Jeannin, 1963a, 63, 66-67, 83). Other aspects of banking (deposit banking, local money-changing, pawn-broking,…) which were sometimes organised by the same transnational merchant-bankers, sometimes by specialised institutions (e.g. money-changers in Flanders, deposit bankers in Venice), were much more limited to the local market, and did not regularly generate transnational flows[53].

[52] Specifically for Florence, Richard Goldthwaite (2009, 37) recently has stressed the importance of commerce as the driving force for dynamics in other network spheres such as banking and government finance.

[53] Consequently, such local bankers have not been included in the business value matrix, with the exception of the Pisani of Venice, who were also important long-distance merchants however (Lane, 1937; Id., 1944b), and Collard van Marke, a Flemish money-changer. Bruges money-changers provided a system of book transfer that allowed their clients to make payments not only in Bruges but also elsewhere, e.g. at the fairs of Antwerp (Hunt & Murray, 1999, 162; Murray, 2005, 249-258). Places of origin of account holders in a deposit bank have been scored the same as those of clients and suppliers of a firm (1 for one account holder, 2 for more than one account holder).

The importance of a last form of flows – flows of information – for late medieval and 16th-century business has already been stressed by many business historians[54]. As a result of the growing sedentarisation and complexity of trade since the 13th-century trade revolution, it became necessary for merchants to develop a system of communication between the different branches of their companies or with factors and agents in cities abroad. This system of communication was not only based upon business travel of personnel of the company (see above), but especially upon correspondence via letters, allowing to give orders, exert control over the different branches, share information on the market (e.g. via price lists and lists of exchange rates added at the end of many business letters) or the political situation, etc. The importance of flows of correspondence is vividly illustrated in the number of letters preserved in the archives of the late medieval Tuscan merchant Francesco Datini (more than 120,000 letters) and of Simon Ruiz, a 16th-century merchant established in Medina del Campo (ca. 50,000 letters) (Brulez, 1959, 441-442; De Roover, 1948b, 29-30; Id., 1963, 96; Doria, 1986, 76-78; Pelus, 1981, 152-153; Spufford, 2002, 25-29; Lapeyre, 1955, 9 (for Ruiz); Melis, 1962, 25 (for Datini)).

Consequently, merchants were often very well informed via their network of correspondents, and even governments made use of the information system of firms such as the Fugger. Moreover, knowledge of foreign markets improved largely in the 16th century with the development of the first commercial newsletters (e.g. the Venetian *avvisi*) and printed lists of commodity prices and exchange rates (Gelderblom, 2000, 113; Harreld, 2004, 46; Prevenier, 1998, 29). The information system of the Fugger for instance developed in the second half of the 16th century into the so-called *Fuggerzeitungen*, almost regular tidings which had a large readership (Von Pölnitz, 1960, 294-295).

The production of such a complex of human, material and information flows – a fundamental function of the agents under investigation – required a business network, the organisation of which has been described above. The vaster this network, the more efficiently a firm could carry out its business activities: more nodes meant more markets where goods could be successfully purchased or sold, more banking places with which profitable exchange transactions could be concluded, and especially more sources of information which allowed to make more rational and strategic business decisions. For those reasons, it was vital for a long-distance merchant or banker to have representatives or correspondents in the principal decision centres of the European world-economy (Bauer, 1936, 18-19, 89-90; Christensen,

[54] A. Christensen (1941, 179) has called the business letter the “nerve of commerce”.

1941, 179; De Roover, 1948b, 29-30; Doria, 1986, 78; Jeannin, 1963a, 67), and as such these networks provide a good approximation of the structure of that world-economy itself.

Although priority has always been given to data on the organisational structure of a firm, flow data often give additional information about the business network of an enterprise (especially when organisational data are lacking). Such flow data have all been scored in a similar way. When a firm (1) purchased or sold, imported or exported merchandise in, from or to, or traded with a particular place, (2) sent or received bills of exchange to or from elsewhere, or (3) corresponded with another place, a standard score 3 has been given. The idea behind this is that in order to produce such a flow, a company needed a representative (also standard score 3). This score has been adjusted when such flows of merchandise, bills of exchange or letters appear to have been exceptionally important (4), or when they occurred only sporadically (2). A score 1 has been used if only one letter or bill of exchange was sent from/to a particular city[55] (see also table 2.4 below).

For a number of firms, large amounts of business letters have been preserved with indication of their place of origin and/or destination. Such data are very suitable for the reconstruction of a business network, at least as long as they have been preserved more or less completely for a certain period (otherwise biases may occur)[56]. Scores have been attributed according to the guidelines explained in table 2.3.

Table 2.3
9-point scoring system for business values: scores for flows of correspondence

Total amount of letters preserved	**Amount of letters sent from/to a particular place**			
100-199	> 25	6-25	2-5	1
200-499	> 50	11-50	2-10	1
500-999 (no cases in the firm sample)	> 100	16-100	2-15	1
1,000-1,999	> 200	26-200	2-25	1
…				
50,000 or more	> 500	51-500	3-50	1-2
Score	**4**	**3**	**2**	**1**

For the company of Francesco di Marco Datini (ca. 1335-1410), a merchant from Prato in Tuscany, the organisational structure as well as the flows of correspondence are known in

[55] A single flow of merchandise has been given a score 2 however, since it can be assumed that several letters needed to be sent to produce such a flow. Unsuccessful attempts to trade with a particular city have been given score 1. Exports to a city which were meant for immediate re-export to elsewhere have been scored 2 (regular) or 1 (sporadic).

[56] For some other firms good quantifiable data exist about the number of bills of exchange, correspondents, clients and suppliers, debtors and creditors,… in different cities.

great detail thanks to the almost complete preservation of its business archive. In his will, Datini made arrangements for the preservation of all the papers that were carefully collected by him and his branch managers during his life. As a result, an impressive amount of more than 120,000 letters received by the different branches from a large number of correspondents and agents of the Datini company have been preserved in the *Archivio Datini* in Prato, together with over 500 account books, as well as a large amount of partnership contracts, insurance policies, bills of exchange and various other business documents, mostly dating from 1383 to 1410, but some going back as early as 1363. As a result, his company is the most well-documented enterprise of the Middle Ages (Melis, 1962, 11, 13-14, 25, 27; Origo, 1963, 7-8, 347-348). This lucky contingency allows us to test for one particular company the assumption that the flow intensity between representatives of higher importance (headquarters, branches) is higher than between less important representatives (agents).

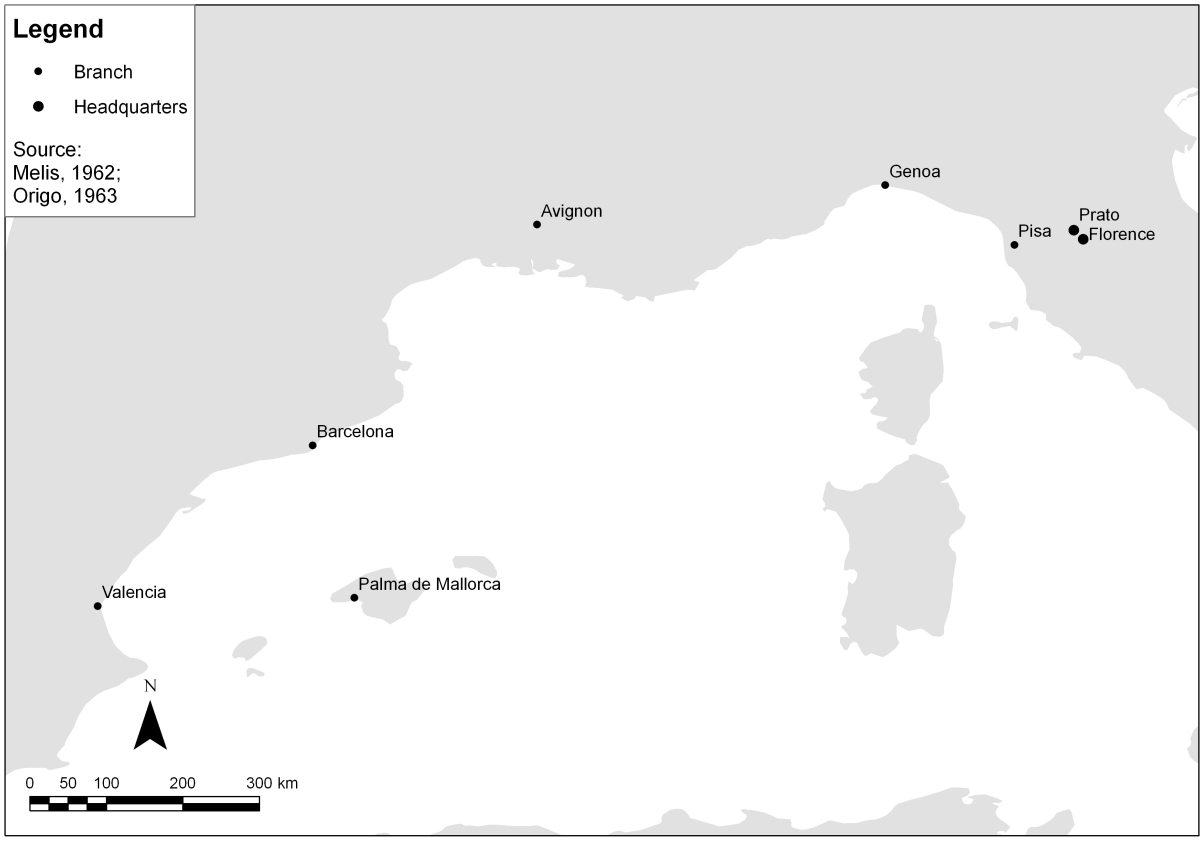

Figure 2.1: Organisational structure of the Datini company, ca. 1383 – ca. 1410.

The firm of Francesco Datini was a multi-branch company, organised according to the partnership system (the different branches were legally independent partnerships). From 1383 to 1410 (the period for which most letters have been preserved), the headquarters were most of the time located in Florence (1386-1401) or Prato (1383-1386, 1401-1410). Branches were

established in Avignon (1383-1410, headquarters before 1383), Pisa (1383-1410), Genoa (1392-1401), Barcelona (1393-1410), Valencia (1394-1410) and Palma de Mallorca (1394-1410) (fig. 2.1). In other places Datini made use of the services of agents, which were often other Florentine companies or their branches. In Paris for example, he was especially represented by the Paris branches of the Florentine companies of Deo Ambrogi and Giovanni Franceschi & Co., and of Luigi and Salvestro Mannini & Co. (Melis, 1962; Origo, 1963).

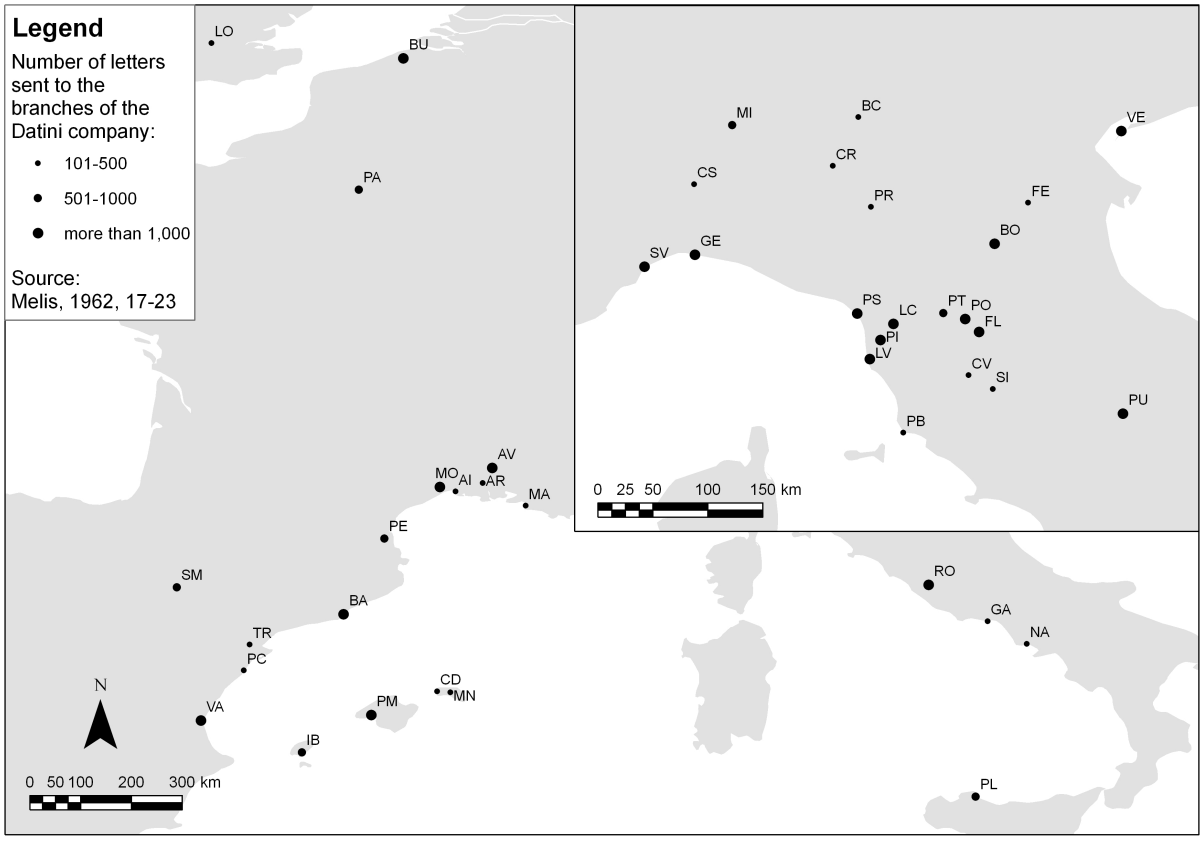

Figure 2.2: Principal places of origin of letters sent to the branches of the Datini company, ca. 1383 – ca. 1411.
Key: AI Aigues-Mortes; AR Arles; AV Avignon; BA Barcelona; BC Brescia; BO Bologna; BU Bruges; CD Ciudadela; CR Cremona; CS Castelnuovo Scrivia; CV Colle di Val d'Elsa; FE Ferrara; FL Florence; GA Gaeta; GE Genoa; IB Ibiza; LC Lucca; LO London; LV Livorno; MA Marseille; MI Milan; MN Menorca; MO Montpellier; NA Naples; PA Paris; PB Piombino; PC Peñiscola; PE Perpignan; PI Pisa; PL Palermo; PM Palma de Mallorca; PO Prato; PR Parma; PS Pietrasanta; PT Pistoia; PU Perugia; RO Rome; SI Siena; SM San Mateo; SV Savona; TR Tortosa; VA Valencia; VE Venice.

The flows connecting the different nodes in the Datini business network can be measured through the incoming correspondence in the headquarters and the branches of the company, which has for the most part been preserved. The assumption of the interlocking network model is that most of these letters were sent from the headquarters, followed by the branches, and that less letters came from agents who were not employed by the firm. This conjecture appears to be more or less valid. In total, 125,353 letters were sent from 267

different locations (for an additional 196 letters, the place of origin is unknown). Most of the preserved letters came from the headquarters in Florence (33,925), followed by the branches in Genoa (10,824), Pisa (10,787), Barcelona (10,350), and Avignon (7,311). Then follow Venice (6,251), the branch in Valencia (5,750), Montpellier (4,652), the headquarters in Prato (4,152), Bologna (4,055), the branch in Mallorca (3,446), Livorno (3,232) and Bruges (2,383) (fig. 2.2). From each of the remaining 254 places of origin less than 2,000 letters were sent (Melis, 1962, 17-23).

Consequently, the eight branches (including the two headquarters) of the company were among the eleven most important places of origin of letters sent to the firm. Our assumption holds less for Prato however, which was only the ninth best connected node in the network, despite being one of the seats of the headquarters. This can be explained by the fact that Prato was not a commercial or banking centre, and one can assume that even during the years in which Francesco Datini resided permanently in his home town Prato most of the business was carried out from Florence. Also Venice, Montpellier and Bologna 'violate' the expectations of our model, since they were better connected in the correspondence network than a number of cities in which a branch was located. For Venice and Bologna, this was not only a result of their commercial and financial importance, but also of the fact that Francesco Datini for some time resided in each of these cities, e.g. for a period of fourteen months when he and his family fled for the plague to Bologna ca. 1400 (Id., 1962, 11).

It is hard to draw general conclusions from this one example, but it appears that there was at least some agreement between the organisational structure of a firm and the flow configuration in its network.

The organisation of transport and communication

To produce the flows described in the previous section, people, merchandise, letters, etc. had to be transported through the network. For this, a whole infrastructure of couriers, carriers, and shippers was needed, making up the infrastructural layer of Castells' (2000) space of flows (see chapter one). These transport and communication infrastructures were partly organised by the merchants and bankers themselves, partly by a specialised transport sector which could be employed by the businessmen. When the infrastructures used by a particular firm can be traced, this again may give additional information about the relative importance of different cities for the business of that firm. For several enterprises in the matrix this

information has been used for the reconstruction and quantification of (parts of) their business networks (see also table 2.4 below).

The dispatch of letters over land was organised by courier services[57]. Apparently, originally merchant companies had organised their own individual courier services. Already from the 1260s onwards, evidence can be found for the existence of regular courier services (*scarselle*) between Tuscany and the fairs of Champagne. In the 14th and 15th centuries, more and more courier services were organised. In 1357 for example, 17 Florentine merchant companies agreed to found a common courier service, the *scarsella dei mercanti fiorentini*. By the early 15th century, a number of regular commercial courier services existed between the Italian commercial cities, and from Italy to Barcelona and to Bruges (Melis, 1973, 394-395). In the same century, south German cities developed similar postal services, while the first courier service in Hamburg only appeared in the 16th century. Beside these regular services, other couriers could be hired *ad hoc* for specific occasions, while important merchant companies maintained their own services (Prevenier, 1998, 29; Spufford, 2002, 25-26, 28). Even in the 16th century the Affaitadi company, based in Antwerp, still had its own courier service to Genoa, which was used by other merchants as well (Denucé, 1934, 38). The Fugger as well maintained an extensive network of couriers for the organisation of communication between the various branches of their company (Harreld, 2007, 66; Von Pölnitz, 1960, 293). Regular destinations of private courier services organised by a trade or banking firm have been given a score 4, since they indicate a relatively strong connection.

The postal services mentioned above were mostly run by merchant communities or commercial cities. Consequently, the resulting correspondence networks were largely parallel to the European trade network, with the same trade cities occupying a central position. However, courier services were also organised by other institutions, such as religious orders (e.g. the Teutonic Order) or centralising states. The development of postal services by states was closely related to the establishment of foreign ambassadors in the 15th century. Very important was the postal service organised by the Milanese Taxis family for Maximilian I, which initially - from around 1489 - connected Innsbruck with Brussels and Mechelen, but developed into an extensive imperial courier service. These state services also carried letters for private commercial organisations, and vice versa (Goris, 1925, 133-136; Kellenbenz, 1985, 350; Prevenier, 1998, 29; Spufford, 2002, 28; Van der Wee, 1963, 328).

[57] Letters were also transported by sea, where they were carried in the same ships as merchandise (see below).

The transport of merchandise in late medieval and 16th-century Europe took place via pack animals and carts along roads, via barges along inland waterways, and via different types of ships across the seas. Overland transport was largely organised by local carriers and watermen. The development of these local transport services was an important factor enabling the 13th-century trade revolution. Mostly, local carriers and watermen were regulated by public authorities and/or organised in guilds or other corporations. They often had a monopoly over the transport along specific stretches of road or river, for example from their own town to the next town or port. From the end of the 15th century, long-distance carriers emerged, transporting goods over much longer distances, such as the carters of Hesse who transported goods the whole way between Antwerp and southern Germany in their four-wheeled carts (De Roover, 1942, 35; Hunt & Murray, 1999, 47, 193-194; Spufford, 2002, 196-199; Van der Wee, 1963, 321-323, 328).

As a result of the fragmentation of the inland transport sector, merchants needed contacts along the way to receive the merchandise from one carrier and hand it over to another, as well as to pay the transporters. Such contacts were especially needed in places where the goods had to be transferred from one means of transport to another, for example from a cart to a boat. Hereby, the goods often had to be unpacked and repacked in another form. These services were provided by innkeepers, who organised transport and transfer of the goods, payment of local tolls or customs dues, and temporary storage of the merchandise in their warehouses. Such a network of innkeepers was vital for merchants, but could only be sustained by large companies. Before the 16th century, small merchants had to call on the networks of the larger firms or had to accompany their goods along the way to organise transport themselves (Hunt & Murray, 1999, 47-48; Spufford, 2002, 203-204).

At the end of the 15th century not only long-distance carriers emerged, but also specialised transport firms which organised transport over long distances, coordinating and paying local carriers and shippers,…, through their representatives in different places along the road. Such firms for example organised transport from Antwerp to the Italian commercial centres and to Lyon. The existence of these long-distance transport firms facilitated transport considerably, especially for smaller merchants (Brulez, 1959, 408-410).

Maritime transport was organised in ships owned by ship-owners, who sailed and managed their ships as a business in itself. Only in some cases ship-owners were merchants, such as in late medieval Genoa or 16th-century Holland, where ships were often owned by different merchants, each having a share in the ship (see also above). For the transport of merchandise over sea, specific arrangements were made between a merchant and a shipper,

often officially recorded in contracts in which rates, terms of the voyage, ports to visit, etc. were covered (Hunt & Murray, 1999, 49).

On short journeys or in safe waters, most ships sailed alone. Long voyages with valuable cargoes on the other hand were organised in convoys to obtain a better protection. The organisation of such convoys was sometimes controlled by the state, such as for the galley fleets of the Italian city states, especially Venice. In Venice, the system of the *galere da mercato* came into existence by the end of the 13th century, originally largely organised by private merchants, but from the 1330s onwards under strict control of the Venetian senate, who decided every year about the itinerary of the galleys. The galleys were provided by the state to entrepreneurs who had to bid for the responsibility over navigation and transport (Hunt & Murray, 1999, 49-50; Lane, 1973, passim; Tenenti & Vivanti, 1961, 83-84).

Since merchants normally made use of innkeepers, shipmasters and other agents (score 3, see above) for the organisation of transport of their merchandise, there is no need to return to this here. Sometimes however, information can be found about the use of a particular transport or trade route by a firm. When carts or ships (either company-owned or chartered) were regularly dispatched to a certain harbour or place by a firm, a score 3 has been used (2 for sporadic or once-only destinations). This also applies to the destination of galley services that were farmed by a firm, or on which a member of the firm was captain or commander. When transport of goods only passed through a place, a distinction has been made between overland and maritime transport. Overland transport of goods via a certain place does not have to mean that the goods of the firm made a stop in this place or that the firm had a representative here. Consequently, only a score 1 has been attributed. Regular traffic of the wares of a firm through a maritime port on the other hand has been given code 2 (1 if the harbour was used sporadically or once-only) since this implies at least some kind of use of the harbour infrastructure by the firm.

Additional indications for scoring business values

Many late medieval and 16th-century merchants and bankers did not limit their activities to wholesale trade and international finance, but were involved in a variety of other activities (see above). Several of these were carried out in separate places and as such generated additional connections, which need to be inserted in the quantitative model (see also table 2.4 below).

Various long-distance merchants were interested in industrial activities (De Roover, 1942, 38; Hunt & Murray, 1999, 38-39, 102-103; Renouard, 1941, 66-67), either directly through ownership of (or partnership in) manufactories such as textile production shops, smelting huts (for metal production), sugar mills, sugar or salt refineries, printing-works, etc. (score 2) or indirectly through a putting-out system, whereby merchants provided individual producers with the necessary raw materials and took care of the marketing of the manufactured goods (score 1). Involvement in mining activities (either through ownership of mines, control over mining output in exchange for loans to sovereigns, or the farming of the exploitation of mines,…) (e.g. for the Fugger, see Von Pölnitz, 1960, 288) has been given score 2, except when these activities were carried out on an extraordinarily large scale, for example when a firm obtained a monopoly over the output of an important mine (score 3).

Many entrepreneurs did not only invest in commerce or industry but also made less risky investments in real estate (land, buildings, water mills), rents, etc., which they often obtained from insolvent debtors. From there, several businessmen became involved in agricultural production (for 14th-century Tuscan firms, Renouard, 1941, 70). Moreover, investment in land could be considered as a move towards assimilation in the nobility[58]. A further step in this process was the acquisition of seigniorial rights over a settlement or territory by a merchant or banker (in a number of Italian city-states, such as Venice and Genoa, merchants belonged to the nobility) (Hunt & Murray, 1999, 52-53). A score 1 has been given to places in which entrepreneurs owned real estate, rents, seigniorial rights, etc.

A whole range of activities bears witness to the close ties between capitalist entrepreneurs and the ruling class. In their capacity as bankers, they provided loans to sovereigns and other secular and clerical princes, but also to cities and private persons, farmed the collection of taxes, or controlled royal mints (De Roover, 1948b, 30; Jeannin, 1963a, 75-77; Renouard, 1941, 71). Towns or cities which were home to mints controlled by a company, or to institutions (such as princely courts, town governments,…) to which regularly loans were advanced by a firm have been given a score 2 (1 if this occurred only once)[59]. On the other hand, places in which a company was entitled to the revenues of customs, taxes, etc. (through tax farm, or in exchange for loans provided to the government) have only been coded 1, since in many cases the collection on the spot was carried out by government

[58] However, among medieval English merchants for instance, admission to the landed gentry was rather exceptional (Kermode, 1998, 16).

[59] Loan contracts were often concluded at the bourses of financial centres such as Antwerp and Lyon in the 16th century. Consequently, direct connections with the place of residence of the debtor were probably not always necessary. As a result, I have opted for a score lower than the standard score 3 here.

officials, while only the coordination and supervision was in hands of representatives of the company (for the farm of papal taxes, see Guidi Bruscoli, 2007, xxiv-xxv).

As merchants or financiers, businessmen sometimes were even involved in war- and state-making activities, for instance through the supply of armies or fortresses (respectively score 2 and 1 for regular and sporadic supplies to particular places where an army was stationed or a fortress located), or the organisation or financing of privateering expeditions to a certain region (code 2 if regularly, code 1 if sporadic).

Consequently, several firms had direct connections with a royal, noble or clerical court as suppliers, court bankers, etc. Since this implies some sort of representation, a score 3 has been given (score 2 if these connections were irregular). Connections with government officials and institutions (mint masters, tax collectors, exchequer,…) have been coded 2.

As a result of their relations with governments, entrepreneurs were sometimes employed by these governments for executing political or diplomatic tasks which had not much to do anymore with commerce or banking (e.g. overseeing of construction works for the government). Locations in which a businessman carried out purely political or diplomatic affairs have been given a score 1[60].

In comparison to the trading, international banking and transport activities carried out by business enterprises, which all had similar and overlapping geographical outcomes (see above), the activities considered in this section are somewhat different. The geography of production (which regularly took place on the countryside) for instance was determined by factors such as the presence of cheap and flexible labour (putting-out system), availability of water (mills), wood (smelting huts), deposits of ores (mining), etc., while public banking had often more to do with political or administrative geography (location of capitals, courts, and government institutions, organisation of taxation,…). These factors are rather contingent to the specific city-ness I am attempting to measure (although there are important overlaps), and in consequence I have systematically used scores which are lower than the standard score 3.

Finally, there are a number of indirect indications for the importance of particular cities for the business of a firm, which have been used when more direct indications were missing. These have been attributed scores ranging from 1 to 4, depending on the strength of the connection they presume (see table 2.4).

[60] However, diplomatic missions in which a businessman participated and which were set up for the renewal of the commercial privileges of a town have been given a score 2 (1 if the entrepreneur only participated once).

A score 4 has been given to cities in which a firm rented a building or room. This could imply the presence of a branch, but not necessarily so, since firms also temporarily rented rooms for the duration of a fair for example.

Table 2.4
9-point scoring system for business values: scores for additional indications*

Score	Description
4	**Regular visits** by the **head** of the company; exceptionally **important flows** (merchandise, bills of exchange, letters); **regular courier service**; **rent** of a **building** or **room**
3	**Regular visits** by fixed **partners** or **factors**; **regular flows** (merchandise, bills of exchange, letters); **regular destination** of **carts** or **ships** chartered or owned by a firm, or of **galley-services** farmed by a firm; very **large-scale mining** activities; **regular connections** with a **court**; **bank account** or **deposit** in the *sopracorpo* of another firm; relative sent as **apprentice**; commercial **privileges**; **citizenship** of a **considerable amount** of **partners**
2	**Regular visits** by fixed **agents** or correspondents; **sporadic flows** (merchandise (also once-only), bills of exchange, letters); **several account holders**; **regular traffic** of goods via a **port**; **sporadic** or once-only **destination** of **carts** or **ships** chartered or owned by a firm, or of **galley-services** farmed by a firm; ownership of a **manufacturing establishment**; **mining**; **irregular connections** with a **court**; control over a **mint**; **regular** provision of **loans** to a prince or city; **connections** with **government officials** or institutions; **regular supply** of a **fortress** or **army**; **regular privateering** expeditions; **more than one debtor/creditor**; connections with **retailers**; **collection of debts**; **citizenship** of a **small number** of **partners**; **stock** of **goods**; **family member** for which **direct ties** with the firm can **not** be **demonstrated**; **family member** who was **not a businessman**
1	**Exceptional visits** or travel through a place; **unsuccessful trade**; **one letter** or **bill of exchange** sent/received; **transport** of merchandise **via** a place; **one account holder**; **sporadic** or once-only **traffic** of goods via a **port**; involvement in production via **putting-out system**; ownership of **real estate**, **rents**, **seigniorial rights**; **once-only** provision of **loans** to a prince or city; **tax farming**; **sporadic supply** of a **fortress** or **army**; **sporadic privateering** expeditions; **diplomatic** or **political activities**; **one debtor/creditor**; **citizenship** of **one partner**; **lawsuit**; **arrest** of a partner/employee; **marriage ties** with another merchant family
0	**No activity**

* Scores 5 to 8 have not been given for additional indications.

For indications which strongly presume or imply the presence of a correspondent or agent, or of trade activities in a certain city (account with a bank in a city, deposit in the *sopracorpo* of another company, relatives sent as apprentices, commercial privileges for a firm in a city), the standard score 3 has been used. Cities in which respectively one, a small number (but more than one), and a considerable amount of partners of a centralised company

had citizenship (which does not automatically mean that the firm carried out business there) have been given score 1, 2, and 3 (the latter also for citizenship of important partners).

Clues referring to clients or suppliers (debtors, creditors, collection of debts, connection with retailers in a city) have been given code 2 (1 if only one debtor/creditor)[61]. Locations in which goods of a firm were stocked (often in production centres) also have been scored 2. Cities in which partners or employees of a business enterprise were arrested, or in which a firm was involved in a lawsuit have been attributed score 1.

A last indication for a connection is the presence of relatives. Many authors stress the importance of solidarity among family members (e.g. Doria, 1986, 106 for the Genoese *alberghi*, a sort of noble family clans). According to Wolfgang Stromer von Reichenbach (1963, 7) the business activities of a member of a southern German family that ran a family firm can always be considered as business for this family firm, even when membership of the family member in the firm can not be demonstrated. I have given score 2 for the presence of a partnership or a family member involved in business, which/who belonged to the same family as the firm for which the business network is being reconstructed, but for which/whom no direct indications for a connection with (or membership of) the firm can be found[62]. The same score has been attributed to cities in which connections existed with a relative who was not a businessman (e.g. a clergyman), since often such a relative nevertheless represented the firm in one capacity or another, provided business information,… A city in which marriage ties existed with another merchant family has been given score 1.

General scoring guidelines

Quantification of business values entails several difficulties, which are related to (1) availability of several overlapping indications on a particular connection of a firm network, and (2) changes in the spatial strategies of firms over time.

Firstly, different indications on one and the same node in a firm network regularly overlap each other. Three rules apply for combining such indications: (1) indications about the organisational structure of a firm are preferred to other indications, but the latter can adjust the former; (2) stronger connections (and higher scores) have been given priority over weaker connections (and lower scores); and (3) complementary indications which reinforce

[61] Code 1 has been used for scoring cities of origin of merchants with whom business was conducted (e.g. for a firm doing business with Genoese merchants in Bruges, Genoa has been given score 1).
[62] If such a family member was a travelling merchant (or when he participated in an overseas expedition for instance), places in which he conducted business have been given code 1.

each other have been combined, resulting into an upgrading of the score. The former rule has always been given precedence over the latter.

Four examples will illustrate how these rules have been applied:

(1) When a firm had a branch in a place (score 6) and at the same time was involved here in mining activities (score 2), the former score will be used (rule one).

(2) When a firm is known to have had an agent in a particular city (score 2, 3 or 4, but standard score 3), while it appears from the preserved correspondence of the firm that not many letters were exchanged with that city (compared to most other cities in which the firm had an agent), score 2 will be attributed (rule one).

(3) Score 3 will be given to a port city in which a firm had a stock of goods (score 2), and whereto it regularly chartered ships (score 3) (rule two).

(4) A business value 2 will be given to a city in which a family firm had one debtor (score 1), and in which at the same time marriage ties existed with a merchant family from that city (score 1) since these indications mutually reinforce each other (rule three).

Secondly, the business network of a firm did not remain constant but changed continually during the lifetime of an enterprise: headquarter locations changed (sometimes only for short periods for reasons of war or plague), branches were closed or established in places where before only a commission agent represented the firm, etc. In the Fugger company for instance, some branches remained in existence during the whole lifetime of the firm, while others rose due to conjunctural circumstances, played an important role for a while, and then quickly were liquidated due to a changing geography of markets and trade routes, or bad political conditions (Von Pölnitz, 1960, 291).

Consequently, a firm should ideally be included in the matrix with its business network at one specific point in time. However, only in a number of cases the source material allows a reconstruction of such a cross-section of the business network at one stage[63], while in many more instances the data give a much more discursive picture of the network. In cases of change in the network, priority normally has been given to higher scores over lower scores (e.g. if a firm at some times had a branch in a city, and at other times only a commission agent, code 6 (for branch) has been given), unless the higher score solely applied for a much shorter period. Scores for such places in which a firm had a certain type of representative only

[63] An example is the network of the business house of the Gapaillon of Lyon, for which an inventory has been preserved which represents the state of affairs at the time of the composition of this inventory in 1583 (Gascon, 1952).

for a short time (typically less than a year) have been downgraded: 3 for headquarters[64] or branches (respectively 5 and 4 if normally the firm was represented here by an agent), 2 for factors or agents (see also footnote 51).

Moreover, for several firms the business organisation or network is significantly better known for one period than for another (due to unequal preservation of source material,…). In such cases the network has been reconstructed for the well-documented period (according to the normal scoring guidelines). Connections which are only known to have existed before or after this period have not been excluded from the data altogether, since links with a city – although they frequently changed in intensity or nature – were probably not often interrupted completely. Instead they have been attributed a lower score (e.g. 3 for headquarters, 2 for branches, factors, correspondents, or regular trade connections, 1 for industrial or mining activities and all other connections which would normally get a score 2) unless the score for the well-documented period was higher of course.

All these quantified data have been brought together in business value matrices, one for each century (respectively ^{14}B, ^{15}B and ^{16}B) and one for the whole period from 1300 to 1600 ($^{14-16}$B). The business value matrices have not been printed out, but can be found in the electronic version of the dissertation (see appendix 3 on CD-rom). In table 2.5 below, an extract from the 15th-century business value matrix is given.

Table 2.5
Extract from the 15th-century business value matrix (9-point scale)

Firm / City	Alberti antichi	Banchi (Andrea)	Barbarigo (Andrea)	Bembo	Betson (Thomas)	Borromei (Milan)
Aachen	0	0	0	0	0	0
Aalen	0	0	0	0	0	0
Aalst	0	0	0	0	0	0
Aardenburg	0	0	0	0	0	1
Abbeville	0	0	0	0	0	0
Acre	0	0	3	0	0	0
Adrianople	0	1	0	0	0	0
Agde	0	0	0	0	0	0
Agen	0	0	0	0	0	0
Agrigento	0	0	0	0	0	0
Aigues-Mortes	0	0	2	0	0	0

[64] If the headquarters of a firm were located in a city for a rather long period (more than a year), but even longer elsewhere, a score 5 has been given (7 if normally the firm had a branch here).

2.2. Data collection and sources

For measuring the present-day world city network GaWC has developed an extensive data collection method whereby data on the office networks of business service firms were extracted from their websites (Taylor, 2004, 65-66; Taylor *et al*., 2002b, 2368-2369; Id., 2010c). Unfortunately, such a ready-made source was not available for reconstructing the networks of late medieval and 16th-century transnational firms[65].

Data about historical business organisations and their networks can be found in primary historical sources preserved in a large range of public and private archives and libraries across Europe and even beyond (sometimes in unexpected places, for Venice see e.g. Lane, 1944a, 137-140)[66].

The most useful sources are business records produced by these enterprises themselves, especially consisting of business letters (incoming letters as well as copies of outgoing correspondence in letter books) and various account books (secret account books, which contain among other things the shares of the different partners, journals, ledgers, cash books,…), but also of bills of exchange, bills of lading, insurance policies, safe-conducts, balance sheets, partnership contracts, *ricordi* (instructions to branch managers,…), and miscellaneous other documents (Van Caenegem, 1978, 116-117; for the Medici, see De Roover, 1963, 391-395; for Francesco Datini, Melis, 1962, 9-28; for Andrea Barbarigo and other 15th-century Venetian merchants, Lane, 1944a, 140-150; for 16th-century Flemish companies, Brulez, 1959, 434-436, 441-442). The chances for survival of such records of private institutions with limited lifetimes were rather small. Often they can be found in judicial archives as a result of the involvement of the firm in a lawsuit or a bankruptcy, or in the archives of charitable institutions to which merchants sometimes left their fortunes. Of the few business archives that are still extant a large majority has only been preserved fragmentarily (Bautier & Sornay, 1971, 1389; Prevenier, 1998, 36-38).

Additional data can be found in chronicles, family histories, diaries, travel stories and other narrative sources (Van Caenegem, 1978, 17-54), several of whom have been produced by merchants who paid considerable attention to aspects of international trade and finance. Examples are the famous Florentine chronicle of Giovanni Villani, the managing partner of the Buonaccorsi company in the 1340s (Luzzati, 1971; Renouard, 1941, 56; Id., 1942, 21-22),

[65] It should be stressed however that the websites of business service firms are not ideal sources either (see Taylor *et al*., 2002b, 2369).

[66] Especially interesting are a number of archives dedicated entirely to a particular firm or family of businessmen, such as the Datini archives in Prato (http://datini.archiviodistato.prato.it/www/indice.html), or the Fugger archives in Dillingen (http://www.fugger.de/en/l2_fuggerarchiv.htm).

the *Fuggerchronik* and *Fuggersche Ehrenbuch*, in which Hans Jakob Fugger, head of the Fugger firm from 1560 to 1563, wrote down the history of his family (Von Pölnitz, 1960, 327), or the *Tagebuch* or diary of Lucas Rem, an Augsburg merchant who began his career as a factor of the Welser company (Ehrenberg, 1928, 139).

A last type of sources produced in merchants circles which may be of use for the reconstruction of business networks are notebooks of merchants and merchant manuals, containing information on weights, measures and currency exchanges, trade routes, or commercial law, or being guides to accountancy, arithmetic or other commercial techniques[67] (Harreld, 2007, 68-80; Spufford, 2002, 52-54). One of the most successful medieval merchant manuals was the *Pratica della mercatura* originally written by Francesco Pegolotti for use by employees of the Florentine Bardi company in which he was a factor himself (Renouard, 1941, 55). An important source about the business network of the Nürnberg Welser is a printed copy of the merchant manual of Lorenz Meder to which several additions were made by members of the Welser company in the 1560s-1580s (Kellenbenz, 1974, 75-76).

Also documents that were not produced by merchants can contain valuable information. Late medieval and 16th-century businessmen regularly made use of notaries (or other institutions with similar competencies) in whose archives partnership contracts, protests against bills of exchange, loan contracts, inventories, shipping contracts, etc. can be found (Bautier & Sornay, 1971, 1141-1147, 1389-1390; Gascon, 1971, 267-269; Prevenier, 1998, 36). Various governmental archives on the other hand hold documents such as proceedings of commercial lawsuits or customs accounts. The principal source about the French merchant Jacques Coeur for instance is a large register drawn up by *procureur* Dauvet, who was in charge of the confiscation of Coeur's possessions in 1451 (Mollat, 1988, 7). Customs accounts – such as the tax registers on the exports from the Low Countries in 1543-1545 which mention for each entry the name of the exporter, the nature and value of the exported goods, and the destination of the exports (Brulez, 1959, 460-461) – sometimes allow to reconstruct parts of the flows of merchandise for particular firms (Van Caenegem, 1978, 113-115).

[67] Merchant manuals, especially those that were conceived as commercial geographies containing information on a range of commercial cities, could be an interesting source for a direct reconstruction of the European commercial network, rather than indirectly through the networks of firms such as in the interlocking network model. A commencement to such an approach has already been made by Donald Harreld (2006). Peter Stabel (1997, 3-10) has used, among other sources, Pegolotti's manual to reconstruct the late medieval view on the Flemish urban network. Other sources that may be useful for the study of urban patterns are itineraries, port books, portolans, and various other maps (for these types of sources, see Spufford, 2002, 54-56).

The consultation of primary historical source material is a very labour-intensive activity: the handwriting is often hard to read, sources such as account books are difficult to interpret, and regularly language is an issue as well. Moreover, unless sources have been made available on-line or via source publications, they need to be consulted on the spot in an archive or library (Prevenier, 1998, 41-44, 60-62). Reading, interpreting and processing primary source material on 130 different business organisations is a physically impossible task, at least with the limited resources of a PhD project. Luckily – and as I will argue below – there is an alternative solution. Consequently, only in a limited set of cases I have directly made use of a number of published sources, especially account books or letters. I have already stressed the usefulness of quantitative data about correspondence flows, which from time to time can be found in such source publications. For a couple of firms, data contained in (sets of) published account books have been directly quantified as well. In these cases I have used the index of place names, which I have assumed to roughly reflect the business network of the firm, for obtaining additional information on that network (see table 2.6).

Moreover, source publications frequently include an introduction by the editor in which important clues towards the interpretation of the source can be found, and sometimes even a description of the activities, structure and business network of the particular firm that was responsible for the production of the source.

Table 2.6
9-point scoring system for business values: scores for place names mentioned in account books

Score	**3**	**2**	**1**
Number of mentions*	> 5	2-5	1

* Number of mentions in the account book, or number of pages in the source edition of the account book on which a place has been mentioned.

In general however, and especially in order to keep in one way or another the extensive set up of the data collection process of the interlocking network model, I have made use of secondary historical literature rather than primary sources. There exists an inexhaustible literature on late medieval and early modern business enterprises, compiled by several generations of historians, regularly containing analyses of the spatial organisation or commercial network of particular firms. As a result, there is often no need to go back to the sources themselves[68].

[68] A similar use in a comparative quantitative analysis of information gathered from historical literature can be found in Grafe & Gelderblom, 2010.

A lot of this literature is very specialised and as such not very widely available[69]. Consequently, for data collection purposes I have visited several libraries in the United Kingdom (the university libraries of Loughborough, Nottingham and Leicester as well as the British Library), Belgium (university libraries of Antwerp and Ghent, library of the Felixarchief (town archives of Antwerp), Erfgoedbibliotheek Hendrik Conscience in Antwerp, Royal Library in Brussels), and the Netherlands (Utrecht university library). Consulting secondary literature is much less time-consuming than using archival source material, but nevertheless data collection has devoured by far the largest share of the time available for this research project (although for most firms only parts of the available literature have been used).

A major advantage of the usage of secondary literature is that collection and interpretation of data and reconstruction of the history of a firm from many scattered data fragments is left to specialists on the matter concerned. However, there is definitely a risk in the use of historical literature, which is often not concerned with geographical detail, for the reconstruction of firm networks, a use for which most of this literature has not been intended in the first place. When possible, preference has been given to books or articles in which data on the business network of a firm have been based directly on archival research. Although in several cases detailed textual descriptions and/or maps of the networks of particular firms were readily available in the literature, often they had to be puzzled together from scattered references[70]. Hereby all information, direct and indirect, that could be found about the business network of a firm (as well as a variety of other data about the general history of the firm, its principal activities, size, etc.) has been collected according to a so-called scavenger method of data collection[71]. One complication with this method is that the nature and amount of information collected vary greatly from firm to firm (Taylor *et al*., 2002b, 2369-2370).

Another problem results from the differences between various strands of historical literature on medieval and early modern business. Richard Goldthwaite (1973, 770-771) distinguished between "two historiographical traditions in the study of the Tuscan bankers in England: one follows the lines of business history […], the other concentrates on royal financial administration". This observation can be extended to the literature on late medieval

[69] The literature search has been described above in the section on firms.
[70] For a number of firms information about their network in the literature was so fragmentary that it would be better to go back to the primary sources. For reasons of time constraints this has not been feasible however.
[71] This scavenger method has some affinity to prosopographical research, since it consists of a systematic tracking down of 'biographical' information about as many firms as possible (Prevenier, 1998, 75).

and 16th-century business in general: while some studies are business histories *stricto sensu*, others focus more on political economy, family history, the history of accountancy, etc.

These divergences in focus of different historical studies sometimes reflect differences in the primary source material used. While correspondence and account books often allow to reconstruct the internal history of a firm, sources from governmental archives are more suitable for the study of public banking or tax farming for instance. Consequently, depending on the nature of the extant sources a different network will come into view, whereby the trade flows generated by a firm will appear stronger in one case, and its political connections in another. Differences between reconstructions of historical business networks in their emphasis on different types of nodes, different organisational features, etc. as a result do not have to reflect 'real' differences between the networks themselves, but can also be owing to the divergent natures of the primary or secondary sources used. The question is whether this variety of networks can be brought together in one model.

From the above it is already clear that, despite the exclusive use of secondary historical literature, it is important to be aware of the deficiencies of the primary sources on which this literature is based – and which deficiencies often feature directly in the secondary literature – as well. Almost always, firm networks have to be reconstructed from scattered fragments of sources. Not only does that mean that most business networks are known merely fragmentarily themselves (sometimes even important nodes might be missing), but also that many conjectures need to be made about the nature, relative importance, date of origin and dissolution, mutual relationships, etc. of several nodes in the network of the firm under investigation. This problem is even reinforced because of the obscurity, lack of specificity, or even silence of many sources about details that are needed for a reconstruction of the network[72]. Moreover, sources are not always reliable: juggling with accounts for instance is a problem of all times.

One consequence of the source deficiencies is that relatively frequently different secondary sources seem to contradict each other. The Guinigi company of Lucca is an excellent – but somewhat extreme – example. According to Yves Renouard (1942, 46), this company had branches or correspondents in Avignon, Bruges, Florence, London, Pisa and Venice ca. 1350-1378, as well as a correspondent at the Papal Curia in Italy in 1368-1370. Raymond De Roover (1948b, 39) on the other hand stated that the Guinigi firm had branches

[72] This explains the need for indirect indications (about the presence of family members, apprentices,…) for scoring business values when more direct clues are missing. Also the problem of imprecise geographical designations (see section on cities above) has its origins here.

in Bruges, Genoa, Naples and Venice in 1372, and in Bruges, London and Rome in 1381, while Bart Lambert (2006, 56)[73] mentioned that around 1370 the Guinigi had branches in Bruges, London, Paris, Pisa and Rome. Consequently, these authors only agree about the location of the headquarters in Lucca and the presence of branches in Bruges, London, and perhaps Rome.

Such disagreements could of course be owed to straightforward mistakes, but in many cases they probably are the result of other factors. Firstly, different authors often did use different source materials and as a result came to different conclusions. For the Guinigi company for instance, we know that Renouard (1942) consulted the archives of the Avignon papacy, while De Roover (1948b) made use of sources preserved in the State Archives of Lucca. Secondly, primary sources are not always very clear, and authors can differ in the interpretation of them. The fact that Renouard (1942, 46) referred to 'branches or correspondents' may indicate that the papal documents used by him did not allow to distinguish between both.

In cases of contradiction between authors scores normally have been averaged[74]. Solely when a distinction could be made between more and less reliable literature, I have attempted to follow the former rather than combining them. When a less reliable author mentioned the presence of a branch in a city for instance, while a more reliable source did not mention a connection at all, only a score 3 has been given (2 if the presence of such a branch seems highly unlikely).

As is clear from the above, important objections should be made to the alleged reliability of many reconstructed business networks. I will come back to this problem in the next section.

2.3. Problems of quantification

In addition to a problem of reliability of the networks taken up in the business value matrix, there are several other difficulties which are not so much related to the quality of the sources and the literature, but more to the nature of the scoring system used.

In the first place – and as will be clear from the previous sections – I have developed a rather complicated scoring system. For each node, nine different scores are available, which is

[73] Lambert gives as his source C. E. Meek, 1978. *Lucca 1369-1400. Politics and society in an early Renaissance city-state*. Oxford, Oxford University Press, 197. I have not consulted this work directly, so I have not been able to trace Meek's sources.

[74] When a connection of a firm with a particular city was mentioned by one out of two reliable authors but not by the other, I have always included this connection in the network.

more than in other quantitative analyses of interlocking city networks (e.g. six-point scale used for most measurements of the current world city network (Taylor, 2004, 66-67; Taylor *et al*., 2002b, 2370); three point-scale for measurement of a network produced by Islamic financial services in 2007 (Bassens *et al*., 2010)). Moreover, not only direct information on the spatial organisation of firms has been gathered and scored, but also a variety of additional indications on flows of merchandise, bills of exchange and correspondence, on the geography of transport, industrial and public banking activities of firms, etc. To make things even worse, scoring guidelines have often been defined rather vaguely, using broad descriptions such as 'important', 'regular', 'sporadic', etc. to differentiate between categories. Unfortunately, the lack of precision in the sources most of the time did not allow to make use of hard, quantitatively defined categories.

Consequently, scoring the information gathered from the literature is not a straightforward process: it requires a lot of interpretation and sometimes even looks like a somewhat arbitrary activity. Often it can be difficult to define whether one node is more, as, or less important as another node in the network of a firm for instance (e.g. how to compare the importance of a place with which there was a regular exchange of bills of exchange with that of a location to which frequently ships were chartered). A crucial problem here is the lack of intersubjectivity already mentioned before, whereby different people using the same information and the same scoring guidelines will nevertheless not always decide on the same score for a particular node in the network (Taylor, 2004, 66-67; Taylor *et al*., 2002b, 2370-2371).

Secondly, quantification is only possible when business values can be measured at different times or places in different conditions, while being sure that the same thing is being measured (Prevenier, 1998, 70-71; Sayer, 1992, 177). However, as will be clear from the earlier description of late medieval and 16th-century business organisation, a large variety of organisational designs of business enterprise existed and it is not obvious to bring these together in one data matrix according to a single scoring scale. Moreover, depending on the quality and nature of the sources and literature, the type and level of detail of information differ massively from firm to firm (I will come back to the problem of detail later). Consequently, quantification requires a streamlining of multifarious information into data that are comparable across firms. The nine-point scoring system used has been designed to accommodate as much of this diversity as possible. Nevertheless, the developed scoring

system is not faultless, and the risk for comparing apples and oranges is not entirely hypothetical.

One reason for this is a possible ambiguity in the terminology on which the scoring system has been based. Terms such as factor (see footnote 39), agent, etc. appear to have had somewhat different meanings in different periods and geographical regions, and even in the historical literature such concepts sometimes seem to differ in content. Consequently, there is a danger for erroneous interpretations of the nature and importance of particular nodes. Second, and more importantly, the assumptions of the scoring system (e.g. a factor generates more flows than a commission agent) do not have a universal validity for all firms and all connections. As the example of the Datini company has already illustrated, the connections with a city in which a branch was located did not always have to be more important than those with a city in which the representative was a commission agent. Each firm was different, and the relative importance of headquarters, branches, partners, factors, agents (permanent or intermittent), and clients, but even more of manufacturing establishments, mining activities, connections with princely courts or family members, etc. could vary greatly from firm to firm[75]. Often differences between individual enterprises are too large to be able to draw generally valid assumptions.

In the historical literature, regularly clues are given about the relative importance of different nodes in the business network of a particular firm (e.g. maps distinguishing between more and less important nodes). In those cases, I have decided to deviate from the general assumptions of the scoring system and to follow the indications in the literature instead. Nevertheless, I have not always been able to account for such differences in firm organisation.

Finally, a remark needs to be made about the alleged hierarchical character of the scoring system. Coding business networks according to a multi-point scoring system implies that a ranking is produced of the different nodes in each particular network. One could argue that such a scoring system would more easily accommodate hierarchically organised firms than network-based enterprises in which all nodes are at the same level. This argument is not correct however, since it is possible to attribute the same score to all different nodes in a network (e.g. score six for each of the partners in a Hanseatic *Fernhandelsgesellschaft auf Gegenseitigkeit*, and no use of score eight since there were no headquarters). Consequently, a hierarchical outcome of the city network is not *a priori* implied in the measurement method.

[75] This problem of diversity in firm organisation is – up to a certain degree – present among business service firms in the current world city network as well (Taylor *et al*., 2002b, 2370).

However, there is a bias towards hierarchical enterprises for other reasons. Hierarchically structured firms were typically much larger than network organisations. While several of the former had more than a dozen branches, the latter only exceptionally included more than a handful of partners representing the firm abroad. Moreover, because of their more formal and stable organisation, generally better and more data exist for hierarchies than for the much more informal and flexible network-based enterprises. As a consequence, the business value matrix is dominated by hierarchically organised firms, although they only constituted a minority in the late medieval and 16th-century business world. Smaller network organisations on the contrary collectively could play an important role in the city network because there were so many of them, a factor which is not accounted for at all in the business value matrix. Again, the representativity of the firm sample needs to be questioned here.

One can conclude that the business networks finally incorporated in the business value matrix have been mediated through three successive levels of manipulation: the contingencies of source production and preservation, the interpretations of historical scholarship, and the translation into quantitative business values. One can wonder how far these networks still mirror historical 'reality'. Nevertheless, given the source constraints, this is the best one can get, and as such there is not really an alternative. The question is whether these issues lead to so much inaccuracy in the data that they become useless. In the GaWC-literature generally two answers are given to this problem. First, a relatively large number of firm networks should be used in measurements of an interlocking city network so that particular inaccuracies are likely to be evened out in the aggregate analyses. Second, the scoring system used should be as simple as possible, so that less decisions need to be taken when scoring the data (Taylor, 2004, 66-67; Taylor *et al*., 2002b, 2370-2371).

Although I have argued before that the size of the firm sample is insufficient to obtain a representative view of the overall city network, I believe that it is large enough to somewhat level out the impact of incorrectly reconstructed or quantified business networks since no systematic biases are to be expected here.

However, the second condition should concern us more here. Despite the fact that the quality of my historical data is significantly lower than in most measurements of the contemporary world city network, I have designed a more complicated method of scoring, containing nine different levels. In answer to this paradox I have developed three additional scoring systems, respectively based on a five-point, four-point and two-point scale, which will be presented in the next section.

The production of these extra scoring systems provides a solution for another problem as well. It should be noted that the data in the business value matrix are ordinal (categories can be ranked from low to high, but there is no fixed interval between the categories) and not cardinal (categories can be ranked, and there is a fixed interval between them) in nature. In other words, although a branch (score 6) is more important than a commission agent (score 3), it is not twice as important. Analogously, the difference in importance between a node with score 6 and a node with score 7 does not have to be the same as the difference between a node with code 7 and one with code 8, although this appears to be implied by the scoring system. That the data are not cardinal may be clear from the observation that just as well another scoring system (e.g. with a five-point scale) can be designed in which the interval between a same pair of nodes would be completely different. The reason for this is that there does not exist a specific scoring scale that is inherent in the spatial organisation of the firms in the matrix.

This observation has strong implications for possibilities of further analysis, since mathematical operations such as adding up, subtracting, multiplying and dividing cannot meaningfully be performed on ordinal variables (De Maeyer & De Vliegher, 2003, 122)[76]. To put it differently, the choice for a particular scoring system will have an impact on the results of mathematical operations and analyses, such as the calculation of connectivities (see later). The development of different methods of scoring allows to control for this problem.

2.3.1. Five-point, four-point, and two-point scoring scales

In order to improve the credibility of the data, three additional scoring systems have been developed, each of them resulting in a new business value matrix (depending on the scoring scale used, matrices and business values respectively will be represented below by the following symbols: B^9, B^5, B^4, B^2, and b^9_{ij}, b^5_{ij}, b^4_{ij} and b^2_{ij}) (see again CD-rom for these matrices).

For producing business values according to these additional scales it was not necessary to manually attribute scores again case by case as for the nine-point scale matrix. Instead the new business values (and business value matrices) have been calculated directly from the nine-point scale business values. As a result, the relations between the different scoring scales are fixed (see table 2.7).

[76] As far as I know, no-one has ever made this remark before in relation to world city network measurements. Yet this means that very common operations such as the calculation of connectivities are in fact meaningless.

Table 2.7
Correlation between the different scoring scales

<table>
<tr><th>9-point scale</th><th>5-point scale</th><th>4-point scale</th><th>2-point scale</th></tr>
<tr><td>8</td><td>4</td><td>3</td><td rowspan="6">1</td></tr>
<tr><td>7</td><td rowspan="3">3</td><td rowspan="5">2</td></tr>
<tr><td>6</td></tr>
<tr><td>5</td></tr>
<tr><td>4</td><td rowspan="3">2</td></tr>
<tr><td>3</td></tr>
<tr><td>2</td><td rowspan="2">1</td><td rowspan="3">0</td></tr>
<tr><td>1</td><td>1</td></tr>
<tr><td>0</td><td>0</td><td>0</td></tr>
</table>

In the five-point scale, the principal assumptions behind the nine-point scale have been retained (see table 2.8): headquarters (code 4) are considered to be more important nodes than branches (in hierarchical multi-branch companies) or partners (in more horizontally structured family enterprises, etc.) (code 3), which in their turn form the level above agents (factors, commission agents, innkeepers, shipmasters, travelling partners in single-venture partnerships,…) (code 2). Code 1 has been preserved for cities with which a firm only had very exceptional connections.

The main difference with the nine-point scale is that the five-point scale does not distinguish between different levels of branches or partners, nor between different levels of agents or correspondents. In other words, this scale is less detailed and as such probably more suited to the type of source material used for this study. On the other hand however, using a less detailed scoring system means that more of the original information is lost. In general, the different methods of scoring give a different solution to the "tension between keeping as much of the original material as possible and creating a credible ordering that accommodates all degrees of information across cases" (Taylor *et al*., 2002b, 2370).

Table 2.8
5-point scoring system for business values

Score	Description
4	Headquarters
3	Branch or long-term resident partner
2	Agent
1	Very weak connection
0	No connection

The four-point scale (table 2.9) serves another purpose than the five-point scale in that it controls for one of the assumptions behind the nine-point scoring scale. In the four-point scale, no distinction is made anymore between branches and long-term partners on the one hand, and factors, agents and correspondents on the other hand. Immediately below the level of the headquarters (code 3) all nodes have been grouped in which a firm was regularly represented, either through a branch, a partner, a factor, a commission agent,… (code 2). Cities in which a firm was only represented on an irregular basis have been given a score 1. Consequently, in this scoring system individually operating merchants are not distinguished anymore from larger firms.

Table 2.9
4-point scoring system for business values

Score	Description
3	Headquarters
2	Regular connection
1	Weak connection
0	No connection

Finally, the two-point scale (table 2.10) gives an answer to the question whether a firm was regularly represented in a city (code 1) or not (code 0), and as such results in a sort of simple presence matrix (Taylor, 2001; Id., 2004, 61), but whereby weak (and often dubious or ambiguous) connections have been scored 0. In the two-point scale not even the headquarters are being singled out, so this is clearly the least detailed scale. On the other hand, the data produced by this method of scoring are the most certain. Since weak connections disappear altogether in this presence matrix, its dimensions are significantly smaller than that of the other matrices (several locations which are included in the other matrices score zero for all 130 firms in the two-point scoring system)[77].

Table 2.10
2-point scoring system for business values

Score	Description
1	Regular connection
0	No (or weak) connection

[77] The three centuries taken together, a total of 615 locations are included in the 2-point scale business value matrix B^2 (524 of which are cities or towns, 25 are distinct regional designations, and 66 are overlapping regional descriptions). For the 14th, 15th and 16th centuries, these numbers are respectively 214 (192+4+18), 301 (274+5+22), and 401 (340+19+42).

Biases in the different scoring systems

Depending on which scoring system is being used, different firms (and different cities) will be favoured or disfavoured in the analysis. These biases can be uncovered through linear regression and residual analysis, comparing the sets of column totals (for the firms) or row totals (for the cities) of the different business value matrices – one for each scoring system – two and two with each other[78].

Before looking at these correlations and residuals, it is important to realise the meaning of row and column totals in a business value matrix. Row totals theoretically are a measure for the total business value C_i present in a city i (Taylor, 2001; Id., 2004, 61-64), whereby:

$$C_i = \sum_j b_{ij}$$

However, because the sample of firms included in the business value matrix is not representative for the European city network as a whole (see above), these total business values only are a measure for the total business carried out in a city by this particular set of firms and cannot be generalised to the whole network[79]. Analogously, column totals give the sums of the scores across all cities for each particular firm, and as such they express the total business value F_j of a firm j (Taylor, 2001; Id., 2004, 61-64):

$$F_j = \sum_i b_{ij}$$

The meaning of this measure will be discussed below.

A common technique for describing the relation between two variables is a standard least squares regression analysis, whereby a simple bivariate function is fitted in a two-dimensional scatter plot mapping out the variables (see fig. 2.3) (Taylor *et al*., 2007). I have used this simple statistical method to explore the correlation – pairwise – between sets of total business values (either for cities or for firms) calculated according to the different scoring methods. Hereby total business values based on the more detailed scoring scale have been treated as the independent variable, since all other coding methods have been derived from the nine-point scoring system, which is the most detailed. In what follows, only the results for comparison of column totals (the total business values of firms) will be discussed, since for

[78] I have carried out these regression analyses for the matrices describing the whole period 1300-1600, and not for each century separately.

[79] Moreover, total business values of cities are rather meaningless when calculated for the whole 300-year period.

row totals (total business values for cities) the results simply confirm what is already known about the relationships between the different scoring systems from table 2.7.

The equations produced by standard least squares regression analysis typically have the form

$$F^{sl}_j = m\, F^{sh}_j + b + r_j$$

F^{sl}_j and F^{sh}_j are the total business values for firms respectively calculated in the lower-point scale and higher-point scale business value matrix, m is the estimated gradient of the regression line, b is the estimated intercept of the regression line on the vertical axis, and r_j is the residual for each firm, expressing the difference between the actual total business value according to the lower-point scale scoring system and the number estimated by the model (Taylor *et al.*, 2007). The term that especially interests us in this equation is the residual.

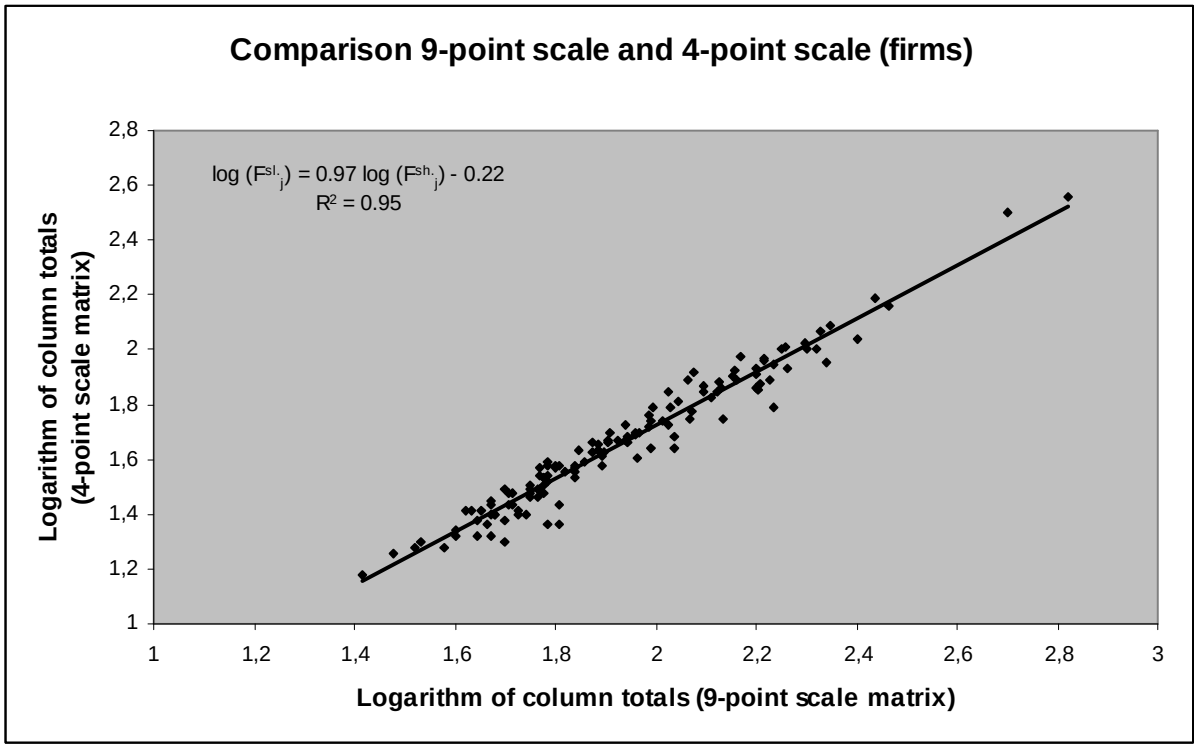

Figure 2.3: Linear regression analysis between column totals (total business values for firms) in the nine- and four-point scale matrices (14th-16th centuries).

However, when regression analysis is carried out on these sets of total business values, a technical problem arises, known as heteroskedasticity. This means that the variance in both variables does not remain constant over the entire data range, and indeed, in this case the variance increases with greater values of F^{sh}_j and F^{sl}_j. The occurrence of heteroskedasticity is problematic for a proper interpretation of the residuals and as such should be neutralised. One solution is to take the logarithm ($\log_{10}$) of both variables, since this up to a certain measure

equalises the variance over the full data range (Taylor *et al*., 2007). Consequently, the equation becomes:

$$\log (F^{sl}_j) = m \log (F^{sh}_j) + b + r_j$$

When pairs of different scoring systems are compared through linear regression analysis on the respective total business values calculated according to each of these scoring methods, a first observation is that the coefficients of determination R^2 (which express the amount of variability in the dependent variable explained by the independent variable) are always relatively high (ranging between 0.60 and 0.98)[80]. This should not be a surprise since the lower-scale scoring systems have all been derived directly from the nine-point scale. Nevertheless, these high coefficients of determination indicate that the choice of scoring system has not so much impact, and that the data are relatively robust.

The differences between the different scoring systems can be evaluated through an assessment of the residuals, which are the vertical distances between points in the scatter plot (representing firms) and the regression line. A residual indicates whether a firm is being 'favoured' or 'disfavoured' in a particular scoring system when compared to another (Taylor *et al*., 2007).

Table 2.11
Top 10 firms ranked by total business value across all places (595) for the different scoring systems (14th century)

Rank	Firm	F^9_j	Firm	F^5_j	Firm	F^4_j	Firm	F^2_j
1	Datini (Fr.)	504	Datini (Fr.)	421	Datini (Fr.)	316	Teutonic Order	58
2	Teutonic Order	222	Stromer	149	Teutonic Order	122	Datini (Fr.)	48
3	Bardi	218	Teutonic Order	135	Stromer	106	Bardi	41
4	Stromer	198	Bardi	117	Bardi	90	Kamerer-Seiler	34
5	Acciaiuoli	172	Van Marke (C.)	108	Kamerer-Seiler	85	Stromer	32
6	Peruzzi	160	Kamerer-Seiler	107	Van Marke (C.)	83	Peruzzi	31
7	Kamerer-Seiler	158	Peruzzi	92	Peruzzi	71	Acciaiuoli	29
8	Buonaccorsi	136	Acciaiuoli	90	Acciaiuoli	62	Buonaccorsi	26
9	Van Marke (C.)	119	Von Geldersen	80	Von Geldersen	58	Alberti	23
10	Alberti	109	Buonaccorsi	75	Buonaccorsi	56	Medici (Av.)	15

Interpretation of the residuals of these regression analyses between sets of column totals hints at an additional data problem, which needs to be looked at before going to the residuals themselves. The total business value F_j for a particular firm j depends on two factors, notably (1) the importance and extent of the business network of this firm, and (2) the amount of detail with which this network has been reconstructed. The top ten of 14th-century

[80] R^2 ranges between 0 (0 % of the variability in the dependent variable explained by the independent variable) and 1 (100 % of the variability explained).

firms according to their total business value (table 2.11) for example consists of a number of very large firms with extensive business networks on the one hand (Bardi, Peruzzi, Acciaiuoli, Buonaccorsi and Alberti of Florence, Stromer and probably also Kamerer-Seiler of Nürnberg, Teutonic Order in the Hanseatic area), and another group of less important firms whose networks are known with great detail – thanks to the availability of good source material and literature – on the other hand (Datini, but especially Collard van Marke and Vicko von Geldersen)[81].

While the large firms rank relatively higher when utilising the nine-point or two-point scale, the smaller firms do better when the four- or five-point scale is used. Especially the two-point scale scoring method appears to rank firms differently than the other coding systems: while the Datini company appears as a clear outlier according to the nine-, five-, and four-point scale scoring systems (with total business values more than twice those of the secondly ranked firm), this firm only ranks second for column totals calculated in the two-point scale business value matrix. This is confirmed by the coefficients of determination, which are all higher than 0.95 when comparing the nine-, five- and four-point scales with each other, but range between 0.60 and 0.72 when they are compared to the two-point scale.

Let us have a look at the relations between the nine-, five- and four-point scales first. As expected, the nine-point scale scoring method favours large firms, while individual merchants and small enterprises are promoted by the four-point scale (and also the five-point scale) scoring system. This picture emerges relatively clearly from an analysis of the residuals of the regression between column totals in the nine- and four-point scale business value matrices, although it is distorted by the fact that the four-point scale method favours high frequencies of scores 3-2-2-1[82] and 1-1-1-0, and disfavours firms having many nodes with score 2-2-1-0 in comparison to the nine-point scale coding system (see table 2.12). Residuals have been given here in units of their standard deviation from the mean (Taylor *et al*., 2007).

Comparison of these coding methods with the two-point scale scoring system reveals something else. Residuals analysis shows firms in which weak connections were well represented (high relative frequency of nodes with scores 2-2-1-0 and 1-1-1-0) to be strongly disfavoured by the two-point scale. These are either rather small firms (e.g. Wolter von Holsten, Gilbert Maghfeld,…) or firms for which a lot of details about the lower levels of the network are available (Datini,…), or a combination of both (Gapaillon, Vicko von Geldersen,

[81] The networks of some of the large firms (especially Teutonic Order and Stromer) are known in great detail as well.

[82] The notation 3-2-2-1 gives the respective scores of a particular node according to the nine-point, five-point, four-point and two-point scoring scales (respectively 3, 2, 2, and 1).

Collard Van Marke, Hans Praun,…). The explanation is that weak connections are actually excluded from the two-point scale business value matrix (in which they are given code 0).

Table 2.12
Low negative and high positive residuals in a linear regression analysis between column totals of the nine-point scale (B^9) and four-point scale (B^4) business value matrices (14th-16th centuries)

Negative residuals (favoured in 9-point scale)			**Positive residuals (favoured in 4-point scale)**		
Firm	**Res.**	**Explanation**	**Firm**	**Res.**	**Explanation**
Guinigi	-3.31	Large firm*	Van Marke (Collard)	2.27	Small firm***
Acciaiuoli	-3.07	Large firm	Praun (Hans)	1.86	Small firm
Scali	-2.92	Large firm	Van Tweenhuysen (L.)	1.80	Small firm
Guicciardini	-2.48	Large firm	Datini	1.70	Other****
Alberti antichi	-2.24	Large firm	Borromei (Milan)	1.69	Other
Buonaccorsi	-2.03	Large firm	De la Pole (William)	1.41	Small firm
Pazzi (Jacopo)	-1.99	Large firm	Poulle	1.35	Small firm
Bardi	-1.91	Large firm	Banchi (Andrea)	1.25	Small firm
Balbani	-1.67	Large firm	Popplau	1.20	Small firm
Soderini	-1.58	Large firm	Mitjavila & Co.	1.18	Small firm
Alberti	-1.52	Large firm	Bembo	1.12	Small firm
Welser (Augsburg)	-1.49	Large firm	Nunes (Estevão)	1.11	Small firm
Spifame	-1.41	Other**	Von Holsten (Wolter)	1.11	Small firm
Paler-Weiss	-1.39	Large firm	Ruland (Ott)	1.09	Small firm
Peruzzi	-1.38	Large firm	De Groote (N.)	1.07	Small firm
Loitz	-1.22	Large firm			
Guardi	-1.11	Other			
Welser (Nürnberg)	-1.10	Large firm			
De Castro	-1.06	Other			

* Large firm: either a multi-branch company with several branches, or a large long-term partnership with several partners residing abroad.
** Other (negative residuals): somewhat smaller firms for which almost no data are available about the lower levels of their business network (almost no nodes with score 3-2-2-1 and/or 1-1-1-0), and which for this reason are being favoured in the nine-point scale method of scoring.
*** Small firm: either an individual merchant, or a firm without (or with only a small number of) branches or resident partners abroad. Such 'small' firms could nevertheless have a large amount of capital, a considerable business, and an extended network of correspondents.
**** Other (positive residuals): considerable firms for which a large amount of data are available about the lower levels of their business network (high relative frequency of nodes with score 3-2-2-1 and/or 1-1-1-0), and which for this reason are being favoured in the four-point scale method of scoring.

The reason why the correlation between column totals in the two-point scale matrix and the other matrices is so low in comparison to correlations between sets of column totals in the other scoring methods, is that there are large differences in the amount of detail in the business networks of different firms (dependent upon the nature of the preserved source material and the available literature). While these differences between firm networks feature in the nine-point, five-point and four-point scale matrices, they have been eliminated – at least up to a certain point – from the two-point scale business value matrix through the exclusion of lower level nodes, since more detailed networks often contain a higher relative amount of these lower level nodes.

The fact that very detailed business networks are included in the same matrix together with firm networks which are only known in their broad outlines (not for the two-point scale business value matrix however) poses a risk for comparing apples and oranges, since the former will weigh relatively stronger than the latter in most analyses. This is illustrated by the observation that two firms which only operated on a regional or even local scale (Collard van Marke and Vicko von Geldersen) were nevertheless included in the list of top ten firms in terms of total business value for the 14th century (see table 2.11), since a large amount of detailed information was available about the geographical composition of their client base. A possible solution would be to attribute weights to firms according to their size, so that large firms for which only limited data are available would nevertheless have a larger impact than small firms for which very many connections have been reconstructed. However, not only is there a lack of information on the size of many firms, but moreover is the size of firms already somewhat accounted for in the (nine-point scale) scoring system, since bigger firms have a larger amount of more important nodes with higher scores (branches,…) in their business network.

An alternative solution is suggested in the empirical literature on the present-day world city network. Although the large variation across firms of the amount of available information has been a feature in the data collection for the contemporary world city network as well (Taylor, 2002b, 2370), the impact of this has largely been mitigated by the fact that data were only collected for a selection of important cities (e.g. 315 for the 2000 and 2004 data). Consequently, data about the presence of offices in a large number of less important cities – which means detailed information that is not available for all firms up to the same level – were not included in the produced service value matrices. In other words, also in relation to the data on the late medieval and 16th-century European city network such a selection in the amount of cities included in the analyses may be desirable in order to even out the variation in detail across the different business networks.

In the table above for instance, the top ten firms for each century in terms of total business value have been given, calculated in the nine-point scale matrices across a selection of places that had at least five percent of the highest total business value in the respective business value matrix (see table 2.13). The firms included in this table are almost all among the largest firms of their period (for the 14th century compare with table 2.11), although a number of smaller firms for which very good data were available still made it to the top ten (Datini for the 14th and 15th century, Spinelli for the 15th century, Della Faille, Antonio Brignole, and especially Hans Thijs for the 16th century), while several very large firms could

not be found here (e.g. Scali (14th century), Centurione, Pazzi, Strozzi, Tucher (15th century), Balbani, Bernuy, Centurione, Grimaldi, Haug-Langnauer-Linck, Mathias Manlich, Mendes, Strozzi, Ximenes (16th century)). Completely eliminating the impact of detail is not only impossible however, but also undesirable since more detailed business networks are often more reliable and as such should weigh more heavily in the overall network.

Table 2.13
Top 10 firms per century ranked by total business value across places* having at least five percent of the highest total business value in their respective century-specific business value matrix (nine-point scale scoring system has been used)

Rank	14th century	F^9_j	15th century	F^9_j	16th century	F^9_j
1	Bardi	198	G. Ravensburger Ges.	183	Fugger	309
2	Acciaiuoli	165	Datini (Francesco)	171	Welser (Augsburg)	163
3	Datini (Francesco)	155	Medici	162	Affaitadi	148
4	Peruzzi	144	Coeur (Jacques)	138	Bonvisi	139
5	Buonaccorsi	117	Diesbach-Watt Ges.	133	Welser (Nürnberg)	132
6	Stromer	110	Alberti antichi	107	Imhoff	124
7	Alberti	98	Borromei (Milan)	106	Della Faille	112
8	Kamerer-Seiler	92	Kamerer-Seiler	103	Brignole (Antonio)	111
9	Teutonic Order	86	Spinelli	92	Manlich (Melchior)	109
10	Guinigi	64	Teutonic Order	91	Thijs (Hans)	108

* Respectively 104 (14th century), 115 (15th century) and 95 (16th century) places.

2.4. Conclusion

One can conclude with the observation that the interlocking network model has proven to be an excellent means in solving the data deficiency problem in current world cities research, since it has allowed to measure the world city network on the basis of relatively abundant, easily available and quantifiable data. However, when implementing this model for the investigation of a historical city network a number of issues arises in relation to the reliability of the reconstructed business networks, the quantifiability of these multifarious networks, the subjectivity of the researcher when attributing scores, and the representativity of the selected sample of business networks. The origins of these problems can be traced back to the diversity of business organisations in late medieval and 16th-century Europe, the limited and unequal availability of primary sources and secondary literature on these organisations as well as the limitations of this historical source material, and the complexity and assumptions of the scoring systems used.

I have at least somewhat mitigated these difficulties through a number of measures such as the use of a relatively large sample of firms in order to even out problems of reliability and subjectivity, and the development of different coding systems taking into

account the diversity of information as well as the difficulties of scoring. Additionally, in what follows the quantitative data of the business value matrix will be complemented with supplementary qualitative data on the geography of merchant nations and transport networks. As will appear from this confrontation, most initial analyses on the data seem to generate plausible outcomes in the light of current historical research, which provides a certain credibility to the produced business value matrices. Despite all this, it is too early yet for a detailed analysis of the late medieval and 16th-century European city network as a whole. Instead, I will begin with an exploratory analysis of the network, which will allow me to uncover some of the biases in the data.

Chapter 3
From firms to nations:
Agency in the European city network, 1300 – 1600

Most quantitative empirical analyses of networks of world cities begin with a calculation of global network connectivities, which describe the overall situational status of a city in the network (Taylor, 2001; Id., 2004, 61-64; Taylor *et al*., 2002b, 2371-2372, 2374). However, without a representative sample of firms the computation of connectivities is rather meaningless. Therefore, in first instance the composition of the sample of 130 firms used for the study of the European city network between 1300 and 1600 should be explored somewhat more in detail.

In essence, the spatial organisation of each firm is unique. Each occupied a somewhat different niche in the world-economy, whereby differences existed in the specific mix of goods and services traded, in the choice of markets serviced, etc. From this point of view, not a single selection of firms can ever be representative for the business world as a whole. On the other hand, different firms could be subjected to the same constraints (the same markets being closed to several firms because of war,…) or attracted by similar opportunities (opening up of new markets through overseas discoveries,…). As a result common patterns will be found in the spatial organisation of firms (Taylor, 2004, 132). One question is of importance here: can one universal spatial strategy be observed across all firms, whereby each of them was represented in more or less the same set of cities, or were there multiple firm geographies whereby differences existed between groups of firms depending on their region of origin, on the period in which they were active, on the goods they traded,...? In other words, is it possible to speak about one homogeneous European world-economy between 1300 and 1600, or were there important (regional) differences and/or changes over time within this world-economy? In the first case, representativity is not an issue. In the second case it is, in the sense that the relative importance of different spatial strategies should be reflected in the composition of the firm sample.

The locational strategies of the 130 selected firms are recorded in the columns of the business value matrices. Consequently, similarities as well as differences in spatial organisation between firms can be drawn from these matrices (Taylor, 2004, 133). A suitable statistical tool to this end is principal components analysis, which belongs to the factor-analytical family of multivariate statistical techniques. I have used principal components

analysis to identify components or factors which can be interpreted as spatial strategies common to particular groups of firms. Let us have a closer look at this technique first.

3.1. Principal components analysis as a tool for exploratory research

Being the least complicated form of factor analysis, principal components analysis produces factors which are linear combinations of the original variables (the columns in the matrix, i.e. the firms), whereby the first component accounts for as much variation in these initial variables as possible. Next, the second component explains as much as possible of the remaining variation while being uncorrelated with the first component. This process of producing components continues until there are as many components as there were variables, which together describe one hundred percent of the variation in the original variables. While the first components explain a large amount of the variation in the matrix, later components increasingly account for less variation. Consequently, the most common use of principal components analysis is data reduction of large multivariate data matrices, whereby the original variables are replaced by a (much) smaller number of components accounting for most of the variation (Taylor, 2004, 129, 133, 158-159; Taylor *et al*., 2002a, 2378-2379).

Components can be interpreted through factor loadings, expressing – in a number ranging between 0 and 1 – for each variable the amount of variance explained by each of the components. Somewhat simplified, factor loadings can be understood as the correlation between a component and a variable. Different variables (firms) having high loadings on one and the same component form ‘clusters’ of firms with a similar spatial strategy. In order to facilitate interpretation of the factors, the components have been ‘rotated’ via varimax rotation, resulting in the variables having high loadings on one (or a small number of) factor(s), and low loadings on a large number of components (Taylor, 2004, 133-134; Taylor *et al*., 2002a, 2379).

Consequently, principal components analysis produces clusters of firms, whereby the number of clusters is the same as the number of factors extracted. This allows the use of principal components analysis for exploration of the business value matrices rather than for data reduction or other more common uses of factor analysis. Such an exploratory analysis exploits the fact that in principal components analysis there is not such a thing as ‘the ideal number of components’ to be extracted from the original data. Instead several alternative results, each extracting a different number of components (and producing a different number

of clusters of firms), can be compared with each other (Taylor, 2004, 158-159; Taylor *et al*., 2002a, 2379, 2393).

The advantage of principal components analysis compared to more conventional 'cluster' techniques, is that while the latter unambiguously allocate each case (firm) to one specific cluster, in principal components analysis 'fuzzy groups' are created, since variables can load relatively high on more than one component at the same time, or on no single component at all. Moreover, in principal components analysis new sets of components are produced each time a new analysis is carried out with another number of components being extracted, each analysis being uninfluenced by any previous analyses at another level. This is very different in many other 'cluster' techniques in which each additional cluster is split off directly from a previous cluster, so that the composition of clusters at each level is determined by the cluster configurations in earlier analyses with a smaller number of clusters (Taylor, 2004, 161; Taylor *et al*., 2002a, 2384, 2393).

The fuzzy-ness and flexibility of principal components analysis are a clear advantage when carrying out exploratory research. The production of different results extracting different numbers of components allows to find various patterns of independent variation at different levels. On the other hand, some factor patterns may appear over and over again, indicating the robustness of these patterns (Taylor *et al*., 2002a, 2379, 2393). Moreover, since principal components analysis is less rigid than many other statistical techniques, it is more suitable for use on historical data which normally do not lend themselves very well to statistical analysis[83]. Finally it should be stressed that principal components analysis, being a form of descriptive statistics, does not claim to predict or explain. It is not more than a tool for describing a complex set of data in such a way that they are more easily interpretable (Sayer, 1992, 191).

I have carried out a total of fifteen different principal components analyses, extracting subsequently two, three, four,… and up to fifteen components, as well as twenty components[84]. These analyses have been done on the business value matrix covering the

[83] An example of the use of principal components analysis in historical research can be found in a study on the late medieval town finances of Ghent by Marc Boone (1990).

[84] A number of statistics exists which describe the suitability of a data matrix for principal components analysis. The Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO measure) indicates the proportion of variance in the original variables that may be caused by underlying factors. Consequently, high values (close to 1) of the KMO measure indicate that a factor analysis on the matrix will probably produce useful results. This is clearly the case for all four business value matrices ${}^{14\text{-}16}B^{9}$, ${}^{14\text{-}16}B^{5}$, ${}^{14\text{-}16}B^{4}$ and ${}^{14\text{-}16}B^{2}$, with KMO measures of respectively 0.927, 0.926, 0.927 and 0.901. A second statistic for assessing the usefulness of factor analysis is Bartlett's test of sphericity, which tests the hypothesis that the original variables are unrelated and as a result unsuitable for structure detection. Consequently, small values (lower than 0.05) of the significance level of this

whole period from 1300 to 1600 so that differences between firms can be discovered not only in a synchronous but also in a temporal dimension. The principal components analyses have been carried out on the nine-point scale business value matrix, because this matrix contains the most amount of detail. All 1337 places (cities/towns and less precise geographical designations) have been included in the analysis in order to incorporate as many details as possible about the geographical extent of each business network.

Not all results are equally relevant. Some components are difficult to interpret, while others return over and over again in subsequent solutions. Consequently, in what follows only the twelve-component and two-component solutions will be examined in detail. The former juxtaposes the principal spatial strategies used by the long-distance merchants and bankers of late medieval and 16th-century Europe, while the latter allows to detect a fundamental transition in the geography of European business between 1300 and 1600 (the two-component solution will be discussed in chapter four). These two solutions have been compared to results of corresponding principal components analyses carried out on the five-point, four-point and two-point scale business value matrices. In most cases the clusters of firms produced on the basis of these matrices are similar to those found for the nine-point scale matrix. This confirms the robustness of the configurations of components found. Clearly they are not the result of contingencies of choice of a particular scoring method, but are inherent to the city network itself.

3.2. The twelve-component solution: Merchant nations as building materials

3.2.1. The primary structure in the data

Of the fifteen different principal components analyses carried out, the two most easily interpretable are the eleven- and twelve-component solutions. The variables loading on each of these eleven or twelve components form very homogeneous clusters of firms with common geographical origin. This is most clearly illustrated in table 3.1 in which the results of the principal components analysis with extraction of twelve components have been reproduced. Since clusters of firms produced on the basis of a principal components analysis carried out on the nine-point scale business value matrix are somewhat less homogeneous, results for the five-point scale matrix have been used here. One of the components is somewhat different in the nine-point scale analysis, an observation on which I will come back later.

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test indicate that a factor analysis on the data may be useful. Again this is the case for the four business value matrices: the significance level is 0.000 for all matrices.

Table 3.1
Firms allocated to twelve components*

Factor loading	I. Tuscan firms, 14th-15th centuries	Cent.**	Or.***	II. Central European firms	Cent.	Or.	III. Low Countries firms (& Portuguese)	Cent.	Or.	IV. Castilian firms	Cent.	Or.
0.70 +	Medici (Av.)****	14-15	FL							Salamanca	16	CA
	Soderini	14	FL							Ruiz (André)	16	CA
	C. of Pistoia	14	PI							Quintanadueñas	16	CA
	Guardi	14	FL							De Soria (D.)	15	CA
	Guinigi	14	LU									
	Scali	14	FL									
	Buonaccorsi	14	FL									
0.60-0.69	Peruzzi	14	FL	Starck (Ulrich)	15	CE	Van Uffele	16	LC	Bernuy	16	CA
	Acciaiuoli	14	FL	Fugger v. Reh	15	CE	Resteau (Jean)	16	LC	Civille	16	CA
	Alberti	14	FL	Welser (15th c.)	15	CE	De Groote (N.)	16	LC	Ruiz (Simon)	16	CA
	Borromei (Ven.)	15	FL				Beckmann	16	HA			
	Spifame	14	LU				Van Immerseel	16	LC			
	Strozzi (il vec.)	15	FL									
	Spinelli	15	FL									
	Pazzi (Jacopo)	15	FL									
	Bardi	14	FL									
	Alberti antichi	15	FL									
0.50-0.59	Medici	15	FL	Haug-Langn.-L.	16	CE	Rodrigues d'E.	16	PO	De Castro	16	CA
	Rapondi	14	LU	Gruber-Pod.-St.	15	CE	Ximenes	16	PO	Lopez de Villa.	16	AR
	Corsi	16	FL	Welser (Augs.)	16	CE	Nunes (Est.)	16	PO			
				Manlich (Matth.)	16	CE	Van Adrichem	16	LC			
				Hirschvogel	15-16	CE	Van der Meulen	16	LC			
				Paler-Weiss	16	CE	Cunertorf-Snel	16	LC			
				Stromer	14	CE	Von Bodeck²	16	LC			
				Viatis-Peller	16	CE	Caldeira (L. A.)	16	PO			
				Welser (Nürn.)	16	CE						
				Ruland (Ott)	15	CE						
				Diesbach-Watt	15	CE						
				G. Ravensb. G.	15-16	CE						
				Von Bodeck	16	LC						
				Imhoff	16	CE						

Table 3.1 (continued)
Firms allocated to twelve components*

Factor loading (continued)	I. Tuscan firms, 14th-15th centuries	Cent.**	Or.***	II. Central European firms	Cent.	Or.	III. Low Countries firms (& Portuguese)	Cent.	Or.	IV. Castilian firms	Cent.	Or.
0.50-0.59 (cont.)				Kamerer-Seiler	14-15	CE						
0.40-0.49	Salviati	16	FL	Runtinger	14-15	CE	Poulle	16	LC	Centurione (G.)	16	GE
	Borromei (Mil.)	15	FL	Tucher	15-16	CE	Rocca	16	FL	Espinosa	16	CA
	Datini	14-15	FL	Praun (Hans)	15	CE	Rinck	15	HA	Salviati²	16	FL
	Fornari (G. B.)²	16	GE	Fugger	16	CE	Della Faille	16	LC	Caldeira (L. A.)²	16	PO
	Guicciardini²	16	FL	Popplau	16	CE	Oesterreicher²	16	CE			
	Banchi (A.)	15	FL	Oesterreicher	16	CE	V. Tweenhuys.	16	LC			
	Strozzi (il giov.)²	16	FL				Thijs (Hans)	16	LC			
0.30-0.39	Olivieri	16	FL	Loitz²	16	HA	Schetz	16	LC	Daza²	16	AR
	Centurione (F.)²	15	GE	Vertema	16	LO	Amsinck (W.)²	16	HA	Cromberger	16	CE
	Coeur (J.)²	15	FR	Rinck²	15	HA	Balbani²	16	LU	Bonvisi²	16	LU
	Llobera-Juny.²	15	CT	Manlich (Mel.)	16	CE	Myddelton (Th.)²	16	EN	Olivieri³	16	FL
	Bonvisi³	16	LU				Vertema²	16	LO	Grimaldi²	16	GE
	Torralba-Sab.²	15	CT									
	Di Negro (Fr.)²	16	GE									
	Affaitadi²	16	LO									

Table 3.1 (continued)
Firms allocated to twelve components*

Factor loading	V. Tuscan firms, 16th c. (& Portuguese)	Cent.**	Or.***	VI. English firms	Cent.	Or.	VII. Genoese firms	Cent.	Or.	VIII. Hanseatic firms	Cent.	Or.
0.70 +				Betson (Th.)	15	EN				Berens (Hans)	16	HA
0.60-0.69	Daza	16	AR	Cely	15	EN	Piccamiglio	15	GE	Wittenborg (J.)	14	HA
				Goldbeter (J.)	14	EN	Centurione (F.)	15	GE	Carstens & pa.	16	HA
										Amsinck (W.)	16	HA
										Von Holsten	16	HA
0.50-0.59	Strozzi (il giov.)	16	FL	De la Pole (W.)	14	EN	Pallavicino (T.)	16	GE	Veckinchusen	15	HA
				Despars	15	LC	Fornari (G. B.)	16	GE			
							Grimaldi	16	GE			
0.40-0.49	Mendes	16	PO	Van Marke (C.)	14	LC	Brignole (Ant.)	16	GE	Loitz	16	HA
	Botti	16	FL	Lopez de Villa.[2]	16	AR	Di Negro (Fr.)	16	GE	V. Tweenhuys.[2]	16	LC
	Guicciardini	16	FL				Da Pontremoli	15	GE			
	Balbani	16	LU									
	Salviati[3]	16	FL									
	Rodrigues d'E.[2]	16	PO									
	Affaitadi	16	LO									
	Corsi[2]	16	FL									
0.30-0.39	Olivieri[2]	16	FL	Borromei (Mil.)[2]	15	FL	Centurione (G.)[2]	16	GE	Teutonic Order	14-15	HA
	Van der Molen	16	LC	Van der Molen[2]	16	LC	Lomellini (M.)	15	GE	Von Geldersen	14	HA
	Centurione (G.)[3]	16	GE	Myddelton (Th.)	16	EN	Vertema[3]	16	LO	Schetz[2]	16	LC
	Strozzi (il vec.)[2]	15	FL	Maghfeld (G.)	14	EN	Botti[2]	16	FL	Cunertorf-Snel[3]	16	LC
	Caldeira (L. A.)[3]	16	PO	Rinck[3]	15	HA						
	Nunes (Est.)[2]	16	PO	Fugger v. Reh[2]	15	CE						
	Imhoff[2]	16	CE									
	Ximenes[2]	16	PO									
	Welser (15th c.)[2]	15	CE									
	Fornari (G. B.)[3]	16	GE									

Table 3.1 (continued)
Firms allocated to twelve components*

Factor loading	IX. Venetian firms	Cent.**	Or.***	X. French firms	Cent.	Or.	XI. Catalan firms	Cent.	Or.	XII. Dutch firms	Cent.	Or.
0.70 +	Da Lezze (M.)	16	VE									
	Pisani	16	VE									
	Bembo	15	VE									
0.60-0.69	Barbarigo (A.)	15	VE	Panse	16	FR						
0.50-0.59	Berengo (A.)	16	VE	Gapaillon	16	FR						
0.40-0.49	Hermite	16	FR	Coeur (J.)	15	FR	Llobera-Juny.	15	CT	Poulle²	16	LC
	Querini (Gugl.)	15	VE				Mitjavila & pa.	14	CT	Cunertorf-Snel²	16	LC
0.30-0.39	Manlich (Mel.)³	16	CE	Bonvisi	16	LU	Torralba-Sab.	15	CT	Paler-Weiss²	16	CE
	Llobera-Juny.³	15	CT	Hermite²	16	FR	Alberti antichi²	15	FL	Manlich (Mel.)²	16	CE
				Tucher²	15-16	CE				Van Adrichem²	16	LC
				Civille²	16	CA				V. Tweenhuys.³	16	LC

* Principal components analysis with varimax rotation, carried out on the five-point scale business value matrix across all 1337 places (14th-16th century).
** Cent.: Century in which the firm was active.
*** Or.: City or region of origin of the firm: AR Aragón; CA Castile; CE Central Europe (excluding Hanse); CT Catalonia; EN England; FL Florence; FR France; GE Genoa; HA Hanse; LC Low Countries; LO Lombardy; LU Lucca; PI Pistoia; PO Portugal; VE Venice.
**** Firms are ranked by loadings in each category.
² Indicates second-highest loading for a firm.
³ Indicates third-highest loading for a firm.

In the table firms have been allocated to a component when their loading on the particular factor was at least 0.3. However, loadings below 0.4 have to be treated with care. Although they regularly confirm the interpretation that has been given to a particular factor, in several cases these small loadings do not appear to make much sense. Moreover, the number of hybrid firms (firms loading simultaneously on two or more components) becomes very high when including loadings below 0.4 (Taylor *et al*., 2002a, 2379, 2388). All 130 firms have been allocated to at least one component in the twelve-component solution, thirteen of them only with a loading below 0.4 however.

Clusters of firms in this twelve-component solution are clearly based upon common origin. The first and fifth components group Florentine and Lucchese firms, respectively of the 14th and 15th centuries and of the 16th century[85]. To the second factor cluster firms from central Europe, to the third factor 16th-century firms from the Low Countries, whereby most Dutch firms additionally also load on component XII, while Flemish firms of the 14th and 15th century (only two firms) do not load on this component but on component VI, which is mostly composed of English firms. Castilian, Genoese and Hanseatic firms respectively make up the fourth, seventh and eighth factor, while Venetian, French and Catalan firms finally are allocated to the ninth, tenth and eleventh component. Portuguese firms are a special case: there is not a separate Portuguese factor, but instead most Portuguese firms equally load on component III (firms from the Low Countries) and – although somewhat lower – on component V (16th-century Tuscan companies). A weak Portuguese component does not appear until after the fifteen-component solution: the twelfth factor of a principal components analysis with extraction of twenty components (on the nine-point scale business value matrix) for instance groups all Portuguese firms, plus a small number of firms from the Low Countries and Genoa with important activities in Lisbon (see table 3.3, column four).

It should be stressed that these components group firms according to their city or country of origin, and not according to the location of their headquarters. Several examples can be given: Tuscan firms of the 14th and 15th centuries all load very strongly on component I irrespective of their headquarters being in Florence, Lucca, Venice (Alberti antichi, Borromei of Venice), Milan (Borromei of Milan), Naples (Filippo Strozzi il vecchio), Rome (Spinelli), Avignon (Company of Pistoia), Bruges (Rapondi), or Paris (Rapondi, Spifame). With the exception of the Van der Molen firm of Antwerp, 16th-century Flemish firms with headquarters in Antwerp as well as those relocating to the northern Low Countries

[85] This 16th-century Tuscan component is absent from the results of a principal components analysis with extraction of twelve components on the nine-point scale business value matrix (see later).

(Amsterdam) or Germany (Hamburg, Bremen, Cologne, Frankfurt am Main) during the Revolt, and Dutch firms with headquarters in Amsterdam, Delft, and even Lisbon, are clearly allocated to the third factor (although Dutch firms also load on component XII, and some overlap occurs with the southern German and Hanseatic components). Apparently transnational business enterprises originating from the same city or region pursued similar spatial strategies which were distinct from those used by other 'nationalities'. This should not come as a surprise given the importance of so-called merchant nations in the organisation of late medieval and early modern European long-distance trade (see below).

Another striking feature is that several components lump together firms active in different centuries. Central European firms of the 14th, 15th and 16th century alike all have been allocated to one and the same component, and the same holds for English and Hanseatic firms. It is not entirely possible to scrutinise this assumption for all factors since for several nations the sample does not include firms from every century, but nevertheless all Catalan (either belonging to the 14th or 15th century), Genoese (15th and 16th century), Venetian (15th and 16th century), Castilian and French (both mostly 16th-century firms, but also one firm active in the 15th century) firms load on a single component irrespective of the century in which they were active.

There are two exceptions to this. Firstly, Tuscan firms are split between a 14th-15th-century component (component I) and a 16th-century factor (component V). However, the overlap between both components is exceptionally large (see table 3.1). Of the seven 16th-century Tuscan firms appearing in component V, five are also present in component I (three of them even loading higher on factor I than factor V). Moreover the Bonvisi company, a 16th-century Lucchese firm, does load on component I instead of component V. Consequently, the first component can be understood as a general Tuscan factor, not only grouping Florentine and Lucchese firms of the 14th and 15th century, but also those of the 16th century.

Secondly, component III only incorporates 16th-century firms from the Low Countries (and Portugal), while Flemish firms of the 14th and 15th century do not load at all on this component, but on factor VI (English firms). Since the sample only includes two Low Countries firms from before the 16th century, it is hard to draw conclusions from this, but nevertheless it appears that the spatial strategies of Low Countries firms changed considerably around 1500.

In general however, exploratory analysis of the firm sample reveals that differences over time between the spatial strategies of firms from the same city or town are smaller than those in geographical organisation of firms with different regional origins. Consequently, in

the reproduction of the European city network between 1300 and 1600 regional tendencies appear to have prevailed over temporal changes.

The robustness of this specific configuration of factors representing the spatial business strategies of the different nations is illustrated by the fact that these components appear over and over again in different analyses. In table 3.2 the twelve factors discussed above (see table 3.1) have been traced across fifteen different principal components analyses carried out on the nine-point scale business value matrix. Already in the four-component solution a distinct factor grouping all central European firms appears, and from the six- to twelve-component analyses the number of distinct nation factors increases steadily. In the twelve- to fifteen- and twenty-component solutions almost all nation components present in the twelve-component analysis on the five-point scale matrix can be found[86].

Table 3.2
Configurations of 'nation' factors extant in the results of successive principal components analyses*

Number of components extracted:	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**20**
Tuscan firms, 14th-15th centuries						x	x	x	x	x	x	x	x	x	x
Central European firms			x	x	x	x	x	x	x	x	x	x	x	x	x
Low Countries firms (& Portuguese)									x	x	x	x	x	x	
Castilian firms							x	x	x	x	x	x	x	x	x
Tuscan firms, 16th c. (& Portuguese)													x	x	x
English firms							x	x	x	x	x	x	x	x	x
Genoese firms							x	x	x	x	x	x		x	x
Hanseatic firms									x	x	x	x	x	x	x
Venetian firms					x	x	x	x	x	x	x	x	x	x	x
French firms								x	x	x	x	x			x
Catalan firms										x	x	x	x	x	x
Dutch firms											x	x	x	x	x

* Principal components analyses with varimax rotation, carried out on the nine-point scale business value matrix across all 1337 places (14th-16th century).

Examination of the ten- and eleven-component analyses on the five-point scale business value matrix and the ten-, eleven and twelve-component solutions of exploratory principal components analyses carried out on the four- and two-point scale matrices also confirms the picture outlined in table 3.1. Most 'nation' components can be found among the results of all of these eight different analyses, with the exception of a Catalan component (only in four cases), a Genoese factor (two cases), a component of 16th-century Tuscan firms

[86] The only factor that appears to be less robust is the component of Tuscan firms of the 16th century. However, this is a result of the difference between the nine- and five-point scale business value matrices. In exploratory principal components analyses on the nine-point scale business value matrix a weak component grouping the 16th-century Tuscan firms appears only in the fourteen-component solution and should be considered a secondary structure (see table 3.3, column three).

(two cases), and a Dutch component (one case). For the Catalan and Dutch components this results from the fact that they appear relatively late (only in the eleven- or twelve-component solution). On the absence of the Genoese and 16th-century Tuscan components from the results of analyses on the four- and two-point scale business value matrices I will come back later. In conclusion the impact of the choice of scoring system on the configurations found is limited.

The eleven- (not including a Dutch factor) and twelve-component solutions can be considered to reproduce the primary structure in the data. Lower solutions (especially from the four- to the nine-component solution) regularly lump together the firms of two or more different nations, and as such are less easily interpretable. Up to the seven-component analysis for instance, Hanseatic enterprises and firms from the Low Countries both load on one and the same component, while in the eight- and nine-component solutions there are two mixed Hanseatic-Low Countries components (one also including Portuguese firms). Analogously, in lower-component analyses Castilian and English firms are more than once combined in one factor (sometimes also incorporating Venetian firms), and the same holds for Tuscan, Genoese and Catalan enterprises. This indicates that the spatial business strategies of some merchant nations more resembled each other than those of other nations, and often the competition or cooperation between such nations with similar strategies was stronger.

New factors emerging after the twelve-components analysis are equally difficult to interpret. The last factor in the thirteen-component solution (analysis on the nine-point scale business value matrix) for instance randomly groups a number of 15th- and 16th-century Florentine companies (Andrea Banchi, Filippo Strozzi il vecchio and the Corsi) and an Augsburg firm (the Welser company of the 15th century). A number of other components do make more sense however and can be understood as secondary structures in the data (see Taylor *et al*., 2002a, 2391-2393). Among these are (see table 3.3):

- A component of firms with headquarters or important branch in Lyon, often combined with activities in Antwerp and Paris (14-, 15- and 20-component analysis).
- A heterogeneous component including several firms trading from Marseille with the Levant (14-, 15- and 20-component solutions).
- A factor of Hanseatic and central European firms with considerable interests in Poland, especially in Wrocław and Kraków (20-component solution).
- A component grouping enterprises with headquarters or important branch in Hamburg (20-component solution).
- A factor of 15th-century Florentine firms (20-component solution).

Table 3.3
Secondary structures to be found in principal components analyses with extraction of more than twelve components*

Factor loading	**XIII (14 fact.)** Lyon firms	**Cent.***	**Or.****	**XIV (14 fact.) Levant traders from Marseille**	**Cent.**	**Or.**	**XI (20 fact.) Tuscan firms, 16th century**	**Cent.**	**Or.**	**XII (20 fact.) Portuguese firms**	**Cent.**	**Or.**
0.60-0.69	Panse*****	16	FR	Hermite	16	FR						
0.50-0.59				Manlich (Mel.)	16	CE	Corsi	16	FL	Mendes	16	PO
							Strozzi (il vec.)[2]	15	FL	Cunertorf-Snel	16	LC
							Guicciardini	16	FL	Lomellini (M.)	15	GE
							Strozzi (il giov.)	16	FL			
0.40-0.49	Gapaillon	16	FR	Da Pontremoli	15	GE	Olivieri	16	FL	Despars[2]	15	LC
	Tucher[2]	15-16	CE				Balbani[2]	16	LU	Nunes (Est.)	16	PO
										Rodrigues d'E.[2]	16	PO
										Caldeira (L.A.)[2]	16	PO
0.30-0.39	Balbani[2]	16	LU	Oesterreicher[2]	16	CE	Salviati[2]	16	FL	Ximenes[3]	16	PO
	Bonvisi[3]	16	LU	Gapaillon[2]	16	FR	Di Negro (Fr.)[3]	16	GE			
				Paler-Weiss[3]	16	CE	Van der Molen[2]	16	LC			
							Mendes[2]	16	PO			

Table 3.3 (continued)
Secondary structures to be found in principal components analyses with extraction of more than twelve components*

Factor loading	**XVI (20 fact.)** Poland traders	**Cent.***	**Or.****	**XVIII (20 fact.) Hamburg firms**	**Cent.**	**Or.**	**XIX (20 fact.) Florentine firms, 15th c.**	**Cent.**	**Or.**
0.70-0.79	Popplau	16	CE						
0.60-0.69				Beckmann	16	HA			
0.50-0.59	Gruber-Pod.-St.	15	CE	Von Geldersen	14	HA	Banchi (A.)	15	FL
0.40-0.49	Diesbach-Watt	15	CE	Van Uffele²	16	LC	Pazzi²	15	FL
	Loitz	16	HA	Vertema	16	LO			
0.30-0.39	Kamerer-Seiler²	14-15	CE	Oesterreicher²	16	CE	Medici (Av.)²	14-15	FL
	Viatis-Peller²	16	CE				Spinelli²	15	FL
	Teutonic Order²	14-15	HA						

* Principal components analyses with varimax rotation, carried out on the nine-point scale business value matrix across all 1337 places (14th-16th century).
** XIII (14 fact.): Thirteenth factor in fourteen-component solution.
*** Cent.: Century in which the firm was active.
**** Or.: City or region of origin of the firm: CE Central Europe (excluding Hanse); FL Florence; FR France; GE Genoa; HA Hanse; LC Low Countries; LO Lombardy; LU Lucca; PO Portugal.
***** Firms are ranked by loadings in each category.
² Indicates second-highest loading for a firm.
³ Indicates third-highest loading for a firm.

The Portuguese component mentioned before also belongs to this group of secondary structures, as well as the factor of 16th-century Tuscan firms (at least for analyses on the nine-point scale matrix).

The new factors appearing from the thirteen-component solution onwards have two characteristics in common. Firstly, the amount of firms allocated to these components is small (rarely more than eight) and includes a large share of hybrid firms loading stronger on other components. Secondly, the emergence of these secondary structures erodes the earlier and more homogeneous 'nation' components. The older French component for instance is split between the Lyon and Marseille factors from the fourteen-component solution onwards. The English component as well disintegrates into two less obvious factors, etc.

These features are also in some degree characteristic to the Dutch component. The Dutch factor clearly hollows out the cluster of Low Countries firms. Moreover, when it appears for the first time in the twelve-component solution it is entirely made up of hybrid firms loading stronger on other factors, at least when the analysis is carried out on the five-point scale matrix (see table 3.1). When the nine-point scale business value matrix is being used however, the Dutch component appears as a much stronger factor in the twelve-component solution: it immediately jumps ahead of the French and Catalan components to become the tenth factor. Consequently, the Dutch factor embodies the transition between primary and secondary structures. Although rather small factors, the Catalan and French components, which appear just before the Dutch component, definitely belong to the primary structure in the data since in earlier solutions Catalan and French firms can be found to be scattered across other components. The emergence of these distinct French and Catalan factors consequently increases the homogeneity and interpretability of the other components.

The twelve components rendering the primary structure in the data together account for about fifty percent of the variation in the original variables or firm strategies (table 3.4)[87]. This implies that commonalities between firms from the same city or region explain half of their spatial strategies, while the other half results from other factors including more unique features of individual firms. The twelve primary components are not equally important: they all explain a different percentage of the initial variation in the five-point scale business value matrix. The weight of each component is perhaps partly a reflection of the relative importance of the different merchant nations within the European transnational business world. Much more however, this mirrors the number of business organisations of each nation included in

[87] The twelve first components extracted in a principal components analysis carried out on the nine-point scale business value matrix account for a somewhat higher share (57.27 %) of the total variance in the matrix.

the firm sample (besides, the relative weight of each component varies somewhat according to the scoring system used). Not only may some nations be underrepresented compared to others, it is also possible that one or more nations are not represented in the business value matrix at all, and as a result have not been identified in the exploratory analysis.

Table 3.4
Percentage of the total variance in the five-point scale business value matrix explained by twelve components*

Component	Percentage of variance explained
I. Tuscan firms, 14th-15th centuries	10.18
II. Central European firms	6.72
III. Low Countries firms (& Portuguese)	6.16
IV. Castilian firms	5.06
V. Tuscan firms, 16th century (& Portuguese)	3.96
VI. English firms	3.53
VII. Genoese firms	3.42
VIII. Hanseatic firms	3.15
IX. Venetian firms	3.11
X. French firms	2.21
XI. Catalan firms	1.83
XII. Dutch firms	1.65
Total	**50.98**

* Principal components analysis (with varimax rotation) with extraction of twelve components, carried out on the five-point scale business value matrix across all 1337 places (14th-16th century).

Consequently, in what follows an overview will be given of the principal trading nations of western Christian Europe and the geographical configuration of their trade and banking activities, as well as some very careful estimations about their relative importance, not only based upon the quantitative firm data but also upon additional information found in historical literature on the trade networks of particular cities, regions or countries. The fact that a large amount of such literature exists, for instance about the long-distance trade of cities as Venice, Genoa, or Florence, or of the German Hanse, England, or Catalonia, indicates that it is generally accepted among historians that international commerce in late medieval and early modern Europe was largely organised by groups of agents with common geographical origins (often a city or a country). However, this phenomenon – which appears so strikingly from the principal components analysis above – is mostly taken for granted. Consequently, in the next section I will attempt to give a number of explanations in order to better understand why common geographical origin of business enterprises could have such an impact upon their spatial strategies. Firstly, let us have a closer look at the concept ‘merchant nation’.

3.2.2. The merchant nations

Until so far, I have used the term merchant nation to indicate all merchants from the same city or country as a whole. However, the word 'natie' – as it was used in late medieval and early modern historical sources from the Low Countries (terms as merchant guild, 'consulado', or 'hansa' have a similar content) – also has a somewhat more specific meaning. The late medieval and early modern nations were foreign merchant communities in a particular place gathering together fellow merchants from the same city or region (Grafe & Gelderblom, 2010, 477; Hunt & Murray, 1999, 78; Mauro, 1990, 262, 285). During the 14th and 15th century for instance, a large number of foreign merchant nations was established in Bruges, including several Italian (Florentine, Genoese, Lucchese, Milanese, Venetian) and Iberian (Biscayan, Castilian, Catalan, Portuguese) nations, an English and a Scottish nation, and the German Hanse (Marechal, 1985a, 216-217).

The nations were extensions abroad of corporations or guilds of local merchants which existed in many cities and towns of Europe. These associations of merchants were formed in order to promote and protect local trade privileges granted to the members of the corporation and to restrict external competition (Harreld, 2004, 40; Mauro, 1990, 258-261, 285). Analogously, fellow merchants from a particular city or region staying in the same commercial centre abroad began to organise themselves in foreign merchant communities or guilds. These consisted of independent merchants and their families, factors, apprentices, etc., not only those permanently residing abroad, but also including temporary residents and even short term visitors (Fagel, 2000). In medieval Europe, such merchant guilds were widespread by the 11th century, but perhaps they were formed as early as the eighth century. They finally disappeared from most parts of Europe in the late 18th century (Grafe & Gelderblom, 2010, 477-478, 481).

Often foreign merchant communities were rather loose associations, being nothing more than simple gatherings of merchants. Sometimes they existed in the form of religious fraternities, whereby the members assembled in the convent of a mendicant order for example. In several cases however, foreign merchant communities evolved into more formal organisations with their own regulations, headed by consuls or aldermen with judicial powers over the members of the community. The consuls were the official representatives of their nation, and they corresponded regularly with the government at home (Harreld, 2004, 41; Marechal, 1985a, 216-218; Mauro, 1990, 262, 264, 285; Stabel, 2001, 211-212). Some

foreign nations, such as those of Venice, stood under strict control of the mother city, while others (e.g. the Genoese colonies) were relatively independent (Hunt & Murray, 1999, 89-90).

In some cities, such as Bruges, foreign merchants resided in houses or in inns across the city, although merchants from the same nation often lived concentrated in a certain neighbourhood where also the nation house was located. In other cities they occupied separate quarters – sometimes detached by a wall from the rest of the city – with their own offices, warehouses, quaysides, living quarters, churches, etc.[88] (Hunt & Murray, 1999, 78; Lane, 1973, 287-290; Marechal, 1985a, 218-219; Spufford, 2002, 20-21; Stabel, 2001, 212-213).

While some merchant communities formed rather secluded colonies others were relatively well integrated in the local society. This did not only depend upon culture and upon politics and attitudes towards strangers in the host city (integration of Christian merchants in Islamic cities was very limited), but also upon characteristics of the foreign merchant community itself. In Bruges, Spanish merchants were more strongly assimilated in the local urban society than Italians, and among the latter differences existed between the relatively well-integrated Tuscans and Genoese and the more detached Venetians, probably as a result of the stronger intervention of the Venetian state in the organisation of Venetian commerce and transport (Stabel, 2001, 199-209, 213-215).

The self-organisation in nations had a number of advantages for their members, which induced individual merchants to delegate control to their fellow merchants in the nation. Merchants living abroad had no legal rights and were regularly subjected to the whims of foreign rulers as well as to the hostility of local merchants who saw the foreigners as a threat to their own business. In order to protect themselves and their goods when trading abroad, merchants attempted to obtain privileges from local, regional or central governments. Such privileges could be acquired and protected much more efficiently when merchants operated as a group rather than individually: as a group merchants could apply more pressure on a government to grant or observe certain privileges, especially when these merchants contributed in a large measure to the prosperity of the city or country over which the particular government ruled. Through these privileges merchant nations not only obtained more security for their members, but also favourable trade conditions such as exemptions from particular tolls or taxes, as well as a number of liberties such as the use of their own weights and measures, or the right to settle internal disputes or enforce contracts concluded

[88] These quarters were called *funduk* in the Islamic ports of the Mediterranean, *fondaco* in Italian and *Kontor* in German.

between members (Grafe & Gelderblom, 2010, 477, 480-485; Harreld, 2004, 41-42; Hunt & Murray, 1999, 75-78; Stabel, 2001, 210).

Moreover, although merchants from the same nation competed with each other, important ties of solidarity existed between members of a foreign merchant community, and as such membership of a nation minimised the costs involved in obtaining information for instance. Consequently, as nodes of information, merchant guilds had a coordinating function for the business activities of their members. Solidarity was guaranteed through measures such as fines or even exclusion of members who attempted to cheat each other (Grafe & Gelderblom, 2010, 485; Selzer & Ewert, 2005, 24). Through the institution of community responsibility membership of a nation heightened the creditworthiness of individual members towards potential external trading partners (Grafe & Gelderblom, 2010, 483). More generally – and as has been stressed by the New Institutional Economics – merchant communities played an instrumental role in guarding property rights, in reducing transaction costs, and in increasing market power (Selzer & Ewert, 2005, 19, 22-24).

Nations also had important social, political, cultural, religious and charitable functions. Merchants of the same nation worshipped together in chapels dedicated to the patron saints of their home town or country (such as Saint Mark for the Venetians, the *Volto Santo* for the Lucchese, Thomas Becket for the English), and collectively participated in processions and other ceremonies (Grafe & Gelderblom, 2010, 483, 485-486; Marechal, 1985a, 17, 41-50, 217-218; Stabel, 2001, 211, 213). Finally, belonging to a community of individuals speaking the same language and having the same customs and cultural background gave merchants living abroad more a feel of home (Harreld, 2004, 41-42, 46-49; Mauro, 1990, 255-256, 283, 285). Merchant guilds clearly were multi-purpose institutions (Grafe & Gelderblom, 2010, 483).

Several of these foreign merchant nations can be characterised as diaspora communities. It should be stressed that merchants (and others) not only went abroad voluntarily for business purposes, but sometimes had to leave their hometown for other reasons. The importance of feuds in late medieval urban society and the use of exile as a means to resolve them forms part of the explanation for the development of foreign merchant communities (Renouard, 1941, 53). Individuals, but sometimes even entire families or political factions had to leave their hometown in exile. Several members of the Alberti, Borromei, and Strozzi families for instance were banished for many years from Florence, and in the meantime established business companies abroad (Bolton & Guidi Bruscoli, 2008; Goldthwaite, 1968, 31-107; Jacks & Caferro, 2001, 36-41). During the first half of the 16th

century an important community of Florentine political exiles – including many merchant-bankers such as Filippo Strozzi il giovane and Bindo Altoviti – existed in Rome, opposing the Medici regime in its hometown (Bullard, 1980; Id., 2003; Guidi Bruscoli, 2007, 16-18).

The dispersal across and beyond Europe of merchants and bankers from Genoa, a city that was almost continually torn apart by feuds (Abu-Lughod, 1989, 114; Heers, 1961, 2-3, 607-611; Lane, 1973, 73), has explicitly been characterised by Giorgio Doria (1986, 78-79) as a diaspora. The proportion of the Genoese nobility living abroad during the 16th century for instance has been estimated between twenty and forty percent. According to Doria it is this Genoese diaspora that explains the dominance of the Genoese in 16th-century European business.

War or religious persecution, especially during the Reformation, were other reasons for leaving one's hometown. The majority of Antwerp merchants for instance definitively left the city during the second half of the 16th century to escape from war or inquisition. Brulez (1960) again speaks about a diaspora in this case. The Flemish merchant community which developed in London at this time was part of a larger colony of religious and economic refugees who had fled the Low Countries (Veluwenkamp, 1996, 146-162). The Antwerp diaspora gave an important incentive to the commercial development of north-western Europe (Brulez, 1960, 281-284).

The central function performed by the nations in the late medieval and early modern world of commerce and banking provides part of the explanation for the striking similarities in spatial strategy between firms from the same city or country. Belonging to a nation had important advantages for individual merchants, and enterprises were attracted to conduct business in those cities in which they could enjoy the privileges of their nation or appeal to the solidarity, expertise and influence of their compatriots. Several reasons why merchant guilds were organised according to common origin of their members – and not according to different sectors (textile traders, spice traders, bankers, insurers,…) for instance – can be given. Most of these are cultural or social: factors such as shared language, cultural beliefs and social norms, or the existence of family or friendship ties established in the home city or country, etc. strengthened the solidarity between merchants with the same regional background. Merchants were more inclined to cooperate and form partnerships with fellow townsmen or compatriots. Hanseatic merchants for instance were not even allowed to conclude partnerships with outsiders. Economically, merchant guilds were often specialised in the trade (in particular goods) between their home region and the host city in which they were established.

Strong merchant guilds (e.g. the Hanse) were even able to monopolise this trade, excluding foreigners (as well as fellow countrymen or townsmen who did not observe the rules of the guild) from the privileges they enjoyed and which gave them particular advantages (Grafe & Gelderblom, 2010, 490-493, 504-505).

Politics played an important role as well. Merchants organising themselves in 'national' groups were often backed by their home government, especially when they participated in that government (which was the case in several city states for example). This support from the state was an important advantage in negotiations with foreign rulers, and trade agreements for instance were often concluded between – or at least in the name of – governments rather than by groups of merchants acting on their own. Moreover, foreign merchant guilds can be seen as extensions of the home government abroad. Consuls were often officially confirmed in their function and sometimes even chosen by the home government, and in many cases merchant guilds obtained privileges allowing them to administer the laws of their home city or country between the members of their community (Grafe & Gelderblom, 2010, 490).

As Grafe and Gelderblom (2010, 478, 487-488, 494, 506) argued, functions similar to those provided by guilds could be offered by states or cities as well. States or cities built commercial infrastructures (such as bourses or cloth halls), gave privileges to fairs, organised legal services to merchants in the form of mercantile courts, etc. (especially when merchants were represented in the government). These public services were often used by merchants complementarily to those provided by merchant guilds. As was the case for merchant guilds, several of the provisions arranged for by states or cities promoted convergences in the spatial strategies of their merchant-subjects. An example is the organisation of regular convoys to particular foreign destinations. Host governments also could provide incentives for the organisation of foreign merchants according to their geographical background, for instance by providing separate residential space for particular foreign nations (such as the *Fondaco dei Tedeschi* for German merchants in Venice, or the funduks for Christians in Islamic harbours). But political factors could contribute to divergences in the spatial strategies of different merchant nations in another way as well, for instance in cases of war when the privileges of hostile nations were withdrawn or their merchants thrown out of the country, or in case of territorial conquests which could open up new markets for merchants.

However, although merchants must have preferred and found it easier to trade with cities in which their hometown or country was represented by a merchant community or in which they enjoyed commercial privileges, this argument can be turned upside-down: foreign

merchant communities developed in those places where merchants from a certain city or country went to trade (but also for reasons of exile, persecution, etc.), and after a while decided to permanently establish themselves or a representative to personally attend business (Veluwenkamp, 1996, 144, 162). These individual choices of merchants or enterprises in their turn depended from many different factors such as the geographical articulation of supply and demand. Hereby, enterprises with the same geographical roots were often subject to similar incentives: they sought markets for the same sort of goods (e.g. those produced in the hometown), were more inclined to act as commercial or financial intermediaries between neighbouring regions (Italians almost naturally became the intermediaries between the Levant and western Europe), etc. Consequently, although they were not entirely overlapping, the spatial strategies of business enterprises and the geographical dispersal of foreign merchant communities mutually influenced each other, and in their turn both depended upon a variety of other aspects, which will be discussed nation by nation (see below).

3.3. The spatial strategies of the merchant nations

In what follows, the trade and banking networks of each individual merchant nation will be looked at in detail, using total business values, connectivities, and component scores, which will be confronted with more general (i.e. not firm specific) data about the network of the nation[89]. First, these different techniques and tools for reconstructing the spatial strategies of merchant nations will be discussed succinctly.

In order to reconstruct the business networks produced by each of the different merchant nations, principal components analysis may give some first clues already. Because the different factors in a principal components analysis form composite variables (i.e. a sort of composite firms), the business value of a city can be calculated for each component. These composite business values or component scores are not restricted anymore to a fixed number – nine, five, four or two depending on the scoring scale used – of discrete codes, but vary across a continuum including positive as well as negative values. For the study of the particular spatial-strategic emphases of different service sectors in contemporary globalisation, Taylor (2004, 137-144) has used such component scores in order to identify

[89] These analyses of the networks of individual nations should not be confused with the study of city hinterworlds, which result from the global distribution of connections of a particular city (see Taylor, 2004, 101-113). While individual cities and their connections are central to the latter analysis, it is groups of firms and their networks that are at the centre of the analysis of nation networks.

primary field cities (with component scores above 1.0) and articulating cities (scores above 3.0) for each sector.

I have calculated such component scores for the twelve factors constituting the primary structure identified above (five-point scale business value matrix). In table 3.5 cities with component scores of 3.0 and higher have been listed for each factor. These can be considered to be primary field cities which had a strategic emphasis in the network of a particular nation. Cities with component scores of 10.0 or higher were the critical network hubs of the different nations, and can be seen as articulating cities in which almost all firms of a nation were strongly represented.

These scores should be interpreted with care however. In the first place, high component scores do not indicate as such that a city was an *important* node in the trade network of a particular merchant nation, but rather that it was a *typical* node in this network when compared to the networks of other nations. On the one hand, this implies that cities that were important nodes for the commercial and financial activities of many different merchant nations at the same time will not be found among the primary field cities for each of these nations (e.g. Antwerp does not appear among the primary field cities of the central European component). On the other hand, in table 3.5 a number of relatively unimportant places (e.g. Marstrand) can be found which were very typically present as nodes (albeit sometimes weak) in the networks of several firms belonging to the same nation, but absent from any other firm networks. As such, articulating cities and primary field cities represent the specific strategic emphases in the trade networks of the different nations.

Especially the primary field cities of components V (16th-century Tuscan firms) and XII (Dutch firms) cannot be interpreted as being the principal nodes of respectively the 16th-century Tuscan and the Dutch trade network. Both these components contain a large number of hybrid firms resulting in important overlaps with respectively component I (Tuscan firms of the 14th and 15th centuries) and component III (Low Countries firms). Consequently, the primary field cities scoring on component V express what is typical in the spatial strategy of 16th-century Tuscan firms compared to Tuscan firms of the 14th or 15th century, and the same can be said about the cities scoring on component XII in relation to Dutch enterprises versus other firms from the Low Countries.

Table 3.5
City scores on twelve components*

Factor score	I. Tuscan firms, 14th-15th centuries	II. Central European firms	III. Low Countries firms (& Portuguese)	IV. Castilian firms
15.00 +	Florence**	Nürnberg		Burgos
10.00-14.99	Avignon, Paris	Augsburg, Frankfurt am Main, Leipzig	Hamburg, Cologne, Antwerp, Amsterdam	Rouen, Sevilla, Medina del Campo
9.00-9.99	Naples		[Lisbon]	Nantes
8.00-8.99	Bruges, Rome, Pisa	Vienna, Venice, Wrocław		
7.00-7.99	Bologna		Middelburg	Bordeaux, Bruges
6.00-6.99	Perugia, London, Venice, Genoa		Sevilla	Bilbao
5.00-5.99	Montpellier	Kraków, Cologne	Stade	Valladolid
4.00-4.99		Nördlingen, Ulm, Prague, Milan	San Lúcar, Venice, London, Frankfurt am Main, Emden	Paris, [Lisbon], [Antwerp], Toulouse, Toledo
3.00-3.99	Barcelona, Lucca	Poznań, Regensburg, Geneva, Salzburg, Lyon, Danzig, [Basel]***, Zaragoza	Paris, Calais, La Rochelle, [*East Indies*****], [Rotterdam]	Bayonne, London, [Madrid]

Table 3.5 (continued)
City scores on twelve components*

Factor score	V. Tuscan firms, 16th c. (& Portuguese)	VI. English firms	VII. Genoese firms	VIII. Hanseatic firms
15.00 +		London	Genoa	Lübeck
10.00-14.99	Antwerp, Lyon, Rome	Bruges, Antwerp	Sevilla	
9.00-9.99				Reval
8.00-8.99		Calais	Valencia	Bruges, Narva, Hamburg
7.00-7.99	Valladolid, Medina del Campo			Riga
6.00-6.99	Naples, Lisbon, Venice		Barcelona	Danzig, Dorpat
5.00-5.99	Florence, Ferrara	Bergen-op-Zoom	Granada	
4.00-4.99		Ghent, York, Middelburg	Toledo, Chios, Rome, Milan	Novgorod, Antwerp, Amsterdam
3.00-3.99	Ancona, Palermo, Medina de Ríoseco, Augsburg, Villalón	Kingston-upon-Hull, Northleach, Boston, Mechelen, [Bordeaux], Augsburg	London, [Geneva], Alicante, Tolfa, [Medina del Campo], Livorno, [Cádiz], Madrid	Pskov, Stralsund, Frankfurt am Main, [Dordrecht], Marstrand, Emden, Lüneburg

Table 3.5 (continued)
City scores on twelve components*

Factor score	IX. Venetian firms	X. French firms	XI. Catalan firms	XII. Dutch firms
15.00 +	Venice			Lisbon
10.00-10.99	Constantinople, Alexandria	Lyon, Marseille	Barcelona, Bruges	
9.00-9.99	London			
8.00-8.99	Aleppo, Beirut		Valencia, Lisbon	Amsterdam
7.00-7.99	Tripoli (Syria), *Barbary*	Paris, Antwerp		
6.00-6.99		Toulouse	Palermo	Danzig, Marseille
5.00-5.99	*Cyprus*, Candia	Barcelona, Rouen	Montpellier, [Cologne]	Augsburg
4.00-4.99	Damascus	Messina, Naples, Palermo, Tours, [Genoa], Bordeaux	Geneva, Sevilla	Kraków, Königsberg, Enkhuizen
3.00-3.99		Milan, Alexandria, [Troyes], *Spain*, Geneva, Zaragoza, [Amiens], [Limoux]	Perpignan, [Pisa], Rhodes, [Venice], Siracusa	[Lyon], [Florence], Rotterdam, Brouage, Vienna, Banská Bystrica, Calais, [Geneva], Setúbal

* Principal components analysis with varimax rotation, carried out on the five-point scale business value matrix across all 1337 places (14th-16th century).
** Cities are ranked by scores in each category.
*** [Basel] (brackets): Cities which were no primary field cities on the corresponding component of a principal components analysis (with varimax rotation) with extraction of twelve components, carried out on the *nine-point scale* business value matrix across all 1337 places (14th-16th century).
Since in the nine-point scale analysis significantly less cities reach the threshold score of 3.0 than in the five-point scale analysis, I have defined primary field cities somewhat differently for the nine-point scale analysis in order to make the number of primary field cities for each component to be the same in both analyses. All cities belonging to the top *n* of cities in terms of component score in the nine-point scale analysis have been considered as primary field cities, with *n* the number of cities scoring 3.0 or higher on the equivalent component in the five-point scale analysis.
No comparisons have been made with the nine-point scale analysis for component V, since there is no corresponding component in the analysis on the nine-point scale business value matrix.
Primary field cities of a component in the nine-point scale analysis, but not of the corresponding component in the five-point scale analysis are Antwerp (for component II), Nürnberg, Bilbao and Liège (component III), Laredo, Middelburg and Avignon (component IV), Kings Lynn (component VI), Nürnberg, Marseille and Constantinople (component VII), *England* (component VIII), Aleppo, Tripoli (Syria), Piacenza and Ferrara (component X), Paris, Alexandria and Avignon (component XI), and Middelburg, San Lúcar and Delft (component XII).
**** *East Indies (italics)*: Less precise geographical designations.

Secondly, the components do not form entirely homogeneous 'nation' factors. On most components, one or more firms are allocated which actually belong to other nations, and as such load on the 'wrong' component. This is especially the case for hybrid firms. Nevertheless, such 'misplaced' firms had an impact on the component scores of cities as well, and as a result some cities in the table may seem to be out of place (e.g. Augsburg, Banská Bystrica, Geneva and Kraków appear as primary field cities of the Dutch component as a result of the fact that also two central European firms load on this component). These distortions are more important among smaller components (such as the Dutch component) and for cities with lower component scores.

Such distortions can be somewhat corrected through comparisons with sets of primary field cities of corresponding components calculated on the basis of business value matrices using other scoring scales, since biases in these components can be expected to be slightly different. In table 3.5 cities that are not among the primary field cities of equivalent factors of the nine-point scale principal components analysis have been put between brackets (the threshold for primary field cities has been defined somewhat differently for the nine-point scale analysis, see table 3.5). Comparison between these two analyses reveals that results were very similar (not many cities have been placed between brackets), however with some variations in the order of primary field cities depending on the analysis used. Again, the conclusion can be drawn that the choice of scoring method only has a limited impact.

Finally, the firms allocated to a particular component in many cases did not exist simultaneously but straddled relatively long periods (for some components three hundred years). Consequently, the sets of articulating and primary field cities listed in table 3.5 represent the average situation across several centuries. Hereby, cities with a high component score are more liable to have been typical for the trade network of a nation over a long time than to have played such a typical role only for a short period.

The urban business network of a merchant nation can also be measured through the calculation of total business values of cities across all the firms belonging to that nation, ideally for each century separately (see previous chapter for total business values). Here, total business values are measures for the total amount of business carried out by firms belonging to a particular trading nation in a particular city. Consequently, total business values are attribute measures of cities. More interesting are connectivities of cities, which are relational measures expressing the aggregate size of the connections of a city with all other cities in a network (in this case the network of a trading nation).

However, connectivities become only reliable when they are computed for a substantial number of firms, and moreover they are meaningless when calculated across firms not operating simultaneously (which is not so much the case for total business values). Consequently, connectivity scores of cities solely will be used when more or less abundant and representative firm data are available for a particular nation and a particular century. In other instances total business values will be given, since these are somewhat less complicated measures than connectivities (although small numbers of firms here as well increase the problem of representativity). It should be stressed that – although connectivities and total business values often produce similar rankings of cities – they are different figures and as such not comparable.

Connectivities are calculated from the elemental interlock links $r_{ab,j}$ between two cities a and b in terms of a firm j, whereby:

$$r_{ab,j} = b_{aj} \cdot b_{bj}$$

with b_{aj} and b_{bj} the respective business values of cities a and b for firm j. The aggregate interlock link between these cities a and b is:

$$r_{ab} = \sum_j r_{ab,j}$$

For each city, a total of n-1 such links exists (with n the number of nodes in the network), notably one to every other city in the network. The interlock or nodal connectivity of a city a with all other cities can be calculated as:

$$N_a = \sum_i r_{ai} \qquad a \neq i$$

In what follows connectivities will always be expressed as a proportion of the highest connectivity in the network:

$$P_a = N_a / N_h$$

with N_h the highest city connectivity in the network (Taylor, 2001; Id., 2004, 61-64).

Total business values as well as interlock connectivities allow to produce rankings of cities. The difference between both is that cities that appear more prominently in the business networks of relatively more important firms (expressed by size of firm network) will have higher rankings in terms of connectivity than in terms of total business value (Taylor *et al*., 2002b, 2372). However, as indicated in the previous chapter, the size of a firm network (measured as the total business value of a firm) is not only function of the importance of the firm, but also of the amount of detail with which the network has been reconstructed. In order to eliminate up to a certain level the impact of detail in the computation of connectivities, the

latter have only been calculated between cities with a total business value of 2 or more across the network according to the four-point scale scoring method. In other words, cities in which only one firm is represented with a score 1 or 2 according to the nine-point scale scoring system have been excluded from the analysis (in the two-point scale coding system such cities have already been left out).

Small connectivities, i.e. the connectivities of cities in which few business organisations were active, are not necessarily robust: "the veracity of the measure of connectivity and related analyses depend upon using large numbers of firms so that they are not dependent upon a few particular firms in a city" (Taylor *et al*., 2007). The same applies to total business values. Consequently, in the tables below only cities with connectivities or total business values above a certain threshold have been included (normally cities with connectivities / total business values amounting to at least one-fifth of the maximum connectivity / total business value in the network). The number of cities reaching the threshold (and being included in the table) differs from nation to nation and from century to century, resulting from several factors such as the number of firms across which the network has been calculated, the size (and detail) and organisational structure of the business networks of these firms, and finally the level of integration of the network of the nation itself. As a consequence of the interplay between these different factors, valid conclusions cannot easily be drawn from the number of cities taken up in the tables below.

Connectivities and total business values have always been calculated for the different scoring scales. As will be clear from the tables below, the rank of a particular city in terms of connectivity or total business value can vary considerably according to the scoring system used. This demonstrates that for ordinal variables such as business values the computation of connectivities or total business values is not independent from the scoring scale used (see previous chapter). That does not imply that these measures are meaningless however. As appears from the tables, cities mostly have similar ranks according to the different scoring systems, often rising or falling a few places in the different rankings, but almost never drastically. Moreover, the fact that a city A can be ranked above a city B according to one scoring system, but below according to another coding method, indicates that these cities in reality have similar rankings, and that they occupy places of more or less equal importance in the network. Consequently, differences in rank between cities in a network are not absolute but gradual. In other words, rather than with strict hierarchies we have to do here with networks in which many cities are more or less equally strongly connected in the network, but in which nevertheless overlapping categories of more (cities appearing in the upper parts of

the table according to the different scoring systems) and less (cities appearing in the lower parts of the table) connected cities can be distinguished. This is basically a "city network with hierarchical tendencies" (Taylor, 2004, 175; Taylor *et al*., 2010c). In that sense, the use of categories (such as alpha, beta and gamma world cities, see Taylor *et al*., 2010c) representing different levels of integration within the network is a more correct way of describing the network than using individual city rankings.

In order to reconstruct the different 'national' spatial business strategies identified in the exploratory analysis, the firm data will be combined with information about the geographical dispersal of foreign merchant communities, as well as other general (i.e. not firm-specific) information about the commercial and financial networks of particular cities and regions. The principal sources for the study of foreign merchant nations are their own archives, consisting of privileges, statutes, membership lists, etc. These archives were preserved in the nation house, in the church or cloister in which they assembled, etc. (e.g. Marechal, 1985a, 63, 67, 125-128). However, nations were often very loose and informal organisations and in those cases the quantity of sources produced and preserved was limited. Additional source-material can be found in the governmental archives of the mother city (e.g. correspondence with the consuls of the nation residing abroad, who in many cases also had a diplomatic function) or in those of the guest city or country (in which often copies of privileges granted to the foreign nations have been preserved). In many cases however, only indirect data are available about the presence of alien merchants in a particular city. Moreover, quantitative indications about the size of foreign merchant communities are almost always missing (e.g. Kellenbenz, 1985, 357), and as a consequence the relative size or importance of different communities is hard to define. Other sources that can be used for the reconstruction of trade flows are for instance notarial documents (which often do not allow to reconstruct individual firm networks, but nevertheless contain valuable information about commercial and financial flows leaving from and arriving into a particular city), customs registers, data about transport infrastructures (organisation of convoys, origin and destination of ships), etc.

Again, I have made use of secondary historical literature rather than primary source-material. However, since the focus in this study is on firms rather than nations I have consulted the literature on merchant nations and trade networks of cities and countries rather cursorily, without the intention to achieve a complete picture of the network of each nation. These more general data have only been collected in order to check the reliability of the outcomes of analyses on the business value matrices.

The advantage of the use of more general data is that they already give an aggregate and averaged picture of the spatial organisation of all firms from the same city or country. This is especially valuable for the study of those nations whose trade was dominated by individually operating merchants or small enterprises, for which a representative reconstruction of the aggregate network would otherwise require the collection of data on a very large number of firms.

Specifically for data on foreign merchant communities however, it should be stressed that these are not always a good proxy for individual firm data. The connection between the geographies of nations and firms was definitely not compulsory. On the one hand the use of travelling agents or local commissionaries allowed merchants to conduct trade via other means than a direct and permanent representation by fellow townsmen or compatriots living in merchant communities abroad (Veluwenkamp, 1996, 161-162). On the other hand, many merchants chose to live in other cities than those in which their nation was officially established. Although the main seats of their respective nations in the Low Countries were located in Bruges, many Castilian and Hanseatic merchants – attracted by favourable opportunities for business – established themselves in Antwerp at the beginning of the 16th century. As institutions, nations were liable to some form of inertia, and indeed, the Hanseatic *Kontor* was only transferred from Bruges to Antwerp many years after most of its members had moved to Antwerp (Dollinger, 1970, 315, 339-340; Marechal, 1985a, 109, 189). Consequently, there was no complete overlap between the networks of foreign merchant communities of particular cities or countries and the interlocking networks produced by business organisations of those nations. As such, one needs to be careful when combining both sorts of data.

In what follows, not all nations have been given the same amount of attention. In the first place, important trading nations for which firm data are particularly deficient (Venice, Genoa, the Hanse) have been treated more thoroughly. Secondly, these sections also provide an introduction to the particular roles played by different cities in the network. As a result the first subchapters are somewhat longer, since most cities still need to be familiarised with here.

3.3.1. The Mediterranean nations

Italians

During the whole period from 1300 to 1600, Italian businessmen played a central role in European long-distance trade and banking. Thanks to their geographical situation, they

became privileged intermediaries between east and west. It was in Italy that the commercial revolution took off, and as a result Italian merchants and bankers dominated European international commerce and finance until well into the 16th century (Abu-Lughod, 1989, 102-103; Braudel, 1984, 116-118; De Roover, 1942, 36; Id., 1963, 1-2). The importance of the Italians is reflected in the above principal components analysis, in which four of the twelve factors have been interpreted as representing the spatial strategies of Italian nations. In the firm sample, Italian pre-eminence is mirrored in the fact that 49 out of a total of 130 firms (38 %) are Italian.

Businessmen from a variety of north and central Italian cities participated actively in late medieval foreign trade. In 15th-century Bruges for instance, merchants from Venice, Genoa, Milan (also including merchants from Como), Florence and Lucca were numerous enough to form their own merchant communities headed by a consul, while also traders from Pisa, Pistoia, Piacenza, Siena, Bologna and Piemonte are known to have been active in Bruges (Marechal, 1985a, 217; Stabel, 2001, 199, 211. More generally, Spufford, 2002, 16). Most important among the Italian merchants were the Venetians, Genoese, Tuscans (especially Florentines), and Lombards (dominated by the Milanese) (Pinto, 2008). The trade networks of the former three groups are extensively treated in the literature and they will be discussed in more detail below. Much less is known about the merchants from the cities of Lombardy, Piemonte, Veneto and Emilia-Romagna (especially Milan, but also Asti, Como, Cremona, Piacenza, Ferrara, Bologna, etc.), and in the business value matrix only two Lombard firms have been included, the Affaitadi of Cremona and the Vertema of Piuro.

Milan was an important centre of production (especially arms and armour) and consumption (capital of the Duchy of Milan), but its merchants as well appear to have played a considerable role in European trade. They were found in large numbers in all the major commercial centres of western Europe, such as Bruges and later Antwerp in the Low Countries, the fairs of Geneva (where they remained active after 1470), and in the 16th century in Lyon, Sevilla, Rome, Venice, etc. (for Antwerp and Bruges: De Roover, 1948b, 13, 17-19; Goris, 1925, 71; Harreld, 2004, 85-87; Lambert, 2006, 15; Marechal, 1985a, 216, 220; Stabel, 2001, 199. Geneva: Bergier, 1957, 891-892, 895. Lyon: Gascon, 1971, 250-251, 358-361; Lapeyre, 1955, 124; Mauro, 1990, 264. Rome: Guidi Bruscoli, 2007, 4-5. Sevilla: Kellenbenz & Walter, 2001, 34; Mauro, 1990, 281. Venice: Lane, 1973, 328). The absence of this important but not very well studied group of merchants from the business value matrix definitely constitutes a bias in the firm sample.

Venetians

Although the Venetians were among the most important merchant nations of Europe from the 11th century until the end of the 16th century, data about individual Venetian enterprises are scarce. For the 14th century, Gino Luzzatto (1937, 34, 45-46; see also Lane, 1965, 72) has lamented the complete lack of private archives on Venetian business organisations. Consequently, despite the key role played by Venetian commerce in the 14th century, it should not come as a surprise that no 14th-century Venetian firms have been incorporated in the business value matrix. Although the situation is better for the 15th and 16th centuries (Lane, 1944a, 137) – three firms each for the 15th and 16th century have been included in the analysis – here as well the flexible character and small scale of most Venetian business organisations (individual merchants or informal family enterprises making use of single venture partnerships and commission) have not been favourable to the preservation of individual firm data. Moreover, the fact that not only a few wealthy merchants but almost all Venetian aristocrats and a large number of other citizens were involved in overseas trade (Braudel, 1984, 127-132; Lane, 1965, 70-71; Luzzatto, 1937, 48) makes that the interlocking network model is not very well suited for a reconstruction of the Venetian commercial network. As a result, the importance of the Venetian nation is not reflected at all in the Venetian component which only appears as the ninth factor in the twelve component solution (table 3.4).

Nevertheless, the list of cities with the highest total business values for Venetian firms (table 3.6) gives us a relatively good picture of the principal centres of activity of Venetian merchants, although the relative importance of the cities in table 3.6 should not be taken for granted[90]. The table shows that the anchor-points of Venetian commerce in north-western Europe were Bruges and London, while in the western Mediterranean connections existed with cities as Valencia and Aigues-Mortes as well as with the north African coast (Barbary). However, the centre of gravity of Venetian business activity was located in the eastern Mediterranean, notably in the Aegean (Thessaloníki), Constantinople and the Black Sea (Tana, Trebizond), Syria (Aleppo, Beirut, Damascus and Tripoli), and Alexandria in Egypt. Among the principal way-stations of Venetian commerce in the east were Corfu, Candia on Crete and Cyprus. The same image emerges from the component scores of particular cities on the Venetian factor (table 3.5), whereby the dominance of the eastern markets is even more clear: not only Venice, but also Constantinople and Alexandria appear as articulating cities.

[90] Because of the small number of firm networks available and the limited size of the individual networks, 15th- and 16th-century enterprises have not been separated. Results for the different scoring systems give more or less the same picture.

Table 3.6
Total business values across six Venetian firms (15th-16th centuries) according to different scoring systems*

R**	City	C^9_i	City	C^5_i	City	C^4_i	City	C^2_i
1	Venice	44	Venice	22	Venice	17	Venice	6
2	London	18	Constantinople	11	London	10	London	5
3	Constantinople	16	London	11	Alexandria	8	Alexandria	4
4	Aleppo (Halab) +	14	Alexandria	8	Constantinople	8	*Barbary* ++	3
5	Alexandria	12	Aleppo (Halab) +	7	*Barbary* ++	7	Bruges +++	3
6	Candia (Iráklion)	11	*Barbary* ++	7	Candia (Iráklion)	7	Candia (Iráklion)	3
7	*Barbary**** ++	10	Beirut +	7	Bruges +++	6	Constantinople	3
8	Bruges +++	9	Candia (Iráklion)	7	Aleppo (Halab) +	5	Aleppo (Halab) +	2
9	Tripoli (Trâblous) +	9	Bruges +++	6	Beirut +	5	Damascus +	2
10	Beirut +	8	Tripoli (Trâblous) +	6	Damascus +	5	Tana (Azov)	2
11	Damascus +	7	Damascus +	5	Tripoli (Trâblous) +	5	Tripoli (Trâblous) +	2
12	Tana (Azov)	6	Aigues-Mortes	4	Tana (Azov)	4	Valencia	2
13	Valencia ++++	6	*Cyprus* +++++	4	Valencia ++++	4		
14	Trebizond (Trabzon)	6	Tana (Azov)	4	Aigues-Mortes	3		
15	Aigues-Mortes	5	Thessaloníki	4	*Cyprus* +++++	3		
16	*Cyprus* +++++	5	Valencia ++++	4	Thessaloníki	3		
17	Thessaloníki	5	Corfu	3				
18			Trebizond (Trabzon)	3				

The following cities/locations are possibly underestimated in the table as a result of overlaps with other places, which are given with their total business values below:
+ Syrian cities: C^9_i (Syria) = 3; C^5_i (Syria) = 2; C^4_i (Syria) = 2; C^2_i (Syria) = 1.
++ Barbary: C^9_i (Tunis) = 3; C^5_i (Tunis) = 2; C^4_i (Tunis) = 2; C^2_i (Tunis) = 1.
+++ Bruges: C^9_i (Flanders) = 3; C^5_i (Flanders) = 2; C^4_i (Flanders) = 2; C^2_i (Flanders) = 1.
++++ Valencia: C^9_i (Spain) = 2; C^5_i (Spain) = 2; C^4_i (Spain) = 1.
+++++ Cyprus: C^9_i (Famagusta, Larnaca, Nicosia) = 3, C^9_i (Kyrenia, Limassol) = 1; C^5_i (Famagusta, Larnaca, Nicosia) = 2, C^5_i (Kyrenia, Limassol) = 1; C^4_i (Famagusta, Larnaca, Nicosia) = 2, C^4_i (Kyrenia, Limassol) = 1 (these cities all appear in the same network).
* The table includes all cities that have at least one-tenth of the highest total business value (Venice's) according to the nine-point scale scoring system (for C^9_i). For total business values according to the other scoring methods more or less equivalent thresholds have been chosen.
** R: Rank.
*** *Barbary (italics)*: Less precise geographical designations.

The lack of firm data for Venice is compensated by abundant information on Venetian commercial colonies and maritime traffic routes (Luzzatto, 1937, 45). This is a result of the strong government intervention in Venetian commerce (Stabel, 2001, 200). Venice was a powerful maritime empire and had established political control over many overseas territories. Hereby it is often difficult to distinguish between feudal estates, naval bases and trade colonies, and there were many overlaps between them. In all its overseas colonies the Venetian state was represented by governors who were elected by the Great Council and who had relatively short terms of office (usually two years). The status of these representatives depended upon the nature of the colony to which they were delegated (see below) (Hunt & Murray, 1999, 90; Lane, 1973, 99).

As is revealed by the dispersal of Venetian representation abroad during the 15th century (figure 3.1), the principal anchor-points of Venetian commerce were the Adriatic, Romania (the Byzantine Empire) and the Levant (Syria, Palestine and Egypt) in the east, and north-western Europe. However, Venetians were also involved in commerce with the north-west coast of the Mediterranean and Barbary. Already from ca. 1000 Venetian merchants played an active role as intermediaries between western Europe and the eastern Mediterranean (Abu-Lughod, 1989, 102-103; Lane, 1973, 1-5). Although the Venetians did not entirely neglect overland trade, the emphasis was on maritime commerce (Luzzatto, 1937, 45). As a standard, Venetians abroad were engaged in trade and not in international banking (Lane, 1965, 68).

Let us have a closer look at the different domains of Venetian commerce (see figure 3.1), and at the most important geographical changes in the Venetian trade network. In the first place, the formation of the Venetian maritime empire was not possible without control over trade in the Adriatic. Venetian domination in most of this part of the Mediterranean was in place by the end of the 11th century. Venice became the staple of an area north of the line Ravenna-Pula, which means that all merchandise entering the northern Adriatic had to be offered for sale on the Rialto, the principal Venetian marketplace. From early on Istria was not only economically but also politically controlled by Venice, and *podestà* or *rettori* were sent to the principal Istrian cities to exercise Venetian authority. After ca. 1200 Venice also established its power over Dalmatia, and commercial ties existed with centres such as Zara and Ragusa. Dalmatia temporarily had to be ceded to Hungary from 1356, but from 1420 Venetian domination was restored – not over Ragusa however, which became an important rival to Venice. The Dalmatian cities were governed by counts, either Venetians or strong partisans of Venice, who had to take an oath of loyalty to the Venetian commune. Venetians were also involved in commerce with Albania, especially with Durazzo and Scutari. In 1468 Albania was even bequeathed to the Venetian republic by the Albanian leader Scanderbeg in order to protect it from Ottoman occupation. However, by the beginning of the 16th century Albania had been entirely lost to the Turks (Hunt & Murray, 1999, 90-91; Kellenbenz, 1985, 344; Lane, 1973, 22-29, 62-65, 99, 177, 183-184, 200, 236, 242).

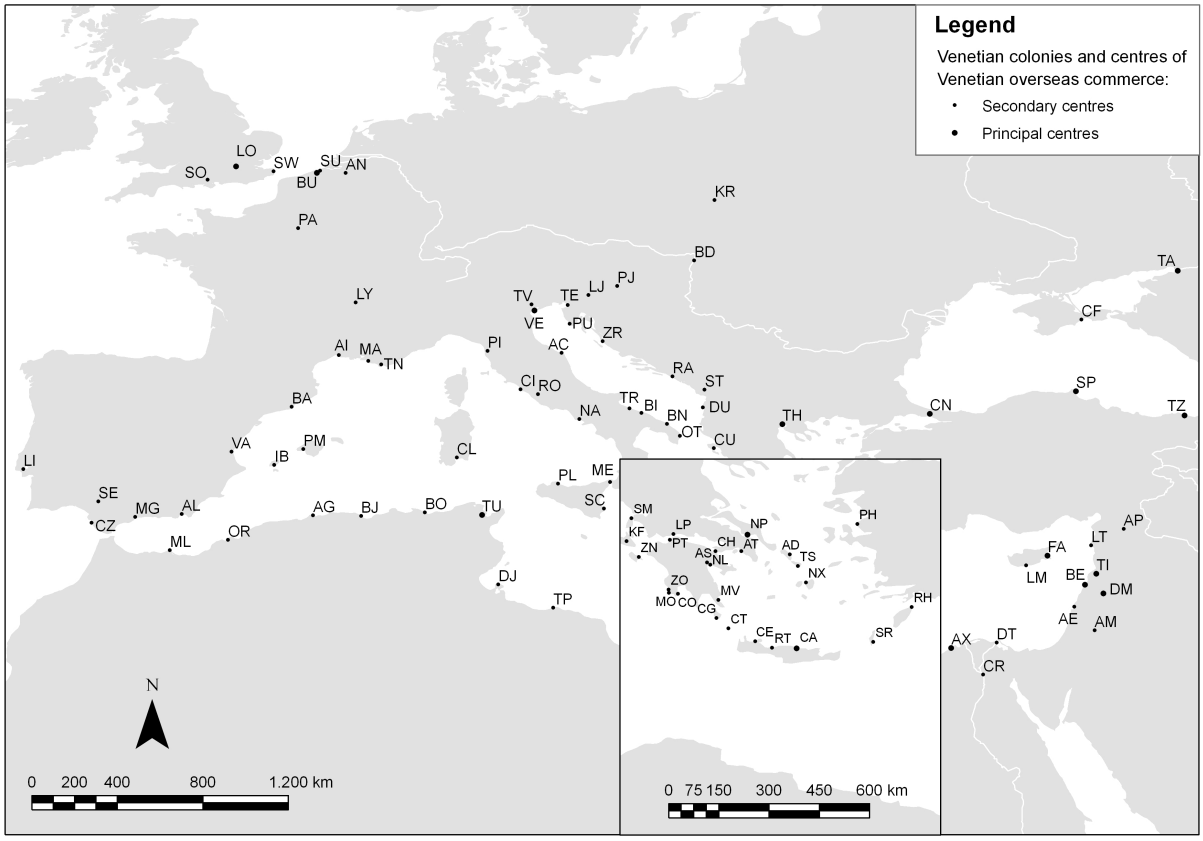

Figure 3.1: Venetian overseas colonies and centres of Venetian overseas commerce (15th century).
Key: AC Ancona; AD Andros; AE Acre (Akko); AG Alger; AI Aigues-Mortes; AL Almería; AM Amman; AN Antwerp; AP Aleppo; AS Argos; AT Athens; AX Alexandria; BA Barcelona; BD Buda; BE Beirut; BI Bari; BJ Béjaïa; BN Brindisi; BO Bona (Annaba); BU Bruges; CA Candia (Iráklion); CE Canea (Chania); CF Caffa (Feodosiya); CG Cerigo (Kíthira); CH Corinth; CI Civitavecchia; CL Cagliari; CN Constantinople; CO Coron (Koroni); CR Cairo; CT Cerigotto (Antikíthira); CU Corfu; CZ Cádiz; DJ Djerba; DM Damascus; DT Damietta (Dumyât); DU Durazzo (Durrës); FA Famagusta; IB Ibiza; KF Kefalonia; KR Kraków; LI Lisbon; LJ Ljubljana; LM Limassol; LO London; LP Lepanto (Naupaktos); LT Latakia; LY Lyon; MA Marseille; ME Messina; MG Málaga; ML Melilla; MO Modon (Methóni); MV Monemvasia; NA Naples; NL Nauplion; NP Negroponte (Chalcis); NX Naxos; OR Oran; OT Otranto; PA Paris; PH Phocaea (Foça); PI Pisa; PJ Ptuj; PL Palermo; PM Palma de Mallorca; PT Patras; PU Pula; RA Ragusa (Dubrovnik); RH Rhodes; RO Rome; RT Réthimnon; SC Siracusa; SE Sevilla; SM Santa Maura (Lefkada); SO Southampton; SP Sinope (Sinop); SR Scarpanto (Karpathos); ST Scutari (Shkodër); SU Sluis (the harbour of Bruges); SW Sandwich; TA Tana (Azov); TE Trieste; TH Thessaloníki; TI Tripoli (Trâblous); TN Toulon; TP Tripoli (Tarābulus); TR Trani; TS Tinos; TU Tunis; TV Treviso; TZ Trebizond (Trabzon); VA Valencia; VE Venice; ZN Zante (Zákinthos); ZO Zonchio (Pylos); ZR Zara (Zadar).
Sources: General: Abu-Lughod, 1989, 123; Lanaro, 2006, 16; Lane, 1973, passim; Luzzatto, 1937, 44, 47; Spufford, 2002, passim. *Ancona:* Marechal, 1985a, 204-205. *Central Europe:* Arany, 2006, 1-2 (Hungary); Kellenbenz, 1985, 342-344, 355. *Constantinople and Aegean:* Thiriet, 1957, 913, 931. *Corfu:* Thiriet, 1957, 916. *Cyprus:* Hunt & Murray, 1999, 183. *Egypt and Syria:* Lane, 1944a, 112, 149; Id., 1965, 71; Tucci, 1957, x, 8-9; Wansbrough, 1965, 483-485. *England:* Lane, 1944a, 123, 131; Ruddock, 1949, 137, 139-141; Stabel, 2001, 201-204. *Lisbon:* Rau, 1957, 717-720. *Low Countries:* De Roover, 1948b, 13-17; Goris, 1925, 71, 157; Lambert, 2006, 13; Marechal, 1985a, 91-93, 180, 183-188, 217-218; Stabel, 2001, 199-204. *Lyon:* Gascon, 1971, 250-251; Mauro, 1990, 264. *Marseille:* Doumerc, 1985, 282. *Paris:* Mirot, 1928, 333. *Phocaea:* Hunt & Murray, 1999, 180, 183-184. *Rome:* Guidi Bruscoli, 2007, 4-5. *Sevilla:* Mauro, 1990, 281. *Trani:* De Roover, 1963, 457 n. 26. *Tunis:* Lane, 1944a, 31.

From the west coast of the Adriatic (Romagna, Marche, Puglia) Venice regularly imported grain, salt, oil, etc. (Lane, 1973, 58-60, 64, 305-306; Luzzatto, 1937, 44). Venetian

consuls were established for instance in Trani (during the 15th century) and in Ancona, a rival of Venice (De Roover, 1963, 457 n. 26; Marechal, 1985a, 204-205). Moreover, for a short period around 1500 several Puglian harbours such as Brindisi and Otranto were annexed to the Venetian state (Lane, 1973, 242-246).

By the end of the 16th century Venetian control over the Adriatic diminished, partly due to increasing competition from cities such as Ancona and Ragusa, partly resulting from a rise of piracy. In answer to this, regular galley services were organised from the second half of the 16th century from Venice to Corfu and Zante (since 1588) and to Dalmatia. The latter service first went to Ragusa and other established commercial centres, but after 1592 was diverted to Spalato (Split) which increasingly became a terminus for overland trade from Constantinople (Lane, 1973, 301-303, 381, 386-388, 401).

Beyond the Adriatic, Venetian merchants firstly became active in trade in the Byzantine empire, of which Venice formed a part. Thanks to their naval support to Byzantium they obtained favourable trade privileges (such as the Golden Bull of 1082) across Romania (Abu-Lughod, 1989, 105; Lane, 1973, 22-29). Venetian influence in this region strongly expanded as a result of the fourth crusade during which Constantinople was sacked (1204) by the crusaders with help of the Venetians, who received 3/8 of the Byzantine empire. The Venetians established naval bases and merchant colonies across Romania, the most important of which was Constantinople where the Venetian colony – governed by a *bailo* – became almost as populous as Venice itself. Other Venetian strongholds were to be found in the Aegean, where Negroponte (Chalcis in Euboea, as well as the island as a whole) became the principal Venetian base; in the whole of Crete, with the main merchant colony being in Candia (Iráklion); and in the Ionian (especially Modon (Methóni) and Coron (Koroni) at the south-western tip of the Peloponnesos). These territories were placed under the authority of governors (with eloquent titles such as Duke of Crete) sent out from Venice (Abu-Lughod, 1989, 105, 109-111; Lane, 1973, 36-43, 68-69, 99-100). Among the exports from Venice to Romania were textiles and coins, while especially silk, alum (from Phocaea, where the Venetians temporarily obtained the alum monopoly after the Genoese were expelled by the Turkish seizure of the mines in 1455), dyes, wax and manufactures from Constantinople were imported. In addition, Venetians were also involved in internal trade between different parts of Romania (Lane, 1973, 348-349; about Phocaea, Hunt & Murray, 1999, 180-184).

Moreover, from ca. 1204 the Venetians gained access to the Black Sea. Here, the principal Venetian merchant colony was originally established in Soldaia (Sudak) on the Crimea, but after 1320 Tana, along the Sea of Azov, became more important. Caffa on the

other hand was a Genoese stronghold but was from time to time also used by the Venetians. On the south coast of the Black Sea Venetian merchant communities developed in Sinope and Trebizond. From these centres not only local goods such as furs, fish, metals and slaves were purchased, but for a while also spices and silks coming from the East (Lane, 1973, 39, 69, 82-83, 128-133, 175, 186, 286, 348-349). In the 13th and 14th centuries, the Black Sea area constituted the western extremity of a trade route reaching all the way to the Japanese Sea. Safety along this route was guaranteed by the Mongols, but it disintegrated with the collapse of the Mongol empire in the second half of the 14th century. However, as long as the route was intact it was used by several Venetian merchants, the most famous of whom was Marco Polo[91] (Abu-Lughod, 1989, 4, 35, 128, 358; Lane, 1973, 79-82, 129, 286; Luzzatto, 1937, 45). In this period the Venetians also had a consulate as far east as Tabriz (Spufford, 2002, 21, 312).

The Ottoman advance in the Byzantine empire in the long term largely resulted in the loss of Romania for Venetian commerce. However, at first instance the Turkish conquests in the Balkans at the end of the 14th century allowed the Venetian Republic to enlarge its territories in southern Romania, since after ca. 1380 the Venetians managed to buy up islands and port cities in the Aegean and the Ionian (including Thessaloníki, Athens, and Corfu, and several centres on the Peloponnesos such as Argos, Nauplion and Patras) from various princes who feared the Ottoman expansion (Lane, 1973, 177, 198). The conquest of Constantinople by the Turks in 1453 was a turning point. It immediately resulted in the closure of the Black Sea for the Venetians and an interruption of trade with Constantinople until peace was concluded in 1479. Venice's naval power could not keep up anymore with that of the Turks, and further Ottoman military victories resulted in the loss of most of the Venetian territories in Romania (including Negroponte, Modon and Coron), especially in 1479, 1503 and 1540. By the end of the 16th century not much more than Crete and a number of Ionian Islands such as Corfu and Zante were left in Venetian hands (Lane, 1973, 235-236, 242, 245-248).

However, the Turkish conquests did not immediately result in the end of Venetian commerce in Romania. Venetian merchants managed to obtain commercial privileges in the Ottoman empire (which were of course withdrawn in periods of war) and they kept on being represented by a *bailo* in Constantinople and a consul in Thessaloníki for instance in the second half of the 15th century (Thiriet, 1957, 913, 915 n. 5, 931 n. 23). Still in the 1560s, Venetian carracks regularly sailed to Constantinople (Lane, 1973, 381). Nevertheless,

[91] A 14th-century example is the Venetian merchant Giovanni Loredan who travelled to China and India (Lane, 1973, 138-139; Luzzatto, 1937, 45 n. 1).

Venetian commercial power in Romania was increasingly curtailed by competition from native merchants (Greeks, Turks, Armenians, Ragusans and Levantine Jews) who were favoured by the Ottoman rulers. In the 16th century Greeks and Turks even had fraternities in Venice (Lane, 1973, 299-302).

With the exception of Cyprus, the Venetian state did not obtain territorial possessions beyond the Adriatic and Romania. Venetian presence elsewhere consisted of purely mercantile communities headed by consuls who were elected in Venice (Lane, 1973, 99). As in Romania, the crusades were instrumental in the development of Venetian Levantine trade. In exchange for their military contributions to the first crusades in the course of the 12th century, Venetian merchants were granted commercial concessions in crusader ports such as Jaffa (Tel Aviv), Haifa, Ascalon (Ashkelon), Tyre and Acre (Akko), and they also began trading with Alexandria in Islamic Egypt. In the crusader cities the Venetians established their own quarters, which were lost again however by the end of the 13th century as a result of the Islamic reconquest of the crusader states (Abu-Lughod, 1989, 107-108; Lane, 1973, 31-36, 70-72; Mack, 2007).

When the Mamluk soldan of Egypt took Acre, Tyre and Tripoli in 1291, Venetian commerce with the Levant temporarily was confined to Cyprus and Lajazzo (Ayas, on the south coast of Turkey), the principal port of the Christian kingdom of Lesser Armenia, where products from Egypt, Persia and the East converged. Although the Venetian trading rights in Egypt were restored in 1302 and also direct exchange with Syria took off again, the Pope persisted in forbidding trade with the Muslims and even excommunicated Venice in 1322. From then on Venetian Levantine trade for the second time limited itself to Cyprus and Lajazzo, for more than twenty years this time. Finally in 1344 direct Venetian trade with Alexandria and Syria was reinstated. With the latter region connections only became regular again in 1374, when most of Cyprus and especially its principal port Famagusta were seized by the Genoese, and the Venetians decided to go straight to Syria rather than picking up Syrian cotton and spices in Cyprus. Lajazzo had already much earlier been ignored by the Venetians, especially since it was conquered by the Mamluks in 1347. Cyprus on the other hand was never entirely abandoned. The Venetian Corner family for instance retained its possessions on the south of the island, and in 1479 Catarina Corner even became queen of Cyprus. Ten years later Cyprus was incorporated in the Venetian republic until it was finally lost to the Turks in 1571 (Abu-Lughod, 1989, 121; Lane, 1973, 82, 130-131, 186, 199, 236, 297-298, 372-373; Spufford, 2002, 345).

In Syria, where the Venetians especially purchased Syrian cotton as well as spices which came from the East via the Red Sea and then by caravan from Jeddah (and in the early 14th and late 16th centuries also via the Persian Gulf), the harbours used by the Venetians in the 14th to 16th centuries were not the same as the crusader ports of the 12th and 13th century. Although there was still a Venetian consul in Acre in the 1430s for instance (Lane, 1944a, 112), Tripoli and Beirut had become the principal harbours for Venetian commerce in Syria. Moreover, Venetian merchants increasingly penetrated the Syrian mainland and established their main consulate in Damascus, which was moved in 1549 to Aleppo, an important market not only of cotton and spices but also of Persian silk. In Egypt Alexandria remained the principal centre for Venetian commerce, and only in 1555 the main consulate was moved inland to Cairo. In Alexandria, which was an even more important market for spices than Syria, the Venetians from the beginning were predominant among western merchants thanks to their privileged relationship with the Mamluks, and they owned two impressive warehouses there (Abu-Lughod, 1989, 35-36, 121; Lane, 1973, 70-71, 199, 286-290, 292, 302-305, 338-339; Spufford, 2002, 20, 311-312, 345-346; Tucci, 1957, 8-9; Wansbrough, 1965, 483-485).

Although the Portuguese discovery of a direct sea route around Africa to the spice producing regions of Asia at the end of the 15th century initially struck a blow to the Venetian spice trade with Syria and Egypt, the latter recovered after 1520 and especially by the middle of the 16th century. While Venetian trade with Syria slowly declined from the second half of the 16th century and was seriously hit by the Turkish conquest of Cyprus in 1571, Egypt remained an important market for Venetian merchants until the Venetian-Turkish war of 1570-1573 when they were temporarily replaced by merchants from Marseille, and again during the 1580s and 1590s when the Dutch and the English increasingly disturbed the Portuguese spice trade in the Atlantic. When the Dutch in the early 17th century took the control over the Asian spice trade and effectively cut off the flows through the Red Sea, Venetian commerce with Egypt finally broke down however. Moreover, at the end of the 16th century Dutch and English shippers began sailing directly to the Mediterranean and the Levant, compromising Venice's traditional role as intermediary between east and west[92] (Lane, 1973, 285, 291-294, 384-386, 400-402; Tucci, 1957, x).

In the west, Venetians were one of the twelve groups of Italian merchants trading at the fairs of Champagne in the 12th and 13th centuries, when the economic development of

[92] Nevertheless, although the central role of Venetian businessmen in European and international trade had come to an end by the early 17th century, they maintained an innovative ability to look for new products, new markets, etc. (Lanaro, 2006, 21, 36-37).

western Europe strongly stimulated the transit trade between east and west. In the early 14th century Venetian galleys began sailing directly to the North Sea, and a Venetian consulate was established at Bruges in 1322 (for a number of years – 1449, 1452, 1459, 1485, 1488-1493 – the Venetians concentrated their activities in Antwerp rather than in Bruges however). A Venetian merchant community also developed in London, which became especially important in the course of the 15th century, although the Venetians from time to time preferred Southampton as a result of anti-alien riots in London in 1455 and 1456 and other disturbances during the Wars of the Roses. In Bruges the Venetians purchased Flemish textiles and sold eastern goods (especially spices) as well as Venetian manufactures. In London Cretan wines and raisins were exchanged for English wool. In the early 16th century the Venetians largely left the Low Countries where the trade with Venice increasingly came in hands of local merchants. London on the other hand remained an important destination of Venetian round ships during most of the 16th century (De Roover, 1948b, 13-17; Lane, 1973, 60, 127, 305, 350-351, 378-381; Marechal, 1985a, 180, 183-188; Puttevils, 2007, 62-63; Ruddock, 1949, 137-140; Spufford, 2002, 134; Stabel, 2001, 199-204).

In the western Mediterranean the Venetians were involved in grain trade with Sicily and salt trade with the Balearics (especially Ibiza) and Sardegna (definitely from the 14th century). The western Mediterranean was traditionally the domain of Genoese and Catalan merchants however, and only in the 15th century regular connections developed between Venice and the harbours of the Italian west coast, southern France and Catalonia. Also in Lisbon a Venetian community existed (already in the 14th century), but again Genoese presence was stronger here (Lane, 1973, 59, 132, 339-349, 378-380; Luzzatto, 1937, 44, 47; Rau, 1957, 717-720; Spufford, 2002, 401). On the Barbary Coast the Venetians already traded with Tunis in the early 14th century, and they had a consul here. Relations with the north-west coast of Africa as well as with the Moorish kingdom of Granada, where Venetian merchants obtained African gold in exchange for silver and textiles, temporarily intensified in the course of the 15th century (Lane, 1944a, 31; Id., 1973, 130-132, 339, 349-350; Luzzatto, 1937, 47).

However, from the early 16th century the Venetians largely withdrew from the western Mediterranean and from western Europe in general. Several reasons for this can be given, including war at home in Venice, competition from the Portuguese in the spice trade, expanding naval power of the Spanish-Genoese alliance, as well as a growth of piracy. Consequently, Venetian merchant communities in 16th-century western European commercial centres such as Sevilla and Lyon were small, and Venetian presence in Antwerp was even negligible. In 1521 Venetian merchants attempted to purchase spices directly in Lisbon, but

when they found prices too high here they decided to concentrate on the Levantine spice trade again. With Tunis as well regular connections came to an end after the conquest of the city by the Ottomans in 1534 (Gascon, 1971, 250-251; Goris, 1925, 71, 125; Lane, 1973, 291, 349-351; Mauro, 1990, 281).

In central and eastern Europe finally, Venetian presence was limited. Although Venetian merchants had obtained a privilege for trading in the German empire in 1178, by 1279 this had been withdrawn. By the early 14th century trade between Venice and the regions north of the Alps had come largely in hands of southern German merchants, and this was even more so after the trade embargo set up by the German emperor Sigismund against Venice in the early 15th century. Attempts of Venetian merchants to establish themselves in Nürnberg or Cologne were vigorously opposed. At the fairs of Geneva as well, Venetians were never very active. Nevertheless, they made use of several overland routes across the Alps through Germany, Switzerland and Savoy to the Low Countries, especially between ca. 1336 and 1374 when the direct maritime route to Bruges was blocked by the Genoese. Venetian control over Treviso hereby was crucial for access to the Alpine passes (Bergier, 1957, 894; Kellenbenz, 1985, 341; Lane, 1973, 185-186; Seibold, 1977b, 10-11; Von Stromer, 1986, 83-84).

More towards to east, Venetians traded from their Black Sea colonies with Lvov during the 14th century, where they met Hanseatic traders. In the 15th century the Venetian merchant Pietro Picorano was involved in lead and salt mining near Kraków, where a Venetian merchant community was established. In Vienna, Venetian traders increasingly played a considerable role in the course of the 16th century. Venetians however were especially active in and along the road to Hungary, which they reached via several overland routes leaving from their strongholds in the northern and eastern Adriatic (Trieste, Istria, Dalmatia) (Arany, 2006, 1-2; Dollinger, 1970, 231; Kellenbenz, 1985, 335, 342-345, 354-355).

Although the Venetian Republic expanded its territory over the cities of the Veneto (Padua, Vicenza, Verona,…), Friuli, and even the west of Lombardy (Brescia, Bergamo, Crema) in the early 15th century, thereby increasingly becoming a city-state, economically these centres remained relatively independent from Venice (with the exception of Treviso and Friuli). Although from the 13th century Venice increasingly controlled the access of the cities of the Veneto and the Po area (including Ferrara) to the Adriatic, these cities managed to maintain their own fairs and overland trade routes to Germany and southern Italy, through which they marketed their industrial products. Venice did not interfere in the inland trade of

the cities in its hinterland and only protected its maritime trade (as a result Venice became an important market for grain and salt imported across the Adriatic for the subject cities). No 'national' economy appears to have developed in the Venetian Republic (Belfanti, 2001, 300-306; Lanaro, 2006, 23-33; Lane, 1973, 58-62, 225-231, 242-245).

Specifically for Venice, there is an additional way to measure the configuration of its trade flows, at least across the seas, by using an infrastructural approach rather than measuring the spatial organisation of business enterprises (for this distinction, see Derudder, 2008; Verbruggen, 2008, 238). The Venetian state organised regular shipping convoys to the principal centres of Venetian overseas commerce in order to protect Venetian maritime trade more efficiently against piracy and enemies. Already in the 13th century, annually two caravans or *mude* sailed to Romania (with regular stops in Zara, Ragusa, Modon, Negroponte, Constantinople, and additionally Soldaia in the Black Sea) and the Levant (Zara, Ragusa, Modon, Candia, Rhodes, Cyprus, Acre, and sometimes further to Jaffa, Damietta and Alexandria) (Lane, 1973, 39, 68-73).

The principal system of Venetian convoy traffic – the galley fleets – originated in the early 14th century. These regular convoys were intended to provide secure transport to all Venetian citizens alike, and a large number of Venetian merchants made use of this facility. Being an expensive form of transport, the galleys – initially built as warships and propelled by oarsmen in addition to sails – especially carried high value goods such as spices. Originally, the galleys were constructed and equipped by private persons, while the government only imposed some rules of navigation. However, after a number of years the Venetian state began to build merchant galleys for convoy shipping in the *Arsenal*. The exploitation of the different galley fleets each year was auctioned to the highest bidders, who had to operate as common carriers organising shipping and transport, while the route to be followed by the fleets was fixed by the Venetian Senate. These routes were described in the *incanti*, the contracts concluded between the State and the farmers of the fleets, which have been preserved from 1332. Tenenti and Vivanti (1961, map) have used these contracts to reconstruct the annual journeys of the Venetian galleys (Abu-Lughod, 1989, 111-113; Lane, 1973, 125-126, 145-146, 337-352; Luzzatto, 1937, 43-44; Stabel, 2001, 200, 205; Tenenti & Vivanti, 1961, 83-86).

The first galley convoys to be organised (see figure 3.2) were those to Romania (1308-1514, to the Black Sea only until 1452, not to Constantinople between 1453 and 1479), Beirut (1308-1570, between 1322 and 1343 to Cyprus and Lajazzo instead, and only regularly to

Syria from 1374; at the end less regular again) and Alexandria (1308-1564, originally a combined voyage Syria-Egypt, interrupted between 1322 and 1343, from 1344 directly to Alexandria; less regular in the 16th century). Soon after also a regular connection with Flanders was set up (1314-1533, largely interrupted between 1336 and 1374, irregular after 1508). The other three services only date from the 15th century: one of these went to the north-west coast of the Mediterranean (1401-1508, to Barcelona and Valencia from 1436), and a second sailed to the Barbary coast (1436-1533, irregular after 1508), while the galleys *al trafego* (1461-1507) connected Barbary with the Levant. Although these convoys sailed more or less annually, there were several variations in the routes followed, and many interruptions for reasons of war, etc. (Abu-Lughod, 1989, 88; Lane, 1973, 126-131, 186, 197, 277, 290, 339-352; Spufford, 2002, 398, 401, 404; Tenenti & Vivanti, 1961).

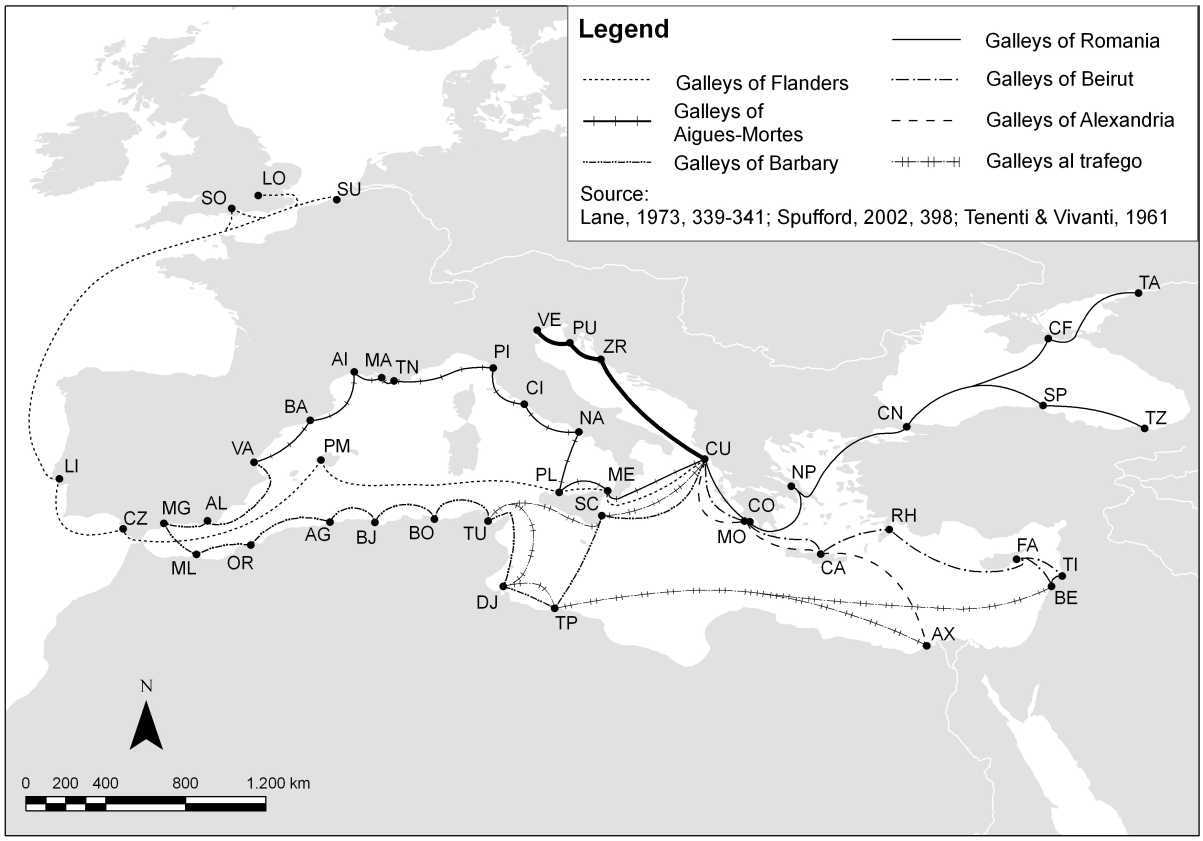

Figure 3.2: Venetian merchant galley fleets in the fifteenth century.
Return journeys were normally the same as outbound journeys, except for the galleys of Barbary which came back more directly from Valencia to Tunis and from Tunis to Venice, and for the galleys *al trafego* which returned together with the galleys of Alexandria or Beirut.
Key: AG Alger; AI Aigues-Mortes; AL Almería; AX Alexandria; BA Barcelona; BE Beirut; BJ Béjaïa; BO Bona (Annaba); CA Candia (Iráklion); CF Caffa (Feodosiya); CI Civitavecchia; CN Constantinople; CO Coron (Koroni); CU Corfu; CZ Cádiz; DJ Djerba; FA Famagusta; LI Lisbon; LO London; MA Marseille; ME Messina; MG Málaga; ML Melilla; MO Modon (Methóni); NA Naples; NP Negroponte (Chalcis); OR Oran; PI Pisa; PL Palermo; PM Palma de Mallorca; PU Pula; RH Rhodes; SC Siracusa; SO Southampton; SP Sinope (Sinop); SU Sluis (the harbour of Bruges); TA Tana (Azov); TI Tripoli (Trâblous); TN Toulon; TP Tripoli (Tarābulus); TU Tunis; TZ Trebizond (Trabzon); VA Valencia; VE Venice; ZR Zara (Zadar).

Not only galley convoys were organised, also round ships (cogs and other large sailing ships) were ordered to sail in caravans on a number of routes, from the middle of the 14th century especially to Crete (the so-called wine *muda*) and to Syria (cotton *muda*) (Luzzatto, 1937, 44; Spufford, 2002, 401-402). However, these fleets only formed a small part of the total Venetian merchant marine. Most round ships did not sail in convoy, and even merchant galleys made many voyages in isolation (Lane, 1973, 132). The system of galley services reached its peak during the 15th century, but was largely abandoned in the early 16th century as a result of the growing strength of the Ottoman, Spanish and French fleets, the decline in flows of spices and bullion handled by the Venetians, and especially due to a number of technical improvements made to round ships (cogs and carracks), which increasingly replaced galleys in Venetian commercial traffic. Venetian shipbuilding and sailing finally declined at the end of the 16th century (Lane, 1973, 337, 348, 381, 384-389).

When comparing figures 3.1 and 3.2, the Venetian galley routes clearly appear as the spine of the Venetian trade network. This should not come as a surprise given the emphasis on maritime trade and the central role played by the Venetian state in the provision of commercial infrastructures.

The firm data are largely in agreement with what is known about the geography of Venetian commerce in general. Figure 3.3, which displays total business values of cities for Venetian firms, clearly shows an emphasis of the business activities of Venetian enterprises on (1) the Adriatic; (2) Romania (Constantinople, Black Sea, Aegean, Ionian, Crete); (3) Syria (with Cyprus) and Alexandria; (4) north-western Europe with Bruges and London; and (5) the western Mediterranean (including Sicily and the Balearics, the west coast of Italy, southern France and Catalonia, as well as Barbary). The absence from central and eastern Europe is striking. Moreover, Venetian merchants appear to have maintained relatively many connections with the Veneto and the Po area. New is that a number of important commercial centres which are normally not or only weakly associated with Venetian commerce (Milan, Geneva, Sevilla, Lyon, Rome, and even Genoa) nevertheless appear on the map (although with low total business values).

Such connections with the hinterland and with important commercial centres beyond the core network of the nation only come out clearly when also cities with low total business values or connectivities are mapped. I have not included such maps (as the one below for Venice) for the other nations, but results almost always show the emergence of these two

phenomena. Two conclusions can be derived from this. In the first place, transnational merchants and bankers were producers of town-ness (relations with the hinterland) as well as city-ness (relations with other cities in a long-distance network). Consequently, from an agency-based perspective the distinction between both processes is often blurred and not very clear. Secondly, a tendency towards concentration can be observed in the network: the principal commercial and financial centres in the world-economy will always attract a certain share of the total flows from or to a particular city belonging to that world-economy.

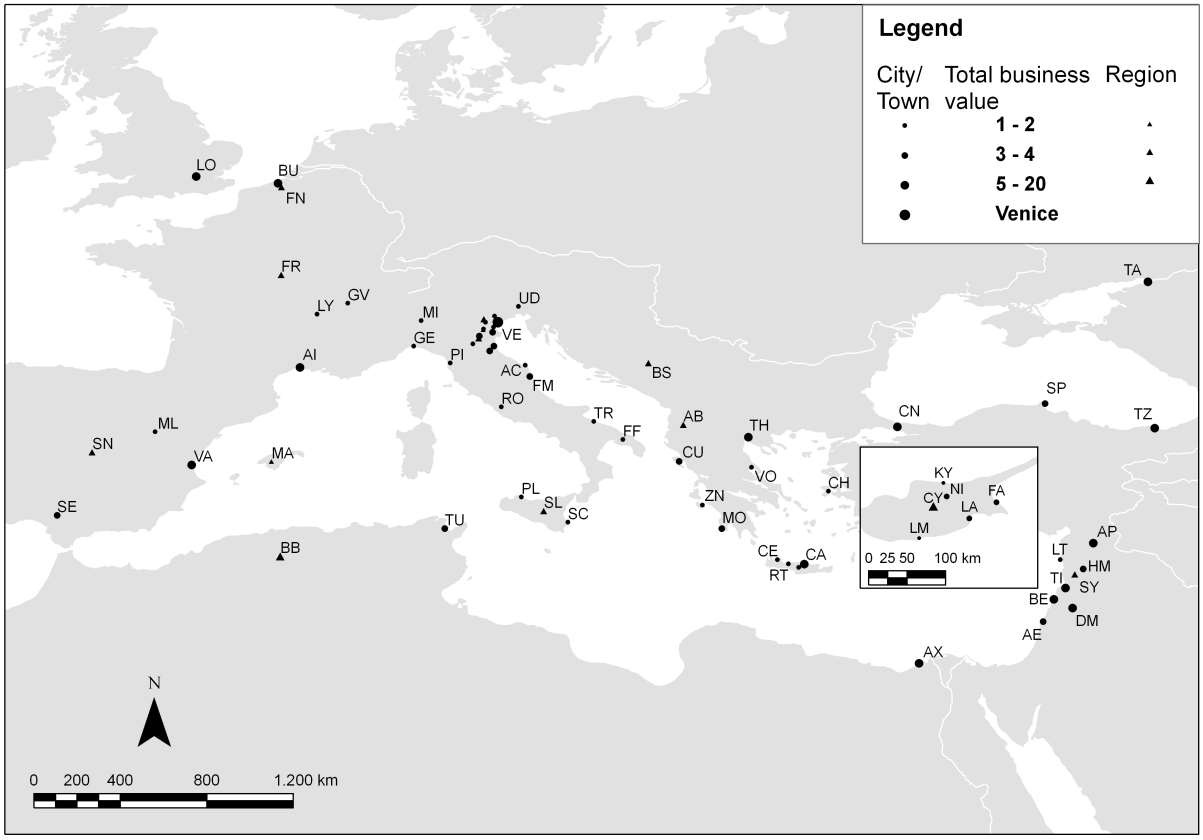

Figure 3.3: Total business values of cities (C^9_i) across six Venetian firms (15th-16th centuries) (nine-point scale business value matrix).
Key (Locations in the Venetian hinterland have not been labelled)*: Cities*: AC Ancona; AE Acre (Akko); AI Aigues-Mortes; AP Aleppo; AX Alexandria; BE Beirut; BU Bruges; CA Candia (Iráklion); CE Canea (Chania); CH Chios; CN Constantinople; CU Corfu; DM Damascus; FA Famagusta; FF Francavilla Fontana; FM Fermo; GE Genoa; GV Geneva; HM Hamāh; KY Kyrenia; LA Larnaca; LM Limassol; LO London; LT Latakia; LY Lyon; MI Milan; ML Molina; MO Modon (Methóni); NI Nicosia; PI Pisa; PL Palermo; RO Rome; RT Réthimnon; SC Siracusa; SE Sevilla; SP Sinope (Sinop); TA Tana (Azov); TH Thessaloníki; TI Tripoli (Trâblous); TR Trani; TU Tunis; TZ Trebizond (Trabzon); UD Udine; VA Valencia; VE Venice; VO Vólos; ZN Zante (Zákinthos).
Regions: AB Albania; BB Barbary; BS Bosnia; CY Cyprus; FN Flanders; FR France; MA Mallorca; SL Sicily; SN Spain; SY Syria.

Genoese

As for Venice, not many private documents of Genoese enterprises have been preserved, especially not for the 14th and 15th centuries (Heers, 1959, 5-6; Id., 1961, 5). Consequently,

although Genoese business probably was as important as that of the Venetians, only a small number of medieval Genoese firms have been included in the business value matrix (not a single firm for the 14th century, four for the 15th century). For the 16th century more data are available, and as a consequence I have been able to reconstruct the business networks of six 16th-century Genoese enterprises. Genoese commerce and banking were definitely more important than appears from the principal components analysis, in which the Genoese factor only surfaces as seventh out of twelve components (see table 3.4).

Among the causes for this is the typical form of business organisation found in Genoa, consisting of individual merchants or informal family partnerships which invested in a large variety of temporary enterprises. One of the difficulties in reconstructing the networks of Genoese businesses is that many different members of one and the same *albergo* (family clan) simultaneously were involved in commerce and/or banking, but that the connections between them is often unclear. The same noble family names (Cattaneo, Centurione, Doria, Gentile, Grimaldi, Lomellini, Salvago, Spinola, Vivaldi, etc.), dominating Genoese business (Doria, 1986, 73-74) appear over and over again in various places but without providing much clarity.

Genoese business experienced an important shift in emphasis between the 14th and 16th century from trade with the east to commerce and banking in the west (Heers, 1961, 1-2). This is reflected in the fact that a homogeneous Genoese component only can be found among the results of a limited number of principal components analyses (those carried out on the nine- and five-point scale matrices). In the ten-, eleven- and twelve-component solutions of an exploratory principal components analysis on the four-point scale business value matrix (see above) a Genoese component is entirely absent, while the equivalent analyses on the two-point scale matrix produce a weak component grouping solely 15th-century Genoese firms (once also including Catalan enterprises). The latter result points towards a difference in spatial strategy between 15th- and 16th-century Genoese business organisations. Consequently I have chosen to look at the firm data century by century instead of lumping them together. The absence of firm data for the 14th century is especially problematic here, since by the 15th century the evolution was already in full swing. Moreover, given the small number of firms (especially for the 15th century), the data should be interpreted with some reserve. They only give a very partial picture. Nevertheless, it is possible to derive some general traits from them.

When comparing figures 3.4 and 3.5, which give total business values of cities respectively for 15th- and 16th-century Genoese firms, firstly some common patterns can be observed. Strong connections existed, both in the 15th and in the 16th century, with the north-west coast of the Mediterranean (Naples, Rome, Pisa, Marseille, Barcelona, Valencia,…) and

the western Mediterranean islands (Sicily, Balearics,…). Genoese firms were well represented in the Ligurian hinterland and in north-west and central Italy in general (Lombardy with Milan, Piemonte, Tuscany), and even in Venice. Striking also is the Genoese presence in the whole of the Iberian Peninsula (not only in the Mediterranean ports of the kingdom of Aragón, but also in Lisbon and especially in Castile and Andalusia: Sevilla, Cádiz, Granada, Toledo, Medina del Campo, etc.). In north-western Europe linkages existed with the Low Countries (Bruges in the 15th century, Antwerp in the 16th century) and England (especially London). A last common feature is the infiltration in the southern Atlantic (e.g. Canary Islands). This picture is confirmed when looking at the primary field cities of the Genoese component (table 3.5). Especially the emphasis on Spanish cities comes out very well here, with Sevilla as articulating city next to Genoa, and another eight Spanish cities appearing as primary field cities.

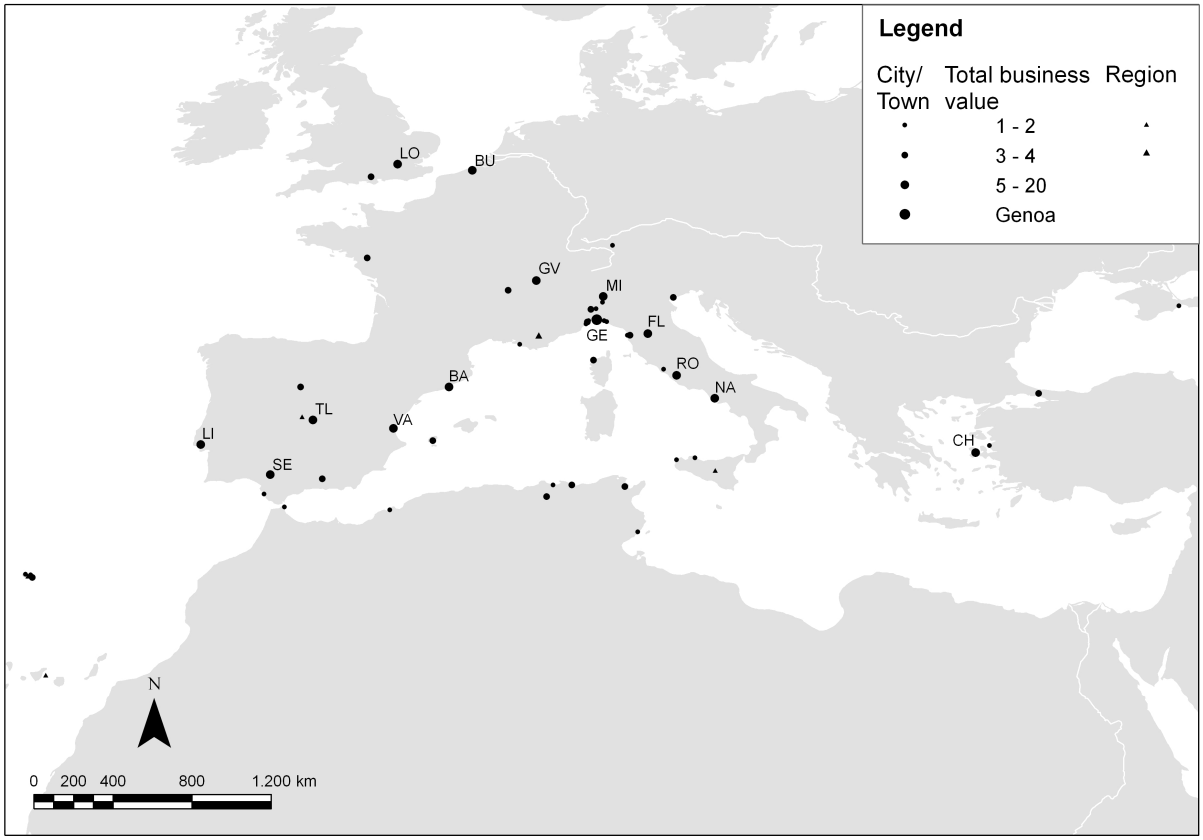

Figure 3.4: Total business values of cities (C^9_i) across 15th-century Genoese firms (4 firms) (nine-point scale business value matrix).
Key (Locations with a total business value below 5 have not been labelled): BA Barcelona; BU Bruges; CH Chios; FL Florence; GE Genoa; GV Geneva; LI Lisbon; LO London; MI Milan; NA Naples; RO Rome; SE Sevilla; TL Toledo; VA Valencia.
Sacca in Sicily (C^9_i = 3) and Marsacares in Tunisia (C^9_i = 1), which I have not been able to identify, have not been indicated on the map. Rivarolo (C^9_i = 1) has not been represented either, since it is not clear from the sources which Rivarolo is meant.

There are some major differences between figures 3.4 and 3.5 as well however. Firstly, 15th-century Genoese firms were stronger represented in the eastern Mediterranean (Chios, Pera (the Genoese colony at Constantinople), Caffa,…) than their counterparts a century later. The same holds for linkages with the north African coast. On the other hand, in the 16th century Genoese firms penetrated into the New World (Santo Domingo, Puerto Rico,…), while their influence in western Europe was more ubiquitous, not only in Italy and Spain – where their presence appears to have become stronger – or the North Sea area, but also in France (Lyon, Rouen,…) and Germany (Cologne, Nürnberg,…).

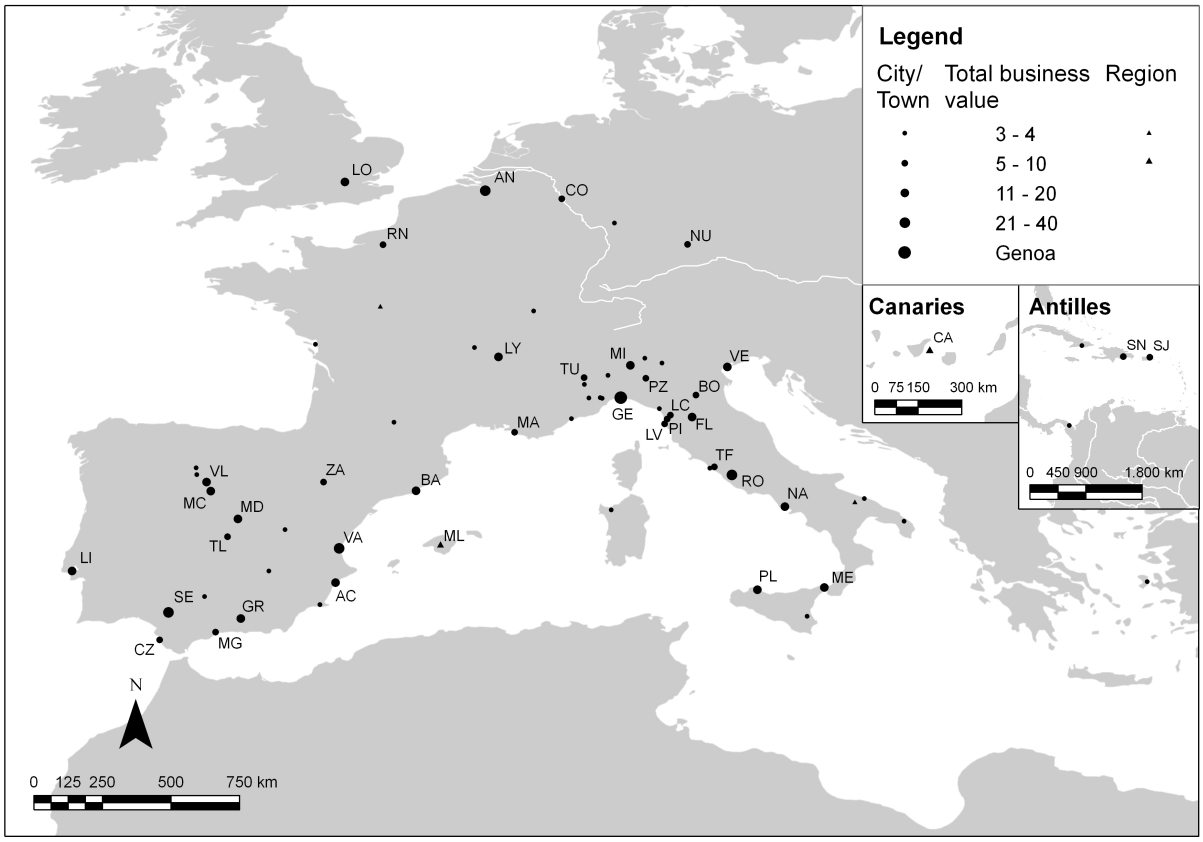

Figure 3.5: Total business values of cities (C^9_i) across 16th-century Genoese firms (6 firms) (nine-point scale business value matrix).
Key (Locations with a total business value below 5 have not been labelled; those with a total business value below 3 have not been indicated on the map)*: Cities*: AC Alicante; AN Antwerp; BA Barcelona; BO Bologna; CO Cologne; CZ Cádiz; FL Florence; GE Genoa; GR Granada; LC Lucca; LI Lisbon; LO London; LV Livorno; LY Lyon; MA Marseille; MC Medina del Campo; MD Madrid; ME Messina; MG Málaga; MI Milan; NA Naples; NU Nürnberg; PI Pisa; PL Palermo; PZ Piacenza; RN Rouen; RO Rome; SE Sevilla; SJ San Juan; SN Santo Domingo; TF Tolfa; TL Toledo; TU Turin; VA Valencia; VE Venice; VL Valladolid; ZA Zaragoza.
Regions: CA Canary Islands; ML Mallorca.
Monteleone (C^9_i = 3) has not been indicated on the map, since it is not clear from the sources which Monteleone is meant.

This crude picture can be refined and extended to earlier periods through more general data on the geographical dispersal of Genoese foreign merchant communities[93]. Differently from Venice however, governmental intervention in business was limited in Genoa, and individual entrepreneurial initiative dominated (Abu-Lughod, 1989, 113-114; Court, 2004, 988; Stabel, 2001, 206). "Although the commune usually, but not always, directed the original foundation of the foreign trading quarters, the relationship between Genoa and these colonies was loose and became progressively looser. For example, the enclaves along the Black Sea coast formed their own self-governing communes, establishing direct diplomatic relations with eastern potentates. And Genoese military ventures and diplomatic initiatives were often carried out by individuals or groups of merchants who acted independently, not as representatives of the republic" (Hunt & Murray, 1999, 89). Several principalities in the Aegean and the Black Sea were even private property owned by Genoese nobles (Heers, 1961, 140). By 1460, after the fall of Constantinople, the administration of several territories controlled by the Genoese commune, such as those in the Black Sea, Cyprus and Corsica, had come in hands of the *Officio di San Giorgio*, a powerful financial institution in Genoa that had its own ships and waged its own wars (Heers, 1961, 140-146; Hunt & Murray, 1999, 258 n. 4).

As a result of its geographical situation, Genoa almost naturally firstly became active in the western Mediterranean which remained its only field of activity until the end of the 11th century. Already in the middle of the 11th century the Genoese organised expeditions to Corsica and Sardegna against the Muslims. After defeating the Pisans in 1284, the Genoese definitively obtained control over the Tyrrhenian Sea (Abu-Lughod, 1989, 105, 120-121; Lane, 1973, 73, 78-79). Genoese merchants were active in all the ports of western and southern Italy (e.g. in the grain trade), not only those in the Ligurian hinterland, such as Savona, Portovenere (where a Genoese fortress was established), and La Spezia, but also in Porto Pisano (the harbour of Pisa), Livorno (especially from the 16th century), Piombino (from where the Genoese controlled the exploitation of the iron ore of Elba during the third quarter of the 15th century), Talamone, Corneto (Tarquinia), Civitavecchia, Gaeta, Naples, Castellammare di Stabia, Amalfi, Salerno, Agropoli, Vibo Valentia, Tropea, Crotone, Otranto, Bari, and Barletta (Balard, 1974, 246-247; Doria, 1986, 91; Heers, 1961, 220, 336-337; Otte, 1986, 21). In the Spanish dominated south of Italy, the Genoese were generally very active, not only as merchants and bankers, but also as government and church officials or feudal

[93] The geographical reach of Genoese commerce and finance as a whole can not only be studied through sources on the Genoese trade colonies, but also thanks to the very rich Genoese notarial archives (Heers, 1961, 4-5).

lords. Genoese immigration into southern Italy became more intense in the course of the 15th and 16th centuries (Doria, 1986, 84-87).

Active commercial ties existed with the islands of the western Mediterranean. Corsica, from where the Genoese especially imported wine, became a Genoese colony, although the Genoese only managed to control a number of harbours and castles along the coast. In Sardegna, Genoese merchant colonies developed in centres as Cagliari, Alghero, Sassari and Castelsardo. In Sicilian business as well, the Genoese occupied a dominant position, in particular in the grain trade. The principal Genoese communities were established in Messina and especially Palermo, but Genoese (not only merchants and bankers, but also government officials, feudal lords, etc.) could be found more or less everywhere in Sicily, including Siracusa, Trapani (an important grain port), Agrigento, Caltabellotta, Cammarata, Castellammare del Golfo, Corleone, Enna, Favara, Gagliano Castelferrato, Licata, Modica, Naro, Naso, Noto, Termini Imerese and on the Aegadian Islands. In the Balearics, Genoese consuls were established in Palma de Mallorca and Ibiza (Balard, 1974, 247-248; Doria, 1986, 82-84, 100; Heers, 1961, 145, 333-341, 355-356; Otte, 1986, 18-20, 28-29; Spufford, 2002, 293).

In Provence and Languedoc, connections with places as Montpellier and Saint-Gilles existed already in the 13th century (Hunt & Murray, 1999, 89). By the 15th and 16th centuries, Genoese merchants were less engaged in business in the Languedoc (Montpellier, Aigues-Mortes, Agde, etc.) than in Provence, where the main Genoese merchant communities were established in Marseille and Avignon. The Genoese nation was the most important foreign nation of Marseille in the 16th century. Arles was used by the Genoese as a distribution centre for grain from Provence. Genoese presence has also been demonstrated in Martigues, Hyères, Toulon, Nice, Villefranche-sur-Mer and Moulinet (Doria, 1986, 91-93; Heers, 1961, 330-332, 337, 352-354; Mollat, 1988, 144; Otte, 1986, 28-29).

In the lands dominated by the crown of Aragón, around 1400 the Genoese and Pisans were the only Italians who were allowed to trade beyond the principal commercial centres Barcelona, Valencia, Tortosa, Perpignan, Mallorca and Ibiza. The largest Genoese merchant community resided in Valencia, from where regular connections developed with Castile. This community remained among the most important on the Iberian peninsula during the 16th century. Also in Barcelona and Alicante Genoese merchant communities were established[94]. From Tortosa, salt and wool were exported. In Zaragoza finally, the Genoese presence

[94] Moreover, in the 16th century Genoese businessmen are known to have resided in Cocentaina, Huesca and Nules (Otte, 1986, 33-34, 38, 44, 53).

became increasingly numerous in the course of the 16th century (Doria, 1986, 100-102, 62 n. 21; Heers, 1961, 355; Origo, 1963, 126; Otte, 1986, 18, 28-29, 31, 33-34, 38, 43-45, 51-56; Spufford, 2002, 20).

Trading concessions also were obtained from the Muslim states in Spain and Barbary (Abu-Lughod, 1989, 105). Already in the late 12th century, the Genoese had their own church in Tunis. By the mid-14th century Genoese merchant communities and trade connections were established in all the major Barbary ports (from where still large amounts of grain were imported during the 15th century): Safi, Honaine (and Tlemcen further inland), Oran, Arzew, Ténès, Alger, Béjaïa, Stora (for grain imports from Constantine), Bona and Tunis. Commercial ties also existed with Tripoli in Libya. In the early 16th century Genoese communities still resided in Tunis, Oran and Macassar (El Kala). On the island of Tabarka, in hands of the Genoese Grimaldi and Lomellini families since 1543, the Genoese dominated the coral trade during the 16th and 17th centuries (Doria, 1986, 81-82; Heers, 1961, 340-341; Spufford, 2002, 20-21).

Although Liguria is separated from inland Italy by a mountain range, which explains the strong connection of Genoese trade and society in general with the sea (Abu-Lughod, 1989, 103), commercial ties also existed between Genoa and cities in Piemonte and Lombardy, such as Turin, Alessandria, Casale Monferrato, and especially Milan (Doria, 1986, 89-91; Heers, 1961, passim).

In the east, the Genoese (just like the Pisans and more than the Venetians) played a very active role in the first crusade (beginning in 1095). Consequently, from the early 12th century they became engaged in commerce with Syria and Palestine where they had obtained the control over parts of Antioch, Acre (1/3), Jaffa (1/4), Jerusalem (1/4) and other cities that had been taken with their help (Abu-Lughod, 1989, 105-107; Hunt & Murray, 1999, 89; Lane, 1973, 31-32, 73-75; Pike, 1966, 153 n. 51; Spufford, 2002, 19). Soon, they also acquired commercial privileges in Alexandria and in Constantinople, where an important Genoese colony was established in Pera (across the Golden Horn) in 1187 after a massacre of the Italians in Constantinople by the Byzantines in 1182. Simultaneously with the development of their eastern trade Genoese merchants also began visiting the Champagne fairs, imposing themselves as middlemen in the east-west trade. After the fourth crusade (1202-1204) however, the Venetians became dominant in the eastern Mediterranean and the Genoese temporarily limited most of their commercial activities to the western Mediterranean and north Africa (Abu-Lughod, 1989, 108-109, 111; Lane, 1973, 38, 68-69; Spufford, 2002, 19, 22).

The tide turned again to the advantage of Genoa when the Byzantines under Michael Paleologue retook Constantinople with assistance from the Genoese in 1261. The latter gained a foothold not only in Pera, but also in the Black Sea, where they established their principal colony at Caffa (Feodosiya) in the Crimea, an important market for grain and slaves. From Caffa, the Genoese also obtained other colonies in the Crimea (e.g. Cembalo (Balaklava), Soldaia, Kerch) as well as on the other side of the Strait of Kerch (Mapa (Anapa), Copa). In addition they acquired bases in Tana and Sebastopolis (Sukhumi), in Moncastro (Bilhorod-Dnistrovskyi), Kilija and Varna along the west coast, and in the southern ports Trebizond, Simisso (Samsun), Sinop and Samastri (Amasra) from the 14th century the latest. In the late 13th and early 14th century, Genoese merchants – like the Venetians – frequently travelled further eastward from their Black Sea colonies, and they even had a *funduk* in Tabriz (Abu-Lughod, 1989, 120-121; Heers, 1961, passim; Lane, 1973, 75-79, 128-131, 175, 178, 195-196, 199, 286; Spufford, 2002, 21, 291, 312, 338, 344). From the Black Sea, the Genoese also maintained connections with eastern and central Europe, especially with Lvov, Lublin, Poznán and Kraków. After the Turkish conquest of Pera in 1453, Genoese relations with Poland and Hungary via the Black Sea were temporarily restored thanks to a trade agreement with the Ottomans (Dollinger, 1970, 231; Heers, 1961, 142-144; Kellenbenz, 1985, 342, 353).

In the Aegean, the Genoese stronghold became Chios, an important source of mastic and a transhipment point for grain, eastern spices and especially alum from the mines of nearby Phocaea (Foça) on the Turkish mainland. The Genoese largely controlled the alum mines of Phocaea – the main source of alum in Europe during the late Middle Ages – from the acquisition of the alum monopoly by the Genoese Benedetto Zaccharia in the late 13th century until 1455, when Phocaea was taken by the Ottomans. The alum trade of Phocaea was handled by the *maona* of Chios, a sort of *societas a carati* mostly headed by members of the Giustiniani family, which administered the Genoese colony in Chios since 1346. In addition to Chios, a number of other islands and ports in the eastern Aegean stood at one time or another (until the 15th century) under Genoese control, including Maroneia and Enez in Thrace, and the islands Thasos, Samothrace, Imbros (Gökçeada), Lemnos, Tenedos (Bozcaada), Lesbos, Samos, and Ikaria. Connections also existed with Thessaloníki, Smyrna (Izmir) and Rhodes, a waystation towards Syria and Egypt. The Venetian bases in the Aegean and Ionian, such as Candia, Negroponte and Corfu (where still Genoese merchants resided in the early 16th century), were only used by the Genoese in times of peace with Venice (Balard, 1974, 247; Doria, 1986, 60, 80-81; Heers, 1961, passim; Hunt & Murray, 1999, 168, 180, 183; Lane, 1973, 78-79, 128; Otte, 1986, 21; Spufford, 2002, 334).

The collapse of the Mongol trade route from the Black Sea to China in the 14th century (Abu-Lughod, 1989, 128; Lane, 1973, 286) and the Ottoman advance in the eastern Mediterranean resulted in a decline of the Genoese trade in Romania. Pera, already becoming less important from the end of the 14th century, fell in 1453 (although a Genoese colony still existed here by 1558) (Doria, 1986, 80; Heers, 1961, 3; Hunt & Murray, 1999, 180). In the Black Sea, where the *Officio di San Giorgio* came in charge of the Genoese colonies after 1453, the Genoese managed to obtain certain trade privileges from the Ottomans in exchange for tribute payments, until Trebizond and Samastro were taken in 1462 and finally Caffa and Tana in 1475[95] (Edler-De Roover, 1966, 238 n. 49; Heers, 1961, 142-144, 341-342; Spufford, 2002, 412). Only Chios was left in Genoese hands until 1566, and even after it was conquered by the Turks the Genoese nation in Chios remained very active, at least up to the middle of the 17th century (Doria, 1986, 80; Heers, 1961, 145; Hunt & Murray, 1999, 237).

In Syria, the Genoese maintained their own quarters in Acre and Tyre during the 13th century, but like the Venetians they moved the centre of their activities in the Levant to Lajazzo from the end of the 13th century until the middle of the 14th century. In the course of the 14th century Beirut and Tripoli became the principal Syrian harbours for Genoese commerce, and Genoese merchants could still be found here – as well as in a number of other ports (e.g. Tyre) and inland centres such as Damascus and Aleppo – as residents in the 15th and 16th century. However, in the 14th and 15th centuries the principal Genoese stronghold in the Levant was Cyprus, which even became a Genoese colony from 1374 until 1464/89. Still in the first quarter of the 16th century, members of the Genoese Sauli family were engaged in business in Famagusta. From Cyprus, where the Genoese attempted to concentrate all commercial activity in Famagusta (and Kyrenia), especially sugar, cotton, salt and grain were imported (Balard, 1974, 252, 254-257; Doria, 1986, 80-81; Heers, 1961, 140-142, 342-343; Hunt & Murray, 1999, 183; Lane, 1973, 73-75, 83, 183-186, 199, 297-298; Mack, 2007, 159-163; Mollat, 1988, 433 n. 130; Spufford, 2002, 345). In Egypt, the Genoese were prominent at Alexandria until the end of the 14th century, but from the early 15th century the Venetians definitely took the lead in the Egyptian spice trade. Nevertheless, a Genoese consulate existed in Alexandria at least until 1521 (Doria, 1986, 80; Doumerc, 1985, 272-273; Heers, 1961, 340-341; Lane, 1973, 287; Mollat, 1988, 177).

From the late 13th century until the end of the 14th century Genoa was more or less equally powerful in the whole of the eastern Mediterranean and the Black Sea as its Venetian

[95] In Caffa, a Genoese merchant community could be found until the end of the 16th century however (Doria, 1986, 80).

rival. In the 15th century however, Genoese trade with Syria, Egypt, and Romania increasingly came in dire straits due to the final Genoese defeat by the Venetians during the War of Chioggia in 1378-1381 and the Turkish conquests in the eastern Mediterranean. Consequently, the Genoese increasingly turned their attention towards the expanding economies of western Europe. Nevertheless, the Genoese presence in the Levant and the Ottoman empire did not entirely disappear after the 15th century, and especially Chios remained a Genoese bastion in the east (Abu-Lughod, 1989, 120; Lane, 1973, 174-175, 186, 197-198, 287-288).

The Genoese not only were one of the principal trading nations in the Mediterranean, they were also pioneers in the Atlantic trade. After the defeat of Muslim forces controlling the Strait of Gibraltar in 1293, the Genoese were the first Mediterranean nation to sail directly to Flanders (already in 1277 to Damme, from 1290 to Sluis) and England as an alternative to the Champagne fairs (Abu-Lughod, 1989, 88, 121-122; Lane, 1973, 78-79; Spufford, 2002, 396; Stabel, 2001, 195). The Genoese community in the Low Countries was established in Bruges, but the Genoese also obtained privileges at the fairs of Antwerp and Bergen-op-Zoom from the early 14th century, and moreover were involved in trade in alum at Calais. Although maritime connections with Sluis became regular from ca. 1310, the Genoese presence in Bruges was not very prominent yet during most of the 14th century. In the course of the 15th century the Genoese became the most important Italian nation in Bruges however. From the end of the 15th to the beginning of the 16th century, the Genoese consulate from time to time was moved from Bruges to Antwerp (e.g. 1485, 1488-1493, 1515, 1517), until it became exclusively established in the latter city after 1522. More or less at the same time, Arnemuiden replaced Sluis as the principal harbour used by the Genoese. By the middle of the 16th century however, the Genoese increasingly made use of the overland route between Italy and Antwerp. In Antwerp – like in Bruges before – the Genoese remained the most influential of the Italian nations. During the 16th century Genoese merchants and bankers also became active at the court in Brussels, and in Tournai (De Roover, 1948b, 13-21; Doria, 1986, 93-96; Goris, 1925, 71, 75-78; Harreld, 2004, 43-44, 54, 104-105; Heers, 1961, 86, 344-345; Marechal, 1985a, 91-93, 180, 183-186, 188; Nicholas, 1979, 25; Otte, 1986, 17, 28-29; Stabel, 2001, 199, 206-207, 211-212).

In England – an important market for alum from Phocaea and dyestuffs such as madder and woad – the principal Genoese colony was established in London. However, from the late 14th century until the third quarter of the 15th century the Genoese preferred the harbour of Southampton for its good connections with the English wool producing regions in

the Cotswolds and because it allowed the Genoese to avoid the staple of London. Nevertheless, already in the 15th century the Genoese community in London was very active, and it only became more important during the 16th century (Doria, 1986, 97-99; Heers, 1961, 86; Hunt & Murray, 1999, 168, 182; Otte, 1986, 17, 28-29; Ruddock, 1949, 137, 139; Spufford, 2002, 48, 134; Stabel, 2001, 206, 211; Watson, 1961, 1088).

In the west, the Genoese became above all influential on the Iberian peninsula. The principal Genoese community here was located in Sevilla, where Genoese merchants are known to have resided permanently since the year of its reconquest from the Muslims in 1248 (although they already traded with Sevilla when it was still controlled by the Muslims). Until the end of the 14th century the Genoese nation in Sevilla was relatively modest, but from the middle of the 15th century, and especially after the discovery of America, Sevilla outstripped the other Genoese settlements in Spain. From Sevilla, the Genoese dominated the trade with the New World (controlled by the *Casa de Contratación* of Sevilla), especially in the first half of the 16th century. At the same time, they were involved in the import of European manufactures to Sevilla for re-export to America, in traffic in African slaves and New World products, and increasingly also in Spanish royal finance (Doria, 1986, 100-101; Heers, 1961, 86, 344-345; Hunt & Murray, 1999, 221-222, 237; Kellenbenz & Walter, 2001, 16; Mauro, 1990, 279-282; Otte, 1986, 17-18, 21, 28-29, 31, 33-35, 38, 42-48; Pike, 1966, passim; Spufford, 2002, 396).

The Genoese presence in the kingdom of Castile was not limited to Sevilla however. Along the coast, Genoese ships not only regularly sailed to the Aragonese ports, but by the 15th century also to La Mata (salt trade) and Cartagena, to Almería and Málaga in the Emirate of Granada, and to San Lúcar, Cádiz, Puerto de Santa María and Jerez de la Frontera, all operating as harbours for Sevilla. In most of these ports Genoese merchant communities were established, the largest of which were located in Cádiz (already in the 14th century) and Málaga. From the coast the Genoese penetrated into the inland cities, in the first place Granada and Toledo. They also settled themselves as bankers at the travelling Spanish court, increasingly during the second half of the 16th century. As a result, they could be found especially in Valladolid and from the latter part of the 16th century in Madrid, but also in Córdoba (where the court was located during the reconquest of Granada at the end of the 15th century), etc. The financial activities of these royal bankers were concentrated at the fairs of Castile, which were held twice a year in Medina del Campo, and once a year each in Medina de Ríoseco and Villalón. By the 16th century, the Genoese presence in southern and central Castile had become almost ubiquitous, not only in the above-mentioned places, but also in

Almagro, Antequera, Baeza, Conil de la Frontera, Cuenca, Guadix, Murcia, Palma del Río, Segovia, Vélez Málaga, Villanueva de la Fuente, Yecla, etc. Moreover, Genoese businessmen were involved in the distribution of alum and mercury from the mines of Mazarrón and Almadén respectively. In northern Spain, the Genoese were not so strongly represented. Nevertheless, they could be found in Burgos and in Galicia for instance (Doria, 1986, 100-103, 62 n. 21; Heers, 1961, 340-341, 344-345, 354-355; Kellenbenz & Walter, 2001, 15-18; Otte, 1986, 17-18, 20-21, 31-55; Pike, 1966, 2, 20, 48-49, 146 n. 6, 146-147 n. 7; Soly, 1974, 815-816, 819; Spufford, 2002, 309, 396, 407; Stabel, 2001, 206).

In Portugal, the Genoese nation of Lisbon had already in the early 14th century become the most outstanding Italian merchant community in the city and the country. On their way to Flanders and England Genoese ships not only stopped in Lisbon, but from time to time also in the ports of the Algarve, in Setúbal, etc. By the middle of the 15th century, Genoese merchants were involved in business all over Portugal (Doria, 1986, 103-104; Otte, 1986, 18; Rau, 1957, 717-720; Spufford, 2002, 396).

The Genoese communities in Sevilla and Lisbon became strongly engaged in trade with the Atlantic islands as well as with the New World. They were actively involved in the colonisation of the Canary Islands, where they controlled more than 50 percent of the sugar trade in the early 16th century (especially in Gran Canaria, Tenerife and La Palma). Moreover, regular exchange transactions were carried out by Genoese bankers between Sevilla and Las Palmas de Gran Canaria in the 16th century. Genoese businessmen also established themselves on Madeira, the Azores, Cape Verde, São Tomé, the Caribbean (especially Hispaniola and Puerto Rico) and Brazil, where they likewise played an important role in the production and commerce of sugar. The principal centre of activity of the Genoese in the New World was Santo Domingo. Beyond the Antilles, Genoese businessmen emigrated to Florida, Mexico, Panama, Peru and Chile (Doria, 1986, 63-64, 104-105; Hunt & Murray, 1999, 184; Kellenbenz & Walter, 2001, 18, 22; Lane, 1973, 297; Mollat, 1973, 426, 431; Otte, 1986, 23, 31, 33-34, 38, 44, 50-55; Pike, 1966, 67, 71; Rau, 1957, 720; Spufford, 2002, 309).

Dominance of the Genoese in transnational banking in the 16th century was strongly connected to their alliance since the 1520s with the Spanish Habsburg monarchy which in the 16th century ruled over large parts of Europe and the Americas. Already under Charles V the Genoese became the largest lenders to the Spanish crown, and they only strengthened their position under Philip II and after (Doria, 1986, 65, 68-72). In order to carry out exchange transactions and *asientos* for the Habsburg emperor – from the last third of the 16th century especially for the payment of the Spanish troops in the Low Countries – the Genoese

financiers were strongly represented in all the financial centres of western Europe (Lapeyre, 1953, 12-20). During the 16th century Genoese merchant-bankers were very active at the fairs of Castile, in Sevilla and at the Spanish court, in Lisbon, Lyon (where they had moved from Geneva in the second half of the 15th century), Antwerp, London, Milan, Turin, Venice, Florence, Pisa, Rome (where they monopolised the trade in alum of the mines of Tolfa and became the principal papal bankers in the second half of the 16th century), Bologna, Naples (where the Genoese merchant-bankers began taking over from the Tuscans in government banking and the silk trade when Charles V became king of Naples), Palermo and Chios (Doria, 1986, 84-92, 96-97; Goris, 1925, 395; Otte, 1986, 28-29, 31, 33, 35. For Lyon: Gascon, 1971, 244, 250-251, 359-366; Lapeyre, 1955, 129; Mauro, 1990, 264-265. Geneva: Bergier, 1957, 888, 891-893. Rome and Naples: Goldthwaite, 2009, 45; Guidi Bruscoli, 2007, xxii-xxiii, 4, 19, 22, 32. Venice: Lane, 1973, 328, 331). Moreover, representatives of the Genoese bankers followed the court of Charles V to Frankfurt am Main, Nürnberg, Speyer, Regensburg, Augsburg, Metz and Innsbruck in the German empire[96] (Doria, 1986, 96; Kellenbenz, 1985, 349-351).

Table 3.7
Total business values across four 15th-century Genoese firms according to different scoring systems*

R**	City	C^9_i	City	C^5_i	City	C^4_i	City	C^2_i
1	Genoa	28	Genoa	14	Genoa	11	Genoa	4
2	Sevilla +	14	Sevilla +	7	Sevilla +	6	Sevilla	3
3	Bruges	10	Bruges	6	Bruges	5	Barcelona	2
4	Lisbon	10	Chios	6	Chios	5	Bruges	2
5	Valencia +	9	Geneva	6	Valencia +	5	Chios	2
6	Chios	8	Lisbon	6	Barcelona +	4	London	2
7	London	8	Rome	6	Geneva	4	Milan	2
8	Geneva	7	Valencia +	6	Lisbon	4	Toledo	2
9	Rome	7	Barcelona +	4	London	4	Valencia	2
10	Barcelona +	6	Constantinople	4	Milan	4		
11	Milan	6	Florence	4	Rome	4		
12	Toledo +	6	London	4	Toledo +	4		
13			Milan	4				
14			Toledo +	4				

+ Spanish cities are possibly slightly underestimated in the table as a result of overlap with the category Spain, which has a total business value C^9_i (Spain) = 1; C^5_i (Spain) = 1; C^4_i (Spain) = 1.
* The table includes all cities that have at least one-fifth of the highest total business value (Genoa's) according to the nine-point scale scoring system (for C^9_i). For total business values according to the other scoring methods more or less equivalent thresholds have been chosen.
** R: Rank.

[96] Moreover, in the course of the 16th century Genoese merchants were also active in Hamburg, Lübeck, Emden, Danzig, Basel, Luzern, Vienna and especially Cologne, whereto several German merchants moved from Antwerp during the revolt against Spain (Doria, 1986, 96-97).

Table 3.8
Connectivity across the networks of six 16th-century Genoese firms according to different scoring systems*

R**	City	P^9_a	City	P^5_a	City	P^4_a	City	P^2_a
1	Genoa	1	Genoa	1	Genoa	1	Genoa	1
2	Sevilla	0.65	Sevilla	0.70	Sevilla	0.74	Antwerp	1
3	Rome	0.61	Rome	0.63	Antwerp	0.71	Rome	1
4	Antwerp	0.56	Valencia	0.61	Rome	0.71	Lyon	0.95
5	Valencia	0.52	Antwerp	0.58	Valencia	0.69	Sevilla	0.95
6	Granada	0.50	Granada	0.57	Lyon	0.67	Valencia	0.95
7	Lyon	0.48	Lyon	0.52	Granada	0.62	Venice	0.82
8	Venice	0.46	Venice	0.52	Venice	0.62	Granada	0.79
9	Naples	0.45	Naples	0.51	Naples	0.61	Naples	0.78
10	Palermo	0.42	Madrid	0.46	Milan	0.56	Palermo	0.78
11	Valladolid	0.40	Valladolid	0.43	Palermo	0.55	Madrid	0.72
12	Madrid	0.40	Barcelona	0.43	Madrid	0.54	London	0.68
13	Milan	0.36	Milan	0.43	London	0.52	Barcelona	0.67
14	London	0.34	London	0.42	Barcelona	0.52	Florence	0.66
15	Florence	0.34	Palermo	0.42	Florence	0.49	Livorno	0.66
16	Lisbon	0.33	Lisbon	0.41	Lisbon	0.48	Messina	0.66
17	Messina	0.33	Florence	0.37	Livorno	0.44	Milan	0.66
18	Medina d. Campo	0.32	Alicante	0.37	Messina	0.44	Pisa	0.66
19	Barcelona	0.31	Livorno	0.33	Pisa	0.44	Lisbon	0.62
20	Alicante	0.28	Messina	0.33	Valladolid	0.43	Valladolid	0.59
21	Pisa	0.28	Pisa	0.33	Alicante	0.39	Bologna	0.51
22	Livorno	0.27	Medina d. Campo	0.33	Bologna	0.34	Cádiz	0.51
23	Bologna	0.23	Nürnberg	0.31	Cádiz	0.34	Marseille	0.51
24	Turin	0.22	*Canary Islands****	0.30	Marseille	0.34	Turin	0.51
25	Marseille	0.22			Turin	0.34	Alicante	0.46
26	Santo Domingo	0.20			Nürnberg	0.34	Cologne	0.46
27					Cologne	0.30	Piacenza +	0.46
28					Piacenza +	0.30	Toledo	0.46
29					Toledo	0.30		

+ The connectivity of the fairs of Genoa, which were originally mostly held in Besançon and later especially in Piacenza, can be calculated as the sum of the connectivities of Besançon and Piacenza: P^9_a (fairs of Genoa) = 0.28; P^5_a (fairs of Genoa) = 0.33; P^4_a (fairs of Genoa) = 0.44; P^2_a (fairs of Genoa) = 0.66.
* The table includes all cities that have at least one-fifth of the highest connectivity (Genoa's) according to the nine-point scale scoring system (for P^9_a). For connectivities according to the other scoring methods more or less equivalent thresholds have been chosen.
** R: Rank.
*** *Canary Islands (italics)*: Less precise geographical designations.

As a result of their alliance with Spain, the Genoese were temporarily forbidden to do business in France (especially at the fairs of Lyon) between 1528 and 1541[97]. They left to Montluel and Chambéry in Savoy, and from 1535 to the fairs of Besançon in Habsburg territory, which were favoured by Charles V in order to compete with the fairs of Lyon. The

[97] Nevertheless, during the 16th century Genoese merchants were not only present in Lyon and at the Mediterranean coast of France, but also in places as Paris (already in the 14th and 15th centuries), Rouen, Tours, Roanne, and Le Mans (Doria, 1986, 93; Mirot, 1928, 333).

Besançon fairs – increasingly held elsewhere from 1569[98], and especially in Piacenza after 1579 – were completely dominated by Genoese bankers (Doria, 1986, 72-74, 91, 93; Gascon, 1971, 361; Kellenbenz, 1990, 451-452; Lapeyre, 1955, 284; Otte, 1986, 35).

The firm data are more or less in accordance with this general picture of the Genoese business network. The top cities in terms of total business value for 15th-century Genoese enterprises are given in table 3.7 (see also fig. 3.4). The reconstructed networks of these firms mostly cover the second half of the 15th century, and consequently there is a clear bias towards western European cities in the table (especially Spanish cities, but also Lisbon, Bruges, London, Geneva, Rome, Milan,…), while the centres of Genoese commerce in the east (Chios, Pera,…) and along the Barbary coast are somewhat undervalued.

Firm data for the 16th century are more balanced and reliable, and consequently connectivities can be calculated without too many distortions (table 3.8)[99]. Not surprisingly, Spanish (Sevilla, Valencia, Granada,…) and Italian centres (Rome, Venice, Naples,…) are well represented among the cities with high connectivity scores, as well as Antwerp, Lyon, London, Lisbon and Marseille. But also with the Atlantic Islands and the New World (Santo Domingo), as well as with the German empire (Cologne, Nürnberg), Genoese firms appear to have maintained rather regular connections during the 16th century.

Florentines

With the exception of Pisa, documentation about the involvement in international business of the inhabitants of most of the cities of Tuscany only becomes available from the 13th century (Goldthwaite, 2009, 28). By 1300 Florence had become by far the largest among the Tuscan cities (database of Bosker *et al*., 2008), and Florentine political and economic dominance over the other Tuscan centres was consolidated in the 15th century, when most of the latter were incorporated in the Grand Duchy of Tuscany (Belfanti, 2001, 294-297). The commercial and financial rise of Florence was made possible by the decline of Siena and Pisa at the end of the 13th century. Siena had been one of the most important banking centres of Europe around the middle of the 13th century, but it began to fade away by the end of the century. The Gran Tavola dei Bonsignori, the largest Sienese company, went bankrupt in 1298, followed by the

[98] The fairs of Besançon took place in Chambéry in 1569-1571, in Poligny in 1571-1572, in Trento in 1573, in Chur in 1576, in Rivoli in 1577, in Ivrea in 1578, in Asti in 1579 and 1582, and in La Spezia in 1588 (Lapeyre, 1955, 284).
[99] For total business values, see fig. 3.5.

Tolomei in 1313. Although individual Sienese businessmen such as Agostino Chigi, papal banker and farmer of the alum mines of Tolfa in the early 16th century, still rose to prominence from time to time, Sienese trade and banking as a whole did not play a central role anymore after the end of the 13th century (De Roover, 1963, 2; Goldthwaite, 2009, 29; Spufford, 2002, 16. About the Bonsignori: De Roover, 1948b, 10; Hunt, 1994, 38, 47; Hunt & Murray, 1999, 102, 253 n. 11. About Chigi: Ehrenberg, 1928, 195, 221; Guidi Bruscoli, 2007, xvii, 10, 169; Soly, 1974, 803-807). Pisa, an important mercantile power in the eastern Mediterranean since the first crusade, was decisively defeated by the Genoese in 1284 (Abu-Lughod, 1989, 105-106, 120-121; Goldthwaite, 2009, 29; Lane, 1973, 31-32, 73, 78-79; Spufford, 2002, 173). Consequently, no Pisan or Sienese firms have been incorporated in the firm sample.

Lucca on the other hand was an important centre of silk production and home to several considerable merchant-banking houses all through the late Middle Ages and the 16th century. In the 13th century, Lucchese merchants played an active role at the fairs of Champagne. In 1369, when Lucca gained independence from Pisa, the Lucchese magistrate granted the Lucchese merchant-bankers already established in Venice, Bruges, Paris and London the right to establish their own nations. As papal bankers the Lucchese were involved in business in Avignon and later in Rome. Although they never became as important as the Florentines in the sphere of papal finance, their financial operations for the Church nevertheless brought them as far as Cologne, the Baltic and Scandinavia. In the 15th century they also were prominent at the fairs of Geneva, from where they later moved to Lyon. In the Low Countries, the Lucchese nation definitively was transferred from Bruges to Antwerp in the early 16th century (ca. 1515/20). In Antwerp as well as in Lyon, Lucchese businessmen played a prominent role during the 16th century (Ehrenberg, 1928, 226; Goldthwaite, 2009, 29. Antwerp and Bruges: De Roover, 1948b, 13, 17-20; Goris, 1925, 71, 80; Harreld, 2004, 54, 85-87; Lambert, 2006, 15, 24, 51-52, 51 n. 127; Marechal, 1985a, 183-188, 258 n. 29-30, 263 n. 102; Stabel, 2001, 199, 211-212. Avignon: Renouard, 1941, 107. Cologne: Kellenbenz, 1985, 337-339. Geneva: Bergier, 1957, 891. London: Goldthwaite, 1973; Spufford, 2002, 134. Lyon: Gascon, 1971, 244, 250-251, 359-361; Lapeyre, 1955, 124; Mauro, 1990, 264-265. Paris: Lambert, 2006, 38, 51. Rome: Bullard, 1980, 95. Venice: Lane, 1973, 328).

The above picture of the Lucchese nation is for the most part confirmed by the spatial strategies of the five Lucchese firms included in the business value matrix, especially for the 14th century. The 16th-century Lucchese firms (Balbani and Bonvisi) had very extensive networks connecting financial and commercial centres all across western Europe (including

the Iberian peninsula), and also penetrating into Germany. The Lucchese firms did not produce a distinct component cluster however. All three 14th-century Lucchese firms incorporated in the firm sample load on a factor which mostly consists of Florentine firms of the 14th and 15th century, while one out of the two Lucchese firms of the 16th century belongs to a category mostly including 16th-century Florentine firms (see table 3.1). One explanation could be that Lucchese businessmen filled in the gaps in the European banking network left by the Florentines after the wave of bankruptcies in Florence in the 1340s as well as in the 16th century, when the Florentine network experienced a contraction (see below) (for the Florentines and Lucchese in the Low Countries, see Prevenier & Blockmans, 1986, 123-126). Because of this similarity in spatial strategy between Lucchese and Florentine firms, I will not discuss the Lucchese nation in detail here. Instead, the remainder of this section will focus upon the network of the Florentines, who formed the most important of the Tuscan nations from the 14th to the 16th century[100].

In contrast to Venice and Genoa, data about individual business enterprises of Florence are abundant. The Florentines indeed have left behind by far the most impressive business archives of all late medieval nations (Goldthwaite, 1968, 3-8, 26-28; Id., 2009, 34). With 25 firms, Florence is very well represented in the business value matrix, and many more firms could have been added on the basis of the available source material. Among the reasons for this are the size and stability of Florentine business organisations, which often existed for several generations, as well as the typical preoccupation of Florentines with the systematical recording of their private wealth (Goldthwaite, 1968, 28). Not surprisingly, Tuscan firms (not only including 25 Florentine enterprises, but also five Lucchese and one Pistoiese company) make up two major components in the twelve component solution (respectively component one and component five for 14th- and 15th-century companies and for 16th-century firms, see tables 3.1 and 3.4), and as such they are overrepresented in the firm sample. Nevertheless, their importance can hardly be overstated: while the Venetians and the Genoese concentrated much of their business activities in the eastern Mediterranean, the Florentines – abroad especially engaged in trade, banking and government finance – disposed of the most extensive commercial and banking network of western Europe during the 14th and 15th centuries (Goldthwaite, 2009, 28, 37).

The Florentine network was anchored upon the major commercial and financial nodes of the European world-economy, but with some peculiarities resulting from three different

[100] In Bruges, several other Tuscan merchants, such as those from Pisa and Pistoia, even fell under the jurisdiction of the consulate of the Florentine nation by the end of the Middle Ages (Marechal, 1985a, 217).

processes: firstly, the need to provision the growing population of the city with grain (especially before the outbreak of the plague in the middle of the 14th century); secondly, the search for always changing markets for the supply of raw materials as well as for the sale of the finished products of the important Florentine woollen and silk cloth industries; and thirdly, the establishment of the Florentines as the prime papal bankers (the first two of these processes have been taken directly from Goldthwaite, 2009, 38-42, while for the Florentine role in papal finance I refer especially to Renouard, 1941 and Guidi Bruscoli, 2007). In his recent synthesis on the Florentine economy in the late Middle Ages and the 16th century, Richard Goldthwaite (2009, 42-48) distinguished four successive and partly overlapping phases in the evolution of this Florentine network, which are confirmed by the firm data (see tables 3.9, 3.10 and 3.11).

In a first phase, up to the middle of the 13th century, the Florentine economy began to reach beyond the immediate region of the city to central and northern Italy and the western Mediterranean (including the islands and north Africa) in search for grain and for supply and outlet markets for the developing woollen industry. Already in this early period, Florentine connections with the eastern Mediterranean went through Venice, which remained an important node in the Florentine network until the 16th century, not only as a gateway to the Levant, but also as the largest market for bullion in Europe, and as such of crucial importance for the Florentine bankers. Nevertheless, Florentine dependence upon Venice as a harbour was limited by the use of alternative maritime networks, especially those of Genoa and Barcelona (Goldthwaite, 2009, 38-43. For Venice, see also Lane, 1973, 328, 331).

The second stage, from the mid-13th to the mid-14th century, witnessed the geographical expansion of the network to its maximal extent, which is represented in table 3.9 (although this table also includes four firms from the second half of the 14th century, the six firms representing the period up to the 1340s were much larger and consequently weigh more strongly on the connectivities). Just like other Italians, the Florentines began operating as intermediaries between the Mediterranean and north-western Europe, firstly via the fairs of Champagne, but from the late 13th century through direct presence in Bruges and London. Originally, Flemish cloth was purchased here for resale (often after finishing in Florence) in the south and the eastern Mediterranean, but increasingly north-western Europe became a supply market of English wool for the growing Florentine cloth industry. Up to the 1340s, Florentine bankers also played a central role in English royal finance. Simultaneously southern Italy was drawn into the Florentine network, especially as a supply area of grain (with Barletta as principal grain port). In Naples the Florentines were moreover involved in

banking and government finance, and in Rome as well they had obtained a firm footing by the 14th century. As papal bankers, many Florentines however followed the Roman Curia to Avignon between 1309 and 1378 (Goldthwaite, 2009, 39, 41, 43. For Avignon: Origo, 1963, 34; Renouard, 1941, 107-112. Barletta: Hunt, 1994, 49. Bruges: Stabel, 2001, 211. Rome and Naples: Guidi Bruscoli, 2007, 3-5, 32).

Table 3.9
Connectivity across the networks of ten 14th-century Florentine firms according to different scoring systems*

R**	City	P^9_a	City	P^5_a	City	P^4_a	City	P^2_a
1	Florence	1	Florence	1	Florence	1	Florence	1
2	Avignon	0.78	Avignon	0.75	Avignon	0.68	Avignon	1
3	Genoa	0.71	Genoa	0.73	Genoa	0.66	Genoa	0.97
4	Bruges	0.69	Venice	0.68	London	0.66	London	0.97
5	Naples	0.69	London	0.66	Bruges	0.65	Bruges	0.97
6	London	0.68	Naples	0.65	Paris	0.65	Paris	0.97
7	Paris	0.65	Bruges	0.65	Naples	0.64	Naples	0.94
8	Venice	0.64	Paris	0.64	Venice	0.63	Bologna	0.93
9	Pisa	0.61	Pisa	0.64	Bologna	0.63	Venice	0.93
10	Bologna	0.58	Bologna	0.62	Pisa	0.60	Pisa	0.90
11	Barletta	0.52	Barletta	0.53	Perugia	0.53	Perugia	0.77
12	Palermo	0.48	Perugia	0.45	Barletta	0.49	Rome	0.66
13	Perugia	0.45	Palermo	0.43	Rome	0.47	Barletta	0.63
14	*Mallorca**** [+]	0.39	Tunis	0.43	Palermo	0.43	Palermo	0.63
15	Rome	0.38	Rome	0.42	Montpellier [+++++]	0.41	Nice	0.61
16	Barcelona	0.38	Barcelona	0.39	Nice	0.41	Montpellier [+++++]	0.60
17	Tunis	0.38	*Mallorca* [+]	0.39	Barcelona	0.39	Barcelona	0.57
18	Rhodes	0.37	Rhodes	0.38	Milan	0.36	*Mallorca* [+]	0.52
19	Constantinople [++]	0.32	Constantinople [++]	0.37	Rhodes	0.35	Marseille [++++]	0.49
20	Ancona	0.29	Nice	0.35	Tunis	0.35	Milan	0.47
21	Nice	0.29	Ancona	0.34	Marseille [++++]	0.34	Rhodes	0.43
22	Milan	0.28	Cagliari	0.33	*Mallorca* [+]	0.34	Tunis	0.43
23	Famagusta [+++]	0.27	Milan	0.33	Constantinople [++]	0.34	Constantinople [++]	0.40
24	Cagliari	0.27	Montpellier [+++++]	0.30				
25	Marseille [++++]	0.25						
26	Montpellier [+++++]	0.25						

The following cities/locations are possibly underestimated in the table as a result of overlaps with other places, which are given with their connectivities below:
[+] Mallorca: P^9_a (Palma de Mallorca) = 0.15; P^5_a (Palma de Mallorca) = 0.16; P^4_a (Palma de Mallorca) = 0.16; P^2_a (Palma de Mallorca) = 0.21. Consequently, the aggregate connectivity for Mallorca and Palma de Mallorca for the respective scoring scales is 0.54 (P^9_a), 0.55 (P^5_a), 0.49 (P^4_a), 0.73 (P^2_a).
[++] Constantinople: P^9_a (Romania) = 0.11; P^5_a (Romania) = 0.10; P^4_a (Romania) = 0.08; P^2_a (Romania) = 0.12.
[+++] Famagusta: P^9_a (Cyprus) = 0.08.
[++++] Marseille: P^9_a (Provence) = 0.10; P^4_a (Provence) = 0.15; P^2_a (Provence) = 0.23.
[+++++] Montpellier: P^9_a (Languedoc) = 0.06; P^5_a (Languedoc) = 0.07; P^4_a (Languedoc) = 0.08; P^2_a (Languedoc) = 0.12.
* The table includes all cities that have at least one-fifth of the highest connectivity (Florence's) according to the nine-point scale scoring system (for P^9_a). For connectivities according to the other scoring methods more or less equivalent thresholds have been chosen.
** R: Rank.
*** *Mallorca (italics)*: Less precise geographical designations.

As a result, around 1300 Florentine merchants were found throughout Italy, in the Levant, across the western Mediterranean from Provence and Spain to north Africa (with Florentine merchant communities in the major Barbary ports), and in north-western Europe in France (with a consulate in Paris), the Low Countries and England. Some even ventured into Germany and eastern Europe. The early 14th century was the period of the Florentine super-companies (Scali, Bardi, Peruzzi, Acciaiuoli), the largest business enterprises of medieval Europe. The bankruptcy of these super-companies as well as of many other Florentine merchant-banking enterprises during the 1340s (the Scali already went into liquidation in 1326) and the outbreak of the plague signalled the end of this period of expansion of the Florentine network (Ehrenberg, 1928, 194; Goldthwaite, 2009, 41; Hunt, 1994. For Barbary: Spufford, 2002, 20-21. Paris: Renouard, 1938, 171; Id., 1941, 63). Table 3.9, which also shows the strong Florentine links with cities in the Papal States (Bologna, Perugia, Ancona) nicely confirms this picture of the early 14th-century Florentine network.

During the third – and probably most vigorous – phase, spanning the second half of the 14th and the whole of the 15th century (see table 3.10), Florentine trade across the western Mediterranean intensified and extended as far as Lisbon in the Atlantic. Along the coast Florentine merchant-bankers were found e.g. in Naples, Marseille, Montpellier, Barcelona and Valencia, but they also penetrated inland into southern France (with Avignon and later Lyon) and the Iberian peninsula, although less prominently than the Genoese. Towards the eastern Mediterranean (where privileges were obtained from the Mamluks in Alexandria for instance), a trade route was developed via Ancona and Ragusa during the second half of the 15th century. On the other hand, London became less important as a market for wool, which was increasingly supplied from central Italy (especially Abruzzo), while raw silk for the expanding Florentine silk industry came from central and southern Italy, Spain and the Levant. The growing capital cities Rome (where the Florentines dominated the papal finances in the 15th century) and Naples with their high demand for luxuries, as well as Constantinople and – towards the end of the 15th century – Nürnberg (a gateway to Germany and central Europe, where Florentine merchants could be found e.g. in Cologne, Lübeck, Prague, Kraków, Buda and elsewhere in Hungary, as well as during the councils of the Church in Konstanz (1414-1418) and Basel (1431-1443)) became important markets for the Florentine textiles. As the leading bankers of Europe, the Florentines played a central role in the development of the fairs of Geneva into an international exchange market in the first half of the 15th century, followed by Lyon later in the century. Both were also outlets for Florentine silks, just like Spain, London, and Bruges (Ehrenberg, 1928, 195, 202-203; Goldthwaite,

2009, 39-44. About Alexandria: Wansbrough, 1965, 483-485. Barcelona: Murray, 2005, 232-233. Bruges, see De Roover, 1948b, 13, 17, 19-21; Guidi Bruscoli, 2006, 1-2; Lambert, 2006, 14; Marechal, 1985a, 63, 91-93, 114, 188, 258 n. 29-30; Stabel, 2001, 199, 213. Buda: Arany, 2006, 2-3, 6-7; Spufford, 2002, 374-375. Central Europe: Kellenbenz, 1985, 339-348. Geneva and Lyon: Bergier, 1957, 888, 891-892; De Roover, 1963, 300; Gascon, 1971, 359. Lisbon: Otte, 1986, 18; Rau, 1957, 717-720. London: Sicca, 2002, 175, 186-187; Spufford, 2002, 134. Lübeck: De Roover, 1963, 64. Rome: Bullard, 1980, 92-95; Id., 2003, 24; Guidi Bruscoli, 2007, 5-10; Jacks & Caferro, 2001, 263, 395 n. 1).

After the Florentine conquest of Pisa in 1406 and the acquisition of the harbours of Porto Pisano and Livorno in 1421, Florence obtained direct access to the sea. In imitation of Venice, Florence launched its own regular galley services from Porto Pisano to the western and eastern Mediterranean and north-western Europe from 1422, which were auctioned to private entrepreneurs. In 1480 the galley system was abandoned however because of strong competition and a lack of competent crew (Goldthwaite, 2009, 42-44; Hunt & Murray, 1999, 181-182; Lane, 1973, 339; Spufford, 2002, 173, 402; Stabel, 2001, 195; Watson, 1961). The routes of the Florentine galleys as they were laid down in 1447 have been reconstructed by Michael Mallett (1967, map 2; for the galleys to Flanders and England see also Watson, 1961 and Ruddock, 1949, 137, 140). In that year galleys sailed to Alexandria (on the way back also making stops in Jaffa (present-day Tel Aviv), Beirut, Famagusta, Rhodes, Chios, Candia, and Modon), Constantinople (with stops at Modon, Negroponte, Gallipoli (now Gelibolu), and returning via Chios and Rhodes), Catalonia (halting at Nice, Marseille, Port-de-Bouc, Aigues-Mortes, Collioure, Barcelona, Palma de Mallorca, and Valencia, and after returning making a second leg to Sicily), Flanders and England (via Port-de-Bouc, San Feliú de Guixols, Palma de Mallorca, Valencia, Denia, Jávea, Villajoyosa, Alicante, Almería, Málaga, Cádiz, Lisbon and La Coruña, to Sluis, Sandwich and especially Southampton, where English wool was loaded), and Barbary (one route via the southern French and eastern Iberian harbours to Bona, Béjaïa, Dellys, Alger and Oran, another via Sicily to Tunis and Tripoli). The galleys of Alexandria, Constantinople, Tunis and Catalonia-Sicily made regular stops in several Tyrrhenian (Talamone, Civitavecchia, Gaeta, Naples, Castellammare di Stabia, Salerno) and Sicilian harbours (Castellammare del Golfo, Trapani, Palermo, Messina, Siracusa).

Table 3.10, which shows strong similarities with table 3.9, again reflects relatively well the above description of the spatial strategy of the Florentine nation between ca. 1350 and ca. 1500. Striking is that Avignon, despite the removal of the popes to Rome, appears to have maintained a relatively strong position in the network during the 15th century. The

absence of eastern Mediterranean and north African harbours (except Rhodes) from the table may be resulting from a bias in the firm selection. The list of articulating and primary field cities of the first component (see table 3.5) also gives a relatively good picture of the second and third phases in the evolution of the Florentine network. The high component scores of Avignon and Paris are due to the fact that other nations were particularly less important here than the Florentines.

Table 3.10
Connectivity across the networks of ten 15th-century Florentine firms according to different scoring systems*

R**	City	P^9_a	City	P^5_a	City	P^4_a	City	P^2_a
1	Florence	1	Florence	1	Florence	1	Florence	1
2	Rome	0.73	Venice	0.75	Bruges	0.77	Barcelona	0.95
3	Bruges	0.72	Bruges	0.74	Barcelona	0.75	Bruges	0.95
4	Venice	0.71	Rome	0.72	Valencia	0.75	Valencia	0.95
5	Barcelona	0.65	Barcelona	0.71	Venice	0.74	London	0.90
6	Valencia	0.62	Valencia	0.68	Rome	0.73	Rome	0.90
7	London	0.60	London	0.67	London	0.71	Venice	0.90
8	Avignon	0.57	Pisa	0.64	Bologna	0.66	Avignon	0.80
9	Pisa	0.57	Bologna	0.62	Avignon	0.65	Bologna	0.80
10	Bologna	0.53	Avignon	0.62	Pisa	0.63	Genoa	0.75
11	Genoa	0.51	Montpellier	0.59	Montpellier	0.62	Montpellier	0.74
12	Montpellier	0.50	Genoa	0.55	Milan	0.61	Pisa	0.74
13	Milan	0.50	Milan	0.54	Genoa	0.60	Milan	0.69
14	Geneva	0.44	Naples	0.50	Naples	0.58	Naples	0.69
15	Naples	0.41	Palermo	0.47	Siena	0.56	Geneva	0.67
16	Palermo	0.39	Geneva	0.47	Geneva	0.53	Siena	0.65
17	Lyon	0.37	Lyon	0.46	Palermo	0.51	Gaeta	0.55
18	Paris	0.33	Siena	0.42	Ferrara	0.48	Palermo	0.55
19	Basel	0.32	Ferrara	0.40	Paris	0.45	Ferrara	0.54
20	Ferrara	0.31	Gaeta	0.38	Perugia	0.45	Paris	0.52
21	Siena	0.31	Lisbon	0.38	Lyon	0.43	Perugia	0.51
22	Gaeta	0.31	Paris	0.37	Gaeta	0.43	Basel	0.47
23	Perugia	0.28	Basel	0.36	Lisbon	0.41	Lyon	0.38
24	Lisbon	0.25	Perugia	0.34	Rhodes	0.37	Antwerp	0.38
25	Palma de Mallor.	0.24	Cologne	0.32	Basel	0.37	Cologne	0.37
26	Cologne	0.24	Sevilla	0.31	Cologne	0.34	Rhodes	0.37
27	Prato	0.23	Parma	0.30	Antwerp	0.33	Lisbon	0.36
28	Ancona	0.21	Ancona	0.30	Lucca	0.31	Lucca	0.36
29	Rhodes	0.21					Perpignan	0.31
30	Lucca	0.20					Palma de Mallor.	0.30
31	Antwerp	0.20						
32	Ibiza	0.20						

* The table includes all cities that have at least one-fifth of the highest connectivity (Florence's) according to the nine-point scale scoring system (for P^9_a). For connectivities according to the other scoring methods more or less equivalent thresholds have been chosen.
** R: Rank.

The fourth stage saw the contraction of the Florentine network, which especially took place during the 16th century (see table 3.11). In this period the Florentines did not manage to find their own niche in the rapidly expanding European economy, nor did they succeed in

facing the growing competition from other nations entering the sphere of western European commerce and banking, especially the Genoese and the southern Germans. Both had – differently from the Florentines – access to large amounts of bullion (respectively from the New World and from Tirol and eastern Europe), as well as strong connections with the Habsburg emperors who in the 16th century ruled over large parts of Europe and needed the support of powerful bankers to fund their expensive military campaigns. The Florentines on the other hand were drawn into the European power struggle through their growing alliance with France. Moreover, the Genoese benefited from their stronger presence since the 14th century in the Iberian peninsula to catch the opportunities offered by the unification of Spain and the discovery of America. In Italy itself the Genoese increasingly competed with the Florentines in Rome (where the latter had increased their grip on papal finances even further under the Medici popes in the early 16th century) and Naples, while at the end of the century the Genoese fairs of Piacenza had become more important as exchange markets than the fairs of Lyon, where the Florentines since the 15th century occupied a prominent position. At the same time the Florentine silk industry had to compete more and more with those of other Italian cities. On the other hand, the Florentine *rascia*, a new type of woollen cloth produced from Castilian wool, was initially successful, but its production declined rapidly after 1600. Moreover, the supply of Spanish wool to Florence was in hands of Castilian rather than Florentine merchants (Bullard, 1980, 13-17, 94; Ehrenberg, 1928, 196; Goldthwaite, 1968, 235-251; Id., 1998, 489-490; Id., 2009, 39-42, 44-46; Guidi Bruscoli, 2007, xxii-xxiii, 9-22, 32).

As a result, the Florentine business network shrunk during the 16th century, and exclusive of Lyon (from where several Florentine bankers moved to the royal court at Paris), Florentine presence became increasingly limited to Italy. With the exception of Castilian wool, raw materials for the Florentine textile industries in the 16th century were almost exclusively obtained in Italy itself. Sales of Florentine textiles as well became confined to a smaller area, and the eastern Mediterranean market was gradually lost to Venice and other competitors from the early 16th century. England as well disappeared as a major node in the Florentine network by the end of the 15th century. Florentine silks and *rascia* still found an outlet in Spain, Lyon, Antwerp, and central and eastern Europe (via Nürnberg connections were maintained with Frankfurt am Main, Leipzig, Augsburg, Lübeck, Wrocław, Kraków, Prague, Vienna, Buda, etc.), but sales were more and more concentrated in Italy itself, especially after 1600 when northern Europe was lost as a market for Florentine woollens. Nevertheless, Florentine merchants and bankers continued to show up in many important

economic centres, including the new financial centres at Antwerp (whereto the Florentines moved from Bruges in the early 16th century) and the fairs of Besançon-Piacenza, as well as Sevilla. Although the development of Livorno as one of the most important free ports of the Mediterranean during the 16th century – attracting many foreign ships, including those of the Dutch, English and French entering the Mediterranean in the late 16th century – further reduced the active role of Florentine businessmen, still at the end of the 16th century the latter can be found re-exporting grain from northern Europe via Livorno to Marseille, Bologna, Sicily, etc. Moreover, despite the shrinkage of the network, the scale of operation of several Florentine firms of the late 16th century exceeded that of those from the 15th century in terms of investments (Ehrenberg, 1928, 201, 218; Goldthwaite, 1998, 489-490; Id., 2009, 39-41, 47-48. Antwerp: Goris, 1925, 71, 78-80; Harreld, 2004, 54, 85-87; Marechal, 1985a, 183-188. Central Europe: Kellenbenz, 1954, 268; Id., 1985, 351-355; Seibold, 1977b, 11. Lyon: Gascon, 1971, 242-251, 358-361, 364; Lapeyre, 1955, 124; Mauro, 1990, 264. Sevilla: Kellenbenz & Walter, 2001, 34; Mauro, 1990, 281).

Table 3.11
Connectivity across the networks of seven 16th-century Florentine firms according to different scoring systems*

R**	City	P^9_a	City	P^5_a	City	P^4_a	City	P^2_a
1	Florence	1	Florence	1	Florence	1	Florence	1
2	Rome	0.83	Rome	0.91	Rome	0.94	Rome	1
3	Antwerp	0.68	Venice	0.77	Venice	0.80	Venice	0.92
4	Lyon +	0.67	Antwerp	0.74	Antwerp	0.76	Antwerp	0.90
5	Venice	0.65	Lyon +	0.67	Lyon +	0.68	Lyon +	0.80
6	Naples	0.64	Naples	0.66	Naples	0.59	Naples	0.68
7	Sevilla	0.44	Sevilla	0.52	Valladolid	0.53	Valladolid	0.63
8	Valladolid	0.34	Medina d. Campo	0.46	Medina d. Campo	0.50	Medina d. Campo	0.58
9	Pisa	0.33	Bari ++	0.43	Burgos	0.46	Burgos	0.56
10	Bari ++	0.33	Valladolid	0.42	Sevilla	0.46	Sevilla	0.52
11	Medina d. Campo	0.32	Pisa	0.41	Bologna	0.43	Bologna	0.50
12	Bologna	0.28	Burgos	0.36	Bari ++	0.35	Bari ++	0.38
13	Burgos	0.26	Bologna	0.35	Marseille +	0.35	Marseille +	0.38
14	Palermo +++	0.25	Marseille +	0.33	Pisa	0.35	Palermo +++	0.35
15	Ferrara	0.23	Palermo +++	0.30			Pisa	0.35
16	Marseille +	0.22						

The following cities are possibly underestimated in the table as a result of overlaps with other places, which are given with their connectivities below:
+ Lyon, Marseille: P^9_a (France) = 0.07; P^5_a (France) = 0.10; P^4_a (France) = 0.15; P^2_a (France) = 0.20.
++ Bari: P^9_a (Puglia) = 0.07; P^5_a (Puglia) = 0.09; P^4_a (Puglia) = 0.11; P^2_a (Puglia) = 0.14.
+++ Palermo: P^9_a (Sicily) = 0.14; P^5_a (Sicily) = 0.20; P^2_a (Sicily) = 0.25.
* The table includes all cities that have at least one-fifth of the highest connectivity (Florence's) according to the nine-point scale scoring system (for P^9_a). For connectivities according to the other scoring methods more or less equivalent thresholds have been chosen.
** R: Rank.

The contraction of the Florentine network in the 16th century appears clearly from table 3.11. Lyon (and perhaps Paris) as well as Nürnberg and Piacenza may be underrepresented as a result of an imbalance in the selection of firms, while Spanish cities appear to be somewhat overestimated. The differences between table 3.11 and the previous two tables are striking. The new focus upon Lyon, Antwerp and the Spanish market, as well as upon Italy itself is not only visible in the table below, but also in table 3.5 (articulating and primary field cities of component five).

Catalans

Nothwithstanding their central role in late medieval European trade, the Italian nations were not the only Latin Christian merchant nations of the Mediterranean. More towards the east, Ragusa competed with Venice in trade with the eastern Mediterranean[101] (Lane, 1973, 290, 302). In the western Mediterranean, merchants from Provence and Languedoc participated in the Mediterranean east-west commerce as well. In Alexandria for instance, traders from Narbonne, Montpellier, Marseille and Avignon were from time to time represented by a consul (often the same consul for all southern French merchants) (Doumerc, 1985). The business value matrix contains one 16th-century firm from Marseille (the enterprise of the brothers Hermite), and also Jacques Coeur, a businessman from Bourges and the largest merchant of France during the 15th century, made a very active use of this French Mediterranean network[102]. Nevertheless, I will not go further into this subject, since for most of the period under consideration the active trade of the Mediterranean harbours of Provence and Languedoc was less important than that of their neighbours and rivals Genoa and Barcelona (Ibid., 269). Only during the late 16th century the French began to play a more central role in Mediterranean commerce, especially in periods of war between Venice and the Ottomans (Kellenbenz, 1965, 368; Lane, 1973, 290, 293).

There is one other group of Mediterranean merchants that deserves some more attention however, and that is the Catalan nation. As for most maritime enterprises, data about Catalan business organisations are rather scarce. Moreover, there is a language barrier since

[101] I have excluded Ragusans and other Balkan merchants from the firm sample, see introduction.

[102] The only other French firms taken up in the business value matrix (Panse and Gapaillon) are two business organisations from Lyon, where Italian merchants were more important than the French themselves (Gascon, 1971, 203-208). Despite the appearance of a (weak) French factor in the twelve-component solution of the exploratory principal components analysis, I will not go into the role of French merchants in international trade. On the one hand, this role appears to have been less considerable than that of the other nations treated here. On the other hand, the commercial networks of the French Mediterranean and Atlantic harbours (see below) were very different and as such it is difficult to speak about a single French nation. In order to not entirely neglect active French commerce however, I have incorporated four French firms in the business value matrix.

not much about Catalan trade has been published in English. Only three Catalan firms have been included in the matrix, resulting in a rather weak Catalan component (factor eleven out of twelve in the principal components analysis, see tables 3.1 and 3.4), and if we follow Peter Spufford's (2002, 380-386) estimate that Catalan pepper trade with Alexandria and Beirut around 1400 was of similar size as that of Genoa (at that time weakened by the defeat against Venice however), this definitely means an underrepresentation.

Catalonia, together with Aragón, Valencia, the Balearics, and Roussillon (the region around Perpignan) was ruled by the kings of Aragón until these territories were united with Castile at the end of the 15th century. Abroad, the subjects of the Aragonese kings appear to have organised themselves at one time as a single group, at another separately. At Bruges for instance, the Catalan consulate changed its name into 'Consulate of the nations of Aragón and Catalonia' around 1487 (Marechal, 1985a, 90-91, 101). The question is whether the spatial strategies of Aragonese and Catalan merchants (the latter also including tradesmen from the other maritime parts of the kingdom) were the same however. Principal components analysis classifies Catalan firms of the 14th and 15th century (three firms in the sample) under a different factor than 16th-century Aragonese firms (two firms): while the former have their own component (component XI), the latter are more or less grouped together with Castilian firms in factor IV (see table 3.1). This might either be an indication for differences in spatial strategy between both groups, or a change in strategy around 1500. A decisive answer cannot be given since the sample does not contain Catalan and Aragonese merchants operating simultaneously. There appears to have been a reversal in relative importance of both groups, with Catalan trade declining in the course of the 15th century, when Aragonese traders became more active (Fagel, 1996, 36-38). Consequently, in what follows the focus will be upon Catalan commerce, while 16th-century Aragonese transnational business will not be treated separately but together with Castilian trade.

The three Catalan firms contained in the firm sample all had their headquarters in Barcelona (see table 3.12 for their aggregate network). Merchants from cities such as Palma de Mallorca, Perpignan, Tortosa and especially Valencia also played an important role in Catalan commerce, and their absence from the business value matrix again produces a certain imbalance. However, the spatial strategies of traders from these other maritime centres of the Aragonese kingdom were similar to those of tradesmen from Barcelona (for Valencia see the map in Guiral-Hadziiossif, 1986, 290-291), and as a result I will chiefly treat the Barcelonese trade network below. At least in Bruges, where the Catalan consulate depended from the 'Consulate of the Sea' of Barcelona, the Barcelonese appear to have had the upper hand over

the other Catalans (Marechal, 1985a, 97-99, 258 n. 29-30). Sources for reconstructing this network mostly consist of notarial deeds and official documents of public authorities (commercial treaties, etc.) (Del Treppo, 1972, 607-637; Madurell Marimón & García Sanz, 1973, 19; Verlinden, 1938, 739).

Since the late 12th century, the principal trade route leaving from Barcelona was directed towards the eastern Mediterranean from where chiefly spices were imported in exchange for textiles produced in the kingdom of Aragón and elsewhere in western Europe. Other connections can be considered as side-tracks from this main route. As long as trade with the eastern Mediterranean remained successful, Catalan commerce in general bloomed, but the decline of this principal route in the 15th century also meant the demise of Catalan trade, which experienced its apogee between ca. 1350 and ca. 1435. By 1448-1449, the volume of Catalan trade had declined seriously, and by the end of the century Catalan traffic only represented five percent of that of the early 1400s (Madurell Marimón & García Sanz, 1973, 20-21; Verlinden, 1938, 747; Vilar, 1956-1959, 14-17, 35, 67).

In the eastern Mediterranean, Catalan merchants were especially active in Egypt and Syria-Palestine, and indications for connections with Alexandria and Acre exist already from the late 12th century. Catalan trade relations with Constantinople and Romania are only known from the early 13th century, and were less important than those with the Levant. As was the case for Venice and Genoa – and for similar reasons – direct trade with Syria and Egypt was largely interrupted from the end of the 13th until the middle of the 14th century, and in this period Cyprus (with Candia in Crete as an important way station) temporarily became the principal destination of Catalan commerce in the east. Direct trade with Syria (chiefly Beirut and Damascus, but also Jaffa) was restored by the middle of the 14th century, while regular relations with Alexandria were only reinstated after peace was concluded between the king of Cyprus (supported by the Catalans) and the Sultan of Egypt in 1370. From the middle of the 14th century, Rhodes – in hands of the Knights Hospitaller since 1310 – became a regular stop on the route to Cyprus, Syria and Egypt. Trade with Romania, where the Catalans made a number of territorial conquests, appears to have become more intense in the 14th century, not only with Constantinople, but also with Thessaloníki, Chios, Ephesus and Modon for instance. However, from the last decade of the 14th century the eastern trade of Barcelona became increasingly limited to Alexandria and especially Rhodes, and although some recovery was experienced around the middle of the 15th century, by the end of the Catalan civil war (1462-1472) Barcelonese trade with the eastern Mediterranean had shrunk seriously and irreversibly. This decline was simultaneous to that of Genoese commerce with the Levant

and Romania, and a common cause for both may have been the disruption of the more easterly trade routes through central Asia and between the Persian Gulf and the Mediterranean (Abu-Lughod, 1989, 359-360; Del Treppo, 1972, 52, 59, 148, 159; Lane, 1973, 287; Madurell Marimón & García Sanz, 1973, 21-32; Mollat, 1988, 168-169; Verlinden, 1938, 737-739).

In the western Mediterranean, Catalan merchants traded in two distinct but connected commercial areas. Firstly, tradesmen from Barcelona were active already by the 13th century along the north coast in Roussillon (Collioure, Perpignan), Languedoc (Narbonne, Agde, Montpellier, Aigues-Mortes), Provence (Marseille), Nice, Liguria (Savona, Genoa, although mercantile relations were often disturbed as a result of political and commercial rivalry), and chiefly from the 15th century in Tuscany (Pisa, but also Florence and Siena) and as far as Rome. In this area, grain, oil, saffron, tallow, etc. from Barcelona and elsewhere in Catalonia, as well as spices from the East were exchanged for textiles which were re-exported by the Catalans. From the middle of the 14th century however, grain and other foodstuffs were often imported by Barcelona rather than exported, while wool and skins became important new exports (Del Treppo, 1972, 148, 159; Heers, 1961, 283; Madurell Marimón & García Sanz, 1973, 32-34; Mollat, 1970, 43-44; Origo, 1963, 136; Verlinden, 1938, 741-742).

Secondly, important connections in the south existed with Sardegna, Sicily, and the north African coast. These territories bordering the Strait of Sicily formed the gate to the eastern Mediterranean. Catalan commerce with Sicily (especially Palermo, Messina and Siracusa) and Sardegna (chiefly Cagliari, but also Alghero) came into being already long before the Aragonese conquest of both islands. The annexation of Sicily (1282) and Sardegna (1323-24) to the Crown of Aragón transformed both islands into strongholds of Catalan commerce. In Sicily, where the Catalans were omnipresent with three consuls and 17 vice-consuls ca. 1335, grain, cotton and slaves were purchased in exchange for textiles. From Sicily Catalan merchants became especially active in the kingdom of Naples (Naples, Gaeta, Ischia, Castellammare di Stabia,…). Naples, which developed into an important outlet for textiles, partly replaced the lost markets in the eastern Mediterranean in the 15th century. Via Sicily, relations also existed with Malta and with the Adriatic (Venice, Ancona, Ragusa, as well as Manfredonia and Otranto in Puglia) (Del Treppo, 1972, 52, 148, 159, 166-167, 236, 252; Lane, 1973, 328; Madurell Marimón & García Sanz, 1973, 32, 34-39; Verlinden, 1938, 739-742).

In northern Africa, Barcelonese trade appears to have been directed originally chiefly to Ceuta (early 13th century), but when peace was concluded with the Hafsids after the Aragonese conquest of Mallorca (1229) and Valencia (1238) regular commercial relations

with the whole of northern Africa (especially Tunis) developed. In the 14th century, trade with the kingdom of Tlemcen (Tlemcen, Honaine, Oran, Béjaïa) and with Tripoli temporarily became considerable as well. The Christian and Muslim harbours along the south-east coast of the Iberian peninsula (Valencia, Denia, Murcia, Almería, Málaga) were important way stations in the trade with north Africa (Del Treppo, 1972, 148, 159; Madurell Marimón & García Sanz, 1973, 35-36, 39; Spufford, 2002, 20; Verlinden, 1938, 740).

If one trade direction for the Catalans in importance came near to the trade route to the eastern Mediterranean, it was the western route to Flanders. Maritime trade with Flanders (chiefly Bruges and its harbour Sluis), which was complementary to the eastern trade, has already been documented from 1240. In Flanders, where the Catalans especially purchased textiles and sold spices, sugar, cotton, alum, and mastic, not only the Barcelonese, but also the merchants from Valencia and Mallorca played an important role during the 14th and 15th centuries. On the way to Flanders, Catalan merchants traded with Sevilla and Cádiz in Castile (although overland trade with Castile via Aragón appears to have been more important) and with Portugal (Lisbon, Porto), and to a lesser degree with Biscay (Bilbao, Santander, Laredo, Castro Urdiales, San Vicente de la Barquera) and the Atlantic coast of France (Bayonne, Bordeaux, the harbours of Saintonge and Poitou, and Rouen). Also an overland trade route via the Rhône valley and Paris to Flanders existed, which was older and from time to time more important than the maritime route. In north-western Europe the Catalans were not only active in Bruges (and still in Antwerp in the 16th century); from the 14th century trade relations developed with England (in the 15th century, Catalan ships went especially to Southampton), and Catalan merchants were even found sporadically in Frankfurt am Main and the Baltic (Del Treppo, 1972, 148, 159; Fagel, 2000, 88; Goris, 1925, 57-58; Kellenbenz & Walter, 2001, 34; Madurell Marimón & García Sanz, 1973, 40-43; Marechal, 1985a, 90-97, 101, 114, 180, 183-186, 189-190; Mauro, 1990, 281-282; Murray, 2005, 218, 223, 226; Ruddock, 1949, 139-140; Spufford, 2002, 147; Stabel, 2001, 199; Verlinden, 1938, 742-747).

Table 3.12 gives an overview of the aggregate network of the three Barcelonese firms included in the firm sample. The fact that total business values for Bruges, Naples and Sicilian cities are higher than for eastern Mediterranean destinations (Alexandria, Cyprus, Rhodes,…) results from two factors: firstly, two of the three firms in the business value matrix operated in the 15th century, when Catalan trade with the Levant was in serious decline already, and commerce with Naples temporarily became relatively more important. Secondly, in contrast to Flanders, Sicily and Sardegna where Catalan merchants were often represented

by fixed representatives, for their business with the east they chiefly made use of *commenda* contracts (Madurell Marimón & García Sanz, 1973, 37-38, 43). In most of the scoring systems I have designed, such single venture contracts are prejudiced in comparison to representation by permanent agents (see previous chapter). For the rest, and despite the small sample of Catalan firms, the table mirrors the Barcelonese trade network relatively well, except for the absence of southern French, Sardinian, Castilian and north African cities (these do appear in the networks, but with total business values below the threshold).

Table 3.12
Total business values across three 14th- and 15th-century Barcelonese firms according to different scoring systems*

R**	City	C^9_i	City	C^5_i	City	C^4_i	City	C^2_i
1	Barcelona	24	Barcelona	12	Barcelona	9	Barcelona	3
2	Bruges	13	Bruges	7	Bruges	6	Bruges	3
3	Naples	13	Naples	7	Naples	6	Naples	3
4	Palermo	11	Alexandria	6	Palermo	6	Palermo	3
5	Siracusa	10	Palermo	6	Alexandria	5	Alexandria	2
6	Alexandria	8	Siracusa	5	*Cyprus* +	4	*Cyprus*	2
7	*Cyprus**** +	6	Beirut	4	Rhodes	4	Rhodes	2
8	Rhodes	6	*Cyprus* +	4	Siracusa	4	Siracusa	2
9	Valencia	6	Perpignan	4	Valencia	4	Valencia	2
10	Beirut	5	Pisa	4	Beirut	3		
11	Perpignan	5	Rhodes	4	Perpignan	3		
12	Pisa	5	Tortosa	4	Pisa	3		
13	Venice	5	Valencia	4	Tarragona	3		
14			Venice	4	Tunis	3		
15					Venice	3		

The following cities/locations are possibly underestimated in the table as a result of overlaps with other places, which are given with their total business values below:
+ Cyprus: C^9_i (Famagusta) = 1; C^5_i (Famagusta) = 1; C^4_i (Famagusta) = 1.
* The table includes all cities that have at least one-fifth of the highest total business value (Barcelona's) according to the nine-point scale scoring system (for C^9_i). For total business values according to the other scoring methods more or less equivalent thresholds have been chosen.
** R: Rank.
*** *Cyprus (italics)*: Less precise geographical designations.

3.3.2. The German Hanse

The German Hanse was a very loose organisation, originally of merchants, later of cities, trading especially in the Baltic and the North Sea. The Hanse originated ca. 1160 as an association of German merchants travelling regularly to the island Gotland in the Baltic Sea, trying to exclude non-German competitors and to promote and defend their common interests against foreign rulers. It originally contained merchants from Lübeck and a number of Westphalian and Saxon cities, but was gradually joined by merchants from the new German cities established in the Slavic lands along the Baltic coast. This merchant Hanse experienced

a decline from the middle of the 13th century, partly because the Hanse merchants became more and more dependent upon their increasingly powerful urban governments who for instance began to take the negotiation of trade agreements in their own hands. Consequently, by the middle of the 14th century the Hanse of the merchants was replaced by a Hanse of the cities, in which enjoyment of the Hanseatic privileges abroad became conditional upon citizenship of a Hanse city. The common mercantile policies of the German Hanse were decided at the Hanseatic diets, general meetings of the representatives of the Hanse cities, convened for the first time in 1356 (Dollinger, 1970, 24-25, 43-44, 63, 85, 92; Hunt & Murray, 1999, 87).

For a century and a half from the middle of the 14th century the Hanse cities had a near-monopoly on the east-west trade between the Baltic and north-western Europe, especially trading in furs, amber and wax from Russia, fish from Norway and Iceland, wool and cloth from Flanders and England, Prussian grain and timber, as well as metals, beer and salt. However, due to increasing competition from southern German and Dutch merchants, the Hanse went into decline in the first half of the 16th century. An important revival of Hanseatic trade was experienced during the second half of the century, but in the course of the 17th century the Hanse went down for good, and it was replaced by a limited alliance between Lübeck, Hamburg and Bremen in 1630 (Dollinger, 1970, 212-213, 217-223, 333, 365, 368-369; Hunt & Murray, 1999, 87, 164-165, 236; Mauro, 1990, 257).

It is not entirely clear which cities were members of the Hanse, since official membership lists were never produced, probably out of fear for collective claims for compensations or indemnities against the Hanse cities. In total, about 200 cities are known whose citizens could make use of the Hanseatic trade privileges abroad. Only around 70 of these were actively involved in the organisation of the Hanse, and shared in the expenses of the community. The Grandmaster of the Teutonic Order, although not a city, was a member of the Hanse as well. Membership of the German Hanse was dynamic as a result of new admissions, exclusions (mostly temporarily), withdrawals, etc., and some cities were only member for a short period or joined the Hanse relatively late. Several cities were refused admission, especially potential competitors such as Narva, Emden and a number of Dutch cities (Dollinger, 1970, 87-92, 116, 336; Hunt & Murray, 1999, 164).

Hanse cities were found from the Meuse and the Zuiderzee in the west to the Gulf of Finland in the east (see figure 3.6). Different groups of cities can be discerned. The core of the Hanse was formed by the so-called Wendish cities Lübeck, Wismar, Rostock, and Hamburg; among this group Stralsund, Lüneburg and Kiel were sometimes counted as well. With the

exception of Kiel, these were all very considerable Hanse members. The Wendish cities, with Lübeck up front, assumed the leadership of the Hanse, officially since 1418. Lüneburg excluded, which played an intermediary role between sea ports and inland cities and possessed rich salt pans, the Wendish cities were all harbours with very active merchant communities. In the course of the 16th century, Hamburg gradually became more important than Lübeck. East of Stralsund, the ports of the Pomeranian coast – with the exception of Szczecin – were of less significance (Dollinger, 1970, 93-95, 116-119).

More inland, about nine towns in Lower Saxony between Weser and Elbe were members of the Hanse by the middle of the 14th century, while most of the others – especially those in Thuringia in the south – did not enter until the 15th century and never played a significant role in the Hanse (although Erfurt for instance was an important commercial hub). Active members were especially Braunschweig, an industrial centre, and Magdeburg, and in addition also Hildesheim and Goslar, which profited from its location near the copper and lead mines of Rammelsberg. As a harbour, Bremen occupied a somewhat unusual position among the Lower Saxon cities. Differently from most Hanse cities, Bremen – excluded from the Hanse on three occasions – was chiefly involved in north-south trade between Scandinavia, England, the northern Low Countries, and the Lower Saxon and Westphalian hinterland. Among the merchants of the Brandenburg cities, those from Berlin-Cölln were active in Hamburg and Flanders since the end of the 13th century, and Frankfurt an der Oder was a not unimportant commercial centre either. The largest number of Hanse members is found in Westphalia. Most of these were very small and with the exception of Dortmund, Soest, Osnabrück and Münster they assumed only a passive role in the Hanse. Nevertheless, from the middle of the 12th century, Westphalian merchants could be found in all areas of Hanseatic commerce. Soest appears to have been the principal Hanse city in Westphalia during the 13th century, a role which was taken over by Dortmund in the 14th century. The active role in the Hanse of most of the inland cities declined in the course of the 15th century however (Dollinger, 1970, 119-122).

Towards the west, merchants from a number of Zuiderzee ports in the Low Countries made use of the Hanseatic privileges at the end of the 13th century, but ties with the Hanse weakened during the first half of the 14th century. Another group of cities from the Low Countries, including Deventer with its important fairs, joined the Hanse during the latter part of the century, while Nijmegen, Arnhem and Kampen only became members in the course of the 15th century. The considerable Zuiderzee harbour Kampen maintained a rather independent position towards the Hanse however, and even favoured the Dutch competitors.

More upstream along the Rhine and Meuse rivers, the only Hanse members up to the middle of the 14th century were Emmerich and Cologne, the most powerful Hanse city after Lübeck. Moreover Cologne was not only strongly involved in the Hanseatic trade between Novgorod and Bruges, but also in commerce between Italy and England via the Rhine (Dollinger, 1970, 122-125).

In the east, the Prussian Hanse cities were important exporters of grain and timber, especially to England. As a result, their interests regularly differed from those of the Wendish cities. Until the middle of the 14th century, Elblag was the principal Prussian harbour, but this role was increasingly taken over by Danzig and to a lesser degree by Königsberg (now Kaliningrad). Toruń, which had good connections inland with Poland and Ukraine, was strongly involved in Hanseatic commerce as well, especially before the 15th century. The merchants of Wrocław (called Breslau in German) and Kraków, far away from the rest of the Hanse cities, were chiefly active in the trade in Slovakian copper with Flanders. As a result of the increasing importance of the trade route via Leipzig and Nürnberg, both cities left the Hanse in the second half of the 15th century. In Livonia, the three principal cities Riga, Reval (Tallinn), and Dorpat (Tartu) were members of the Hanse from the beginning, while most of the other Livonian cities only joined in the 15th century. While Riga maintained regular connections along the Dvina, Reval and Dorpat (destroyed by the Russians in 1558) were central way stations in the trade with Novgorod. Visby on the island Gotland, so important in the early history of the Hanse, was in decline by the second half of the 14th century. Finally a number of Swedish cities, including Stockholm, appear to have belonged to the Hanse in the 14th century, but not anymore in the next century. Stockholm was an important exporter of copper, iron, and forest products, and had especially strong connections with Lübeck (Böhnke, 1962, 27-30; Dollinger, 1970, 28-29, 90, 125-128, 230-238, 337).

The Hanse cities were grouped in thirds and later quarters, which had their own representatives in the principal foreign trade establishments of the Hanse. The Lübeck third contained the Wendish, Pomeranian, Saxon and Brandenburg cities, while the geographically dispersed Westphalian-Prussian third, first headed by Dortmund and later by Cologne, also included the Hanse cities in the Low Countries and along the Rhine. Finally, the less powerful Livonian third was sometimes presided by Riga, sometimes by Visby. In 1494, the thirds were reorganised, with a Lübeck third, a Westphalian third headed by Cologne, and a Saxon third, which also incorporated the Prussian and Livonian cities, headed by Braunschweig. Fifty years later, the Prussian and Livonian cities separated from the latter third, forming their own quarter under the chairmanship of Danzig (Dollinger, 1970, 95-96).

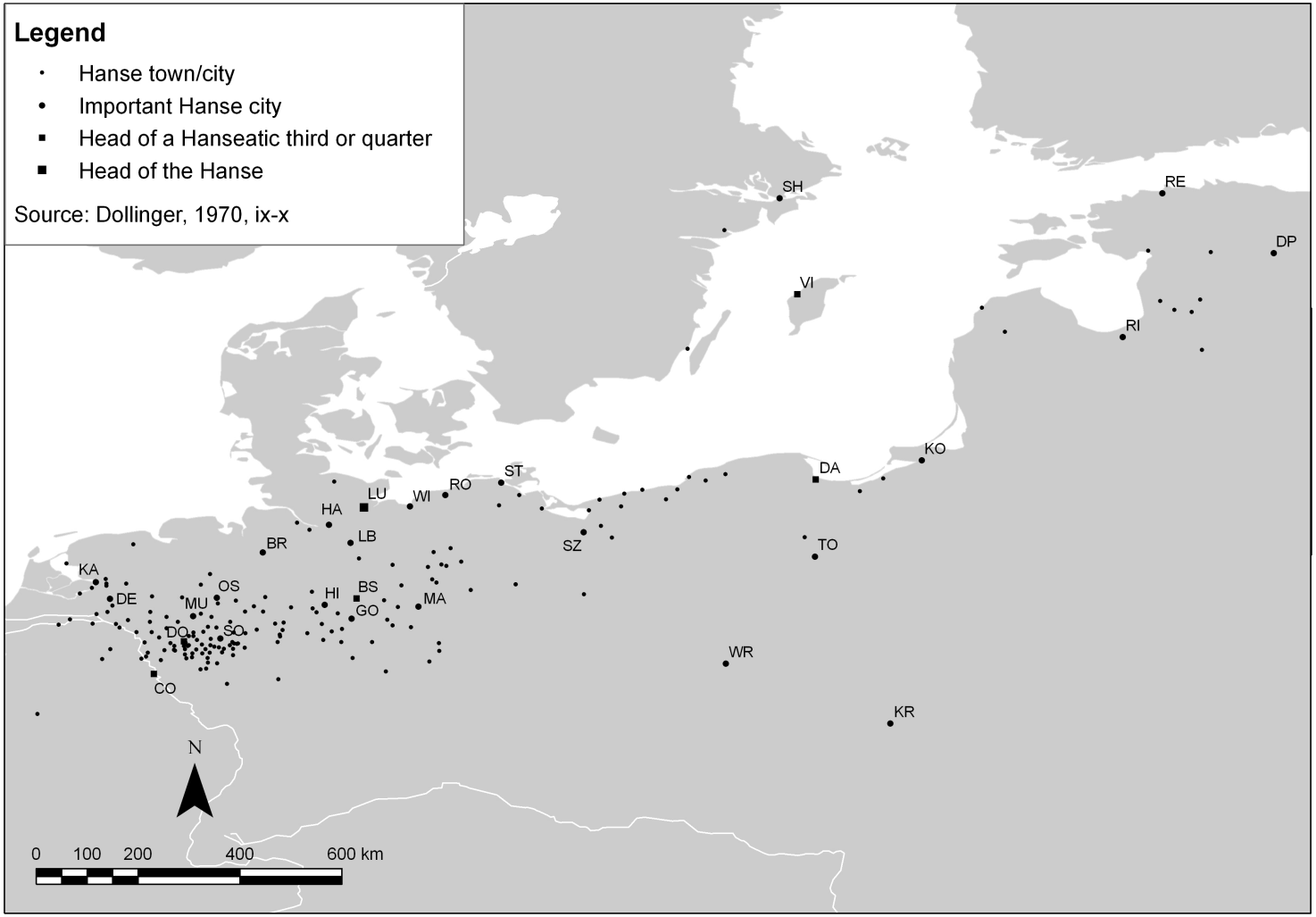

Figure 3.6: Cities whose merchants shared in the Hanseatic privileges from the 14th to the 16th century (in some cases only for a short period).
Key (only important Hanse cities have been labelled): BR Bremen; BS Braunschweig; CO Cologne; DA Danzig (Gdańsk); DE Deventer; DO Dortmund; DP Dorpat (Tartu); GO Goslar; HA Hamburg; HI Hildesheim; KA Kampen; KO Königsberg (Kaliningrad); KR Kraków; LB Lüneburg; LU Lübeck; MA Magdeburg; MU Münster; OS Osnabrück; RE Reval (Tallinn); RI Riga; RO Rostock; SH Stockholm; SO Soest; ST Stralsund; SZ Szczecin; TO Toruń; VI Visby; WI Wismar; WR Wrocław.

It is impossible to sufficiently account for the large diversity of merchants from so many different Hanseatic cities, each with their own specialisations in particular trade directions, in this general study of European business organisations and their spatial strategies. That several Hanse cities indeed had somewhat divergent trade networks is indicated by the fact that the Rinck of Cologne (15th century), the Beckmann of Hamburg (16th century), and the Cunertorf-Snel of Kampen (16th century) are not grouped among the Hanseatic factor, which is dominated by Lübeck firms, but among Low Countries firms (see results of the principal components analysis in table 3.1).

The problem becomes even larger when one realises that Hanseatic enterprises, just like those of many other maritime centres such as Venice and Genoa, were mostly small, flexible and rather informal organisations for which the source situation is not very favourable. Most Hanse merchants had a linear rather than a star-shaped network, trading only between Lübeck and Bergen for instance (Jeannin, 1973, 271-272). These linear networks are symbolised in the different *Fahrer* organisations, associations of merchants trading with a specific foreign region, which could be found in many Hanse cities. Examples are the *Schonenfahrer* (trading with Scania), *Bergenfahrer* and *Spanienfahrer* of Lübeck (in total ten such *Fahrer* companies existed in Lübeck by the end of the 15th century) (Dollinger, 1970, 162-163, 360). Although the available source material on Hanseatic firms has not entirely been exhausted, the inclusion of additional Hanse firms in the business value matrix would only up to a limited level have mitigated the existing biases. Moreover, as a result of the limited scope of their networks, many Hanseatic firms did not fulfil the criteria for inclusion in the business value matrix[103]. It is difficult to assess the importance of Hanseatic commerce in comparison to that of the Mediterranean nations discussed above, but in view of the many cities involved in Hanseatic trade and the large area covered by their aggregate networks, as well as the small size of the individual enterprises (although the networks of the Teutonic Order, the Loitz, and perhaps also the Venedische Gesellschaft of the Veckinchusen brothers were extraordinarily large to Hanseatic standards), Hanseatic firms (eleven in total) appear to be underrepresented in the sample[104].

[103] An example is the 16th-century Lübeck merchant Hans Moller, who was specialised in the trade with Livonia (Pelus-Kaplan, 2005).

[104] The Popplau firm from Wrocław and the Cunertorf-Snel partnership of Kampen (both from the 16th century) have not been included in this analysis of Hanse trade, since Kampen and Wrocław were no prototypical Hanse cities (moreover, Wrocław had withdrawn from the Hanse by the 16th century). This is confirmed by the exploratory principal components analysis, which categorises the Popplau firm among southern German business organisations, and Cunertorf-Snel among Low Countries and Dutch firms (see table 3.1).

Table 3.13
Total business values across five 14th- and 15th-century Hanseatic firms according to different scoring systems*

R**	City	C^9_i	City	C^5_i	City	C^4_i	City	C^2_i
1	Lübeck	29	Lübeck	15	Lübeck	12	Lübeck	5
2	Bruges +	22	Bruges +	11	Bruges +	9	Bruges +	4
3	Danzig	20	Danzig	11	Danzig	9	Danzig	4
4	Reval	16	Hamburg	9	Hamburg	8	Hamburg	3
5	Cologne	15	Reval	8	London ++	6	London ++	3
6	Hamburg	15	Cologne	7	Novgorod	6	Novgorod	3
7	London ++	13	London ++	7	Reval	6	Reval	3
8	Dorpat	10	Dordrecht	6	Cologne	5	Antwerp	2
9	Lüneburg	10	Lüneburg	6	Lüneburg	5	Cologne	2
10	Novgorod	10	Novgorod	6	Antwerp	4	Dorpat	2
11	Riga	9	Stralsund	6	Dordrecht	4	*England* ++	2
12	Königsberg	8	Dorpat	5	Dorpat	4	Frankfurt am Main	2
13	Malbork	8	Riga	5	*England* ++	4	Lüneburg	2
14	Stralsund	8	Antwerp	4	Frankfurt am Main	4	Riga	2
15	Dordrecht	7	Augsburg	4	Riga	4		
16	*England**** ++	7	*England* ++	4	Stralsund	4		
17	Toruń	7	Frankfurt am Main	4	Augsburg	3		
18	Antwerp	6	Königsberg	4	Königsberg	3		
19	Elblag	6	Kortrijk +	4	Kortrijk +	3		
20	Frankfurt am Main	6	Malbork	4	Malbork	3		
21	Venice	6	Strasbourg	4	Paris	3		
22			Toruń	4	Toruń	3		
23			Wismar	4	Wismar	3		

The following cities/locations are possibly underestimated in the table as a result of overlaps with other places, which are given with their total business values below:
+ Bruges and Kortrijk: C^9_i (Flanders) = 3; C^5_i (Flanders) = 2; C^4_i (Flanders) = 2; C^2_i (Flanders) = 1.
++ Possible overlap between London and England. For England also possible overlap with Colchester: C^9_i (Colchester) = 1; C^5_i (Colchester) = 1; C^4_i (Colchester) = 1.
* The table includes all cities that have at least one-fifth of the highest total business value (Lübeck's) according to the nine-point scale scoring system (for C^9_i). For total business values according to the other scoring methods more or less equivalent thresholds have been chosen.
** R: Rank.
*** *England (italics)*: Less precise geographical designations.

The eleven Hanseatic enterprises have been split up here in 14th- and 15th-century firms (five) and enterprises active in the 16th century (six), whereby the early 16th-century crisis of the Hanse has been taken as a caesura (see tables 3.13 and 3.14). Among the 14th- and 15th-century enterprises, two can be considered as Lübeck firms, one each came from Hamburg and Cologne, and also the Teutonic Order (with headquarters in Königsberg and Malbork), which played an important role in Prussian commerce, has been included as a firm. Of the 16th-century firms, four had their headquarters in Lübeck, one in Szczecin, and one in Hamburg. Consequently, one can expect a relative overrepresentation of Lübeck – at least for the 16th century – and an underrepresentation of virtually every other Hanseatic city. Looking at the Hanse cities included in tables 3.13 and 3.14, especially the absence of inland cities (many of them experienced a decline by the 15th century however) as well as of Bremen and

Rostock is striking, while on the other hand the principal Prussian and Livonian Hanse cities, in addition to Lübeck and Hamburg, can be found in both tables. Indeed, Lübeck emerges as the articulating city of the Hanseatic component, while the Hanse cities that appear among the primary field cities are all maritime harbours (Hamburg, Stralsund, Danzig, Riga and Reval), with the exception of Dorpat and Lüneburg (table 3.5). This reflects the dominant orientation of Lübeck merchants, who were chiefly involved in east-west trade in the Baltic and with the west.

Table 3.14
Total business values across six 16th-century Hanseatic firms according to different scoring systems*

R**	City	C^9_i	City	C^5_i	City	C^4_i	City	C^2_i
1	Lübeck	38	Lübeck	19	Lübeck	14	Antwerp	5
2	Hamburg	24	Hamburg	14	Hamburg	12	Hamburg	5
3	Antwerp	22	Antwerp	13	Antwerp	11	Lübeck	5
4	Narva	22	Narva	12	Narva	11	Narva	5
5	Amsterdam	15	Amsterdam	10	Amsterdam	8	Amsterdam	3
6	Frankfurt am Main	13	Frankfurt am Main	8	Frankfurt am Main	7	Frankfurt am Main	3
7	Reval	13	Reval	7	Lisbon ++	6	Lisbon	3
8	Riga	12	Riga	7	Reval	6	Reval	3
9	Danzig +	11	Lisbon ++	6	Riga	6	Riga	3
10	Leipzig	9	Nürnberg	6	Nürnberg	5	Danzig +	2
11	Lisbon ++	9	Copenhagen	5	Danzig +	4	Emden	2
12	Nürnberg	9	Danzig +	5	Emden	4	Leipzig	2
13	Szczecin +	9	Dorpat	5	Leipzig	4	Marstrand +++	2
14	Copenhagen	8	Leipzig	5	Marstrand +++	4	Nürnberg	2
15	Dorpat	8	Szczecin +	5	Szczecin +	4		

The following cities/locations are possibly underestimated in the table as a result of overlaps with other places, which are given with their total business values below:
+ Danzig, Szczecin: C^9_i (Pomerania) = 3; C^5_i (Pomerania) = 2; C^4_i (Pomerania) = 2; C^2_i (Pomerania) = 1.
++ Lisbon: C^9_i (Portugal) = 2; C^5_i (Portugal) = 2; C^4_i (Portugal) = 1.
+++ Marstrand: C^4_i (Sweden) = 2; C^2_i (Sweden) = 1.
* The table includes all cities that have at least one-fifth of the highest total business value (Lübeck's) according to the nine-point scale scoring system (for C^9_i). For total business values according to the other scoring methods more or less equivalent thresholds have been chosen.
** R: Rank.

Just like for Venice and Genoa, an alternative to the interlocking network model is a reconstruction of the Hanseatic trade network in general. This is facilitated by the fact that the Hanse since the 19th century has received a lot of attention in German historiography (Selzer & Ewert, 2005, 8-18). I have chiefly made use here of the classic work of Philippe Dollinger (1970)[105]. An essential source for the study of Hanseatic commerce are customs accounts (the Pfundzollbücher) (Dollinger, 1970, 210-212).

[105] The original French edition dates from 1964. That this is still a standard work is indicated by the fact that it has been republished with a new introduction in 1999.

Hanseatic foreign trade was anchored upon the Hanseatic merchant settlements abroad, the most important of which were the four *Kontore* in Novgorod (Russia), Bergen (Norway), Bruges and London. Each of these *Kontore* had its own aldermen and assessors, often chosen by the different thirds or quarters, its own tribunal, treasury, seal, etc. Hanseatic merchants were obliged to trade through the *Kontore* or other Hanseatic settlements, which as such can be considered as staples, giving the Hanseats monopolistic control over the trade with their home cities. Moreover, the possibility of transferring the Hanseatic settlement elsewhere was a powerful tool for obtaining more favourable privileges from the local or central authorities in whose territory the settlement was located, and the Hanse several times made use of this strategy. As the location of the four *Kontore* indicates, the principal foreign destinations of Hanseatic commerce were Russia in the east, Scandinavia in the north, the Low Countries and England in the west, and in addition also the Atlantic coasts of France, Spain and Portugal, where especially salt was loaded, and southern Germany from where also northern Italy was reached. The principal Hanseatic trade axis connected Novgorod via Reval, Lübeck and Hamburg to Bruges and London. There was another important and even older axis however, linking Italy with the Low Countries and England via the Rhine (Dollinger, 1970, 98-99, 110-111, 212-214; Hunt & Murray, 1999, 87, 165-166).

In Novgorod, where Gotland and German merchants are already mentioned at the end of the 11th century, the Hanse merchants had their own enclosed establishment, the Peterhof, which was finally closed in 1494 as a result of the decline of trade with Novgorod in the 15th century and the Moscovite conquest of the Republic of Novgorod. Hanseatic and Russian merchants also met in Pskov, and in Polotsk along the Dvina, where the Germans had their own church. From the 15th century, Hanseatic commerce with Russia increasingly came in hands of the Livonian Hanse cities, with Riga dominating the settlement in Polotsk, and Dorpat the one in Pskov. Due to the downturn of the Hanseatic Novgorod trade, the Livonian cities became even more important as markets for Russian products, just like the Finnish harbours Turku and Vyborg, and from the second half of the 16th century also Narva, since 1558 the Russian gateway to the Baltic and a rival to Reval. In Lithuania and further towards the south, Hanseatic merchants – chiefly those from Prussia and Poland – were found in Kaunas, and in Lvov where they traded with Venetian and Genoese merchants coming from the Black Sea, especially before 1400 (Dollinger, 1970, 7, 26-30, 99-101, 105, 182, 231-237, 294-295, 312; Hunt & Murray, 1999, 165; Pelus, 1981, 107-110; Spufford, 2002, 21, 335).

In Scandinavia, Bremen had the oldest connections with Bergen, but by the end of the 12th century merchants from Lübeck also began trading in Norway. After a while Lübeck

dominated the Bergen *Kontor*, and even the trade between Bergen and Boston in England. Smaller Hanseatic settlements were founded in Oslo and Tønsberg, where chiefly Rostock merchants were active. From the end of the 13th century, the Hanseats had a very strong hold on Norwegian commerce as far north as Bergen. From the late 15th and early 16th century, Kampen, Deventer, Hamburg, Bremen and Holland increasingly began to compete with the Wendish cities in this area, but Hanseatic trade with Bergen experienced a new expansion in the second half of the 16th century, and only went into decline during the next century. In Denmark, merchants from the Wendish and Pomeranian cities established a Hanse community in Copenhagen in 1378 which obtained a large share of the trade with Denmark, but its privileges were withdrawn in 1475 as a result of the bad relations between the Hanse and the Danish king. In Scania, the southern tip of Sweden which at the time belonged to Denmark, Hanseatic as well as Danish and Dutch merchants visited the fairs of Scania and held concessions for processing, salting and sale of fish. The most important of the Hanse concessions were located near Skanör and Falsterbo. Decline slowly set in from the 15th century as a result of competition from the North Sea fisheries, where especially fishermen from Holland and Zeeland were active (Dollinger, 1970, 38, 49-50, 64, 98, 101-102, 105, 239-243, 313-314, 369; Hunt & Murray, 1999, 165; Murray, 2005, 228; Spufford, 2002, 21).

In London, merchants from Bremen and especially Cologne were already active in the 11th century, before the foundation of the Hanse, and not surprisingly the London *Kontor*, the Steelyard, developed from the original settlement of the Cologne merchants, who maintained a central role in Hanseatic trade with London also in later centuries. Hanseats from Westphalia and the more easterly cities (Lübeck, Hamburg, and the Prussian cities) only appeared in London and England in the 13th century. The latter group of merchants was chiefly active in the English east coast harbours Ipswich, Great Yarmouth, Kings Lynn, Hull, Newcastle upon Tyne and especially Boston (which for a long time depended from the Bergen *Kontor* rather than the one in London and was a thriving export centre of wool and cloth). Hanse merchants moreover visited the southern harbours Southampton, Sandwich and Bristol on their way back from the Atlantic, and even went inland, especially to York and Norwich, but in addition they also attended the fairs of Stamford, Lincoln, Westminster, Canterbury and Winchester. Consequently, Hanseatic trade with England was rather decentralised until the end of the 14th century, but a concentration under the London *Kontor* set in during the 15th century. While Hanseatic trade with London still thrived in the 16th century, commerce with the other English harbours had seriously decreased by then. The preferential treatment of English merchants by the English kings from the second half of the

16th century and the expansion of English commerce finally were detrimental to the London trade of the Hanse as well, and the Steelyard was closed by Elisabeth I in 1598. With Scotland, regular trade relations existed from Bremen and Prussia (chiefly Danzig) from the 14th century. Edinburgh was the principal destination of Hanseatic merchants in Scotland, followed by Glasgow, Dunbar and Aberdeen (Dollinger, 1970, 5-6, 39-40, 55-56, 64, 102-106, 243-246, 306, 309-310, 315-316, 341-343, 367-369; Hunt & Murray, 1999, 165; Spufford, 2002, 21, 48, 302).

Perhaps the most important of the Hanseatic *Kontore* was the one in Bruges, which during the 14th and 15th century was the privileged commercial centre in north-western Europe not only of the Italians, but also of the Hanseats. The latter became active in Flanders from the 13th century, in which period they also traded at the fairs of Champagne. Differently from the other *Kontore*, in Bruges the Hanseats did not have their own quarters but resided in houses and inns in the middle of the city. The Hanseatic merchants, who came from virtually all parts of the Hanse area to the Low Countries, not only established themselves in Bruges however, but also went to the Zwin harbours, especially Damme and Sluis, to Antwerp and Bergen-op-Zoom with their important fairs, to cloth producing centres in Flanders and Brabant such as Ieper, Ghent, Aardenburg, Poperinge, Mechelen, and to a variety of other cities such as Dordrecht, Utrecht, Middelburg and even Amsterdam, which became an important market for beer from Hamburg already in the 14th century. From time to time, the Bruges *Kontor* was temporarily transferred elsewhere in order to obtain more favourable privileges or due to revolts, e.g. to Aardenburg (1280-1282, 1307-1309), Dordrecht (1358-1360, 1388-1392), Antwerp (1436-1438, 1485, 1488-1493), Deventer (1450-1452) and Utrecht (1453-1458). Although the Hanseatic *Kontor* in the Low Countries officially remained in Bruges until 1553, the *Kontor* began to decline from ca. 1450, when Hanseatic merchants increasingly began to settle elsewhere, especially in Antwerp. In the latter city, which (like Dordrecht) was favourably located on the route from Cologne and Westphalia to England, the Hanseats already enjoyed privileges in the early 14th century, and by 1500 it had become the principal centre of Hanseatic trade in the Low Countries. When the *Kontor* was finally moved to Antwerp, it did not manage to establish its authority over the Hanseatic merchants settled there. Moreover, most Hanseats definitively left Antwerp during the Revolt in the Low Countries, especially after 1576 (De Roover, 1948b, 21; Dollinger, 1970, 40-42, 48-51, 75-77, 103-105, 202-203, 247, 249, 250-252, 299-302, 314-315, 339-340, 367-369; Harreld, 2004, 30-34, 44-45, 50-51, 69-71, 85-87, 90, 182; Hunt & Murray, 1999, 165; Marechal, 1985a, 63,

67, 91-97, 101, 174, 180-186, 189; Murray, 2000, 6-7; Id., 2005, 95-97, 220-247; Stabel, 2001, 198).

Via the North Sea and the English Channel, the Hanseats also reached the Atlantic, from where they especially imported salt and wine. Regular contacts existed from the second half of the 14th century. The Hanseatic settlements along the Atlantic coast all depended from the Bruges *Kontor*. The chief Atlantic salt ports for Hanseatic merchants were Bourgneuf, Brouage and Setúbal. Other principal destinations for Hanseatic commerce were Nantes, La Rochelle, Bordeaux, and Lisbon, but in addition Hanseats also could be found occasionally in Paris (especially over land from Cologne), Rouen, Honfleur, Harfleur and Bayonne in France, and Bermeo, Laredo, Viveiro and La Coruña in northern Spain. In the 16th century the Dutch took over most of the French Atlantic salt and wine trade from the Hanse, but at the same time the Hanseatic trade with the Iberian Peninsula, especially with Porto, Lisbon, Setúbal, Sevilla, San Lúcar, Cádiz, and Málaga, expanded in the second half of the 16th century. At the end of the century, Hanseatic grain ships temporarily even sailed as far as Genoa, Livorno and Venice (Dollinger, 1970, 105, 252-258, 345-346, 350-351, 366; Jeannin, 1973, 263-272; Kellenbenz, 1954, 287-296).

Despite the dominance of south German firms in mainland central Europe, the Hanseats (mostly from Cologne and Lübeck) managed to increase their commercial relations in this area in the 14th century, especially with Nürnberg and the fairs of Frankfurt am Main, but also with Augsburg, Konstanz, Leipzig, and even Prague. Moreover, via southern Germany they established direct connections with Italy, where Cologne and Lübeck merchants had their own rooms in the *Fondaco dei Tedeschi*, the German residence in Venice. Cologne merchants were even more involved in the trade with Genoa, Milan and Como than with Venice, and they traded as far as Messina, Catania and Barcelona. Unlike traders from Cologne, Lübeck merchants withdrew from southern Germany and Italy by the end of the 15th century (Dollinger, 1970, 228-229, 258-259, 346).

In view of the above description of Hanseatic foreign trade, the striking difference between tables 3.13 and 3.14 can be explained by the important reorientation of Hanseatic commerce in the 16th century. The 14th-and 15th-century Hanse enterprises included in the firm sample (table 3.13) were involved in trade with the traditional centres of Hanseatic commerce, the *Kontore* in Bruges, London and Novgorod being the principal foreign nodes, followed by Antwerp and Dordrecht in the Low Countries (probably overrepresented), England (cities not specified), and Frankfurt am Main. Hanseatic connections with the Atlantic and especially Scandinavia (the Bergen *Kontor* is not even mentioned in the table)

are strongly underrepresented in the sample however. In the 16th century (table 3.14), individual Hanseats clearly did not observe the Hanseatic staples anymore: none of the *Kontore* appears in the table, indicating a bias in the case of London and Bergen (Scandinavian trade being represented by Marstrand and Copenhagen, secondary destinations of Hanseatic trade compared to Bergen). In the Low Countries Antwerp definitely had become the centre of Hanseatic commerce, while in Russian trade a similar role was assumed by Narva (this may well result from the overrepresentation of Lübeck firms however, since it were especially the latter which traded with Narva). Amsterdam – the principal competitor of the Hanse cities – apparently had become so important in the Baltic trade that even Hanseatic merchants had to maintain connections there, and the same may hold for Emden and the southern German cities (Frankfurt am Main, Nürnberg and Leipzig), strongly represented in the table despite the fact that Lübeck merchants had largely withdrawn from this area by the 16th century. The expansion of Iberian trade in the 16th century finally is demonstrated by the presence of Lisbon in the table. The existence of connections of Hanseatic enterprises with competitors of the Hanse is confirmed in table 3.5, in which Narva, Amsterdam and Emden emerge as primary field cities together with more typical centres of Hanseatic foreign commerce such as Novgorod and Pskov in Russia, Bruges, Antwerp and Frankfurt am Main.

3.3.3. Southern German merchants

The Hanseats were not the only merchants active in central Europe. While Hanseatic enterprises dominated commerce in the Baltic and in the northern parts of central and eastern Europe, merchants from the south-east of present-day Germany played a crucial role in trade in central Europe south of the Hanse sphere. These High Germans were not the only tradesmen conducting business in this area however. More towards the west, merchants from the Upper Rhine cities (especially Frankfurt am Main, Mainz, Worms, Speyer and Strasbourg) actively traded with Genoa and later Venice where they went to purchase spices (Eikenberg, 1976, 69). In the east, merchants from the Hanse cities Kraków and Wrocław already in the 14th century went to the Low Countries, the fairs of Frankfurt am Main and Venice (where also traders from Prague, Brno and Buda could be found). The development of an export-oriented textile industry in Bohemia and Poland (in Brno, Wrocław, Görlitz,…) in the same century was probably not unrelated to this. By the end of the 15th and early 16th century, merchants from Wrocław – at that time not a member of the Hanse anymore – were numerous enough to form their own nation in Antwerp (Eikenberg, 1976, 101, 106; Harreld, 2004, 4;

Luzzatto, 1937, 49-50). With the exception of the Popplau firm of Wrocław (16th century), none of these Upper Rhine, Bohemian or Polish merchants is represented in the firm sample, effecting a certain partiality in the data. Compared to the south-eastern Germans these other merchants from the central European interior were of much less significance however, and in what follows I will focus the discussion upon these south-east Germans[106].

Table 3.15
Headquarter locations of southern German business enterprises included in the firm sample

C.*	Augsburg	Nürnberg	Ravensb.	Regensb.	St. Gallen	Sevilla	Ulm
14		Kam.-Seil.** Stromer		Runtinger			
15	Fugger v. R. Welser	Gruber-P.-S. Hirschvogel Kam.-Seil.** Praun (H.) Starck (U.) Tucher	Ravensb. G.	Runtinger	Diesb.-W.****		Ruland (O.)
16	Fugger Haug-L.-L. Manlich (Ma.) Manlich (Me.) Oesterreicher Paler-Weiss Welser (Aug.)	Hirschvogel Imhoff Tucher Viatis-Peller Welser (N.)***				Cromberger	

* C: Century. Firms of which the reconstructed network straddled two centuries have been mentioned for both centuries.
** According to the map in Von Stromer, 1973, 335, the Kamerer-Seiler firm had headquarters in Košice (in Slovakia) as well.
*** Between 1537 and 1559 the headquarters of the Nürnberg Welser were transferred to Augsburg.
**** The headquarters of the Diesbach-Watt partnership were located in Sankt Gallen from the late 1440s. Before they had been in Bern.

The principal commercial centres of south-eastern Germany were Regensburg (apogee before the 1340s) and especially Nürnberg in the northern part of the area, and the Swabian cities (Augsburg, Konstanz, Ravensburg, Sankt Gallen, Ulm,…) in the south, among which Augsburg gained the upper hand from the late 15th century (Eikenberg, 1976, 69-71, 100-101; Schulte, 1923, I, 30-31; Von Stromer, 2002, 215, 219). This is nicely illustrated in table 3.15 which enumerates the headquarters of the southern German firms included in the firm sample. An exception here is the Cromberger enterprise in Sevilla, founded by an emigrated southern German printer and bookseller (perhaps from Nürnberg) (Griffin, 1988, 20, 27). The Cromberger were especially active in Spain and Portugal and in the New World, and in the

[106] In what follows I will use the terms southern Germans or High Germans as they are normally called in the literature.

twelve-component solution of the principal components analysis this firm is ranked among Castilian firms (although with a loading below 0.4) instead of central European firms (see table 3.1)[107].

Southern German business organisations are very well documented in the sources (Nürnberg firms more than Augsburg enterprises) and in the literature (Seibold, 1995, 7). The business value matrix contains not less than 24 firms originating from southern Germany, and several more firms could have been added easily on the basis of available literature. Among the reasons for this are the strong internal organisation and large size of many southern German firms, the structure of which was influenced by those of the centralised companies of inland Italy. That was the case as well for the relatively advanced methods of book keeping used by the southern German companies (Von Stromer, 1970, 214). Belonging to a strong factor (notably the second component, see table 3.4) in the principal components analysis, they are definitely overrepresented in comparison to most other nations, especially for the 15th century when they had not reached yet the dominant position in European high finance which they held in the first half of the 16th century.

Tables 3.16 to 3.18 give the aggregate networks of the southern German firms incorporated in the business value matrix for the 14th to 16th century respectively[108]. No distinction has been made between enterprises from Nürnberg, Augsburg and the other southern German cities, since close connections and family ties existed between the business classes of the different cities of south-eastern Germany. Accordingly, Wolfgang von Stromer (2002, 218) argued that it would be more accurate to speak about High German high finance rather than about Nürnberg or Augsburg high finance. This is confirmed by the fact that southern German firms all belong to one and the same component in most results of the principal components analysis. The tables mostly are in agreement with what is known from the historical literature about the commercial networks of the south German cities. The general trade network of Nürnberg especially can be studied in detail thanks to the very active policy of the Nürnberg patriciate in securing trade privileges from other cities and from a variety of princes (more than 100 in the 13th and 14th century). In 1332, Nürnberg obtained the exemption from customs duties in seventy different cities in the German Empire from

[107] Nevertheless, the Cromberger enterprise has been included in the analysis of the southern German firms in tables 3.16 to 3.18 below. The Popplau of Wrocław on the other hand have not been taken up in this study of the southern German network.

[108] Since the sample only contains three southern German firms of the 14th century, total business values have been given instead of connectivities for the 14th century. As a result of the large extent of the networks of most southern German enterprises, relative total business values and connectivities are higher than for other nations. Consequently, a slightly higher threshold for inclusion in the tables (30 % or more of the maximum total business value / connectivity) has been chosen here.

Emperor Ludwig IV. However, already from 1264 Nürnberg began to acquire commercial privileges for her citizens abroad by granting freedom to trade and exclusion from tolls in Nürnberg to merchants from all cities which gave them the same rights in exchange (Von Stromer, 1970, 210, 215, 218-220).

Table 3.16
Total business values across three 14th-century southern German firms according to different scoring systems*

R**	City	C^9_i	City	C^5_i	City	C^4_i	City	C^2_i
1	Nürnberg	19	Nürnberg	10	Nürnberg	8	Frankfurt am Main	3
2	Venice	14	Frankfurt am Main	7	Frankfurt am Main	6	Nürnberg	3
3	Frankfurt am Main	13	Prague	7	Prague	6	Prague	3
4	Prague	12	Venice	7	Venice	6	Venice	3
5	Vienna	12	Vienna	7	Vienna	6	Vienna	3
6	Kraków	12	Košice	6	Wrocław	6	Wrocław	3
7	Cologne	10	Kraków	6	Maastricht	5	Bruges	2
8	Košice	10	Maastricht	6	Bruges	4	Buda	2
9	Wrocław	9	Wrocław	6	Buda	4	Cologne	2
10	Milan	9	Barcelona	5	Cologne	4	Kraków	2
11	Regensburg	9	Cologne	5	Košice	4	Maastricht	2
12	Strasbourg	9	Leuven	5	Kraków	4	Milan	2
13	Maastricht	8	Milan	5	Milan	4	Strasbourg	2
14	Barcelona	8	Regensburg	5	Regensburg	4	Toruń	2
15	Leuven	8	Strasbourg	5	Strasbourg	4		
16	Bruges	7			Toruń	4		
17	Buda	6						
18	Toruń	6						
19	Genoa	6						
20	Mainz	6						

* The table includes all cities that have at least thirty percent of the highest total business value (Nürnberg's) according to the nine-point scale scoring system (for C^9_i). For total business values according to the other scoring methods more or less equivalent thresholds have been chosen.
** R: Rank.

Among the incentives for the development of southern German trade was a search for supply markets of raw materials as well as outlets for the manufactures of the industries of Nürnberg and the Swabian cities. Swabia was an important linen and fustian producing region, while Nürnberg on the other hand was specialised in the production of metal wares (Schulte, 1923, I, 40; Von Stromer, 1970, 215; Id., 2002, 219-221). Important markets in the first place were the principal German fairs, especially those of Frankfurt am Main and Leipzig, but in addition also those of Erfurt and Nördlingen for instance, the latter of which were of particular significance for Nürnberg merchants. These fairs were not only meeting points for wholesale traders but they also developed into centres of international exchange (Bolton & Guidi Bruscoli, 2008; Eikenberg, 1976, 100; Harreld, 2004, 35, 135-137; Hunt & Murray, 1999, 192, 194, 197-198; Seibold, 1977b, 292; Spufford, 2002, 49-50).

Table 3.17
Connectivity across the networks of twelve 15th-century southern German firms according to different scoring systems*

R**	City	P^9_a	City	P^5_a	City	P^4_a	City	P^2_a
1	Nürnberg	1	Nürnberg	1	Nürnberg	1	Frankfurt a. Main	1
2	Venice	0.82	Venice	0.83	Frankfurt a. Main	0.81	Nürnberg	1
3	Frankfurt a. Main	0.58	Frankfurt a. Main	0.64	Venice	0.81	Venice	1
4	Vienna	0.48	Nördlingen	0.53	Nördlingen	0.66	Nördlingen	0.77
5	Wrocław	0.46	Vienna	0.53	Vienna	0.54	Wrocław	0.64
6	Sankt Gallen	0.43	Leipzig	0.52	Wrocław	0.53	Vienna	0.60
7	Geneva	0.41	Wrocław	0.48	Leipzig	0.49	Cologne	0.55
8	Nördlingen	0.39	Sankt Gallen	0.45	Milan	0.45	Bruges	0.50
9	Zaragoza	0.37	Augsburg	0.44	Augsburg	0.44	Sankt Gallen	0.47
10	Leipzig	0.36	Geneva	0.43	Cologne	0.44	Leipzig	0.46
11	Bruges	0.35	Milan	0.41	Sankt Gallen	0.41	Milan	0.43
12	Avignon	0.34	Lyon	0.40	Bruges	0.39	Avignon	0.40
13	Lyon	0.34	Cologne	0.38	Geneva	0.38	Geneva	0.40
14	Milan	0.34	Zaragoza	0.38	Florence	0.36	Zaragoza	0.40
15	Cologne	0.33	Bruges	0.37	Lyon	0.34	Ulm	0.38
16	Augsburg	0.32	Konstanz	0.35	Ulm	0.34	Konstanz	0.38
17	Ravensburg	0.32	Ravensburg	0.34	Ravensburg	0.34	Maastricht	0.38
18	Barcelona +	0.32	Avignon	0.33	Zaragoza	0.34	L'Aquila	0.37
19	Valencia	0.31	Florence	0.32	Konstanz	0.33		
20	Konstanz	0.31	Basel	0.32	Avignon	0.30		
21	Kraków	0.31	Rome	0.31	Maastricht	0.30		
22			Barcelona +	0.31				

The following cities are possibly underestimated in the table as a result of overlaps with less precise geographical designations, which are given with their connectivities below:
+ Barcelona: P^9_a (Catalonia) = 0.03; P^5_a (Catalonia) = 0.04.
* The table includes all cities that have at least thirty percent of the highest connectivity (Nürnberg's) according to the nine-point scale scoring system (for P^9_a). For connectivities according to the other scoring methods more or less equivalent thresholds have been chosen.
** R: Rank.

South German merchants not only traded with these fair cities, but also with a large variety of other places in the German Empire. Nürnberg obtained commercial privileges in various centres in its surroundings (e.g. Sulzbach, Regensburg and Passau towards the east, Bamberg, Würzburg and Cheb in the north, Rothenburg ober der Tauber, Schwäbisch Hall, Heilbron and Wimpfen towards the west, and Weiβenburg, Schwäbisch Gmünd, Nördlingen, Donauwörth and Munich in the south), in several cities along or near the Rhine (including Basel, Colmar, Strasbourg, Hagenau, Speyer, Worms, Mainz, Frankfurt am Main, Koblenz, Cologne – which was of particular importance – and Duisburg), in Trier and Aachen, in Lorraine (Metz, Saint-Nicolas-de-Port, Verdun, Saint-Mihiel and Neufchâteau), in Burgundy (Besançon), and in the Swiss lands (Bern, Solothurn,…) (Hirschmann, 1967; Schulte, 1923, I, 31; Von Stromer, 1970, 210, 218-219). In the Baltic, competition from the Hanse was strong, but nevertheless southern Germans penetrated into Prussia and Livonia via Poland. They used

the harbour of Danzig for the shipment of copper to the Low Countries. Even in Lübeck Nürnberg merchants acquired privileges (1373), and some of them became involved in the herring trade of Lübeck with Scania and Sweden in the 14th century. In Hamburg, they appeared in the early 16th century (Dollinger, 1970, 197, 317, 357-359; Hirschmann, 1967; Von Stromer, 1970, 211-212, 216, 219).

From early on traders from southern Germany, especially those from Regensburg, also became involved in commerce with the east. Already in the 12th century, merchants from Regensburg went as far as Kiev and even Novgorod (via Volodymyr-Volynskyi). By the late 14th century, tradesmen from Nürnberg and Ulm had become more important in eastern trade than those of Regensburg however. Nürnberg merchants even reached Constantinople and the Genoese colonies in the Black Sea via the Danube and the Dniester, but more regular destinations in the east were Prague in Bohemia, Wrocław in Silesia, Poznań, Kraków, Warsaw and Lvov in the kingdom of Poland, Vienna in Austria, and Buda in Hungary. In all these principalities, as well as in Brandenburg, Moravia, Steiermark, Kärnten and Slovenia Nürnberg had acquired commercial privileges. Among the wares exported eastwards were fustians, linen, metal wares, weapons, cloth from the Low Countries and the Rhine region, wines from Austria and Tirol, and spices, which were exchanged for furs, skins, wax and honey (Eikenberg, 1976, 100-101, 118; Hirschmann, 1967; Schulte, 1923, I, 31; Seibold, 1977b, 290; Von Stromer, 1970, 210-211, 216-219).

However, the principal goods obtained in the east were the metals (chiefly copper and silver) from the central European mines. Merchants from Nürnberg especially were very successful as entrepreneurs in the mining and smelting industries. The iron ore deposits of the Upper Palatinate just east of Nürnberg played an important role in the development of the metal producing industries of the city, which were supplied with raw materials from the mines of the Upper Palatinate by Nürnberg merchants. Soon southern German merchants – from Nürnberg as well as from Augsburg – became active in other mining areas as well, such as the Ore Mountains (Erzgebirge), the Harz, Tirol, the Sudetes and the Carpathians, and south German businessmen increasingly dominated the economies of mining centres such as Schwaz in Tirol and Kutná Hora in Bohemia. The exploitation of mines or the control over their output often came in hands of southern German firms as a repayment of the loans wich they provided to central European princes in whose territories the mines were located (Hunt & Murray, 1999, 197-198; Von Stromer, 1970, 211, 213-215, 217-218. About the economies of late medieval mining centres, which were highly dependent upon long-distance trade connections, see Spufford, 2002, 352-375).

Table 3.18
Connectivity across the networks of thirteen 16th-century southern German firms according to different scoring systems*

R**	City	P^9_a	City	P^5_a	City	P^4_a	City	P^2_a
1	Augsburg	1	Augsburg	1	Augsburg	1	Leipzig	1
2	Nürnberg	0.99	Nürnberg	0.93	Nürnberg	0.89	Nürnberg	1
3	Venice	0.88	Venice	0.83	Leipzig	0.79	Venice	1
4	Antwerp	0.88	Antwerp	0.81	Venice	0.79	Lyon	0.92
5	Lisbon	0.75	Leipzig	0.77	Lyon	0.74	Antwerp	0.91
6	Leipzig	0.75	Lisbon	0.76	Antwerp	0.74	Frankfurt a. Main	0.88
7	Lyon	0.71	Lyon	0.71	Lisbon	0.72	Augsburg	0.88
8	Frankfurt a. Main	0.65	Frankfurt a. Main	0.66	Frankfurt a. Main	0.69	Lisbon	0.87
9	Cologne	0.56	Cologne	0.62	Cologne	0.65	Cologne	0.74
10	Vienna	0.55	Genoa	0.61	Vienna	0.56	Danzig	0.70
11	Genoa	0.53	Vienna	0.61	Salzburg	0.56	Sevilla	0.69
12	Rome	0.53	Wrocław	0.59	Genoa	0.55	Zaragoza	0.69
13	Wrocław	0.52	Milan	0.58	Sevilla	0.55	Vienna	0.66
14	Sevilla	0.49	Salzburg	0.53	Danzig	0.54	Genoa	0.65
15	Banská Bystrica	0.48	Sevilla	0.52	Wrocław	0.54	L'Aquila	0.64
16	Milan	0.48	Rome	0.51	Zaragoza	0.53	Wrocław	0.62
17	Naples	0.46	Amsterdam	0.50	L'Aquila	0.52	Innsbruck	0.62
18	Amsterdam	0.46	Naples	0.49	Ulm	0.51	Banská Bystrica	0.61
19	Kraków	0.45	Kraków	0.48	Milan	0.48	Salzburg	0.61
20	Valladolid	0.44	L'Aquila	0.48	Innsbruck	0.47	Ulm	0.59
21	L'Aquila	0.42	Ulm	0.46	Naples	0.47	Hamburg	0.59
22	Madrid	0.42	Zaragoza	0.46	Marseille	0.46	London	0.59
23	Danzig	0.41	Valladolid	0.46	Rome	0.46	Bolzano	0.59
24	Innsbruck	0.41	London	0.45	London	0.46	Naples	0.58
25	Salzburg	0.40	Bolzano	0.44	Banská Bystrica	0.46	Barcelona ++	0.58
26	Schwaz	0.40	Innsbruck	0.44	Bolzano	0.45	Valladolid	0.56
27	Zaragoza	0.40	Banská Bystrica	0.44	Prague +	0.45	Rome	0.56
28	Hamburg	0.39	Danzig	0.42	Amsterdam	0.45	Linz	0.56
29	Ulm	0.37	Hamburg	0.41	Memmingen	0.44	Marseille	0.56
30	Bolzano	0.36	Prague +	0.40	Kraków	0.44	Valencia	0.56
31	London	0.36	Schwaz	0.39	Barcelona ++	0.44	Kraków	0.54
32	Toledo	0.36	Madrid	0.39	Valencia	0.43	Amsterdam	0.53
33	Prague +	0.32	Marseille	0.38	Valladolid	0.43	Memmingen	0.53
34	Medina d. Campo	0.31	Geneva	0.38	Hamburg	0.43	Milan	0.53
35	Hall	0.31	Medina d. Ríosec.	0.38	Geneva	0.42	Prague	0.51
36	Barcelona ++	0.30	Medina d. Campo	0.38	Medina d. Campo	0.42	Schwaz	0.50
37	Medina d. Ríosec.	0.30	Villalón	0.38	Linz	0.42	Burgos	0.50
38	Villalón	0.30	Toledo	0.37	Poznań	0.41	Santo Domingo	0.50
39			Barcelona ++	0.36	Medina d. Ríosec.	0.41	Toledo	0.50
40			Memmingen	0.36	Villalón	0.41		
41			Florence	0.35	Florence	0.41		

The following cities are possibly underestimated in the table as a result of overlaps with less precise geographical designations, which are given with their connectivities below:
+ Prague: P^9_a (Bohemia) = 0.05; P^5_a (Bohemia) = 0.09; P^4_a (Bohemia) = 0.05.
++ Barcel.: P^9_a (Catalonia) = 0.02; P^5_a (Catalonia) = 0.02; P^4_a (Catalonia) = 0.03; P^2_a (Catalonia) = 0.04.
* The table includes all cities that have at least thirty percent of the highest connectivity (Augsburg's) according to the nine-point scale scoring system (for P^9_a). For connectivities according to the other scoring methods more or less equivalent thresholds have been chosen.
** R: Rank.

The almost complete control which the southern German merchants obtained over the metals of central Europe (often to the detriment of the Italians) gave them a lever for strengthening their position in Italy as well. The southern German cities were located along an important trade route from Italy to the north. High Germans not only traded with Italian businessmen at the fairs of Geneva and Bolzano, but actively entered the Italian market. Venice, where German merchants resided in the *Fondaco dei Tedeschi* since 1228, from the beginning was the principal Italian destination of southern German merchants, first especially from Regensburg, from the 14th century increasingly from Nürnberg, Ulm and Augsburg. German silver was crucial for the Venetians to balance their trade with the Levant, and was exchanged for spices, silks, cotton (for the fustian industry), etc. which were re-exported by the south Germans to central Europe. In Genoa – and along the road in Milan – the High Germans were active as well, especially when relations with Venice were bad (such as during the blockade organised against Venice by Emperor Sigismund in the early 15th century). As a result of their interest in the saffron trade, southern Germans went as far as L'Aquila and Puglia, as well as to Aragón and Catalonia (Barcelona, Valencia, Perpignan), which were reached via Genoa or via the Rhône route along which High Germans were also active in Avignon, Arles and especially Lyon (Ammann, 1928, 68-69; Eikenberg, 1976, 69-71, 100; Gascon, 1971, 359-361; Hirschmann, 1967; Hunt & Murray, 1999, 192-194, 197-198; Kalus, 2009, 4; Lane, 1973, 61; Mauro, 1990, 264-265; Schulte, 1923, I, 31, 242, 258-275, 288-289, 318-339; Seibold, 1977b, 10, 284-285, 291; Id., 1995, 137; Spufford, 2002, 20-21, 352-353; Von Stromer, 1970, 210-212, 216-220; Id., 1986).

The textiles produced in the Low Countries were not only purchased by High German merchants at the fairs of Frankfurt, but also in the production region itself, which was reached via Frankfurt and Cologne. The decline of the fairs of Champagne (which had also been attended by south German traders) and the Hundred Years' War had resulted in an eastward shift of the trade routes between Italy and the Low Countries, which benefited southern German business. Shortly after 1300, Nürnberg merchants obtained commercial privileges in the textile producing centres of Brabant (including Leuven, Mechelen and Brussels) and in Antwerp, followed by privileges in Flanders (Bruges, Ghent, Ieper,…) in the early 1360s. Favourable trade conditions were also secured in other parts of the Low Countries, such as in the textile centres Cambrai, Valenciennes and Tournai, and along the Meuse in Dinant, Namur, Liège and Maastricht. In contrast to most other nations, the southern Germans from the beginning appear to have preferred Antwerp to Bruges as the centre of their activities in the Low Countries, and they often used the fairs of Antwerp and Bergen-op-Zoom

complementarily to those of Frankfurt. Nevertheless they established themselves in large numbers in Antwerp only from the early 16th century, playing an important role in the development of the city as one of the principal financial centres of Europe. By the end of the 14th century, High German businessmen also entered the English market, although they purchased English products especially in Antwerp (Bolton & Guidi Bruscoli, 2008; Dollinger, 1970, 196; Eikenberg, 1976, 100; Harreld, 2004, passim; Hirschmann, 1967; Marechal, 1985a, 181, 186-187; Schulte, 1923, I, 31, 400; Spufford, 2002, 354; Von Stromer, 1970, 210-212, 215-219).

High German businessmen were not only wholesale traders or mining entrepreneurs. Several of them were also active as bankers. Already in the 14th century, business houses of Nürnberg, Ulm and Strasbourg were involved in exchange transactions with Milan, Venice, Bologna, Florence, Bruges, Prague, etc. Nürnberg enterprises collected papal revenues in Germany, Poland and Sweden, which were then forwarded to the papal court in Avignon and later Rome (Von Stromer, 1970, 212-213; Id., 2002, 219-220). However, the large business houses of southern Germany became especially involved in government banking. Already in the 15th century, Nürnberg bankers obtained political influence thanks to their loans to the German emperors of the house of Luxemburg, and from the end of the 15th century a similar relationship developed between several Augsburg bankers – in the first place the Fugger and Welser – and the Habsburgs (Ehrenberg, 1928, passim; Von Stromer, 2002, 215, 219).

As the principal bankers of the Habsburg Emperors during the first half of the 16th century – after which period the Genoese, their biggest rivals, definitely took the lead – Augsburg firms became ubiquitous in the 16th century. Following the Habsburgs, they gained a foothold in Spain (especially Sevilla and its harbours San Lúcar and Cádiz, as well as at the travelling Spanish court) and Portugal (Lisbon), and from there some of them participated in expeditions to the East Indies in the early 16th century, or in commerce with the New World (Ehrenberg, 1928, 138; Kellenbenz, 1954, 287, 291-297; Kellenbenz & Walter, 2001; Mauro, 1990, 279-282; Von Stromer, 1970, 212; Id., 2002, 218).

The original focus of High German business on the central European markets and the strong orientation towards Venice can be derived from table 3.5 (articulating cities and primary field cities of the central European component). Tables 3.16 to 3.18 nicely reproduce the scope as well as the expansion of this network of the southern German cities over time. In the 14th century High German trade was especially directed towards Germany itself (Frankfurt am Main, Cologne, Strasbourg), the eastern markets (Prague, Wrocław, Kraków, Vienna, Košice in Upper Hungary (now Slovakia), Buda) and Venice, and to a lesser degree also to

Bruges and the Brabant textile centres (table 3.16). Not much changed in the 15th century, although the fairs of Leipzig, Nördlingen and Geneva – in addition to those of Frankfurt – appear to have attracted an increasing number of south German tradesmen, while we can also see the development of the trade route along the Rhône (Lyon, Avignon) to the saffron markets of Aragón (Zaragoza) (table 3.17). Somewhat surprisingly, the southern German firms investigated appear to have had stronger connections with Bruges than with Antwerp during the 14th and 15th centuries. The 16th century (table 3.18) witnesses the strengthening of the south German position in all parts of the Habsburg empire: in the Austrian crown lands (Vienna, Salzburg, Innsbruck, the fairs of Linz), the Low Countries (Antwerp), Italy (not only Venice, Genoa and Milan, but also Rome and Naples) and especially on the Iberian peninsula (Lisbon, Sevilla, the Spanish court travelling between Valladolid, Madrid and Toledo, and the fairs of Castile). The appearance of mining centres such as Banská Bystrica (in Upper Hungary) and Schwaz (in Tirol) should not come as a surprise. That they only emerge in the 16th-century table is perhaps a result of the revival of silver mining in the middle of the 15th century (Hunt & Murray, 1999, 197-198)[109].

3.3.4. The Atlantic nations

The firm sample contains a large number of firms originating from the territories bordering the Atlantic and North Sea. The twelve-component solution of the exploratory principal components analysis (table 3.1) categorises them in four components, respectively made up of firms from the Low Countries, Castile, England and the northern Low Countries, with a strong overlap between the first and last of these factors. Portuguese firms on the other hand are not grouped in a separate component, but come out in the analysis as hybrid firms loading in the first place on the Low Countries factor, and secondly on a component constituted mostly of 16th-century Tuscan firms.

The principal group of Atlantic nations missing from the business value matrix are those from the French west coast. Native tradesmen from the French Atlantic (especially Normans and Bretons) were not unimportant, although the Hundred Years' War was a disruptive factor. Merchants from Normandy (chiefly from Rouen) for instance actively traded with Lyon, London, Bruges, Antwerp, Nantes, Bilbao, Burgos, Lisbon and Sevilla to name only the most important connections, and in the 16th century they went as far as the New World and around Africa to the East Indies. Although the absence of French Atlantic

[109] Although this might be a coincidence as well: mining centres such as Kutná Hora fell only just below the threshold for inclusion in the 14th-century table for instance.

merchants doubtlessly produces a bias in the matrix, the most important transnational entrepreneurs in the cities of the French west coast were often foreign businessmen, especially Castilians from the late 15th century and Dutch merchants from the end of the 16th century. Since several of these foreigners have been included in the firm sample, imbalances in the data are probably not as large as one would think at first sight (Mollat, 1952, 507-520, 597; Veluwenkamp, 1996, 152-156).

Castilians

The late medieval kingdom of Castile contained large parts of present-day Spain, except for the territories controlled by the kingdom of Aragón (Aragón, Catalonia, Valencia, Balearics), the small kingdom of Navarra, and the Muslim kingdom of Granada in the south. When abroad, the merchants from the different areas of Castile at one time formed a single nation, while at another they were organised in separate communities. In Bruges, until 1455 there was a single Castilian nation – consisting of merchants from Castile, Biscay, Andalusia, and even Navarra – which then was split up between a Biscay and a Castilian nation *stricto sensu*, the former grouping the merchants from the Spanish north coast (the Basque provinces, Cantabria, Asturias and Galicia, as well as Navarra, whose merchants established their own consulate in Bruges in 1530), the latter those from the Spanish cities south of the Ebro, especially Sevilla, Toledo, Segovia, Soria, Valladolid, Medina del Campo, Logroño, Nájera, Navarrete, and above all Burgos. Moreover, in Middelburg a separate Andalusian nation existed from the early 15th century (Casado Alonso, 1996, 64; Fagel, 2000, 88; Marechal, 1985a, 97-99, 101-103, 190).

The nine Castilian firms included in the firm sample all originated from Castile *stricto sensu*. Seven of the families heading these enterprises came from Burgos or its surroundings, one family came from Ávila, and one from Medina de Ríoseco. Most of them also had their headquarters in Burgos, although one firm was established in Medina del Campo, another in Sevilla, and several had moved to France (Rouen, Nantes or Toulouse). This should not come as a surprise, since merchants from Burgos (since 1494 organised in the Consulado of Burgos) dominated the Castilian nation and especially the important trade in Castilian wool thanks to the favourable location of Burgos between the ports of Biscay and the northern ends of the sheepwalks of Castile (Caunedo del Potro, 1985, 163; Mathers, 1988, 367-370; Mollat, 1970, 44, 46; Spufford, 2002, 330). However, the one-sided inclusion in the business value matrix of firms from only Castile *stricto sensu* prejudices merchants from other parts of the

kingdom, notably those from Andalusia, active in trade with the New World (although Genoese businessmen had the upper hand in southern Spain), and those from Bilbao and the other harbours from the Spanish north coast, resulting in a bias in the data. Merchants from Biscay (Bilbao, but also Laredo, Santander, etc.) were chiefly involved in the shipping trade in wine and iron from northern Spain, but also of Castilian wool, which they carried for instance to Bruges. Being experienced shippers, they appear to have been mostly itinerant merchants, which partly explains why data about the business networks of individual Biscay enterprises are scarce (Casado Alonso, 1996, 68; Fagel, 2000, 95; Goris, 1925, 57-58; Marechal, 1985a, 91-99, 114-116, 190-193, 219; Mollat, 1970, 44; Phillips, 2000, 78; Spufford, 2002, 330).

In what follows, the focus as a result will be upon the network of the Castilian nation *stricto sensu*, epitomised by the large merchants of Burgos. In contrast to the Biscayans, data about Burgos enterprises are relatively well available (at least for the late 15th and 16th century), and several other firms could have been added to the sample. However, with eight 16th-century enterprises they are already strongly represented for the latter century, producing a substantial factor (component four in the twelve-component solution, see tables 3.1 and 3.4). For earlier centuries, data are less abundant, and the business value matrix only contains one 15th-century Castilian firm and none for the 14th century. This is more or less in line with the development of Castilian trade in general. Although Castilian merchants and shippers became active in Atlantic trade already in the 12th century and were found in numerous European ports during the 13th century, the Castilian merchant communities declined in the 14th century due to the general economic crisis (Casado Alonso, 1996, 61-64). There appears to be some disagreement about the date of recovery of Castilian overseas trade. According to Hilario Casado Alonso (loc. cit.) the mercantile connections between Castile and the rest of western Europe began to intensify again from the end of the 14th century, and especially since ca. 1425-1430. Other authors however situate the renewed commercial expansion of Castile more towards the end of the 15th century (around 1470) (Mathers, 1988, 367, 371; Mollat, 1970, 51). A new decline set in around 1570 as a result of the Spanish royal bankruptcies and the Revolt in the Low Countries against Philip II of Spain (Casado Alonso, 1996, 61-64; Mathers, 1988, 371, 394; Phillips, 2000, 82-83). Depending on when one places the revival of Castilian commerce, Castilian firms are more or less underrepresented in the 15th-century business value matrix.

In table 3.19, which describes the combined network of the Castilian business enterprises incorporated in the sample, I have lumped together the 15th-century firm with

those of the 16th century, since the activities of the former were concentrated in the last quarter of the 15th century. Moreover, I have also added the Aragonese firms to the analysis, since the two of them (both dating from the 16th century) also loaded on the Castilian factor in the twelve-component solution of the principal components analysis described above (see table 3.1). The table is very much in accordance with what is known more generally about the Castilian commercial network (see below).

Table 3.19
Connectivity across the networks of eleven late 15th- and 16th-century Castilian (and Aragonese) firms according to different scoring systems*

R**	City	P^9_a	City	P^5_a	City	P^4_a	City	P^2_a
1	Burgos	1	Burgos	1	Burgos	1	Burgos	1
2	Antwerp	0.74	Medina d. Campo	0.78	Medina d. Campo	0.88	Antwerp	0.98
3	Medina d. Campo	0.71	Antwerp	0.78	Sevilla	0.84	Medina d. Campo	0.98
4	Rouen	0.66	Rouen	0.73	Antwerp	0.83	Sevilla	0.98
5	Sevilla	0.64	Sevilla	0.70	Rouen	0.83	Rouen	0.92
6	Nantes	0.59	Nantes	0.69	Nantes	0.76	Nantes	0.86
7	Bruges	0.50	Bruges	0.57	Bruges	0.67	Bruges	0.81
8	Valladolid	0.46	Lisbon	0.53	Lisbon	0.66	Lisbon	0.78
9	Lisbon	0.45	Valladolid	0.50	Bilbao	0.60	Bilbao	0.76
10	Bilbao	0.38	Bilbao	0.46	London	0.53	London	0.61
11	London	0.36	Bordeaux	0.43	Bordeaux	0.52	Lyon	0.58
12	Bordeaux	0.35	London	0.43	Lyon	0.49	Bordeaux	0.57
13	Lyon	0.33	Florence	0.41	Valladolid	0.43	Paris	0.46
14	Toulouse	0.32	Lyon	0.41	Florence	0.40	Medina d. Ríosec.	0.42
15	Florence	0.32	Toledo	0.38	Toulouse	0.37	Valencia	0.42
16	Madrid	0.23	Toulouse	0.34	Paris	0.36	Madrid	0.38
17	Toledo	0.23	Villalón	0.30	Valencia	0.36	Valladolid	0.37
18	Paris	0.22	Segovia	0.30	Toledo	0.36	Toulouse	0.36
19	Valencia	0.21			Madrid	0.34	Laredo	0.35
20	Villalón	0.21			Medina d. Ríosec.	0.33		
21					Villalón	0.32		

* The table includes all cities that have at least one-fifth of the highest connectivity (Burgos') according to the nine-point scale scoring system (for P^9_a). For connectivities according to the other scoring methods more or less equivalent thresholds have been chosen.
** R: Rank.

In the Iberian Peninsula itself, Burgalese merchants had important ties with the harbours of the Spanish north coast. At the end of the 15th century Burgos formed an association with several ports (Castro-Urdiales, Laredo, Santander, San Vicente de la Barquera) and inland centres (Castrojeriz, Logroño, Medina de Pomar, Medina de Ríoseco, Nájera, Navarrete, Segovia, Valladolid) for organising the freighting of ships in the northern harbours. The principal port used by merchants from Burgos was Bilbao however. Burgalese tradesmen not only were active in the northern harbours, but also in the rest of the kingdom of Castile, especially at the Castilian fairs (Medina del Campo, but also Medina de Ríoseco and Villalón) and in Sevilla, which – like Córdoba – was an important trans-shipment point in the

wool trade with the Mediterranean (Marechal, 1985a, 97-99; Mathers, 1988, 370-371, 384, 386; Mollat, 1952, 520; Spufford, 2002, 331).

Beyond the kingdom of Castile, Castilian commerce was supported by the creation of consulates, which represented the Castilian community in the city in which they were established, and which had legal authority over the community. Most of these consulates came into being between the end of the 14th and the first half of the 15th century. Close connections were maintained between the different Castilian overseas communities, resulting from the family ties which existed between many of their members. Moreover, by 1538 the *consulado* of Burgos organised its own regular mail service to Sevilla, Flanders, Rouen and Brittany. Compared to most other foreign nations, Castilians tended to settle themselves more permanently abroad, and several of them assimilated into the host society (Brunelle, 1989, 204-205; Casado Alonso, 1996, 61-64; Mathers, 1988, 370; Mollat, 1970, 50).

Although Castilian merchants also traded in iron, alum from Mazarrón (in the south-east of Spain), Mediterranean fruits, wine, oil, sugar (which they imported from the Canary Islands or Madeira), leather, and increasingly in products from the New World, the configuration of their foreign trade network was strongly influenced by the demand for Castilian wool (Mathers, 1988, 385; Mollat, 1970, 45, 52; Phillips, 2000, 75-76). As a result, already in the 13th century Castilian merchants and shippers were found in Bruges, where the Spanish wool staple for the Low Countries (with their important woollen cloth industry) became located. Castilian presence in Bruges grew stronger from the early 15th century when Spanish wool increasingly replaced English wool as a raw material for the textile industries of the Low Countries, and a consulate was established here in 1428. In the 16th century the Castilian wool staple remained fixed in Bruges, and although Castilian merchants (chiefly those trading in other goods than wool) also became very strongly involved in trade with Antwerp during the 16th century, many of them preferred to stay in Bruges. Only after the 1550s, the Castilian community in Bruges began to decline (Brunelle, 1989, 205; Casado Alonso, 1996, 62-69; De Roover, 1948b, 21; Fagel, 2000, 89-101; Goris, 1925, 54-71; Harreld, 2004, 45, 55-58, 85-87; Lapeyre, 1955, 119; Marechal, 1985a, 91-116, 183-193, 219; Mathers, 1988, 368, 370, 384-385; Mollat, 1952, 510, 520; Id., 1970, 42-50; Murray, 2000, 7-8; Id., 2005, 95-97, 223, 226-228, 241-243; Phillips, 2000, 76-85; Spufford, 2002, 331; Stabel, 2001, 198-199).

Along the way to Bruges, the Castilians established consulates in the principal harbours of the French west coast, including Bordeaux, La Rochelle, Nantes and Rouen (the latter two were important outlets for Spanish wool), as well as in Toulouse, where they

became involved in the woad trade. Perhaps except for La Rochelle all these cities housed among the most important Castilian foreign communities during the 15th and 16th centuries (in Normandy the Castilians had been concentrated at Harfleur rather than at Rouen before the late 15th century). Although connections also existed with Lyon and Paris, not many Castilians appear to have settled themselves there. Across the English Channel and the North Sea, a substantial Castilian nation developed in London, but Castilians also were to be found in Southampton and Bristol (Brunelle, 1989, 203-205; Casado Alonso, 1996, 63; Gascon, 1971, 359-360, 366; Lapeyre, 1955, 48-49, 119-124, 370-374; Marechal, 1985a, 99; Mathers, 1988, 370-371, 376-377, 384-386; Mollat, 1952, 508-511, 516, 519-520; Id., 1970, 41-50, 55). In the opposite direction, towards the south, the Castilians founded an important consulate in Lisbon around 1400. They also became involved in Mediterranean trade, especially with Florence (which textile industry was an important consumer of Castilian wool), but also with Mallorca, Barcelona, Marseille, Genoa, Pisa, Livorno, Naples and Venice (Casado Alonso, 1996, 63; Lane, 1973, 328; Lapeyre, 1955, 119; Marechal, 1985a, 99; Mathers, 1988, 384, 386; Mollat, 1952, 520; Ruiz Martín, 1965, vii, x, xv-xvi).

The strong Atlantic orientation of Castilian commerce in the 16th century, directed to the Iberian peninsula itself, the French west coast, and the North Sea (Bruges, Antwerp, London) emerges strongly from table 3.19 (Florence and Valencia are the only Mediterranean cities mentioned in the table), as well as from the list of articulating cities and primary field cities of the Castilian component (table 3.5). As such, Castilian tradesmen had a spatial strategy which differed strongly from those of the other southern European nations discussed above.

Portuguese

Although Portuguese overseas trade was not completely unimportant in the 14th and 15th centuries, the 15th-century Portuguese Atlantic discoveries and colonisation of Madeira, the Azores, Cape Verde and São Tomé – which became important centres for sugar production just like Brazil in the 16th century – and especially the discovery and commercial exploitation of the direct sea route around Africa to the pepper and spices markets in the East Indies from the end of the 15th century, increasingly opened up the European markets to Portuguese merchants in the 16th century. The Portuguese nation became more and more important towards the end of the century, and its merchants even eclipsed the Genoese in the course of the 17th century (Hunt & Murray, 1999, 185; Kalus, 2009, 6; Lane, 1973, 297; Ruiz Martín,

1965, xii). Consequently, although the business value matrix only contains 16th-century Portuguese firms, imbalances resulting from the absence of 14th- and 15th-century enterprises are probably limited.

The Portuguese chiefly purchased East Indian pepper in the ports of Goa and Cochin, which were reached via a number of way-stations along the road, especially Madeira, the Cape Verde Islands and Mozambique. This overseas network was largely separated from the Portuguese European trade network however. Since 1505, all import and export trade of Portugal with the overseas colonies was controlled and monopolised by the *Casa da India* in Lisbon. Outfitting of the ships or procurement of the pepper in India were farmed out via contracts, which were different from the contracts set up for the organisation of the sale of pepper in Europe (Hunt & Murray, 1999, 220; Kalus, 2009, 6). Although a number of merchants appear to have been involved in European as well as intercontinental trade, the Portuguese business networks included in the sample focus mostly on Europe.

The principal Portuguese long-distance merchants were Jewish converts, the so-called New Christians, many of whom had fled from Spain to Portugal for the Inquisition at the end of the 15th century. When persecutions against New Christians also began taking place in Portugal from 1536, several of them left Portugal and settled down in the chief commercial centres and harbours of Europe, including Antwerp, London, Livorno, Venice, Ferrara, Ancona, Ragusa, Thessaloníki, and Constantinople. From 1580, when Philip II of Spain also became king of Portugal, many New Christians returned to Spain where they began to play an important role in the commercial centres of the kingdom and in the Spanish overseas colonies (Lane, 1973, 300-304; Mauro, 1990, 266-268, 279; Rau, 1957, 720; Roth, 1948, 16, 38). Portuguese merchants (Jews and Christians) as a result of this diaspora were involved in trade all over Europe, including the French Atlantic harbours (e.g. Bayonne, Bordeaux, Nantes, Rouen), Lyon, Marseille, Sevilla, Medina del Campo, Genoa, Florence, and Venice (Florence and Venice: Ruiz Martín, 1965, xii. French Atlantic ports: Kellenbenz, 1954, 256; Lapeyre, 1955, 124; Mollat, 1952, 508. Genoa: Rau, 1957, 724. Lyon and Marseille: Gascon, 1971, 92, 361, 366; Mauro, 1990, 264-265. Medina del Campo: Kellenbenz, 1954, 241. Sevilla: Kellenbenz & Walter, 2001, 34; Mauro, 1990, 279-282).

The principal nodes of the Portuguese European pepper trade in the 16th century however were Lisbon – where the pepper ships coming from Asia entered Europe – and Antwerp, where the Portuguese established their pepper staple for north-western Europe (also including France). Already in the late Middle Ages strong commercial ties had existed between Portugal and the Low Countries, and a Portuguese nation – mostly consisting of

merchants from Lisbon and Porto – could be found in Bruges since the end of the 14th century (although Portuguese merchants are mentioned in Bruges from the early 13th century). From 1416 the latest, the Portuguese king was represented in Bruges by a royal factor, who had to make purchases for the Portuguese court and who was in charge of controlling the Portuguese royal monopoly over the trade in African products (chiefly pepper from Guinea, ivory and gold). The Portuguese royal factory, which received the pepper destined for the northern markets from the *Casa da India* during the first half of the 16th century, was transferred from Bruges to Antwerp at the far end of the 15th century, and by ca. 1510 the Portuguese nation as well had moved from Bruges to Antwerp. However, the Portuguese increasingly left Antwerp as a result of the religious and political troubles after 1570, establishing themselves instead in the northern Low Countries and the Rhineland, but also moving to Italy for instance. In Cologne, a Portuguese community resided temporarily between ca. 1578 and ca. 1588, but at the end of the 1580s most Portuguese returned to Antwerp. From Antwerp or Cologne several Portuguese businessmen also moved to Hamburg or Amsterdam. In both these cities, the Portuguese became increasingly influential from the early 17th century (Dollinger, 1970, 353-357; Gelderblom, 2000, 61, 120-121; Goris, 1925, 37-55, 69-70, 194-196; Harreld, 2004, 44, 49-53, 85-87, 90; Hunt & Murray, 1999, 220; Kellenbenz, 1954, 241-243, 252-255; Lambert, 2006, 15, 139; Lane, 1973, 291; Marechal, 1985a, 183-188, 217-219; Murray, 2005, 96-97, 223, 227-228, 241-242; Paviot, 2000, 58-59, 62, 70-73; Stabel, 2001, 199; Thimme, 1912, 390-397, 404-405, 410).

The strong penetration of Portuguese merchants not only in the markets of the Iberian Peninsula and the Mediterranean, but also in those of northern Europe via Antwerp explains why Portuguese firms straddle two different factors in the twelve-component result of the principal components analysis, one of them a Mediterranean component (16th-century Tuscan firms), the other a northern European factor (Low Countries firms) centred around the articulating cities Antwerp, Amsterdam, Hamburg and Cologne (tables 3.1 and 3.5). The reason for the clustering of Portuguese firms on the 16th-century Tuscan component is probably that this factor – in contrast to the other Mediterranean factors – has a strong affinity with the new commercial and financial centres booming in the 16th century (articulating cities are Antwerp, Lyon and Rome). The double focus of Portuguese enterprises upon Lisbon and Antwerp also appears clearly from table 3.20: the connectivity of Antwerp is even higher than that of Lisbon. Also for the less connected levels of the network the table is in accordance with the above description of the spatial strategies of Portuguese business.

Table 3.20
Connectivity across the networks of five 16th-century Portuguese firms according to different scoring systems*

R**	City	P^9_a	City	P^5_a	City	P^4_a	City	P^2_a
1	Antwerp	1	Antwerp	1	Antwerp	1	Antwerp	1
2	Lisbon	0.93	Lisbon	0.93	Lisbon	0.90	Lisbon	1
3	Cologne	0.46	Cologne	0.58	Lyon	0.68	Lyon	1
4	Lyon	0.46	Lyon	0.55	Hamburg	0.59	Hamburg	0.86
5	Hamburg	0.43	Hamburg	0.53	Madrid	0.59	Madrid	0.86
6	Florence	0.41	Florence	0.46	Medina d. Campo	0.59	Medina d. Campo	0.86
7	Sevilla	0.40	Madrid	0.45	Sevilla	0.59	Sevilla	0.86
8	Madrid	0.36	Medina d. Campo	0.45	Cologne	0.55	Amsterdam +	0.74
9	Venice	0.35	Sevilla	0.45	Amsterdam +	0.50	Cologne	0.74
10	Medina d. Campo	0.34	Venice	0.39	Florence	0.50	Florence	0.74
11	Amsterdam +	0.29	Amsterdam +	0.38	Porto	0.50	Porto	0.74
12	Porto	0.29	Porto	0.38	Brussels	0.46	Brussels	0.67
13	Brussels	0.27	Brussels	0.35	Venice	0.46	Venice	0.67
14	Cádiz	0.25	Rome	0.35	London	0.43	Cádiz	0.55
15	Valladolid	0.24	Valladolid	0.35	Valladolid	0.39	Frankfurt a. Main	0.53
16	London	0.24	London	0.33	Cádiz	0.37	Genoa	0.53
17	Rome	0.23	Frankfurt a. Main	0.28	Frankfurt a. Main	0.36	London	0.47
18	Frankfurt a. Main	0.21	Genoa	0.28	Genoa	0.36	Valladolid	0.45
19	Genoa	0.21	Cádiz	0.27	Rome	0.34	Calais	0.40
20	Mozambique ++	0.20	Livorno	0.27	Mozambique ++	0.30		
21			San Lúcar	0.27				
22			Paris	0.26				
23			Goa +++	0.25				

The following cities are possibly underestimated in the table as a result of overlaps with less precise geographical designations, which are given with their connectivities below:
+ Amsterdam: P^9_a (Northern Low Countries) = 0.05; P^5_a (Northern Low Countries) = 0.07; P^4_a (Northern Low Countries) = 0.09; P^2_a (Northern Low Countries) = 0.12.
++ Mozambique: P^9_a (Africa) = 0.10; P^4_a (Africa) = 0.14.
+++ Goa: P^5_a (East Indies) = 0.10, P^5_a (Asia) = 0.07.
* The table includes all cities that have at least one-fifth of the highest connectivity (Antwerp's) according to the nine-point scale scoring system (for P^9_a). For connectivities according to the other scoring methods more or less equivalent thresholds have been chosen.
** R: Rank.

Flemish and Dutch

As was the case for Castilian and Portuguese business organisations, Flemish[110] and Dutch firms incorporated in the business value matrix are not evenly spread across the three centuries between 1300 and 1600. The large majority of them (fourteen out of sixteen) are 16th-century organisations, and for the latter century they are probably overrepresented in the sample compared to other nations. The 16th-century focus of this subsample reflects the general evolution of Flemish overseas commerce: while Flemish businessmen from the 11th to the 13th century were strongly involved in long-distance trade, for instance purchasing wool in England or exporting Flemish cloth to the Champagne fairs (respectively via the London

[110] Flemish is used here in the general meaning of 'from the southern Low Countries', rather than 'from the county of Flanders'.

Hanse and the Hanse of Seventeen Cities), the majority of them were active as intermediaries between local cloth producers and international merchants or between foreign merchants of different nations coming to Bruges during the 14th and 15th centuries. Although Flemish businessmen and especially Brabant cloth merchants remained actively engaged in overseas commerce in this period, foreign merchants took the lead in Flemish long-distance trade. This changed in the course of the 16th century (especially after 1530), when tradesmen from various parts of the Low Countries, chiefly trading from Antwerp, controlled an increasingly large share of Flemish international commerce again (Brulez, 1959, 445-451, 457-458; Prevenier & Blockmans, 1986, 74-79; Stabel, 2000; Id., 2004; Van Houtte & Van Uytven, 1980, 87-111. About the 12th-13th-century Hanses: Abu-Lughod, 1989, 62, 66-67; Dollinger, 1970, 3-5, 8; Murray, 2002, 262; Spufford, 2002, 327). Although the sample also contains two Flemish firms of the 14th and 15th century (one for each century), the discussion below will focus upon the 16th century.

Ironically, the flight of Flemish businessmen from Antwerp during the religious and political crisis of the second half of the 16th century and their dispersal across the commercial and financial centres of Europe has strongly stimulated the role of merchants from the Low Countries in European long-distance trade (Brulez, 1960, 280-284). Not surprisingly, the business value matrix contains not only Flemish firms with headquarters in Antwerp (Della Faille, Jan van Immerseel, Van der Molen, Schetz – who came originally from Aachen), but also enterprises established in Amsterdam (Poulle, Hans Thijs – who temporarily established himself in Elblag and Danzig before moving to Amsterdam), Bremen (Van der Meulen), Cologne (Nicolas de Groote, Jean Resteau), Frankfurt am Main (Johann von Bodeck, who was actually the son of a Hanseatic merchant established in Antwerp, and who went from Antwerp to Frankfurt via Lübeck), and Hamburg (Dominicus van Uffele). These merchants all could make use of an international network of relatives and fellow countrymen spread across Europe.

In the analysis below (see table 3.21) I have also included the three Dutch firms from the sample (Cunertorf-Snel, from the Hanse city Kampen but with headquarters in Lisbon; Nicolaas van Adrichem, from Delft; Lambert van Tweenhuysen, with headquarters in Amsterdam but originally from Zwolle) since all of these loaded strongly on the same component as the Flemish firms, producing a general Low Countries component (factor III, see table 3.1). Until the end of the century a political division between the northern and southern Low Countries did not exist, and while several Dutch merchants established themselves in Antwerp before the Revolt (e.g. the Van der Molen, who came from Haarlem),

many moved in the opposite direction from Antwerp to Amsterdam at the end of the century. Moreover, Dutch and Flemish merchants abroad were regularly organised together in the same merchant guilds up to the early 17th century (Brulez, 1960, 299). According to Oscar Gelderblom (2000, 249), merchants from the northern and southern Low Countries can be considered as a single merchant community, despite small differences. This is largely confirmed by the results of the exploratory principal components analysis.

That differences existed nevertheless is indicated by the appearance of a weak Dutch component (factor XII). Although one should be careful with the interpretation of component scores on this factor, the particular focus of Dutch trade (especially that of Amsterdam) on trade with the Baltic (the so-called 'moedernegotie' or mother trade) as well as with the Atlantic salt harbours can nevertheless be derived from the list of primary field cities of the Dutch component (table 3.5). Indeed, among these primary field cities do not only feature a number of Dutch cities (Amsterdam, Enkhuizen and Rotterdam), but also several Baltic (Danzig, Königsberg) and Atlantic (Lisbon, Brouage, Setúbal) harbours.

As Clé Lesger (2006) has argued, the Low Countries during the 16th century formed a closely integrated economic system centred on Antwerp, but in which several other cities occupied specific niches in the international trade of the Low Countries as well. Secondary centres for maritime commerce for instance were the Zeeland harbours (especially Middelburg) exporting to England and the south, the Dutch river-ports of the Rhine-Maas delta (chiefly Dordrecht) trading mostly along an east-west axis between England and the Rhineland, and the harbours of the Zuiderzee coast and the Ij (with Amsterdam as most substantial harbour) which had important connections with the northern and eastern Low Countries, Norway, the North Sea coast of Germany and Denmark, and the Baltic (Lesger, 2006, 26-45, 65-75; see also Gelderblom, 2000, 82-84). In the southern part of the Low Countries Bruges remained a relatively important centre in the import trade from Spain (although mostly dominated by Spanish merchants), while cities such as Ghent, Kortrijk and especially Lille were secondary markets located in the Flemish textile producing region, where Antwerp merchants supplied themselves with cloth for export via Antwerp (Lambert *et al*., 2008). A number of textile producing centres in Holland (Haarlem, Leiden) may have developed into such secondary markets as well (Lesger, 2006, 22).

The existence of a well-integrated economic system in the Low Countries in the 16th century is supported by the fact that a relatively large number of cities from the northern as well as the southern Low Countries appear in table 3.21 (which outlines the aggregate network of 16th-century Low Countries firms), several of them with high connectivities.

Table 3.21
Connectivity across the networks of fourteen 16th-century Low Countries firms according to different scoring systems*

R**	City	P^9_a	City	P^5_a	City	P^4_a	City	P^2_a
1	Antwerp	1	Antwerp	1	Antwerp	1	Antwerp	1
2	Amsterdam +	0.90	Amsterdam +	0.83	Amsterdam +	0.93	Amsterdam +	0.98
3	Hamburg	0.67	Hamburg	0.68	Hamburg	0.78	Hamburg	0.92
4	Venice	0.65	Venice	0.64	Middelburg +	0.73	Middelburg +	0.90
5	Middelburg +	0.59	Middelburg +	0.60	Venice	0.69	London	0.84
6	Cologne	0.56	Cologne	0.58	Lisbon	0.68	Venice	0.83
7	Lisbon	0.55	London	0.57	London	0.66	Lisbon	0.83
8	London	0.54	Lisbon	0.57	Cologne	0.65	Cologne	0.71
9	Danzig	0.48	Danzig	0.55	Danzig	0.54	La Rochelle	0.59
10	Frankfurt a. Main	0.47	Frankfurt a. Main	0.47	Frankfurt a. Main	0.51	Lübeck	0.59
11	Sevilla ++	0.39	Sevilla ++	0.44	Sevilla ++	0.50	Genoa	0.58
12	La Rochelle	0.36	Nürnberg +++	0.42	Emden	0.48	Danzig	0.57
13	Emden	0.36	Emden	0.40	La Rochelle	0.48	Emden	0.56
14	Nürnberg +++	0.35	La Rochelle	0.40	Nürnberg +++	0.48	Königsberg	0.55
15	Königsberg	0.34	Königsberg	0.38	Genoa	0.46	Sevilla ++	0.55
16	Lübeck	0.34	Genoa	0.37	Königsberg	0.46	Frankfurt a. Main	0.54
17	Haarlem +	0.32	Haarlem +	0.36	Lübeck	0.45	Nürnberg +++	0.53
18	Genoa	0.32	Lübeck	0.36	Haarlem +	0.39	Rouen	0.47
19	Rouen	0.31	Rotterdam +	0.33	Rouen	0.39	Haarlem +	0.43
20	Delft +	0.29	Brussels	0.33	Lille	0.33	Stade	0.42
21	Bordeaux	0.26	Rouen	0.31	Bordeaux	0.33	Lille	0.40
22	Bremen	0.26	*East Indies****	0.31	Delft +	0.33	Bordeaux	0.38
23	Rotterdam +	0.25	Calais	0.30	Stade	0.33	Aachen	0.38
24	Verona	0.25	Delft +	0.29	San Lúcar ++	0.32	Delft +	0.38
25	Brussels	0.24	Verona	0.29	Brussels	0.32	Stockholm ++++	0.38
26	Stade	0.24	Bordeaux	0.28	Rotterdam +	0.31	Szczecin	0.36
27	Lille	0.24	Lille	0.28	Calais	0.31	Brouage	0.31
28	Aachen	0.23	Utrecht +	0.28	Augsburg +++	0.29	San Lúcar ++	0.31
29	Calais	0.23	Augsburg +++	0.27	Aachen	0.29	Augsburg +++	0.30
30	Leiden +	0.22	*Guinea reg.* +++++	0.27	Stockholm ++++	0.29	Calais	0.30
31	Naples	0.22	Riga	0.27	Szczecin	0.28	Ghent	0.30
32	Augsburg +++	0.21	San Lúcar ++	0.26	Verona	0.27	Kortrijk	0.30
33	Elblag	0.21	Stade	0.26	Riga	0.26	Naples	0.30
34	San Lúcar ++	0.21	Bremen	0.25	Ghent	0.26	Verona	0.30
35	Stockholm ++++	0.20			Paris	0.25		

The following cities/locations are possibly underestimated in the table as a result of overlaps with other places, which are given with their connectivities below:
+ Amsterdam, Middelburg (not for Holland), Haarlem, Delft, Rotterdam, Leiden, Utrecht (not for Holland): P^9_a (Northern Low Countries) = 0.04, P^9_a (Holland) = 0.04; P^5_a (Northern Low Countries) = 0.05, P^5_a (Holland) = 0.05; P^4_a (Northern Low Countries) = 0.06, P^4_a (Holland) = 0.06; P^2_a (Northern Low Countries) = 0.08, P^2_a (Holland) = 0.06.
++ Sevilla, San Lúcar: P^9_a (Spain) = 0.08; P^5_a (Spain) = 0.10; P^4_a (Spain) = 0.09; P^2_a (Spain) = 0.08.
+++ Nürnberg, Augsburg: P^9_a (High Germany) = 0.02; P^5_a (High Germany) = 0.02; P^4_a (High Germany) = 0.03; P^2_a (High Germany) = 0.04.
++++ Stockholm: P^9_a (Sweden) = 0.03; P^4_a (Sweden) = 0.04; P^2_a (Sweden) = 0.05.
+++++ Guinea region: P^5_a (Africa) = 0.05.
* The table includes all cities that have at least one-fifth of the highest connectivity (Antwerp's) according to the nine-point scale scoring system (for P^9_a). For connectivities according to the other scoring methods more or less equivalent thresholds have been chosen.
** R: Rank.
*** *East Indies (italics)*: Less precise geographical designations.

Almost all of these were located in the maritime core regions of Flanders (Lille, Ghent, Kortrijk), Brabant (Antwerp, Brussels), Zeeland (Middelburg) or Holland (Amsterdam, Haarlem, Delft, Rotterdam, Leiden).

Concerning the foreign connections, the discussion below will chiefly focus upon the network produced by Flemish merchants, since these make up most of the subsample.

Flemish/Dutch consulates were only established in southern Europe, and in contrast the Flemish merchant communities in England, France and central Europe were much more informally organised (Stols, 1971, 93). Flemish merchants regularly traded with the Iberian Peninsula already during the late Middle Ages. The principal Flemish consulates around 1600 were those of Lisbon, Sevilla and its harbour San Lúcar, Cádiz, and Málaga. These consulates were often shared with merchants from Germany, Burgundy and Artois. Smaller consulates and/or communities existed in places such as San Sebastián, Bilbao, Valladolid, Madrid, Toledo, Viana do Castelo, Porto, El Puerto de Santa María, Gibraltar, Marbella, Vélez Málaga, Motril, Cartagena, Alicante, Valencia, and perhaps Zaragoza. Several of these only appear to have developed in the early 17th century however. In Lisbon on the contrary, a Flemish religious fraternity already existed in the early 15th century, and in Sevilla and Cádiz merchants from Bruges were active by the second half of the 15th century. Under Philip II, the position of the Flemish in Sevilla became so strong that they increasingly began to challenge the role of the Genoese. From Spain and Portugal, Flemish traders maintained regular connections with the Canaries and other Atlantic Islands (Brulez, 1959, 445, 453-454; Id., 1960, 296-298; Denucé, 1934, 19; Goris, 1925, 38; Kellenbenz, 1954, 287, 292-297; Mauro, 1990, 279-282; Mus, 1964, 79-82, 85-86, 91, 94; Otte, 1986, 41; Pike, 1966, 30; Rau, 1957, 719 n. 15; Stols, 1971, 80-83, 86, 90-92).

In Italy, the largest Flemish merchant community could be found at Venice. The withdrawal of Venetian merchants from the Low Countries at the beginning of the 16th century probably had been an important stimulus for the early development of active commercial relations with Venice by Flemish merchants filling in the gap left by the Venetians. The other Flemish nations in Italy – including Genoa, Livorno, Rome and Palermo – were much smaller and only developed towards the end of the century, often in conjunction with beginning Dutch grain shipping to the Mediterranean (Brulez, 1959, 454-455; Id., 1960, 299-302; Gelderblom, 2000, 153-155, 179; Lesger, 2006, 86; Puttevils, 2007, 62-63, 187-188; Stols, 1971, 89). On the way to the south, merchants from the Low Countries established themselves in the French Atlantic harbours, such as Rouen, Bordeaux and especially La

Rochelle (after ca. 1560), from where they exported chiefly wine and salt. Elsewhere in France Flemish merchants could also be found in Paris, and many traded with Lorraine. In Lyon on the other hand, Flemish merchants did not appear to have been very active (Brulez, 1959, 452-453; Id., 1960, 285-286; Gascon, 1971, 366; Mauro, 1990, 264-265).

In the north, important communities of Flemish merchants developed in London in the west, and after the outbreak of the religious and political troubles in the Low Countries also in Hamburg, Cologne, Frankfurt am Main, and Nürnberg in Germany. In 1580, Flemish merchants trading with England established their own organisation with a representative in Antwerp and one in London in order to promote their common interests. Towards the east, Cologne, Frankfurt, Nürnberg and Augsburg not only were attractive to Flemish traders as markets in their own right, but also as way stations along the overland route to Italy. In trade with the north-eastern parts of the North Sea (Emden, Bremen, Stade, Hamburg,…), the Baltic (Lübeck, Lüneburg, Danzig, Königsberg, Riga, etc.), Scandinavia (e.g. Stockholm) and Russia (Narva) Flemish businessmen cooperated with Dutch merchants, who became increasingly important competitors of the Hanseats (Bostoen, 1998, 13; Brulez, 1959, 452-459; Id., 1960, 284-285, 290-295; De Smedt, 1926; Dollinger, 1970, 354-359; Kellenbenz, 1954, 179-181, 236-238; Thimme, 1912, 390).

The network enumerated in table 3.21 is largely in accordance with the above sketch of the foreign connections of Flemish and Dutch merchants (see also table 3.5 for the primary field cities of the Low Countries component). A small number of places appearing in the table (e.g. East Indies) however should be connected to the strong expansion of Amsterdam trade at the end of the 16th century, which largely falls beyond the scope of this dissertation, and as such is not very visible in the table. According to Lesger (2006), it was the disruption of the spatial economy of the Low Countries during the Revolt against Philip II and the subsequent split between the northern and southern Low Countries that allowed the rise of Amsterdam thanks to the development in the north of a new economic system independent from Antwerp and centred on Amsterdam.

The network of Amsterdam, originally strongly directed towards the Baltic, expanded immensely during the last decades of the 16th century and the first quarter of the 17th century. By 1615 the trade network of Amsterdam spanned most parts of the world known to Europeans at that time, including the Baltic, Russia (Archangelsk in the White Sea, Moscow), London, the French west coast (Nantes, La Rochelle, Bordeaux,…), the Iberian peninsula (Lisbon, and several Spanish harbours in which Dutch merchants traded indirectly through their Flemish connections when they were not allowed in Spain due to the war), the

Mediterranean and the Levant (the so-called *Straatvaart*, which they entered as grain shippers, hereby making use of the Flemish communities in the Mediterranean), the East Indies, and the Atlantic with west Africa and the Americas (Gelderblom, 2000, 80-82, 114-115, 153-158, 186-188; Lesger, 2006, 1, 85-92; Veluwenkamp, 1996, 145-163). It should be stressed that not only Amsterdam, but also the other Zuiderzee ports of Holland, and the harbours of the Rhine-Maas delta (especially Rotterdam) and Zeeland experienced a marked expansion of their overseas trade at the end of the 16th century (Lesger, 2006, 92-96). The intercontinental trade of the northern Low Countries from the early 17th century was largely monopolised by privileged joint-stock companies (the VOC and WIC), and it is with the arrival of these institutions that the chronological framework of this study ends (Prak, 2005, 111-121).

English

Up to the late 16th century, English overseas commerce was largely concerned with the export of the two main English trade goods – wool and cloth – to the Low Countries. English wool was the principal raw material for the textile industries of the Low Countries and Florence at least up to the end of the 14th century. However, with the development of a native English textile industry from the 14th century, English wool was increasingly processed in England itself rather than exported to the continent. As a result, between 1350 and 1540 England's export trade was largely transformed from wool trade to trade in English cloth. From the middle of the 14th century, the trade in both goods came in hands of two distinct groups of merchants, the Staplers – chiefly exporting wool, but also leather, hides and tin – and the Merchant Adventurers – whose principal trade good was cloth (Carus-Wilson, 1954, xv-xvi, xix-xxi, 149-150; Power, 1924, 112).

Under the reign of Elisabeth I in the second half of the 16th century, English overseas commerce experienced a marked growth. Many new trade directions were established, to Russia (Archangelsk), to the Mediterranean (including the Levant and the Barbary Coast), to west Africa and the Americas, and to the East Indies. Several of these new directions originally developed as privateering trade, and subsequently came in hands of companies obtaining a monopoly from the English government for commerce with a particular region. The first of these was the Muscovy company, trading with Russia via Archangelsk in the White Sea since the 1550s. Most of these companies were established after 1575 as joint-stock companies, incorporating merchants as well as shareholders-investors. They differed

from the older regulated companies, such as that of the Merchant Adventurers, which consisted of individual merchants carrying out their own business. Between 1575 and 1630 more than 30 joint-stock companies were founded, trading with the Levant (establishing depots at Aleppo, Damascus, Alexandria, Tunis, etc.), Africa, the East Indies, and various parts of the New World (Dollinger, 1970, 337; Gelderblom, 2000, 46, 121; Loades, 2000, vii, 87-126).

Looking at the dispersal of the six English firms incorporated in the business value matrix across the centuries (respectively three, two and one enterprises for the 14th, 15th and 16th century), the growth and geographical expansion of English trade in the second half of the 16th century is not accounted for at all in the firm sample. However, the inclusion of additional 16th-century enterprises not necessarily would have made up for this imbalance. As argued above, the new trade directions developed from the 1560s came under control of joint-stock companies, which – as a result of their geographical monopolies – do not lend themselves for inclusion in an interlocking network model. The bias resulting from this should not be overestimated: at the beginning of the 17th century cloth exports by the Merchant Adventurers to northern Europe still constituted by far the largest share of English overseas trade (Loades, 2000, 117). Consequently, in what follows the discussion will be limited to the spatial strategies of the two principal groups of English merchants up to the late 16th century, notably the Staplers and the Merchant Adventurers.

English wool trade with the continent from the late 13th century was organised as a staple trade, forcing merchants to export their wool via a particular gateway in order to more efficiently collect English royal customs dues on English wool. The establishment of the English wool staple increased the role of English merchants in the wool trade with the Low Countries (which before had been dominated by Flemish tradesmen), while Italians controlled English wool exports to the Mediterranean (which were largely exempted from the staple regulations). Until 1363, the English wool staple was transferred several times between England (e.g. York) and several places in the Low Countries, including Antwerp (1296-1297, 1315-1316, 1338-1340), Bruges (1325-1326, 1340-1348), Dordrecht (1337), and Middelburg (1348-1353, 1383-1388). From 1363 the English wool staple (also pertaining to woolfells, hides, leather and tin) became fixed in English-dominated Calais for almost two centuries, until the city was recaptured by the French in 1558, and the staple moved to Bruges again until 1585. It was during the Calais-staple that the merchants of the Staple appeared as a distinct group. Despite the staple being located in Calais, English wool merchants in this period remained very active as well in Bruges, the principal wool market for the cloth

industry of the Low Countries, and an English nation was located not only in Calais, but also in Bruges already by the early 14th century (Carus-Wilson, 1954, xiv-xv, xxv, 149-150; Fryde, 1988, 26, 66, 98, 142, 213-214; Harreld, 2004, 21; Lambert *et al*., 2008, 10; Marechal, 1985a, 13-50, 193; Murray, 2000, 7; Id., 2005, 96, 218-227, 236-241, 253, 262-265, 272-276; Nicholas, 1979, 23-45; Power, 1924, 112).

The Merchant Adventurers, trading in cloth and other miscellaneous wares which did not have to pass via the staple in Calais, became separated from the Staplers from the late 14th century when English cloth exports began to rise. Fellowships of Merchant Adventurers, often rivalling each other, were established in different English cities in the 15th and 16th centuries, including London, Norwich, Hull, York, Newcastle, Exeter, and Bristol. However, by the late 15th century – when all Merchant Adventurers trading with the Low Countries were united in one association – the Londoners had become dominant, and only Merchant Adventurers not trading very much with the Low Countries (such as the Bristol merchants) maintained their independence from the London Merchant Adventurers. Although the Merchant Adventurers fellowship took care of the chartering of ships to the Low Countries,… the members of the fellowship conducted their trade individually (Carus-Wilson, 1954, xv-xvii, xxvi-xxx, 144, 147, 150-164, 172-181; Kermode, 1998, 18-19, 189, 212).

During the middle of the 14th century Gascony had been the principal market for English manufactures (and French harbours as Bordeaux remained regular destinations for English wine merchants in the following centuries), but later in the century English cloth was especially exported to the Low Countries, Prussia and Scandinavia (exports of English cloth to the Mediterranean were largely controlled by Italian businessmen, but occasionally English merchants ventured into the Mediterranean as well). In the Baltic, English merchants – chiefly from the northern harbours – from the middle of the 14th century regularly exported cloth to Danzig, Elblag and Stralsund, in exchange for timber, grain and copper, while in Scandinavia they were especially active in trade with Bergen and Scania. During the 15th century, English cloth trade with the Baltic and Scandinavia strongly declined due to Hanseatic rivalry however, and only in Danzig the English Merchant Adventurers were still represented up to 1579, when they moved to Elblag forming a separate Eastland company for the Prussian trade. However, by the late 15th century the Merchant Adventurers active in the Low Countries had eclipsed all other communities of English textile traders (Carus-Wilson, 1954, xv-xvii, xxiii-xxvi, 144-145, 149-150, 169; Dollinger, 1970, 73-74, 192, 303, 342, 359; Kellenbenz, 1954, 180; Kermode, 1998, 212; Loades, 2000, vi-vii).

In the Low Countries, the Merchant Adventurers traded freely in different centres in Flanders, Brabant, Holland and Zeeland. However, their trade became increasingly concentrated at the fairs of Antwerp and Bergen-op-Zoom (where the English had obtained privileges as early as 1296), partly because the import of English cloth to Bruges was prohibited since 1359 in order to protect the Flemish textile industry. The trade of English cloth became entirely directed to Antwerp in 1421, and permanently from 1468 after several attempts earlier in the century to ban the import of English cloth in the Burgundian Low Countries. Consequently, the Merchant Adventurers were one of the earliest groups of merchants conducting most of their trade in the Low Countries through Antwerp. However, the Merchant Adventurers temporarily went from Antwerp to Emden in the early 1560s, and as a result of the Revolt in the Low Countries they definitely left the city in 1567. In that year they established themselves in Hamburg, ca. 1577 they moved back to Emden, and in 1587 they went to Stade (Bolton & Guidi Bruscoli, 2008; Carus-Wilson, 1954, xiii-xiv, 150; Dollinger, 1970, 341-343, 356; Harreld, 2004, 26-29, 43, 49-51, 85-90, 116-117, 180; Kellenbenz, 1954, 154, 179-180; Loades, 2000, 91; Marechal, 1985a, 13-50, 193; Soly, 1974, 852).

Merchant Adventurers from Bristol, the second seaport of England during the late Middle Ages and the 16th century, did not trade very much with the Low Countries or the Baltic, but directed their cloth exports chiefly to Spain (San Lúcar), Portugal (Lisbon), France (including Bordeaux, Bayonne and Toulouse), Ireland (Dublin) and Iceland. Exeter Merchant Adventurers traded mostly with France (Carus-Wilson, 1954, xxvii-xxviii; Loades, 2000, vi; Mathers, 1988, 377 n. 32). The English merchants enclosed in the firm sample are mostly London merchants however (four out of six), and further only a merchant from York (John Goldbeter) and one from Hull (William de la Pole) are included, both from the 14th century. The absence of Bristol merchants with their particular network differing from that of the Londoners definitely biases the English subsample, although London merchants had the largest share in English overseas trade[111]. Another cause of skewedness is that the sample is dominated by wool merchants. For the 14th century (two wool merchants and one merchant chiefly trading in iron and cloth) this does not have to be a problem since the distinction between both groups of merchants was not very obvious yet, and moreover wool trade was

[111] The English were obviously not the only inhabitants of the British Isles involved in overseas trade, but English merchants were nevertheless by far the most important group. Although Scottish merchants, mostly exporting Scottish wool, hides and leather, formed a separate nation with its own consulate in Bruges (which moved in the early 16th century to Middelburg and Veere) for instance, their absence from the business value matrix should not bias the firm sample too much (Marechal, 1985a, 21-23, 27, 51-53, 180, 187-188; Murray, 2005, 222, 226-227, 264).

still more important than cloth trade in the 14th century. However, the 15th-century subsample (consisting of two Staplers) is clearly biased (Thomas Myddelton, the 16th-century merchant, was a Merchant Adventurer however).

Despite these difficulties, table 3.22 (giving the combined network of all English firms from the 14th to the 16th century) nicely reflects the focus of English trade upon the Low Countries, with the three principal foreign destinations Bruges, Antwerp and Calais being of more or less equal importance. The same affinity with the Low Countries appears from the list of primary field cities of the English component (table 3.5), in which not only Bruges, Antwerp and Calais, but also Bergen-op-Zoom, Ghent, Middelburg and Mechelen are mentioned. Somewhat less important trade directions, such as those to Scandinavia, the Baltic, the Atlantic coast of France, Portugal and Spain, or the Mediterranean, are not represented in any of these tables however.

Table 3.22
Total business values across six 14th- to 16th-century English firms according to different scoring systems*

R**	City	C^9_i	City	C^5_i	City	C^4_i	City	C^2_i
1	London	39	London	20	London	16	London	6
2	Bruges +	15	Antwerp	9	Antwerp	9	Antwerp	4
3	Antwerp	14	Bruges +	9	Bruges +	8	Bruges +	4
4	Calais	13	Calais	8	Boston	6	Boston	2
5	York	12	Boston	7	Calais	5	Calais	2
6	Kingston-upon-Hull	11	Kingston-upon-Hull	6	Kingston-upon-Hull	5	Kings Lynn	2
7	Boston	9	York	6	York	5	Kingston-upon-Hull	2
8							Northleach ++	2
9							York	2

The following cities/locations are possibly underestimated in the table as a result of overlaps with other places, which are given with their total business values below:
+ Bruges: C^9_i (Flanders) = 3; C^5_i (Flanders) = 2; C^4_i (Flanders) = 2; C^2_i (Flanders) = 1.
++ Northleach: C^2_i (English wool region) = 1.
* The table includes all cities that have at least one-fifth of the highest total business value (London's) according to the nine-point scale scoring system (for C^9_i). For total business values according to the other scoring methods more or less equivalent thresholds have been chosen.
** R: Rank.

3.4. The role of nations reconsidered

Until so far, the discussion has concentrated upon the results of a principal components analysis with extraction of twelve components carried out on the five-point scale business value matrix (see table 3.1). However, in one way the results of this analysis on the five-point scale matrix are exceptional. This appears when the twelve-component solutions of the principal components analyses executed on the nine- and on the five-point scale matrix are

compared with each other. Both results are highly similar, which largely confirms the robustness of the 'nation' configuration. However, there is one important difference: the 16th-

Table 3.23
Firms allocated to the third component in the twelve-component solution of a principal components analysis carried out on the nine-point scale business value matrix*

Factor loading	Southern European firms, 16th century	Cent.**	Or.***
0.70 +	Daza****	16	AR
0.60-0.69	Centurione (Gaspare)	16	GE
	Botti	16	FL
	Ruiz (Simon)	16	CA
	Grimaldi	16	GE
0.50-0.59	Espinosa	16	CA
	Affaitadi	16	LO
	Rodrigues d.Evora	16	PO
	Caldeira (L. A.)	16	PO
	Strozzi (il giovane)	16	FL
	Ximenes	16	PO
	Salviati²	16	FL
0.40-0.49	Cromberger	16	CE
	Nunes (Est.)	16	PO
	Mendes	16	PO
	Olivieri²	16	FL
	Fornari (G. B.)²	16	GE
	Welser (Augsburg)²	16	CE
	Balbani²	16	LU
	Centurione (F. & F.)²	15	GE
	Brignole (Antonio)²	16	GE
0.30-0.39	Pallavicino (Tobias)²	16	GE
	Di Negro (Fr.)³	16	GE
	Bonvisi³	16	LU
	Ruiz (André)²	16	CA
	Welser (Nürnberg)²	16	CE
	Van der Molen²	16	LC
	Lomellini (Marco)²	15	GE
	Bernuy²	16	CA
	Guicciardini³	16	FL
	Van Immerseel²	16	LC

* Principal components analysis with varimax rotation, carried out on the nine-point scale business value matrix across all 1337 places (14th-16th century).
** Cent.: Century in which the firm was active.
*** Or.: City or region of origin of the firm: AR Aragón; CA Castile; CE Central Europe (excluding Hanse); FL Florence; GE Genoa; LC Low Countries; LO Lombardy; LU Lucca; PO Portugal.
**** Firms are ranked by loadings in each category.
² Indicates second-highest loading for a firm.
³ Indicates third-highest loading for a firm.

century Tuscan component in the five-point scale analysis (component V, see table 3.1) has been replaced in the results of the nine-point scale analysis by a broader component grouping 16th-century southern European firms from different nations (component III, see table 3.23).

With the exception of two Genoese enterprises of the 15th century, all firms loading 0.30 or higher on the latter component are 16th-century firms. The cluster of firms with loadings of 0.40 or more on this factor consists of five Genoese, five Tuscan, one Lombard, five Portuguese, two Castilian and one Aragonese firm, as well as two central European enterprises. Consequently, with the exception of Venetian and southern French business organisations, most southern European nations have 16th-century firms loading on this component. Not surprisingly, the 16th-century southern European factor contains a large number of hybrid firms – 13 out of 21 firms with a component loading of 0.40 or more – which also load on the component of their respective nation (the Genoese, Tuscan, Castilian, or – for Portuguese firms – Low Countries factor).

Such a 16th-century southern European component appears much more frequently in the exploratory analysis than the 16th-century Tuscan factor. That the latter component is rather exceptional is revealed by table 3.2: the factor grouping 16th-century Tuscan and Portuguese firms is largely missing from the nine-point scale principal components analyses, where such a factor only appears from the fourteen-component solution. Idem, a 16th-century Tuscan component has not been found either in the ten- to twelve-component solutions of an exploratory principal components analysis carried out on the four- and two-point scale business value matrices (see above). Instead, in these latter cases, as well as in the four- to thirteen-component results of the analysis on the nine-point scale matrix the larger 16th-century southern European component emerges, not only including Tuscan and Portuguese firms operating in the 16th century, but also 16th-century Genoese and Spanish enterprises[112].

The conclusion to be drawn from this is that the spatial business strategies of southern European enterprises converged towards each other in the 16th century. The specific spatial accents of this common strategy are outlined in table 3.24, in which the articulating cities and primary field cities of the 16th-century southern European factor are enumerated. The table contains the principal commercial and financial centres of 16th-century south-western Europe with a strong promince of the rising Atlantic economies of Spain (with Sevilla, the fairs of Castile in Medina del Campo, Ríoseco and Villalón, the Spanish court in Valladolid and Madrid, as well as Granada, Valencia and Santo Domingo) and Portugal (Lisbon), but also including major markets in France (Lyon) and Italy (Rome, Venice and Florence). The shift in emphasis of southern European business towards the Atlantic in the 16th century is very

[112] In the results of the principal components analyses with extraction of eight and nine components carried out on the nine-point scale matrix, this 16th-century southern European component also includes a large number of Low Countries firms from the 16th century.

clearly illustrated by the fact that the highest factor score on this component pertains to Antwerp. Not surprisingly, Venetian firms do not load on this component. Venetian business in the 16th century moved exactly in the opposite direction, withdrawing largely from western Europe.

Table 3.24
Articulating cities and primary field cities of the 16th-century southern European component*

Factor score	Southern European firms, 16th century
10.00-14.99	Antwerp, Sevilla, Medina del Campo, Valladolid**
9.00-9.99	Lisbon, Rome
8.00-8.99	Lyon
7.00-7.99	
6.00-6.99	
5.00-5.99	
4.00-4.99	Madrid, Venice, Granada
3.00-3.99	Santo Domingo, Medina de Ríoseco, Valencia, Florence, Villalón

* Component III in the principal components analysis (with varimax rotation) with extraction of twelve components, carried out on the nine-point scale business value matrix across all 1337 places (14th-16th century).
** Cities are ranked by scores in each category.

Several reasons for this can be given. The principal explanation is a shift of the centre of gravity of the European world-economy from the Mediterranean to the Atlantic in the 16th century (see next chapter), which induced southern European firms in general to increasingly relocate (part of) their activities towards the Atlantic. Other factors might have been related to this convergence of spatial strategies as well, one of them being the decreasing importance of the merchant nations. Although in most parts of Europe strongly organised foreign merchant guilds only began to decline in the 17th and 18th centuries, this process already started in a number of important commercial centres (including Venice, Antwerp and Amsterdam) during the 16th century. In these centres, merchants more and more began operating individually within informal networks of friends and relatives (although social, cultural and religious functions of guilds were maintained). Despite the many benefits of strong merchant guilds (see above), the principal disadvantage for individual merchants was that they had to delegate some control and decision power to fellow merchants with whom they were associated in the merchant guild. Apparently these disadvantages were increasingly being felt from the 16th century (Grafe & Gelderblom, 2010, 480, 485-489, 497-499, 508).

According to Grafe and Gelderblom (2010, 505-507, 510) one reason for the diminishing economic, legal and political relevance of merchant guilds was the larger size of 16th-century markets such as Venice and Antwerp compared to their counterparts in earlier centuries, with a lowering of transaction costs as a result. In these 16th-century markets a wide

availability of insurance on the private market, the appearance of the first commercial newsletters, or the presence of public institutions such as bourses, mercantile courts, etc. may have lowered the need for organisation in merchant guilds, although it were often the merchant guilds themselves who pressurised governments to provide such public services. Moreover, in larger and more strongly integrated markets, possibilities of market control by merchant guilds were probably more limited.

The convergence of the spatial strategies of various nations in the more strongly integrated markets of the 16th century can either be a sign of increased cooperation or of increased competition between merchants belonging to different nations. Indications for both processes can be found. On the one hand, it appears that cooperation between merchants from different nations became more common in the 16th century, facilitated by a growing familiarity with techniques such as commission and participation for instance (Brulez, 1959, 366-375; Veluwenkamp, 1996, 145-148, 162). Several examples can be given, such as the cooperation in 16th-century Rome between Genoese and Florentines in the provision of loans to the Camera Apostolica or the organisation of tax farming operations in the Papal States (Guidi Bruscoli, 2007, xxii-xxiii, 211-213), or between southern Germans, Italians and Portuguese in the 16th-century pepper consortia (Kalus, 2009, 8). On the other hand, Richard Goldthwaite (2009, 41) attributed the contraction of the Florentine network in the 16th century to “the geographic expansion of trade and the entrance of many more large players on the stage of international commerce and finance”. This phenomenon “in the course of the century much reduced the relative importance of Florentines in these sectors and eventually pushed them very much to the sidelines”.

Although the classification of the data in crude century-matrices does not allow to reconstruct the exact chronology, these evolutions may nevertheless be linked to Giovanni Arrighi’s first systemic cycle of accumulation (ca. 1450 – ca. 1640). According to Arrighi (1994, 12-14, 214-215), the material expansion phase of each systemic cycle is characterised by increased cooperation between cities, while the ensuing phase of financial expansion shows an intensification of inter-state and inter-capitalist competition. Although such a succession of cooperation and competition between cities was already present in a previous cycle (ca. 1250 – ca. 1450) of expansion of the European world-economy (this was not a full systemic cycle of accumulation yet), these processes may have become more visible from the end of the 15th century as a result of the growing integration of the European world-economy during the first systemic cycle (Arrighi, 1994, 88-93).

3.5. Conclusion

Principal components analysis appears to have been a very fruitful statistical technique for exploring the different spatial strategies used by late medieval and 16th-century transnational merchants and bankers in the reproduction of the European city network. The results of this analysis are very clear: a number of distinct spatial strategies can be observed, each of which was used by a particular group of firms with a common geographical origin (either a city, a region or a country). As a result it is possible to speak about (1) regional tendencies in the network (similarities between agents with the same origin), and (2) about the existence of multiple transnational processes (in analogy to the multiple globalisations observed for the present-day world city network, see Taylor, 2004, 132). This indicates a certain lack of integration in the network, and in that sense it might be better to speak about multiple city networks rather than about a single European city network for the period between 1300 and 1600. In the course of the 16th century however, there appears to have been a tendency towards increasing convergence of spatial strategies, especially between southern European firms. Perhaps this reflects a growing integration of the network in the 16th century.

It should be stressed that the existence of regional differences between agents and their strategies does not mean (1) that these agents operated on a regional rather than a European scale (as the discussion of the different strategies has demonstrated this was definitely not the case), nor (2) that regional tendencies existed in the network in relation to cities as well, with cities in each others neighbourhood being more similar in terms of composition of represented firms than cities which were located at a larger distance from each other.

The existence of distinct regional strategies of late medieval and 16th-century transnationally operating businessmen is generally accepted in the historical literature but often taken for granted. Several reasons can be given for the occurrence of such regional differences between agents in the network. Firstly, there are a number of institutional factors. The role of the state (either a city-state or a larger territorial state) in many ways promoted the development of common spatial strategies shared between its different businessmen-subjects. Territorial conquests, and especially the establishment of maritime empires could open up new markets for merchants and bankers, while war on the other hand restricted entry to markets located in enemy territory (although merchants knew several ways to get around this problem, such as the use of agents belonging to a neutral nation). Moreover states could offer certain public services to merchants (native and/or foreign) which encouraged regional similarities between agents to be produced, such as the provision of privileges, residences, etc.

to particular regional groups of foreign merchants, or the organisation of regular convoys (e.g. the Venetian and Florentine galley services) to particular foreign markets.

Another institutional factor was the development of foreign merchant guilds which were mostly organised according to the place of origin of their members. Membership of such a merchant guild had several advantages, including enjoyment of commercial privileges, or access to monopolised sectors of the market (such as trade between certain regions or in particular trade goods), which was especially the case when staple regulations had to be observed. Other advantages were not so much of an economic nature. The organisation in a merchant guild resulted in a stronger position towards local authorities for instance. Moreover, merchant nations also catered for social, cultural or religious needs.

A second set of factors is more related to the economic geography logic of commodity chains. Merchants from the same region often had common incentives, such as the search for markets supplying raw materials for local industries and/or the search for outlets for raw materials (English and Castilian wool, Portuguese pepper imported from Asia) or manufactures (Nürnberg metal wares, textiles from England, the Low Countries, Swabia, Florence,…) produced in the region. The need for foodstuffs to feed a growing population induced merchants to gain a foothold in foreign grain markets, as was the case for Florence and Genoa (the latter city being surrounded by mountains and as such not having a grain producing hinterland), but also for the Low Countries where Amsterdam developed into a grain market in which the import of grain from the Baltic became concentrated during the 16th century.

Several merchant nations became specialised intermediaries attuning neighbouring regions with complementary markets to each other. Venetians and Genoese – and to a lesser degree other Mediterranean nations as well – linked the markets of the Levant and Romania with those of western Europe, and Hanseats played a similar role in connecting Russia and Livonia in the east with Flanders and England in the west. Southern German merchants in their turn provided a connection between Venice, the Low Countries and the central European mining regions. The logics of distance and practicable transport routes played a considerable role here.

Finally, a number of other reasons can be invoked, such as the development of diaspora communities as a result of war, religious persecution, feuds, exile, etc. Thanks to their transnational networks of relatives and friends, members of such diaspora communities (Genoese, Florentines, Portuguese New Christians, Antwerp merchants,…) often became powerful commercial or financial agents in the European world-economy.

Chapter 4
From firms to cities: Structure and dynamics of the European city network, 1300 – 1600 [113]

4.1. The European city network reassembled

The overview of the different trading nations of western Christian Europe in the previous chapter has uncovered a number of important biases in the composition of the business value matrix.

A first problem is the unequal representation of particular groups or periods within the nation subsamples. The lack of 16th-century Catalan enterprises or of Atlantic firms operating in the 14th or 15th century reflects the relative growth or decline in importance of these nations, and biases resulting from this as a consequence should be limited. This is not the case for the absence of 14th-century Genoese and Venetian business organisations or 16th-century English firms however. In other nations particular groups are relatively underrepresented, such as the English Merchant Adventurers in general, and those from Bristol specifically, or Valencian, Mallorcan and Perpignan merchants among the Catalans. The latter problem is particularly pertinent for the Hanseatic subsample in which basically data are lacking for firms from all cities other than Lübeck, and especially for merchants from the inland cities – above all Cologne. Despite all this, the firm data confirm for most nations surprisingly well our general knowledge about their networks (perhaps except for England and the Hanse).

More problematic is that several nations are (almost) completely missing from the firm sample: Milanese and other Lombards as well as a number of less considerable Italian nations (Bolognese, Ferrarese,…); Aragonese, Navarese, Andalusians and especially Biscayans in the Iberian Peninsula; French merchants in general, but more specifically those from the Mediterranean as well as from the Atlantic and Channel ports; Scottish traders; Scandinavian merchants; central European merchants from the Upper Rhine cities, Silesia, Bohemia, Poland, etc. Other nations – most importantly Venetians, Genoese, Catalans, and Hanseats – are strongly underrepresented. As has been argued in chapter two already, inland nations with their large hierarchical firm structures (Tuscans, southern Germans, Castilians from Burgos, Flemish from Antwerp) in general are much better represented in the business value matrix than maritime nations with their many small and flexible network-like

[113] In this chapter I will regularly make use of information already discussed in the previous chapter. In those cases I will not give references to the literature anymore.

organisations (Venetians, Genoese, Mediterranean French, Catalans, Biscayans, Bretons, Normans, Hollanders, English, Hanseats).

Over- and underestimations of particular flows and cities can be expected to be very large when all these firms from different nations are uncritically combined into a single analysis. Consequently, overall connectivities calculated for the 14th, 15th and 16th centuries (tables 4.1, 4.2 and 4.3) should be interpreted with a lot of care. Nevertheless, a careful investigation of these connectivities allows to draw some general structural traits of the European city network, as well as to identify the major dynamics in the network between 1300 and 1600.

Connectivities have been computed according to the methodology described in the previous chapter[114]. In order to exclude cities that only appeared in the business networks of a small number of firms, the average connectivity for the top three cities (in terms of connectivity) of each century has been computed, and solely cities with connectivities amounting to at least one-fifth of this value have been included in the tables (for the nine-point scale)[115]. For the 14th, 15th and 16th centuries these thresholds in terms of relative connectivities are respectively 0.18, 0.18 and 0.16, while the respective numbers of cities included in the tables are 32, 47 and 50. This increase in number of cities with high relative connectivities over time may reflect a strengthening integration of the western Christian European city network between 1300 and 1600, but more likely this outcome is a result of the larger number of firms included in the analysis for later centuries compared to earlier centuries.

The order in which cities are ranked (in terms of connectivity) differs according to the scoring scale used (see tables 4.1, 4.2 and 4.3). Consequently, no strict hierarchy between European cities can be observed (see also § 3.3). Comparison of connectivity ranks between the different scoring scales allows to identify a number of distinct levels within the network (indicated in tables 4.1 to 4.3 by the dashed lines). Within each of these levels, fluctuations between the different scoring systems in connectivity rankings of cities are relatively strong. The scope of these fluctuations in city ranks rarely reaches beyond the levels however (i.e. across the dashed lines), and as such the latter can be interpreted as hierarchical levels in the network. In other words, between 1300 and 1600 the European city network had a relatively horizontal structure, but with certain hierarchical tendencies.

[114] Consequently, connectivities have only been calculated between cities with a total business value higher than one in the century-specific four-point scale business value matrices.
[115] Using the average of the top three connectivities instead of the connectivity of only the largest city makes the selection of cities less dependent on the quirks of just one single connectivity figure.

For each century three of these levels have been identified, allowing to distinguish between alpha cities (the upper level), beta cities and gamma cities. An additional gamma–level contains the cities that only reached the threshold for inclusion in the table (respectively table 4.1, 4.2 and 4.3 for the 14th, 15th and 16th century) according to two of the four scoring systems. Moreover, for the 16th century two distinct sublevels can be observed within the gamma category, the upper level of which has been named gamma+ (for maps of alpha, beta and gamma cities for each century see figures 4.1, 4.2 and 4.3)[116].

4.1.1. The 14th century

At first sight, the 14th-century firm sample is quite strongly biased. Venetian, Genoese, Lombard and French Mediterranean merchants, all playing a crucial role in the network, are missing altogether, while only one Catalan firm has been taken up in the matrix (see table 2.1). The subsample of 14th-century Hanseatic firms is too small and partial. Also nations which did not play a crucial role in the 14th-century network yet are often underrepresented or even absent from the sample, such as most Atlantic merchants for instance. On the other hand there is a strong bias towards Tuscan business organisations, making up more than half of the sample, while English merchants might be somewhat favoured in the data as well[117].

Nevertheless, during the 14th century transnational business in Europe was dominated by Italian merchants (e.g. Hunt & Murray, 1999, 65), except for central Europe and the Hanseatic world which can be considered to be outside of the Italian dominated world-economy. Since the activities of Genoese and Venetian (as well as southern French and Catalan) merchants were strongly concentrated upon the eastern Mediterranean, while in western Europe they were probably nowhere significantly stronger represented than Tuscan merchant-bankers (except for their own hinterlands, the Mediterranean islands, and the Genoese and Catalan presence on the Iberian peninsula), their absence from the matrix is probably not as much a problem as one might think at first instance (at least for Latin Christian Europe). Moreover, while Genoese and Venetians were in the first place merchants, the Tuscans – and especially the Florentines – were the masters of transnational banking in 14th-century Latin Christian Europe, partly thanks to their enviable position as the preferred

[116] Connectivity ranges of the alpha, beta and gamma levels are not the same for the different centuries. Ranges in connectivity (calculated in the nine-point scale matrix) are for the 14th, 15th and 16th centuries respectively: 1.00-0.68; 1.00-0.54; and 1.00-0.53 (alpha cities); 0.59-0.31; 0.47-0.32; and 0.48-0.35 (beta cities); and 0.30-0.18; 0.28-0.18; and 0.32-0.16 (gamma cities).

[117] However, English firms were small compared to most other business organisations taken up in the matrix, and consequently their impact on overall connectivities is limited.

bankers of the popes. As papal bankers they were responsible for the transfer of ecclesiastical revenues from everywhere in the Latin Christian world to Avignon, and this necessitated their presence in all the financial centres of western Europe (Renouard, 1941, 106-112).

Table 4.1
Connectivity across the networks of twenty-five 14th-century firms according to different scoring systems*

R**	City	P^9_a	City	P^5_a	City	P^4_a	City	P^2_a
1	Bruges	1.00	Bruges	1.00	Bruges	1.00	Bruges	1.00
2	Florence	0.95	Florence	0.93	Florence	0.91	London	0.78
3	Avignon	0.81	Venice	0.77	London	0.74	Paris	0.76
4	London	0.77	Paris	0.77	Paris	0.74	Venice	0.75
5	Paris	0.75	Avignon	0.76	Venice	0.69	Florence	0.72
6	Venice	0.75	London	0.76	Avignon	0.68	Avignon	0.72
7	Genoa	0.74	Genoa	0.76	Genoa	0.64	Naples	0.66
8	Naples	0.68	Naples	0.65	Naples	0.63	Genoa	0.66
9	Pisa	0.59	Pisa	0.59	Bologna	0.54	Bologna	0.61
10	Bologna	0.53	Bologna	0.55	Pisa	0.52	Pisa	0.57
11	Barcelona	0.46	Barcelona	0.49	Rome	0.47	Rome	0.46
12	Barletta	0.43	Rome	0.44	Barcelona	0.44	Perugia	0.45
13	Palermo	0.42	Milan	0.43	Milan	0.42	Barcelona	0.44
14	Rome	0.40	Barletta	0.41	Perugia	0.41	Milan	0.41
15	Perugia	0.39	Perugia	0.37	Montpellier	0.37	Montpellier	0.39
16	Milan	0.36	Palermo	0.37	Barletta	0.35	Palermo	0.37
17	*Mallorca**** +	0.34	Constantinople	0.37	Palermo	0.35	Barletta	0.35
18	Tunis	0.32	Tunis	0.35	Constantinople	0.33	Nice	0.33
19	Constantinople	0.31	*Mallorca* +	0.33	Lucca	0.31	*Mallorca* +	0.31
20	Rhodes	0.30	Rhodes	0.30	Nice	0.30	Wrocław	0.30
21	Montpellier	0.26	Cagliari	0.29	Tunis	0.27	Constantinople	0.29
22	Nice	0.24	Montpellier	0.29	Aigues-Mortes	0.27	Kraków	0.29
23	Ancona	0.24	Nice	0.28	*Mallorca* +	0.27	Toruń	0.29
24	Cagliari	0.24	Ancona	0.27	Wrocław	0.27	Aigues-Mortes	0.28
25	Lucca	0.23	Lucca	0.26	Lübeck	0.27	Marseille ++	0.27
26	Famagusta	0.22	Lübeck	0.26	Toruń	0.26	Lucca	0.26
27	Lübeck	0.22	Danzig	0.25	Rhodes	0.26	Lübeck	0.25
28	Marseille	0.21	Mechelen	0.24	Danzig	0.25	Danzig	0.24
29	Nürnberg	0.21	Kraków	0.24	Kraków	0.25	Rhodes	0.23
30	Kraków	0.21	Marseille	0.23	Marseille ++	0.25	Tunis	0.23
31	Danzig	0.20	Toruń	0.23	Cagliari	0.23	Włocławek	0.21
32	Toruń	0.19	Nürnberg	0.23	Nürnberg	0.23	Lvov	0.21
33							Riga	0.21

The following cities/locations are possibly underestimated in the table as a result of overlaps with other places, which are given with their connectivities below (corrections have only been indicated for connectivities of 0.10 or higher):
+ Mallorca: P^9_a (Palma de Mallorca) = 0.13; P^5_a (Palma de Mallorca) = 0.14; P^4_a (Palma de Mallorca) = 0.12; P^2_a (Palma de Mallorca) = 0.11.
++ Marseille: P^4_a (Provence) = 0.11; P^2_a (Provence) = 0.13.
* The table includes all cities that have at least one-fifth of the average of the three highest connectivities according to the nine-point scale scoring system (for P^9_a). For connectivities according to the other scoring methods more or less equivalent thresholds have been chosen.
** R: Rank.
*** *Mallorca (italics)*: Less precise geographical designations.

Consequently, I would argue that overall connectivities calculated for the 14th century are not entirely meaningless despite the imbalances in the data. The fourteen Tuscan firms included in the sample (consisting of 25 firms in total for the 14th century) allow to reconstruct the backbone of the western European network, albeit with some 'Tuscan' peculiarities. Only looking at Italian (in this case Tuscan) firms for studying 14th-century world city formation in western Europe is as such not so much different from studying the present-day world city network in terms of the spatial strategies of contemporary business service firms from the core areas of the present-day world economy (north America, western Europe and Pacific Asia). However, in order to at least somewhat decentre this "overriding geographic imagination […]" of world city-ness (quote from Bassens *et al.*, 2010) also a number of firms from outside the core or even belonging to other, but partly overlapping, world-economies have been included in the 14th-century business value matrix[118].

As appears from table 4.1 and figure 4.1, the bipolar structure of the 13th-century European world economy (see Braudel, 1984, 96-116) is still present in the network. The alpha cities were almost all located in north-central Italy (Venice, Genoa, Florence) and north-western Europe (Bruges, but also London and Paris). With the exception of these alpha cities, the north-western pole does not come out very strongly on the map. It consisted mostly of industrial centres producing for an international market and marketing their manufactures (mostly textiles) via Bruges (see also later).

The north-central Italian pole on the other hand was much more dense (with cities as Pisa, Lucca, Bologna, Milan,…), and moreover appears to have been merged in a larger north-western Mediterranean network, comprising the whole of Italy, the Mediterranean coast of France, and the western Mediterranean islands. Doubtlessly, Catalonia (here only represented by Barcelona) belonged to this network as well. Furthermore, connections existed with the eastern (Constantinople, Rhodes), and southern (Tunis) parts of the Mediterranean, although these links are definitely underestimated as a result of the lack of Venetian and Genoese firms in the 14th-century business value matrix (as witnessed by the absence of Alexandria from the map). Clearly this 14th-century European city network was centred on the Mediterranean (see Braudel, 1984, 116-118). This Mediterranean emphasis is somewhat inflated by the strong Florentine presence in the sample, and the overrepresentation of cities from Tuscany (Florence, Pisa, Lucca), the Papal States (Bologna, Perugia, Ancona, Rome, but

[118] Notably three English, three southern German and three Hanseatic firms. Also a Catalan firm and a Bruges money-changer have been added.

also Avignon) and the Kingdom of Naples (where the Florentines were the favoured bankers of the Angevin kings), is partly to be attributed to this bias in the business value matrix.

Mirroring the southern maritime network, there was another – but not as strongly developed – sea-centred network in the north, entirely made up of gamma cities. This Hanseatic network does not appear very well on the map however (the Livonian-Russian and Scandinavian links are missing for instance, as well as those with the Westphalian and Saxon cities), definitely as a result of imbalances in the data. Between the Baltic and Mediterranean networks, a big gap features on the map. Only via Bruges both networks were permanently connected, but for the rest they can be considered as two separate world economies.

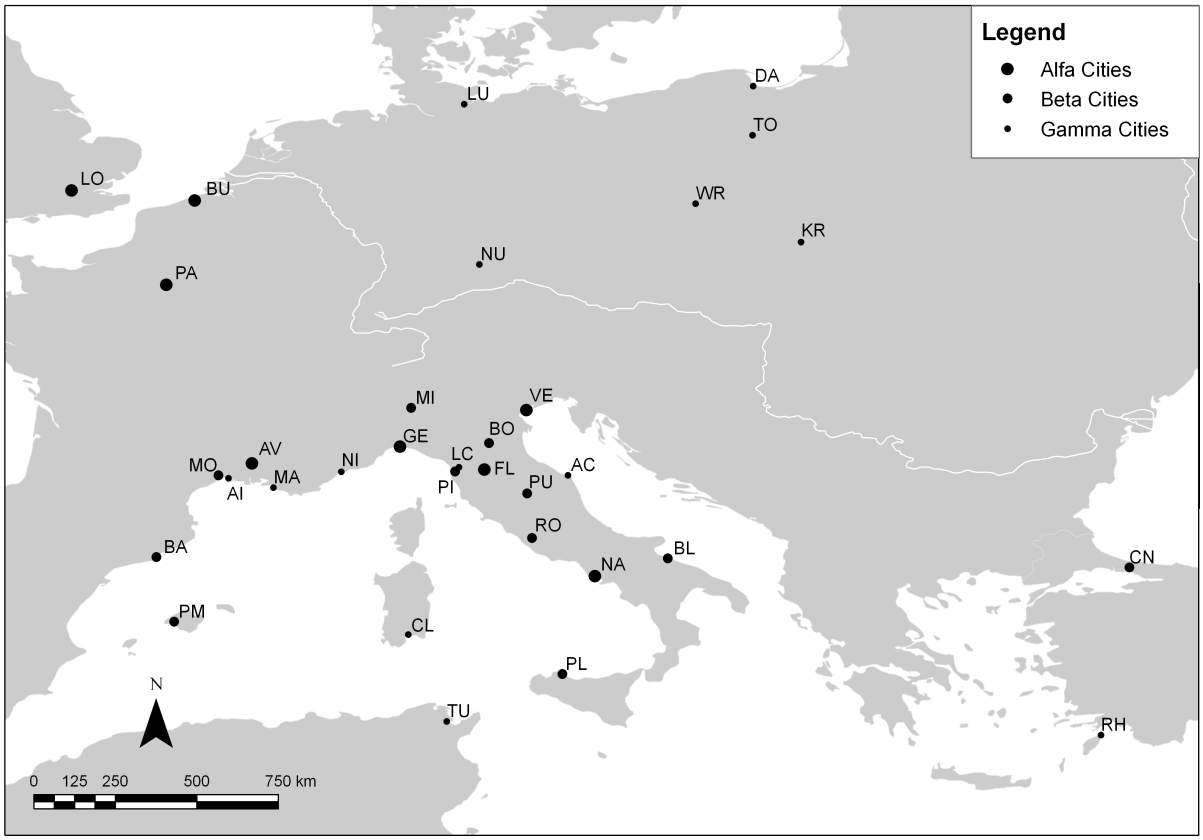

Figure 4.1: Major nodes in the European city network, 14th century.
Key: AC Ancona; AI Aigues-Mortes; AV Avignon; BA Barcelona; BL Barletta; BO Bologna; BU Bruges; CL Cagliari; CN Constantinople; DA Danzig; FL Florence; GE Genoa; KR Kraków; LC Lucca; LO London; LU Lübeck; MA Marseille; MI Milan; MO Montpellier; NA Naples; NI Nice; NU Nürnberg; PA Paris; PI Pisa; PL Palermo; PM Palma de Mallorca; PU Perugia; RH Rhodes; RO Rome; TO Toruń; TU Tunis; VE Venice; WR Wrocław.

Although the absence of well-connected cities from Continental Europe is somewhat overemphasised as a result of a number of biases (think about cities as Regensburg and especially Cologne), the decline of the Champagne fairs at the end of the 13th century and the development of a direct maritime link between Italy and the North Sea (which is not very well

represented on the map as a result of the absence of cities as Sevilla and Lisbon) definitely had shifted European trade away from the continent, while the new continental routes through Germany and via the Rhine do not appear to have been very important yet (only Nürnberg features on the map). This is also indicated by the fact that central Europe was largely excluded from the Italian-dominated exchange network during the 14th century for instance (Hunt & Murray, 1999, 65; Spufford, 2002, 34, 37-38, 342).

A striking feature is the appearance of several capital cities in figure 4.1, including London, Paris, Avignon, Barcelona, Milan (Visconti), Naples, Palermo, Kraków and Constantinople. Peter Spufford (2002, 60-139, 228-232) has very eloquently described the power of attraction of these capital cities for late medieval and 16th-century merchants. Capital cities were centres of consumption, "in which were concentrated both the demand of huge numbers of ordinary people for food, and the desire of small numbers of very wealthy aristocrats and courtiers for high-priced luxuries, which two demands together created the trade of Europe" (Spufford, 2002, 14).

4.1.2. The 15th century

The 15th-century business value matrix has a somewhat more balanced firm composition than the 14th-century matrix, but biases can still be expected to be large (see table 2.1). Florentines (10 firms) and southern Germans (12 firms) together account for more than half of the 15th-century firm sample (containing 39 firms in total). Although for the 15th century a number of Genoese and Venetian merchants (respectively four and three) have been included in the matrix, they are still underrepresented, just like the Catalans (two firms) and the French (one firm). With only three firms in the sample, Hanseatic trade can be expected to be underestimated as well. The matrix is completed by a small number of Atlantic firms (two English, one Castilian and one Flemish enterprise) foreboding their important role in the 16th century.

At first sight, differences between figure 4.2 (15th century, see also table 4.2) and 4.1 (14th century) appear to be very large. A closer look reveals that there were many similarities however. Most alpha cities for instance were still located in north-central Italy (Venice, Genoa, Milan and Florence) and north-western Europe (Bruges and London). Compared to the north-western European node, the north-western Mediterranean still formed a much denser network. Italian, southern French and especially Catalan-Aragonese cities (which are

Table 4.2
Connectivity across the networks of thirty-nine 15th-century firms according to different scoring systems*

R**	City	P^9_a	City	P^5_a	City	P^4_a	City	P^2_a
1	Venice	1.00	Venice	1.00	Bruges	1.00	Bruges	1.00
2	Bruges	0.99	Bruges	0.96	Venice	0.96	London	0.89
3	Florence	0.77	Florence	0.79	London	0.85	Venice	0.89
4	Barcelona	0.70	London	0.71	Florence	0.79	Valencia	0.68
5	London	0.68	Barcelona	0.69	Barcelona	0.70	Barcelona	0.68
6	Valencia	0.63	Nürnberg	0.64	Valencia	0.68	Florence	0.65
7	Nürnberg	0.63	Valencia	0.64	Milan	0.66	Avignon	0.59
8	Genoa	0.60	Rome	0.63	Nürnberg	0.65	Genoa	0.57
9	Rome	0.58	Genoa	0.62	Genoa	0.64	Milan	0.56
10	Avignon	0.58	Milan	0.60	Rome	0.63	Geneva	0.53
11	Geneva	0.55	Avignon	0.57	Avignon	0.59	Rome	0.53
12	Milan	0.54	Geneva	0.57	Geneva	0.57	Nürnberg	0.51
13	Lyon	0.47	Lyon	0.55	Frankfurt a. Main	0.50	Montpellier	0.45
14	Montpellier	0.41	Pisa	0.46	Lyon	0.49	Frankfurt a. Main	0.45
15	Pisa	0.41	Bologna	0.44	Pisa	0.47	Naples	0.44
16	Cologne	0.39	Cologne	0.43	Naples	0.47	Pisa	0.43
17	Bologna	0.37	Montpellier	0.43	Montpellier	0.46	Cologne	0.42
18	Naples	0.36	Frankfurt a. Main	0.41	Cologne	0.46	Wrocław	0.41
19	Frankfurt a. Main	0.36	Naples	0.40	Bologna	0.45	Bologna	0.40
20	Wrocław	0.34	Paris	0.37	Paris	0.44	Paris	0.39
21	Palermo	0.33	Palermo	0.36	Palermo	0.41	Lyon	0.38
22	Paris	0.32	Wrocław	0.36	Wrocław	0.41	Antwerp	0.37
23	Antwerp	0.28	Basel	0.34	Antwerp	0.39	Palermo	0.36
24	Basel	0.28	Augsburg	0.32	Perpignan	0.36	Perpignan	0.36
25	Perpignan	0.28	Antwerp	0.32	Nördlingen	0.33	Gaeta	0.33
26	Vienna	0.26	Lisbon	0.31	Lisbon	0.32	Nördlingen	0.29
27	Zaragoza	0.25	Zaragoza	0.31	Rhodes	0.31	Rhodes	0.29
28	Lübeck	0.25	Leipzig	0.29	Aigues-Mortes	0.31	Lübeck	0.28
29	Lisbon	0.23	Perpignan	0.28	Gaeta	0.31	Aigues-Mortes	0.28
30	Augsburg	0.23	Nördlingen	0.28	Augsburg	0.30	Siena	0.26
31	Sankt Gallen	0.23	Vienna	0.28	Basel	0.29	Ferrara	0.24
32	Aigues-Mortes	0.22	Sevilla	0.28	Lübeck	0.29	Lisbon	0.24
33	Konstanz	0.22	Gaeta	0.26	Ferrara	0.28	Danzig	0.23
34	Gaeta	0.22	Lübeck	0.25	Siena	0.28	Kraków	0.23
35	Danzig	0.22	Perugia	0.25	Perugia	0.27	Vienna	0.23
36	Kraków	0.22	Aigues-Mortes	0.25	Leipzig	0.27	Basel	0.22
37	Nördlingen	0.21	Ferrara	0.24	Sevilla	0.27	Konstanz	0.21
38	Marseille	0.21	Constantinople	0.24	Vienna	0.27	Lucca	0.20
39	Leipzig	0.21	Rhodes	0.24	Lucca	0.26	Perugia	0.20
40	Rhodes	0.20	Konstanz	0.24	Toulouse	0.26	Toulouse	0.20
41	Sevilla	0.20	Sankt Gallen	0.23	Alexandria	0.24	Leipzig	0.19
42	Ferrara	0.19	Tunis	0.23	Zaragoza	0.24	Marseille	0.19
43	Perugia	0.19	Danzig	0.23	Danzig	0.23	Alexandria	0.18
44	Ravensburg	0.19	Lucca	0.22	Poznań	0.23	Augsburg	0.18
45	Poznań	0.19	Palma d. Mall.	0.22	Kraków	0.23	Sankt Gallen	0.18
46	Palma d. Mall.	0.19	Marseille	0.22	Konstanz	0.22	Sevilla	0.18
47	Lucca	0.18	Poznań	0.22	Tunis	0.22		
48			Kraków	0.22	Marseille	0.22		

* The table includes all cities that have at least one-fifth of the average of the three highest connectivities according to the nine-point scale scoring system (for P^9_a). For connectivities according to the other scoring methods more or less equivalent thresholds have been chosen.
** R: Rank.

less underrepresented than for the 14th century) appear even more prominently in figure 4.2 than figure 4.1 (moreover, in many cases the Mediterranean cities that figure on these maps are identical). Connections with the eastern Mediterranean (Constantinople, Alexandria, Rhodes) and Barbary (Tunis) were almost the same as in the 14th century. With the appearance of Sevilla and Lisbon, the maritime connection between the Mediterranean and north-western Europe becomes more visible on the other hand. As expected, the Hanseatic network is again badly represented on the 15th-century map.

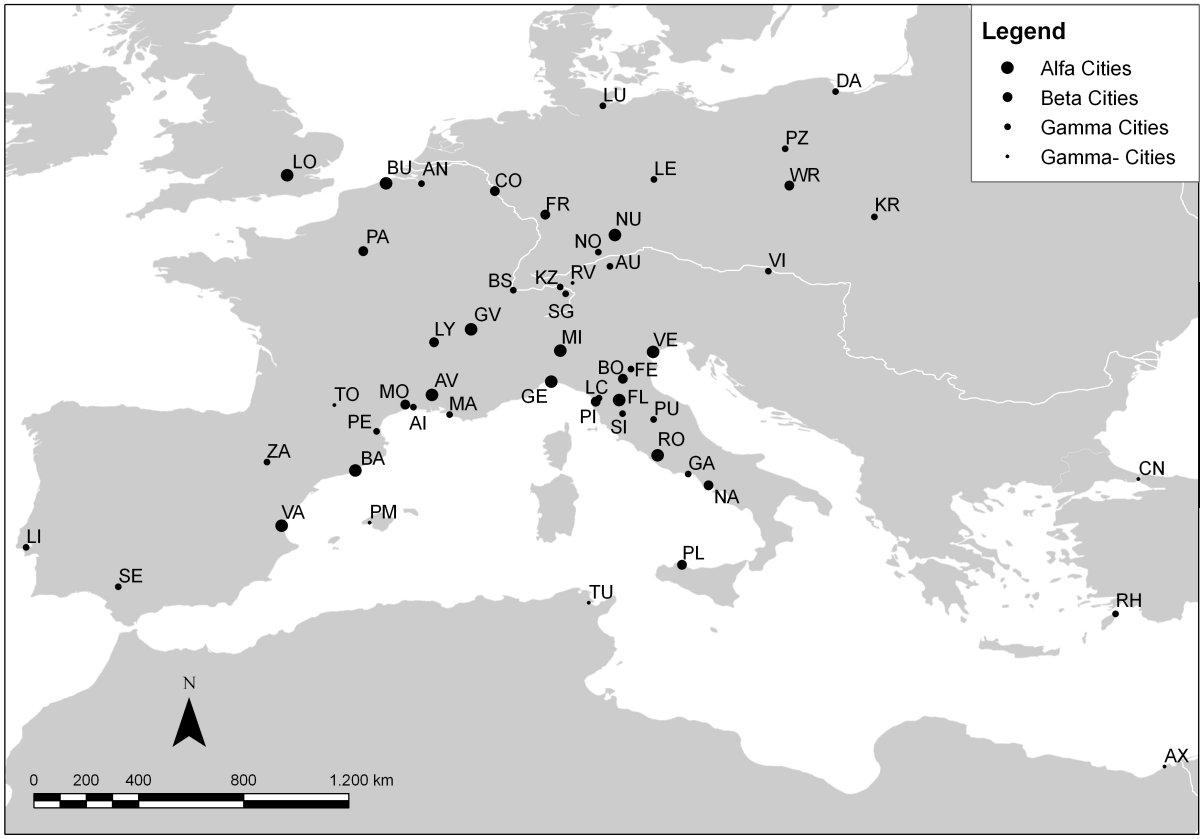

Figure 4.2: Major nodes in the European city network, 15th century.
Key: AI Aigues-Mortes; AN Antwerp; AU Augsburg; AV Avignon; AX Alexandria; BA Barcelona; BO Bologna; BS Basel; BU Bruges; CN Constantinople; CO Cologne; DA Danzig; FE Ferrara; FL Florence; FR Frankfurt am Main; GA Gaeta; GE Genoa; GV Geneva; KR Kraków; KZ Konstanz; LC Lucca; LE Leipzig; LI Lisbon; LO London; LU Lübeck; LY Lyon; MA Marseille; MI Milan; MO Montpellier; NA Naples; NO Nördlingen; NU Nürnberg; PA Paris; PE Perpignan; PI Pisa; PL Palermo; PM Palma de Mallorca; PU Perugia; PZ Poznań; RH Rhodes; RO Rome; RV Ravensburg; SE Sevilla; SG Sankt Gallen; SI Siena; TO Toulouse; TU Tunis; VA Valencia; VE Venice; VI Vienna; WR Wrocław; ZA Zaragoza.

The difference is to be found in continental Europe, where many cities became much stronger connected to the European commercial network, at the same time provoking a better integration between the different parts within the network. A crucial factor in this continental upsurge was the revival of fairs at the end of the 14th and in the 15th century (see Hunt &

Murray, 1999, 192-195; Munro, 2001). After the decline of the Champagne fairs around 1300, fairs appear to have played a rather limited role in the European economy during most of the 14th century. That they had become much more important again in the 15th century is witnessed by figure 4.2, in which several fair cities can be identified. The most important of these during the 15th century was Geneva (alpha city), the role of which later in the century was largely taken over by Lyon. Other substantial fairs were held in Leipzig, Nördlingen, Antwerp and especially Frankfurt am Main.

Moreover, these fair centres were strategically located on one of the several continental trade routes that appear to have become increasingly important during the 15th century, which can be linked to improvements in transport technology (four-wheeled wagons,…) (Hunt & Murray, 1999, 192-194). Firstly, a number of roads connected northern Italy with the Low Countries. An eastern route went via Augsburg, Nürnberg and Frankfurt am Main to Cologne where it joined a more westerly route via the Rhine (Konstanz, Basel,…). From Cologne, the route went further to Antwerp (Brulez, 1959, 329-330). Secondly, an eastern route linked Italy and the Low Countries via Leipzig to the central European markets (Wrocław, Kraków) and mining regions. Finally, a last commercial highway went from southern Germany along the Rhône (Geneva, Lyon, Avignon) and the Mediterranean (or overland via Toulouse) to Catalonia and Aragón. The importance of the central axis of the European world economy linking England and the Low Countries to the central-north Italian core of this world economy has also been stressed by Braudel (1984, 124), who saw the zones east and west from this axis as peripheral regions.

Undoubtedly, this continental upswing of the 15th century is somewhat exaggerated in the data as a result of the very strong representation of southern German firms in the sample, and as a result the connectivities of cities as Konstanz, Ravensburg and Sankt Gallen are definitely inflated. However, the much larger presence of southern German firms in the 15th-century business value matrix than in the 14th-century matrix reflects a 'real' rise of southern German business, which was related to the above-mentioned revival of fairs and continental trade routes.

Finally, the presence of several capital cities can be observed again (e.g. London, Kraków, Vienna, Lisbon, Naples, Rome, Milan, Florence and Venice, the latter increasingly turning into city-states during the 15th century). Notice that Paris and Avignon lost their status of capital city, respectively as a result of the transfer of the French royal court to the Loire region and of the Papal court to Rome (Spufford, 2002, 65-67, 136-137).

4.1.3. The 16th century

Table 4.3
Connectivity across the networks of seventy-three 16th-century firms according to different scoring systems*

R**	City	P^9_a	City	P^5_a	City	P^4_a	City	P^2_a
1	Antwerp	1.00	Antwerp	1.00	Antwerp	1.00	Antwerp	1.00
2	Venice	0.73	Venice	0.74	Venice	0.74	Venice	0.81
3	Lisbon	0.64	Lisbon	0.68	Lyon	0.71	Lyon	0.75
4	Lyon	0.64	Lyon	0.67	Lisbon	0.70	Lisbon	0.72
5	Nürnberg	0.55	Genoa	0.60	Sevilla	0.65	Sevilla	0.70
6	Sevilla	0.55	Sevilla	0.59	Genoa	0.60	London	0.59
7	Genoa	0.53	Nürnberg	0.58	Nürnberg	0.58	Genoa	0.58
8	Rome	0.48	London	0.52	London	0.57	Nürnberg	0.55
9	Augsburg	0.47	Cologne	0.51	Cologne	0.53	Hamburg	0.53
10	Frankfurt a. Main	0.45	Augsburg	0.50	Frankfurt a. Main	0.51	Frankfurt a. Main	0.52
11	Cologne	0.44	Rome	0.50	Rome	0.50	Cologne	0.51
12	Amsterdam	0.43	Frankfurt a. Main	0.50	Amsterdam	0.50	Rome	0.50
13	London	0.42	Amsterdam	0.48	Hamburg	0.49	Amsterdam	0.50
14	Hamburg	0.42	Hamburg	0.47	Augsburg	0.49	Medina d. Campo	0.47
15	Naples	0.41	Naples	0.44	Medina d. Campo	0.45	Naples	0.46
16	Valladolid	0.38	Valladolid	0.41	Naples	0.45	Florence	0.46
17	Leipzig	0.38	Medina d. Campo	0.41	Florence	0.44	Leipzig	0.43
18	Medina d. Campo	0.36	Leipzig	0.40	Valladolid	0.40	Valladolid	0.43
19	Florence	0.35	Florence	0.39	Leipzig	0.39	Danzig	0.40
20	Milan	0.32	Milan	0.38	Danzig	0.38	Valencia	0.40
21	Danzig	0.31	Danzig	0.34	Milan	0.38	Zaragoza	0.38
22	Madrid	0.31	Madrid	0.31	Valencia	0.35	Madrid	0.37
23	Wrocław	0.25	Marseille	0.30	Paris	0.34	Augsburg	0.36
24	Lübeck	0.25	Paris	0.29	Zaragoza	0.33	Milan	0.36
25	Zaragoza	0.24	Zaragoza	0.29	Madrid	0.33	Paris	0.35
26	Burgos	0.23	Valencia	0.29	Burgos	0.31	Lübeck	0.34
27	Marseille	0.23	Lübeck	0.28	Rouen	0.31	Burgos	0.32
28	Vienna	0.23	Burgos	0.27	Marseille	0.31	Bruges	0.31
29	Valencia	0.23	Rouen	0.27	Lübeck	0.30	Marseille	0.30
30	Kraków	0.23	Wrocław	0.27	Bruges	0.28	Nantes	0.30
31	Paris	0.22	Vienna	0.25	Brussels	0.27	Rouen	0.30
32	Rouen	0.22	Toledo	0.25	Barcelona	0.27	Barcelona	0.30
33	Toledo	0.21	Kraków	0.24	Nantes	0.26	Brussels	0.29
34	Banská Bystrica	0.19	Villalón	0.24	Cádiz	0.26	Toledo	0.28
35	Villalón	0.19	Bruges	0.24	Middelburg	0.26	Bologna	0.28
36	Medina d. Ríosec.	0.19	Medina d. Ríosec.	0.24	Toledo	0.26	Livorno	0.28
37	Barcelona	0.19	Toulouse	0.23	Medina d. Ríosec.	0.26	Granada	0.27
38	Bruges	0.19	Barcelona	0.23	Villalón	0.25	Cádiz	0.27
39	Innsbruck	0.18	Salzburg	0.22	Bologna	0.25	Middelburg	0.27
40	L'Aquila	0.18	Middelburg	0.22	Toulouse	0.25	Calais	0.26
41	Nantes	0.17	Brussels	0.22	Livorno	0.24	Medina d. Ríosec.	0.25
42	Toulouse	0.17	Nantes	0.21	Wrocław	0.24	Bordeaux	0.24
43	Middelburg	0.17	Cádiz	0.20	Granada	0.24	Toulouse	0.24
44	Salzburg	0.17	Bologna	0.20	Bordeaux	0.23	Wrocław	0.24
45	Prague	0.16	L'Aquila	0.20	Calais	0.22	Kraków	0.24
46	Santo Domingo	0.16	Bordeaux	0.20	Kraków	0.22	Villalón	0.24
47	Bolzano	0.16	Livorno	0.20	Salzburg	0.22	Santo Domingo	0.24
48	Schwaz	0.16	Innsbruck	0.20	Vienna	0.22	Königsberg	0.23
49	Granada	0.16	Constantinople	0.20	San Lúcar	0.22	San Lúcar	0.23

Table 4.3 (continued)
Connectivity across the networks of seventy-three 16th-century firms according to different scoring systems*

R**	City	P^9_a	City	P^5_a	City	P^4_a	City	P^2_a
50	Brussels	0.16						

* The table includes all cities that have at least one-fifth of the average of the three highest connectivities according to the nine-point scale scoring system (for P^9_a). For connectivities according to the other scoring methods more or less equivalent thresholds have been chosen.
** R: Rank.

Compared to the 14th- and 15th-century matrices, the 16th-century sample (containing seventy-three firms) has a much more balanced composition (table 2.1). Tuscan (nine firms, seven from Florence, two from Lucca), central European (thirteen firms from southern Germany, one from Wrocław), Spanish (eight Castilians, two Aragonese), and Low Countries (fourteen firms) enterprises are all more or less equally well represented. Portuguese (five firms) feature relatively strongly as well. Hanseatic (six firms, mostly from Lübeck however), Genoese (six firms), French (three firms, one from Marseille, two from Lyon), and Lombard (one firm from Cremona, one from Piuro) business organisations, still somewhat underrepresented, nevertheless weigh stronger on the 16th-century sample than on those of the earlier centuries. The largest biases probably are to be expected from the weak Venetian (three firms) and English (only one firm) subsamples.

While the evolution of the European city network between the 14th and 15th century can be described as a process of proceeding integration between the different parts of the network, the transition between the 15th and 16th century can be characterised as a veritable restructuring, notably as a shift towards the Atlantic (table 4.3 and figure 4.3). The north-western Mediterranean cities still feature well in the European network, but their dominant position has gone. Not only have eastern and southern Mediterranean cities – as well as those from the Mediterranean islands – disappeared from figure 4.3, moreover are only two of the eight alpha cities located along the Mediterranean (Venice and Genoa), while four of them are Atlantic cities (Antwerp, London, Lisbon and Sevilla). According to Braudel (1984, 138-139), a principal factor in this shift to the Atlantic was the Portuguese discovery of a sea route to Asia (more than the Spanish discovery of the Americas).

The rise of the Atlantic manifested itself in all the territories bordering the western European coast, with increasing connectivities for Antwerp, Amsterdam, and Middelburg in the Low Countries; Rouen, Nantes, Bordeaux and Calais in France (while only Marseille maintains its substantial position along the French Mediterranean coast); and Lisbon, Sevilla,

Cádiz and San Lúcar in the Iberian Peninsula. Striking as well are the growing connectivities of Spanish cities in general, which can be related to the importance of the Habsburg dynasty with its strong connections to Genoese and German high finance, as well as to the developing trade with the New World (Santo Domingo appears as a gamma- city). Consequently, not only Sevilla and its harbours, but also the fairs of Castile (Medina del Campo, Ríoseco and Villalón), and the principal seats of the travelling Spanish court (Valladolid, Madrid, Toledo), as well as Burgos and Granada appear in the list of major nodes in the European city network.

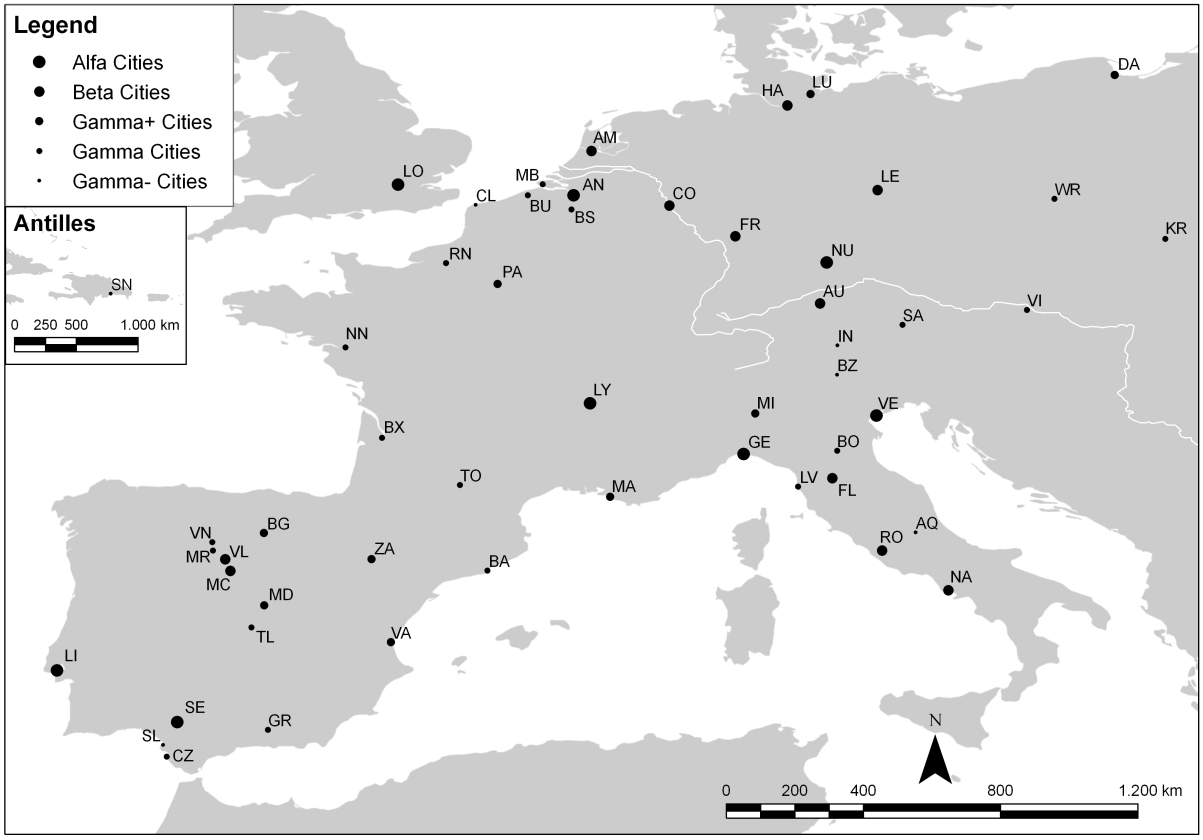

Figure 4.3: Major nodes in the European city network, 16th century.
Key: AM Amsterdam; AN Antwerp; AQ L'Aquila; AU Augsburg; BA Barcelona; BG Burgos; BO Bologna; BS Brussels; BU Bruges; BX Bordeaux; BZ Bolzano; CL Calais; CO Cologne; CZ Cádiz; DA Danzig; FL Florence; FR Frankfurt am Main; GE Genoa; GR Granada; HA Hamburg; IN Innsbruck; KR Kraków; LE Leipzig; LI Lisbon; LO London; LU Lübeck; LV Livorno; LY Lyon; MA Marseille; MB Middelburg; MC Medina del Campo; MD Madrid; MI Milan; MR Medina de Ríoseco; NA Naples; NN Nantes; NU Nürnberg; PA Paris; RN Rouen; RO Rome; SA Salzburg; SE Sevilla; SL San Lúcar; SN Santo Domingo; TL Toledo; TO Toulouse; VA Valencia; VE Venice; VI Vienna; VL Valladolid; VN Villalón; WR Wrocław; ZA Zaragoza.

Even within the different subnetworks important changes took place. In the Mediterranean, Livorno replaced Pisa as the principal Tuscan harbour, while in the Hanseatic region Hamburg with its westward links became more important than Baltic-oriented Lübeck. Along the Rhône axis, Lyon was confirmed in its position as successor to Geneva (which completely disappears from figure 4.3. The Genoese fairs of Besançon-Piacenza are probably

missing as a result of a bias in the sample). The largest shift occurred in the Low Countries however, where Antwerp (and later Amsterdam, already well-represented on the map) replaced Bruges as the principal gateway of north-western Europe (see e.g. Braudel, 1984, 143-157).

The continental trade routes remained intact however, and especially the Venice – Antwerp route via Bolzano, Innsbruck, Augsburg, Nürnberg, Frankfurt am Main and Cologne is clearly visible on figure 4.3. In the east, changes appear to have been limited: the Leipzig-Wrocław route maintained its importance. As always, the Hanseatic network features badly. Finally, again a rather large number of capital cities can be discerned, including London, Brussels, Paris (only from the late 16th century however), the seats of the travelling Spanish court (see above), Naples, Rome, Florence, Milan, Venice, Vienna and Kraków.

4.1.4. Spatial assumptions behind city-ness

The patterns observed in figures 4.1 to 4.3 allow to formulate a number of assumptions about the particular spatial arrangement of cities that is promoted by city-ness, in analogy to central place theory which describes the spatial organisation of town-ness. The central place model of Christaller (1966) is a distance decay model: it suggests (1) that customers go to the most nearby central place of a certain rank to obtain central goods and services of that rank. As a result there is a tendency to minimise distance in the model (range); (2) that central places need a minimum number of customers to be viable (depending upon the nature of the central functions). Consequently, there is also a tendency to minimise the number of central places in the model (threshold). The outcome of the model is an equilibrium between these two tendencies, resulting in Christaller's market principle. Central place relations are typically the outcome of the behaviour of retailers and customers for instance.

On the other hand, the city-ness relations I am investigating are generated by agents such as wholesale merchants, transferring goods from places where they are in abundance to places where they are lacking, making their profit in the price difference between these places. The tendency in this model is not to minimise distance, but to optimise traffic between as many different places as far away located from each other as possible, geographically resulting in Christaller's (Ibid.) traffic principle (city-ness is about crossing distance)[119].

[119] The better the ability in a certain society to cover distance, the less dominant this traffic principle will be: subsequent transport and ICT-revolutions (road revolutions of the 13th and 18th century, railway, telephone, internet,…) have allowed to overcome restrictions of space more efficiently, increasing the integration and expansion of networks.

Theoretically this means that one expects cities in a network to be located on straight lines connecting the different cities: settlements located on a line connecting two major commercial centres according to this model will develop more strongly than settlements located off such a line.

Is there a tendency to minimise the number of commercial centres in this model? On the one hand, wholesale merchants may prefer to visit staple markets, depots, and gateway cities, where a large variety of goods are concentrated and can be obtained (increasing purchase costs, decreasing transport/transaction costs). On the other hand, they may prefer to visit the production sites themselves, since here the goods can be obtained for the lowest price (decreasing purchase costs, increasing transport/transaction costs). The outcome of the model will be an equilibrium between both tendencies. The more efficient and cheaper transport in a society is, the less there is a need to minimise the number of centres. However, there are other factors promoting concentration within the network. One of these is the importance of information. The concentration of long-distance merchants and bankers resulted in a concentration of information (information about foreign markets is obtained by merchants through correspondence with their representatives abroad, travel,…). This concentration of information in certain centres in its turn attracted other merchants and businessmen (e.g. Lesger, 2006; Smith, 1984).

Similarly to the market principle of Christaller, in reality the traffic principle is distorted by a number of factors: the real world is not an isotropic plain. A first observation is that city networks would not even exist in an isotropic plain, since wholesale trade results from an unequal spread of resources between different regions. Wholesale trade is based upon diversity between places[120]: not all settlements attract merchants equally. Consequently, the spatial structure of the network is strongly influenced by the geographical diversity between places (availability of natural resources (mining regions, wool production,…), differences in economic and social organisation of production, presence of a court,…). As a result, a regular spatial pattern will even be harder to find in a city network than in a central place hierarchy.

Some deviations of the traffic principle can be expected. Since maritime transport was more efficient than overland transport (e.g. Masschaele, 1993), many well-connected cities in the network typically were maritime harbours. Inland cities on the other hand tend to be

[120] Stouffer's (1940) intervening opportunities model has the advantage that it does not postulate an isotropic plain: its starting point is an unequal geographical spread of opportunities. However, Stouffer defines opportunities very basically, according to a binary principle: for each point, an opportunity can be either available or not (when it is occupied by someone else). This binary model is much too simplistic for the description of a city network (it is only able to describe networks generated by trade organised in geographic monopolies, as by the Joint Stock Companies of the 17th century).

located along navigable rivers or important land-routes, again for reasons of transport-efficiency. The straight lines of the model often translate in reality in maritime routes, navigable rivers, main roads,…

Various traces of the functioning of this (distorted) traffic principle of Christaller have been observed. In maritime trade, several harbours became stepping stones along the principal maritime trade routes. This appears very clearly from the routes of the Venetian and Florentine galleys for instance, which made regular stops in many ports along the way to their principal destination (see figure 3.2; see also Balard, 1974 for the Genoese waystations along the maritime road to the eastern Mediterranean). In overland trade as well, a number of major commercial arteries developed (the Rhine, the Rhône, different routes leaving from southern Germany,…) along which important commercial centres developed. According to Hohenberg and Lees (1995) for instance, many European cities are located at one coach-day distance from each other along the main roads while smaller centres in between developed as resting stops (see also Antrop, 2000, 262).

4.2. Dynamics in the European city network, 1300 – 1600

The changes observed in the European city network between 1300 and 1600 are summarised in table 4.4. One of the features that comes out strongly from this table is the continuity in the network between the 14th and 15th century as well as the major changes taking place between the 15th and 16th century, although interpretation is somewhat hampered by the fact that less cities reached the threshold connectivity for inclusion in the table for the 14th century (33 cities) in comparison to the 15th (52 cities) and 16th (53 cities) centuries. Of the 33 alpha, beta and gamma cities of the 14th century, 28 were still to be found among the alpha, beta and gamma cities of the 15th century, while only five cities disappeared from these top layers of the network (Barletta, Nice, Ancona, Cagliari and Toruń). Moreover, of the 28 cities present among the major nodes of the network in the 14th and 15th centuries, 17 did not even change categories: six 14th-century alpha cities were still alpha cities in the 15th century, and the same applies to four beta cities and seven gamma cities. The only major change that occurred was the arrival of many new cities (24) among the top layers of the network in the 15th century.

While in the 16th century again a large number of new cities (24) surfaced among the major nodes of the European city network, this was not simply the result of a proceeding integration of the network as in the case of the 14th-15th-century transition, but instead it was accompanied by the decline of a more or less equal number of cities (23) not appearing in the

table anymore for the 16th century. Moreover, of the 29 cities present among the alpha, beta or gamma cities of the 15th as well as of the 16th century, 16 cities changed categories. The timing of this restructuring of the European city network does not fit very well into Arrighi's (1994) chronology of systemic cycles of accumulation (although it should be stressed that the grouping of the data in rather crude century-matrices does not allow to identify precise periodisations). Arrighi's model predicts major reorganisations in the world-economy to occur during phases of financial expansion of the world-system, i.e. ca. 1350 – ca. 1450 or ca. 1560 – ca. 1640 (see chapter one). In reality however, the principal changes appear to have taken place during the phase of material expansion between ca. 1450 and ca. 1560.

In the course of the transition from the 15th to the 16th century, several cities – among which a number of very important centres – appear to have declined more or less simultaneously. The principal 'casualties' were Avignon, Geneva, Bruges, Barcelona, Montpellier, Pisa, and to a lesser degree also Florence for instance. Although case-specific factors often played an important role in these downturn (withdrawal of the papal court from Avignon to Rome, silting up of the harbour of Bruges, Catalan civil war,…), this simultaneity in the decline of different cities all across Europe is striking. These cities all belonged to the core nodes of the European city network in the 14th and 15th century, and were strongly connected with each other thanks to the networks of Italian, especially Tuscan, bankers. As long as this network stood firm, the cities belonging to it fared well, but as soon as decline made its appearance in the network, the different nodes simultaneously experienced a downturn as well. It appears that cities tend to decline together with the city network to which they belong, rather than individually. In other words, city networks matter: cities come in packs, but also disappear in packs.

A good example is Avignon. Although one might expect Avignon to have lost its commercial and financial prominence as soon as the papal curia was transferred from Avignon to Rome in 1378, the city managed to maintain a central position in the European city network for another century (Avignon was still an alpha city during the 15th century), partly thanks to its location along the Rhône route between southern Germany and Catalonia and its traditional links with Florence. Only when Florence and the Catalan cities themselves began to decline (for Florence only limited) Avignon as well dwindled as a centre of international business. Indeed, in the 16th century Avignon did not even reach the rank of gamma city anymore. As such, the functioning of city networks – as long as they remained intact – could be an important factor of stability or tenacity in the urbanisation pattern of a

particular region, despite the dynamic character of city-ness (about the tenacity of urban systems, see Kloosterman & Lambregts, 2007).

Similar observations can be made in relation to the rise of cities in the network. Upcoming cities of the 16th century were for instance Antwerp, Lisbon, Sevilla, Lyon, Madrid, Amsterdam, Hamburg, Leipzig, Augsburg, Medina del Campo, etc. Here as well, individual explanations can be invoked for each particular instance: the Portuguese discovery of a direct route to Asia (Lisbon), the permanent settlement of the Spanish royal court in Madrid at the end of the 16th century,… But again, cities belonging to one and the same network appear to have had the inclination to rise as a group, in conjunction with the ascendancy of the network as a whole. The same can be said about the simultaneous upsurge of several continental cities around 1400, including Nürnberg, Geneva, Frankfurt am Main, Basel, Konstanz, Nördlingen, etc.

Table 4.4
Major nodes in the European city network, 14th, 15th and 16th centuries

	14th century	**15th century**	**16th century**
Alpha	Bruges*	Venice	Antwerp
	Florence	Bruges	Venice
	Avignon	Florence	Lisbon
	London	Barcelona	Lyon
	Paris	London	Nürnberg
	Venice	Valencia	Sevilla
	Genoa	Nürnberg	Genoa
	Naples	Genoa	London
		Rome	
		Avignon	
		Geneva	
		Milan	
Beta	Pisa	Lyon	Rome
	Bologna	Montpellier	Augsburg
	Barcelona	Pisa	Frankfurt am Main
	Barletta	Cologne	Cologne
	Palermo	Bologna	Amsterdam
	Rome	Naples	Hamburg
	Perugia	Frankfurt am Main	Naples
	Milan	Wrocław	Valladolid
	Palma de Mallorca	Palermo	Leipzig
	Constantinople	Paris	Medina del Campo
	Montpellier		Florence
Gamma	Tunis	Antwerp	Milan
	Rhodes	Basel	Danzig
	Nice	Perpignan	Madrid
	Ancona	Vienna	Lübeck
	Cagliari	Zaragoza	Zaragoza
	Lucca	Lübeck	Burgos
	Lübeck	Lisbon	Marseille
	Marseille	Augsburg	Valencia

Table 4.4 (continued)
Major nodes in the European city network, 14th, 15th and 16th centuries

	14th century	**15th century**	**16th century**
Gamma (cont.)	Nürnberg	Sankt Gallen	Paris
	Kraków	Aigues-Mortes	
	Danzig	Konstanz	Wrocław
	Toruń	Gaeta	Vienna
	Aigues-Mortes	Danzig	Kraków
	Wrocław	Kraków	Rouen
		Nördlingen	Toledo
		Marseille	Villalón
		Leipzig	Medina de Ríoseco
		Rhodes	Barcelona
		Sevilla	Bruges
		Ferrara	Nantes
		Perugia	Toulouse
		Poznań	Middelburg
		Lucca	Salzburg
		Siena	Granada
			Brussels
			Bologna
			Cádiz
			Livorno
			Bordeaux
Gamma-		Ravensburg	Innsbruck
		Palma de Mallorca	L'Aquila
		Constantinople	Santo Domingo
		Tunis	Bolzano
		Toulouse	Calais
		Alexandria	San Lúcar

* Cities are ranked by 9-point scale connectivities in each category.

4.2.1. The alternation of continental and maritime networks

In the 1960s, the historian Herman Van der Wee (1963, 309-318; Van der Wee & Peeters, 1970; see also Hunt & Murray, 1999, 145-146; Munro, 2001; Spufford, 2002, 16, 390-397, 407-408) has developed a theory linking general trends in the evolution of transport in the Middle Ages and the early modern period to inter-secular cycles of economic growth and crisis. This theory very eloquently explains the evolutions in the European city network described above.

The long period of economic growth in Europe in the 11th to 13th centuries was associated with the rise of long-distance overland transport, especially in the 13th century. The key trade routes of 13th-century Europe formed a triangle connecting Tuscany and Lombardy via the Alpine passes and the fairs of Champagne with Flanders to the west, and via Vienna with the European mining areas in Saxony and Bohemia to the east. These mining areas were in turn linked to Flanders via the road running from Freiberg to Bruges. Most international

trade took place at fairs, which provided security and stability (Munro, 2001; Spufford, 2002, 390-391; Van der Wee, 1963, 309-310; Van der Wee & Peeters, 1970, 104-105).

As a result of improvements in maritime navigation since the end of the 13th century and of the increasing insecurity of road transport due to wars such as the Hundred Years' war, the land routes became partly circumvented by longer, but cheaper sea routes, especially in the west where Genoese and Venetian ships sailed directly to Bruges since the end of the 13th century. This route became more safe for Italian ships after the reconquest of most of Andalusia from the Muslims in the middle of the 13th century (Munro, 2001; Spufford, 2002, 395-397; Van der Wee, 1963, 310-313; Van der Wee & Peeters, 1970, 107-108).

Although there was a marked growth in Atlantic shipping in the late 15th and 16th century, related to the new sea routes discovered by the Portuguese and Spanish, maritime transport in the Mediterranean declined strongly in the second half of the 15th and the 16th centuries. At the same time, overland transport in Europe experienced a strong recovery. This cannot entirely be explained by improvements in road transport, because technological advances in maritime transport appear to have been more important in this period[121] (although the development of specialised long-distance overland transport firms may have played a role in the renewed flourishing of overland trade). However, in the second half of the 15th century land travel became safer again, due to the end of the Hundred Years war, the wars in Italy, etc. Transport by sea on the other hand became less and less safe as a result of the increase of piracy, especially between Muslims and Christians, and the conquests of the Ottomans in the eastern Mediterranean. Another reason for the restoration of overland transport was the growing importance of the south German cities in the European economy. Consequently, the triangular road pattern of the 13th century was replaced by the end of the 15th century by a web of roads radiating outwards from southern Germany, the most important of which were the road across the Brenner pass to north and central Italy, and the road to Antwerp via Frankfurt. Other roads ran from the southern German cities to the French royal court in Tours through Geneva and later Lyon, and to the newly active mining areas in the east. The Brabant fairs procured the link between the continental and the maritime trade circuits, and promoted the growth of Antwerp in the 15th century (Munro, 2001; Spufford, 2002, 391-395, 407-408; Van der Wee, 1963, 314-316; Van der Wee & Peeters, 1970, 112-113).

In the 16th century, continental routes, like those that linked Brabant to Italy, kept their importance. Maritime trade however took over again, especially from the middle of the

[121] See also Menard, 1991, 273-274.

century when Dutch and English shipping became more and more important. Luxury trade was increasingly sided by trade in bulk commodities, like Dutch hop, grain from the Baltic, Flemish linen, copper from Hungary, Breton canvas, etc., the transport of which was more efficiently organised by ship (Van der Wee, 1963, 317-318).

According to Van der Wee and Peeters (1970, 104-116) the concentration of economic activity in a relatively small number of maritime ports in the 14th and 15th century was one of the causes of the late medieval crisis, leading to economic decline in the vast continental regions of Europe. Similarly, the recovery of overland transport in the late 15th and 16th centuries played an important role in the economic revival of the 16th century. The downward trend of the European economy in the 17th and early 18th centuries can be attributed analogously to a decline in transcontinental transport and a concentration of wealth in the maritime centres of the United Provinces and the United Kingdom.

4.2.2. Back to principal components analysis: From the Mediterranean to the Atlantic

In the previous chapter, principal components analysis has been used in order to distinguish several different spatial strategies used by late medieval and 16th-century Latin Christian European business organisations. To get a better view of the dynamics in the network, the two-component solution (which has not been discussed yet in the previous chapter) of this exploratory principal components analysis will be presented here (see table 4.5). The table gives the results of analysis on the nine-point scale business value matrix, but these are very similar to the two-, four- and five-point scale analyses (although component loadings on average are somewhat lower in the latter analyses)[122]. Of the 130 firms taken up in the analysis, 24 have factor loadings below 0.30 and as such have not been allocated to a component. Another 19 enterprises do not load higher than 0.39 on any of the two components, and these should be interpreted with care.

A relatively consistent pattern emerges from the table. Firms loading high on the first component include especially Tuscan enterprises, followed by Genoese and Catalan firms. Venetian firms, although with loadings below 0.4, nevertheless also clearly belong to the first component. Consequently, component I can be interpreted as a cluster of Mediterranean firms. This interpretation is corroborated by the fact that French firms – most of which do not load higher than 0.3 on any component – nevertheless have some affinity with this factor as

[122] A principal components analysis with extraction of two components accounts for 28.87 % of the original variation in the nine-point scale business value matrix. After rotation, the first component explains 15.72 % of the original variation, while the second component accounts for 13.15 %.

well. Component II on the other hand is loaded strongly upon by central European, Portuguese, and 15th- and 16th-century Hanseatic firms as well as 16th-century Flemish and Dutch enterprises. This factor can be described as an Atlantic-German component. Castilian and Aragonese firms, somewhat on the verge between the Mediterranean and the Atlantic, either load weakly on component I (two firms) or II (three firms), or on both (two hybrid firms) or none of them (four firms, all loading higher on the second than on the first factor). Consequently, their affiliation to the Atlantic component appears to be somewhat stronger than to the Mediterranean factor. English firms are almost never allocated to any of both components, but surprisingly most of them have higher loadings on the Mediterranean component.

Table 4.5
Firms allocated to two components*

Factor loading	**I. Mediterranean firms**	**Cent.****	**Or.*****	**II. Atlantic and German firms**	**Cent.****	**Or.*****
0.70 +	Medici (Averardo)****	14-15	FL	Von Bodeck (Johann)	16	LC
	Guinigi	14	LU	Ximenes	16	PO
	Borromei (Venice)	15	FL			
	Spinelli	15	FL			
	Alberti antichi	15	FL			
	Peruzzi	14	FL			
	Buonaccorsi	14	FL			
	Company of Pistoia	14	PI			
	Guardi	14	FL			
	Alberti	14	FL			
	Strozzi (F. il vecchio)	15	FL			
0.60-0.69	Medici	15	FL	Rodrigues d'Evora	16	PO
	Bardi	14	FL	Van Immerseel (Jan)	16	LC
	Pazzi (Jacopo)	15	FL	Schetz	16	LC
	Scali	14	FL	Beckmann	16	HA
	Acciaiuoli	14	FL	Welser (Nürnberg)	16	CE
	Soderini	14	FL	Van Uffele	16	LC
	Salviati	16	FL	Hirschvogel	15-16	CE
	Fornari (Gio Batta)	16	GE	Resteau (Jean)	16	LC
	Corsi	16	FL	Caldeira (Luis A.)	16	PO
	Borromei (Milan)	15	FL	Haug-Langnauer-Linck	16	CE
	Olivieri	16	FL			
0.50-0.59	Bonvisi	16	LU	Della Faille	16	LC
	Centurione (F. & F.)	15	GE	Welser (Augsburg)	16	CE
	Datini	14-15	FL	Nunes (Estevão)	16	PO
	Rapondi	14	LU	Rinck	15	HA
	Di Negro (Francesco)	16	GE	Paler-Weiss	16	CE
	Strozzi (F. il giovane)	16	FL	Cunertorf-Snel	16	LC
	Brignole (Antonio)	16	GE	Van der Meulen	16	LC
	Affaitadi	16	LO	Fugger (von der Lilie)	16	CE
	Llobera-Junyent	15	CT	Manlich (Matthias)	16	CE
	Coeur (Jacques)	15	FR	De Groote (Ni.)	16	LC
	Spifame	14	LU	Thijs (Hans)	16	LC
	Botti	16	FL	Fugger vom Reh	15	CE

Table 4.5 (continued)
Firms allocated to two components*

Factor loading	I. Mediterranean firms	Cent.**	Or.***	II. Atlantic and German firms	Cent.**	Or.***
0.50-0.59 (cont.)				Imhoff	16	CE
				Mendes	16	PO
				Vertema	16	LO
				Oesterreicher	16	CE
				Loitz	16	HA
0.40-0.49	Guicciardini	16	FL	Carstens & partners	16	HA
	Piccamiglio (Giovanni)	15	GE	Rocca	16	FL
	Ruiz (Simon)	16	CA	Balbani	16	LU
	Grimaldi	16	GE	Veckinchusen	15	HA
	Lomellini (Marco)	15	GE	Viatis-Peller	16	CE
	Van der Molen	16	LC	Affaitadi²	16	LO
	Banchi (Andrea)	15	FL	Daza	16	AR
	Pallavicino (Tobias)	16	GE	Welser (15th c.)	15	CE
	Centurione (Gaspare)	16	GE	Poulle	16	LC
	Torralba-Sabastida	15	CT	Amsinck (Willem)	16	HA
	De Soria (Diego)	15	CA	Tucher	15-16	CE
				Van Adrichem (Ni.)	16	LC
				Manlich (Melchior)	16	CE
				Van Tweenhuysen (L.)	16	LC
0.30-0.39	Bembo	15	VE	Berens (Hans)	16	HA
	G. Ravensburger Ges.	15-16	CE	Gruber-Podmer-Str.	15	CE
	Da Pontremoli (G.)	15	GE	Bonvisi²	16	LU
	Querini (Guglielmo)	15	VE	Popplau	16	CE
	Mitjavila & partners	14	CT	Starck (Ulrich)	15	CE
	De Castro	16	CA	Ruiz (Simon)²	16	CA
	Balbani²	16	LU	Grimaldi²	16	GE
	Barbarigo (Andrea)	15	VE	Quintanadueñas	16	CA
	Welser (15th c.)²	15	CE	Van der Molen²	16	LC
	Da Lezze (Michele)	16	VE	Kamerer-Seiler	14-15	CE
	Welser (Nürnberg)²	16	CE	Espinosa	16	CA
	Pisani	16	VE	Centurione (Gaspare)²	16	GE
	Daza²	16	AR	G. Ravensburger Ges.²	15-16	CE
	Betson (Thomas)	15	EN	Bernuy	16	CA
	Oesterreicher²	16	CE	Fornari (Gio Batta)²	16	GE
				Pallavicino (Tobias)²	16	GE
				Lomellini (Marco)²	15	GE
				Ruland (Ott)	15	CE

* Principal components analysis with varimax rotation, carried out on the nine-point scale business value matrix across all 1337 places (14th-16th century).
** Cent.: Century in which the firm was active.
*** Or.: City or region of origin of the firm: AR Aragón; CA Castile; CE Central Europe (excluding Hanse); CT Catalonia; EN England; FL Florence; FR France; GE Genoa; HA Hanse; LC Low Countries; LO Lombardy; LU Lucca; PI Pistoia; PO Portugal; VE Venice.
**** Firms are ranked by loadings in each category.
² Indicates second-highest loading for a firm.
Firms unallocated to two components: Van Marke (Collard) 14 LC, Panse 16 FR, Cely 15 EN, Gapaillon 16 FR, Diesbach-Watt 15 CE, Maghfeld (Gilbert) 14 EN, Goldbeter (John) 14 EN, De la Pole (William) 14 EN, Hermite 16 FR, Berengo (Andrea) 16 VE (all loading higher on the first component); Stromer 14 CE, Salamanca 16 CA, Despars 15 LC, Lopez de Villanueva 16 AR, Civille 16 CA, Von Holsten (Wolter) 16 HA, Ruiz (André) 16 CA, Runtinger 14-15 CE, Praun (Hans) 15 CE, Myddelton (Thomas) 16 EN, Von Geldersen (Vicko) 14 HA, Cromberger 16 CE, Wittenborg (Johann) 14 HA, Teutonic Order 14-15 HA (all loading higher on the second component).

Looking at differences in periodisation between both components, it is obvious that factor I more or less equally covers the three centuries between 1300 and 1600, while component II has a strong preference for 16th-century firms. 15 of the firms allocated to the first component were active in the 14th century, 23 in the 15th century, and 20 in the 16th century; for the second factor these totals are respectively 1, 10 and 43[123]. 15th- and especially 14th-century firms load significantly higher on component I than 16th-century enterprises; for factor II this is entirely the opposite. Moreover, Hanseatic firms of the 14th century as well as 14th- and 15th-century Flemish enterprises and most 14th-century central European firms are unallocated to any of the components, although one would expect them to cluster to the Atlantic-German component. English merchants have almost never been allocated to a component either, but while English firms of the 16th century load higher on factor II, their counterparts of the 14th and 15th centuries have stronger loadings on the first component.

This is in agreement with our observations for the individual nations: while the Mediterranean nations played a considerable role in European trade in the 14th and 15th centuries and experienced some decline in the 16th century (Catalans, to a certain degree also Florentines and Venetians, but not Genoese), the southern Germans and especially the Atlantic nations went through a phase of expansion in the 15th and especially 16th century (except for the Hanse). Since the analysis clearly makes a distinction between these two groups of firms, I am inclined to interpret both components as two different but overlapping subnetworks, whereby the Mediterranean subnetwork dominated in the 14th and 15th centuries but was increasingly taken over by the Atlantic-German subnetwork in the 16th century. Nevertheless, the Mediterranean subnetwork did not disappear in the 16th century!

Both clusters of firms had different spatial-strategic emphases. These are outlined in table 4.6, summing up the articulating cities (component scores 10.00 or higher) and primary field cities (3.00 or higher) as well as a number of other cities with a somewhat weaker affiliation to one of the components (factor scores 1.00-2.99). Also cities with strong negative scores have been taken up in the table. These can be interpreted as important nodes that were conspicuous by their absence from one of both subnetworks. A first observation is that the cities in this table were almost all important centres of the European world-economy during (part of) the late Middle Ages and/or the 16th century.

[123] Firms straddling two centuries have been counted among both centuries. Hybrid firms have only been counted for the factor on which they loaded the strongest.

Three types of cities can be discerned. A first category consists of cities with high scores on the Mediterranean component, and without any affinity to the Atlantic-German component (or even scoring strongly negative on the latter). Not surprisingly these include a large number of central and southern Italian (Florence, Naples, Rome, Pisa, Bologna, Palermo, Perugia, Lucca,…), southern French (Avignon, Montpellier, Marseille,…) and Catalan cities (Barcelona, Valencia, Mallorca,…), as well as several places in the eastern Mediterranean (Constantinople, Rhodes, Alexandria,…). Typical anchorpoints of this network in and on the road to north-western Europe were Bruges, Paris, and Geneva. Several of these cities experienced some degree of decline as international commercial and financial centres in the course of the 15th century (most of them towards the end of the century): Bruges, Geneva, Barcelona, Montpellier, Avignon, Pisa, Florence, Constantinople, Paris,... (see above).

Table 4.6
City scores on two components*

Factor score	I. Mediterranean subnetwork	II. Atlantic-German subnetwork
15.00 +		**Antwerp**
10.00-14.99	Florence**, Bruges, **Genoa***	Lisbon, Hamburg, Nürnberg
9.00-9.99	**London**, Naples, Rome, **Venice**	Cologne
8.00-8.99		Frankfurt am Main
7.00-7.99	Avignon	**Venice**, Amsterdam
6.00-6.99	Paris, Pisa, Barcelona	Leipzig, Augsburg
5.00-5.99	**Lyon**, Valencia, Bologna	Lübeck, **Sevilla**, Danzig
4.00-4.99	Palermo, **Milan**, **Sevilla**	**Lyon**, Middelburg
3.00-3.99	Montpellier, Perugia, Lucca	**London**, **Medina del Campo**, Vienna, Wrocław
2.00-2.99	Geneva, Marseille, Constantinople, **Antwerp**	**Rouen**, Kraków, **Valladolid**, Madrid, Emden, **Burgos**
1.00-1.99	Ferrara, **Medina del Campo**, Rhodes, **Valladolid**, **Burgos**, *Mallorca*****, Messina, Barletta, Alexandria, Tunis, Ancona, Siena, Piacenza, Toledo, **Nantes**, **Rouen**, L'Aquila, Basel, Chios	Calais, Bordeaux, Stade, Narva, Reval, San Lúcar, Königsberg, Riga, Bilbao, Ulm, Prague, Salzburg, **Genoa**, Brussels, Zaragoza, **Nantes**, Strasbourg, La Rochelle, Bolzano, Poznań, *East Indies*, **Milan**, Rotterdam, Banská Bystrica
-1.99 - -1.00	Frankfurt am Main, Danzig, Leipzig, Reval, Narva	Florence, Perugia, Barcelona, Montpellier, Naples, Rhodes, Bologna, Palermo, Tunis
-2.99 - -2.00	Hamburg, Amsterdam, Lübeck	Avignon, Pisa

* Principal components analysis with varimax rotation, carried out on the nine-point scale business value matrix across all 1337 places (14th-16th century).
** Cities are ranked by scores in each category.
*** **Genoa (bold)**: Cities scoring high on both components.
**** *Mallorca (italics)*: Less precise geographical designations.

A second group comprises cities scoring high on the second component but not on the first factor. This category contains several Atlantic (Lisbon, Bordeaux, San Lúcar, Bilbao,…), North Sea (Hamburg, Amsterdam, Middelburg, Emden, Calais, Stade,…) and Baltic harbours

(Lübeck, Danzig, Narva, Reval, Königsberg, Riga,…), as well as central European cities (Nürnberg, Cologne, Frankfurt am Main, Leipzig, Augsburg, Vienna, Wrocław, Kraków,…). In contrast to the former group, this set includes many rising cities of the 16th century, such as Lisbon, Madrid, Middelburg, Amsterdam, Hamburg, Leipzig, Augsburg, etc. (see above).

The last type of cities are those which score high on both components (bold in table 4.6). Most of these are cities in which the Mediterranean and Atlantic-German world met each other: Venice, Genoa and Milan in northern Italy, a number of Castilian cities (Sevilla, Medina del Campo, Valladolid), Lyon, Antwerp and London[124]. With the exception of the latter two, these cities indeed were physically located at the edge of the Mediterranean and the Atlantic-German world. As in the second category, the majority of the cities in this group experienced an important economic boom during the 16th century. This results from the fact that the second component has a strong inclination towards that particular century, and consequently only cities connecting the Mediterranean with the Atlantic and Germany during the 16th century score high on both components. Their counterparts of the 14th and 15th century – especially Bruges, Geneva and Venice – solely can be found under the first component. However, a number of cities which already played an important role in the European world-economy during the 14th and 15th centuries nevertheless score high on both components (especially the north Italian cities Venice, Genoa and Milan, but also London). These cities made a successful transition from the old Mediterranean to the new Atlantic-German subnetwork.

Not only cities, as physical meeting-points, but also businessmen or nations, as intermediaries, connected the two subnetworks. Revealing in this respect are the doubly-loaded or hybrid firms (see table 4.7), whose business networks straddled both the older Mediterranean and the younger Atlantic-German subnetwork. No 14th-century firms can be found among these hybrid firms: the Atlantic-Central European subnetwork had not developed yet (the Atlantic world in this period was dominated by Mediterranean nations), while the Mediterranean and Hanseatic networks can be seen as two different world-economies: no firms were simultaneously active in those two world-economies yet. The 15th century witnessed the ascendancy of southern German business. South German firms in this period not only traded in central Europe and the west (especially Antwerp), but they also had connections with the Mediterranean (in addition to Venice and the other north Italian cities,

[124] Burgos, Nantes and Rouen – also bold in the table – should not be considered as typical meeting points between Atlantic / German merchants and Mediterranean businessmen. Rather, they were important centres of Castilian trade; and since Castilian firms are scattered between the two components, these cities as well score relatively high on both factors.

also central Italy, southern France and Catalonia). At the same time, Genoese merchants increasingly turned their attention towards the developing Castilian and Portuguese economies.

Table 4.7
Hybrid firms (firms with two loadings above 0.30) with two components*

Firm	Century**	Origin***	I. Mediterranean subnetwork	II. Atlantic-German subnetwork
Lomellini (Marco)	15	GE	0.43	0.31
Welser (15th c.)	15	CE	0.33	0.43
G. Ravensburger Ges.	15-16	CE	0.37	0.32
Centurione (Gaspare)	16	GE	0.42	0.32
Fornari (Gio Batta)	16	GE	0.63	0.32
Grimaldi	16	GE	0.48	0.36
Pallavicino (Tobias)	16	GE	0.42	0.31
Oesterreicher	16	CE	0.30	0.51
Welser (Nürnberg)	16	CE	0.31	0.64
Balbani	16	LU	0.34	0.47
Bonvisi	16	LU	0.59	0.37
Daza	16	AR	0.31	0.44
Ruiz (Simon)	16	CA	0.48	0.36
Affaitadi	16	LO	0.55	0.45
Van der Molen	16	LC	0.43	0.34

* Principal components analysis with varimax rotation, carried out on the nine-point scale business value matrix across all 1337 places (14th-16th century).
** Century: Century in which the firm was active.
*** Origin: City or region of origin of the firm: AR Aragón; CA Castile; CE Central Europe (excluding Hanse); GE Genoa; LC Low Countries; LO Lombardy; LU Lucca.

However, hybrid firms almost all were 16th-century enterprises, since only then the Atlantic-German subnetwork had become well established. Although the category of 16th-century hybrid firms is composed of firms from a variety of nations (two southern German firms[125], two from Lucca, and one each from Aragón, Castile, Lombardy and the Low Countries) this sample is dominated by Genoese firms (four enterprises). The central role of Genoese finance during the second half of the 16th century has been stressed by Braudel (1984, 157-174) – who termed the period between 1557 and 1627 the "age of the Genoese" – as well as by Arrighi (1994), who saw the Genoese bankers as the leading capitalist elite during his first systemic cycle of accumulation. One can assume that this Genoese dominance of European finance in the second half of the 16th century was partly a result of their enviable position of intermediaries between the Atlantic and the Mediterranean subnetworks. However, despite the central role of the Genoese, I would argue that the centre of gravity of the European world-economy did not shift back to the Mediterranean in the second half of the

[125] The Grosse Ravensburger Handelsgesellschaft was in decline by the early 16th century, and as such should not be counted among the 16th-century southern German hybrid firms.

16th century (as has been claimed by Braudel, 1984, 157-174), but already by the early 16th century had permanently moved to the Atlantic. For as Braudel (1984, 157) wrote himself, the "age of the Genoese" was not the age of "the city of Genoa itself, but [of] a handful of banker-financiers", many of whom were established at the Spanish court or at Antwerp. Indeed, it is important to make a distinction between a city (as a node in a network) and its merchants, who operated in a network in which their city of origin not necessarily was the principal node.

4.3. Connectivity versus population: A case study for the 14th century

One way to obtain more reliable results from an overall analysis of the data would be to account for the relative importance of the different nations by attributing different weights to firms belonging to different nations according to the significance of the nation and to the degree to which it is already over- or underrepresented in the firm sample. However, comparative and quantifiable data about the prominence of the various European trading nations are almost not available, and as a result it is impossible to establish anything more than some very rough rules of thumb. Peter Spufford (2002, 376-388) has attempted to compare the trade volumes handled by different European cities. He estimated the total trade volume in the Mediterranean in the second half of the 14th century to have been five to ten times the size of the total trade of the Baltic[126]. Still in the 1490s, Venetian trade was many times larger than Lübeck trade (Venetian trade with Beirut and Alexandria alone at this time was double the size of overall Lübeck trade).

Spufford's estimations correspond relatively well with our connectivities[127]. However, the question is whether such direct comparisons between connectivities and trade volumes are allowed. Moreover, limited indications such as those of Spufford clearly do not suffice for the creation of reliable weights for the different nations. Consequently, another solution has been designed, based upon a comparison between connectivities of cities and urban populations. This analysis will be carried out as a case study for the 14th century, since biases for this century can be expected to be the largest.

[126] This assumption is based on the observation that the trade volume of Genoa was twice as much as that of Lübeck in 1368, and five to six times as large in 1379-1384, as well as on the fact that Genoese and Venetian trade were probably of more or less equal size in the early 1380s, after which period Venetian trade became relatively more important.

[127] Lübecks overall connectivity amounted to ca. 29 to 42 % of Venice's and Genoa's connectivities in the 14th century, and to ca. 25 to 31 % of Venice's connectivity in the 15th century (see previous footnote). Calculations have been made for the different scoring systems.

Comparison of city connectivities calculated across the totality of the network for the 14th century with urban population data serves a twofold purpose. Firstly, biases in the data incorporated in the 14th-century business value matrix can be checked. Secondly, and more interestingly, such a confrontation enables to investigate the relationship between city-ness (measured as connectivity) and urban development (measured as population size). The hypothesis that will be tested here – partly via standard least squares regression analysis – is that city-ness produces demographic growth in cities. As will be clear from the analysis this assumption is only valid up to a certain degree, and there were definitely other factors which had an impact on urban growth. Several of these alternative explanations can be uncovered through the examination of the regression residuals.

Reliable urban demographic data are not readily available for the period before the first national censuses of ca. 1800. Consequently, several historians have produced datasets of populations of cities in Europe (Bairoch *et al*., 1988; De Vries, 1984) or the world (Chandler, 1987) before 1800, mostly based on specialised historical literature (such as demographic studies or town histories) and in some cases also on direct archival research. Almost always these historical population data are approximations based on tax records, lists of baptisms and burials, etc., or even estimated guesses by historians specialised in the history of a particular city (see e.g. De Vries, 1984, 23-24; Taylor *et al*., 2010a, which discusses the different databases available). There are some serious problems not only with the data for individual cities, but with the datasets as a whole as well. Firstly, they only include cities with at least 10,000 inhabitants. For the medieval period, when urban settlements often had no more than a few thousand or even a few hundred inhabitants, this is a high threshold to define a city (Bosker *et al*., 2008, 6; specifically for Flanders, see Stabel, 1997, 19-20). The deficiency of this criterium is confirmed by the fact that rather many places can be found with relatively high connectivities but with populations below 10,000 inhabitants (in some cases this might be the consequence of errors in the population database however). Secondly, no completeness is guaranteed, and especially cities which had less than 10,000 inhabitants in 1800 but were larger before might be missing. Thirdly, for a large number of cities no data were available for one or more survey years in the databases, especially for earlier periods and smaller cities. In such cases interpolations had to be made (De Vries, 1984, 23-27).

The population data I have used are a slightly updated and corrected version of the database of European cities published by Paul Bairoch, Jean Batou and Pierre Chèvre in 1988, which has been produced by Maarten Bosker, Eltjo Buringh and Jan Luiten van Zanden (2008) for their comparative study of urbanisation in Europe and the Arab world between 800

and 1800[128]. This dataset contains urban population data for European cities with 10,000 inhabitants or more. I have chosen to utilise this revised version of the database of Bairoch *et al*. for several reasons. Firstly, it is more reliable than the population data found in Chandler (1987). Secondly, although there are some significant differences, especially for smaller cities, in comparison to the data produced by Jan De Vries (1984), the latter have the disadvantage that they only cover the period 1500-1800 (Taylor *et al*., 2010a).

One difficulty is that data are only available for 100-year intervals, notably for 1300 and 1400 (for this 14th-century case study), i.e. not the middle-, but the start- and end-years of the century-specific business value matrix. However, since a causal relationship is being assumed between city-ness and city-size this does not have to be a problem. The impact of transnational economic connections of cities on their urban population size can best be determined at the end rather than in the middle of the period for which these connections are measured. Consequently, in what follows 14th-century connectivities (independent variable) will be compared with population data for 1400 (dependent variable).

A preliminary comparison for the 14th century of cities with the highest connectivities and those with the highest population figures shows that the overlap between both categories is smaller for two-point scale connectivities than for those calculated for the other scoring scales, while overlaps are similar in number of cities for the latter three. This indicates that the simple two-point scale coding method is inherently less suitable for quantification of the firm data than the more detailed scoring systems. Since the nine-point scale business value matrix retains most of the original information contained in the data, I have decided to use the connectivities calculated on the basis of this matrix in what follows. Since small connectivities are not necessarily robust (see previous chapter), I have only included cities with connectivities of at least one-fifth of the average of the top three connectivities (i.e. the cities enumerated in table 4.1 above). Connectivity ranks of cities below this threshold vary increasingly depending on the scoring scale used, and as such become less reliable.

Geographically, connectivities and population data have only been compared for cities located in western Christian Europe (except for the Hanseatic cities of the Baltic States (and Kaliningrad) since no population data were available for these cities)[129]. Although merchants

[128] I would like to thank Maarten Bosker for providing me with a digital version of the population data for European cities, 1300-1600. For the improvements made on the database of Bairoch *et al*. (1988), see Bosker *et al*., 2008, 6-7. Especially for cities with populations of 60,000 inhabitants or more at some point between 800 and 1800 more recent literature has been consulted, and where necessary revisions were made.

[129] As already mentioned in the first chapter, I have geographically defined western Christian Europe as consisting of the territories of the present-day countries of Scandinavia (including Finland and Denmark), the

from beyond this region were not entirely inactive in the Latin Christian world[130], western Christian (and western and central European Jewish) businessmen – the agents included in the business value matrix – produced the great majority of the commercial and financial flows departing from and arriving in the cities in this area. This was definitely not the case for other cities, such as those in the eastern and southern Mediterranean or in Russia. For the latter cities the connectivities calculated on the basis of a matrix only incorporating western Christian agents are not a good approximation of their overall city-ness, and consequently they have been excluded from the analysis. Moreover, in his study of European urbanisation between 1500 and 1800, Jan De Vries (1984, 19) likewise has limited his analysis to Latin Christian Europe, arguing that the cities of Russia, Orthodox Europe and the Ottoman Empire possessed very distinctive characteristics from those of western and central Europe (see also Bosker *et al*., 2008).

The 14th-century nine-point scale business value matrix contains a total of 32 cities with connectivities above the cut-off point of one-fifth of the average connectivity of the top three cities (see table 4.1). Of these, four were located beyond western Christian Europe (Tunis, Constantinople, Rhodes and Famagusta), which indicates that connections with the Byzantine and Muslim parts of the Mediterranean were clearly important. However, the absence of Alexandria (and perhaps also of cities as Candia, Beirut and Tripoli, as well as Black Sea centres such as Tana, Trebizond or Caffa) shows that the lack of Venetian, Genoese and southern French firms and the strong underrepresentation of Catalan enterprises distorts connectivities of these centres in the eastern Mediterranean, Black Sea and Barbary[131].

The database of Bosker *et al*. (2008) contains in total 119 cities with 10,000 inhabitants or more in 1400. Only 21 of these reached the threshold connectivity. Seven of the 28 Latin Christian cities in table 4.1 on the other hand had populations below 10,000 inhabitants in 1400: Barletta, Perugia, Palma de Mallorca, Nice, Ancona, Cagliari, and Toruń. The high connectivities of a number of these relatively small cities can be attributed to biases

British Isles, the Low Countries, France, the Iberian peninsula, Italy, central Europe (Germany, Poland, Czech Republic, Slovakia, Switzerland, Austria, Slovenia and Hungary), and the Baltic states, but without the Balkans.

[130] Greek businessmen could be found in Venice, Sevilla and Antwerp in the 16th century for instance (Goris, 1925, 70; Kellenbenz & Walter, 2001, 63-64; Lane, 1973, 300; Pike, 1966, 30). Another example are Armenian merchants, who in the 16th century traded from their home base along the Aras river with Armenian communities spread all over the Ottoman empire, but also in Amsterdam, Livorno, and Venice in western Europe, Ukraine, Moldavia, the Crimea, and Persia (Mauro, 1990, 270-271).

[131] One might also have expected Novgorod to appear in table 4.1. The fact that this Hanse Kontor is not mentioned in the table may be a result of the underrepresentation of Hanseatic firms in the 14th-century business value matrix.

in the firm sample. This is perhaps the case for Ancona and Perugia in the Papal State, and for Barletta in the Kingdom of Naples, two regions in which the Florentines were particularly active (although Ancona and Barletta had substantial port functions). Palma, Nice and Cagliari on the other hand were strategic harbours in the western Mediterranean, while Toruń was strongly involved in Hanseatic trade during the 14th century.

For the remaining 21 cities with 14th-century connectivities above the cut-off point and with 10,000 or more inhabitants in 1400, a standard least squares regression analysis has been carried out in order to establish the relationship between connectivities and urban population[132]. The fact that cities with populations below 10,000 inhabitants are not included in the regression analysis results in the analysis being carried out on a closed number system however, producing a tendency for large cities to have big positive residuals for instance. Since no population data exist for small cities, there is not really a way to get around this problem. Consequently, the results of this regression analysis should be interpreted with care.

Standard least squares regression analysis produced the following equation:

$$P_{1400} = 0.01\ C + 9.90 + r$$

with P_{1400} the urban population in 1400 (expressed in 1,000 inhabitants), C the 14th-century connectivity of a city (computed for the nine-point scale business value matrix), and r the residual or error term. The coefficient of determination R^2 – which gives the strength of this relationship – amounts to 0.21. This low coefficient of determination indicates that the relationship between connectivities and urban populations is not very strong, with connectivities only accounting for just above one-fifth of the variability in population figures across cities. This relationship might have been stronger for connectivities based on a more representative firm sample and/or for more reliable population data. Another factor that might have had an impact on this low value of R^2 is that only cities with relatively high connectivities have been included in the analysis. As has been argued above, these cities did form a more or less horizontally structured network rather than a hierarchy, and consequently differences in connectivity between these cities are not very significant. Nevertheless, some hierarchical tendencies can be observed. As a result, the gradient of the regression line is positive (+0.01)[133], which means that higher connectivities – as expected – produce on the average higher population figures[134].

[132] For a discussion of standard least squares regression analysis, I refer to chapter two.

[133] The very low value of the gradient does not have any significance since the scales used for measuring connectivities and population numbers are different.

[134] The inclusion of cities with lower – and less robust – connectivities would probably have yielded a more explicit relationship. I have carried out such an analysis for the 14th-century matrix, incorporating all cities with

Despite the rather weak relationship between connectivities and population figures coming out of this regression analysis, an investigation of the residuals allows to draw some interesting conclusions (see table 4.8). A positive residual indicates that the population size of a city is larger than expected from its connectivity, while the opposite applies to negative residuals. Strong positive residuals can be found for Paris and Milan, both important capital cities. Capital cities did not only attract a large number of merchants and bankers (see above), but also many servants, administrators, noblemen, artists, craftsmen, etc., residing at or working for the court (Spufford, 2002, 60-139). As a result the population figures of capital cities are typically higher than expected from their connectivities (Taylor *et al*., 2010a). The positive residual of Milan can also partly be attributed to a bias in the data, notably to the absence of Milanese merchants from the firm sample.

Table 4.8
Standardised residuals in a linear regression analysis between connectivity and population size (14th century)*

Positive residuals		**Negative residuals**	
City	**Residual**	**City**	**Residual**
Paris	3.55	Bruges	-1.22
Milan	1.41	Avignon	-1.05

* Analysis carried out for 21 cities with connectivities above 0.18 (nine-point scale) and population figures of 10,000 inhabitants or more (population data from Bosker *et al*., 2008, based upon Bairoch *et al*., 1988). Only standardised residuals above 1 and below -1 have been given.

Since Avignon was – just like Paris and Milan – a major capital and court city during the 14th century, the negative residual found for Avignon might be somewhat unexpected, but it can be attributed to the strong overrepresentation of Florentine and Lucchese firms involved in papal banking with the court at Avignon. The more interesting case of Bruges is explained by the fact that it was the principal commercial and financial gateway of the Low Countries and of north-western Europe in general (see also below).

Of the 21 cities included in the above regression analysis, 19 had population figures of 20,000 inhabitants or more, while only two cities had populations between 10,000 and 20,000 inhabitants (another group of seven cities had less than 10,000 inhabitants, see above). In order to detect further biases in the data as well additional factors playing a role in urban demographic development, let us have a look at those cities which had 20,000 inhabitants or

connectivities amounting to at least one-tenth (instead of one-fifth) of the average of the top three connectivities. The results of this regression analysis were more outspoken indeed, but because of the lack of robustness of these lower connectivities I have not reported this analysis here.

more, but with connectivities below the cut-off point of one-fifth of the average connectivity of the top three cities in the 14th-century sample. Since not many cities with population figures below 20,000 inhabitants reached this connectivity threshold, the 20,000 inhabitants cut-off point seems suitable.

The population dataset of Bosker *et al*. (2008) contains 60 western and central European cities with populations estimated at 20,000 inhabitants or more in 1400. Of these, ten (17 %) are entirely absent from the 14th-century business value matrix (table 4.9, upper part). These were large cities in which, for one reason or another, no single firm of the 14th-century sample was represented. All of these cities were located on the Iberian peninsula (two in Castile, and two in the kingdom of Granada; none in Catalonia however), France (four cities) or Germany (two cities, one of which was a member of the Hanse). Cities from the core areas of the 14th-century western European world-economy (north-central Italy and the Low Countries) on the other hand are entirely absent from the table. This can largely be explained as a bias in the 14th-century firm sample. Lack or underrepresentation of Genoese, Castilian and Catalan firms accounts for the absence of several of the Iberian cities (e.g. Almería), including those of the Muslim kingdom of Granada which had regular commercial ties with Christian Europe. The harbours located along the French west coast (e.g. Rouen, Bordeaux) were actively involved in commerce and moreover attracted some Spanish, English and Italian merchants. Bremen finally was strongly engaged in Hanseatic commerce during the 14th century.

However, Italian international trade and banking activities in north-western Europe were largely concentrated in cities such as Bruges, Paris and London in the 14th century, and from there Italian imports were carried by merchants operating on a regional scale to centres in the German Empire, northern France and England (Spufford, 2002, 136). Consequently, several cities mentioned in table 4.9 were not directly linked to the international trade network, but only indirectly via a gateway. Merchants of Metz for instance traded chiefly through the gateways in the Low Countries, Cologne and Paris (Schneider, 1951, 9-50). Specifically for French cities, the impact of the Hundred Years' War partly explains the absence of international merchants and financiers from so many of them.

The second part of table 4.9 contains cities with at least 20,000 inhabitants in 1400 in which one or more firms of the 14th-century sample were represented, but only weakly, since their connectivities fall below the threshold of 20 % of the average connectivity of the top three cities. This category consists of 31 cities (52 % of the total number of cities with population figures of 20,000 inhabitants or more in 1400). Among this group of cities, again

several Iberian (3 in Castile, 2 in the kingdom of Aragón, 1 in Portugal, 1 in the kingdom of Granada), French (2 cities) and Hanse (5 cities) centres can be found. For these, analogous explanations can be given as for the cities missing from the business value matrix above.

Table 4.9
Cities with 20,000 or more inhabitants in 1400 with weak 14th-century connectivities*

City	Population 1400**	Region
Cities not mentioned at all in the 14th-century business value matrix:		
Granada	100,000	Kingdom of Granada
Córdoba	40,000	Crown of Castile
Rouen	35,000	France
Bordeaux	30,000	France (under English control)
Orléans	30,000	France
Almería	25,000	Kingdom of Granada
Angers	25,000	France (Anjou)
Metz	25,000	German Empire
Bremen	20,000	Hanse city
Valladolid	20,000	Crown of Castile
Cities mentioned in the 14th-century business value matrix, but with connectivities below one-fifth of the average of the three highest connectivities:		
Prague	95,000	Bohemia
Sevilla	70,000	Crown of Castile
Ghent	56,000	Low Countries
Lisbon	55,000	Portugal
Toledo	45,000	Crown of Castile
Cologne	40,000	Hanse city
Ferrara	40,000	Northern Italy
Málaga	40,000	Kingdom of Granada
Tournai	40,000	Low Countries
Valencia	36,000	Crown of Aragón
Cremona	35,000	Northern Italy
Verona	35,000	Northern Italy
Padua	34,000	Northern Italy
Lyon	33,000	France
Liège	30,000	Low Countries
Brescia	27,000	Northern Italy
Burgos	27,000	Crown of Castile
Brussels	26,000	Low Countries
Mantua	25,000	Northern Italy
Piacenza	25,000	Northern Italy
Erfurt	24,000	Hanse city
Valenciennes	23,000	Low Countries
Hamburg	22,000	Hanse city
Lille	22,000	Low Countries
Toulouse	21,000	France
Magdeburg	20,000	Hanse city
Pavia	20,000	Northern Italy
Speyer	20,000	German Empire
Vienna	20,000	Austria
Wrocław	20,000	Hanse city
Zaragoza	20,000	Crown of Aragón

* Connectivities calculated from the nine-point scale business value matrix.
** Population data from Bosker *et al*., 2008, based upon Bairoch *et al*., 1988.

Connectivities are probably undervalued for e.g. Sevilla, Málaga, Lisbon, and the Hanse cities Cologne, Hamburg and Wrocław (which actually had a connectivity above the threshold connectivity according to the 4- and 2-point scales, see table 4.1).

New however is the appearance in the table of several cities of the Low Countries (6 cities), northern Italy (8 cities), the kingdom of Aragón (2 cities), and central Europe (3 cities, not including the Hanse cities). For the weak connectivities of northern Italian and Aragonese cities, biases in the firm sample are largely responsible again: Catalan-Aragonese merchants are strongly underrepresented, while northern Italian firms are completely missing in the 14th-century matrix. The same applies to the central European cities, especially to Speyer (absence of merchants from the Upper Rhine region in the sample).

For the Low Countries, another explanation needs to be given. During the 14th century, the cities of the southern Low Countries were only limitedly involved in active trade, and the lack of Flemish firms in the matrix as such should not be a problem. Why then are the connectivities of so many cities of the southern Low Countries comparatively low? One reason is that rather than being commercial hubs, most of these cities were important industrial centres, especially involved in the production of woollen textiles (e.g. Ghent, Tournai, Lille, Valenciennes, Brussels; Liège on the other hand was a centre of metal production and coal mining). The woollens, produced for an international market, were mostly marketed via Bruges, the commercial gateway of the southern Low Countries (Abu-Lughod, 1989, 78-101; Lambert *et al*., 2008; Prevenier & Blockmans, 1986, 79-81, 84-85, 88-91; Stabel, 1997, 137-158; Id., 2008). This partly explains why the connectivity of Bruges was so high in comparison to its population figure (see residuals analysis above): in fact the connectivities for the southern Low Countries as a whole were centred in Bruges. Consequently, this area can be characterised as a polycentric city region in which different cities fulfilled divergent but complementary functions (for the concept city region in a historical context, see Kloosterman & Lambregts, 2007).

It appears that the connectivities of cities specialised in production rather than commerce or finance are often lower than expected on the basis of their population size, not only for the Low Countries but also for other regions. Several of the north Italian cities in the table for instance (e.g. Verona and Brescia) were important manufacturing centres (Belfanti, 2001; Lanaro, 2006, 23-25; Spufford, 2002, 14, 228-232). Not surprisingly, table 4.9 also incorporates several court cities, not only royal or princely capitals such as Granada, Prague, Lisbon, Verona (ruled by the Della Scala), Ghent (counts of Flanders), Brussels (dukes of Brabant), Valenciennes (counts of Hainaut and Holland) or Vienna (dukes of Austria)

(Spufford, 2002, 66-67), but also centres containing the courts of lesser noblemen or clergymen, such as the seats of important bishoprics (Tournai,…). As has been stressed above, capital cities tend to have a larger population than could be expected from their connectivities. One can conclude that capital cities were important points of attraction for merchants thanks to their consumption power, but that this consumption power was partly a result of their typically large population size (mostly caused by other factors than city-ness). As such their connectivities are on average smaller than those of more specialised commercial centres of similar size.

The cities found in the second part of table 4.9 are not the only nodes with connectivities below the threshold value of 0.18 that are contained in the 14th-century business value matrix. In totality, the matrix encloses 528 of such cities (out of a total of 560 cities in the matrix). Most of these had populations below 20,000 inhabitants, and this indicates that the activities of 14th-century businessmen were not limited to large cities, but also encompassed smaller cities and towns and even rural settlements.

Finally, a remark about continental European cities. In figure 4.1 continental European cities were almost entirely absent, from which the conclusion has been drawn that the 14th-century network was very much centred on maritime trade. Since table 4.9 does only contain a small number of central European cities (Metz, Prague, Cologne, Erfurt, Magdeburg, Speyer, Vienna and Wrocław) we can conclude that the above observation will still hold when biases are being eliminated.

One can conclude that there existed some relationship between connectivity and urban population in the 14th century, but that the overlap was far from perfect. Biases in the connectivity data (and probably also in the population figures) are responsible for a good deal of these divergences from the model. More interestingly, it appears that consumption centres such as capitals and other court cities can be considered as ‘overpopulated’ in terms of connectivity, and the same applies to industrial centres not exporting their products themselves. This was especially the case when such consumption and production centres imported their foodstuffs and luxuries or marketed their manufactures through a gateway. These gateways – harbours for instance – on the other hand were often ‘overserviced’ by businessmen in comparison to their population figures. Different cities played different roles in the network, and there was some functional specialisation between administrative centres, manufacturing centres, commercial centres, etc. In a number of cases, such as Flanders, this resulted in the development of polycentric city regions, in which different cities fulfilled complementary functions.

Final conclusion

The research carried out in this dissertation can be described as an investigation of the spatial strategies of 130 transnationally operating late medieval and 16th-century western and central European trading and merchant-banking organisations, in order to reconstruct the configuration, structure and dynamics in the European city network between A.D. 1300 and 1600. To this end an interlocking network model has been used, which originally was specifically designed for the study of the contemporary world city network produced by the office networks of business service firms. The application of this model to a historical case study obviously has involved a number of methodological challenges.

To sum up, the principal methodological difficulties were related to (1) the representativity of the selected firm sample, (2) the quality and reliability of the source material used to reconstruct the business networks of the firms included in the sample, and (3) the quantification of these multifarious business networks.

Up to a large measure, the problem of representativity can be attributed to the strong dependency on the availability of data for the selection of firms. Data of sufficient quality for the reconstruction of the business network of a firm have only been preserved for a small number of enterprises. Hereby strong inequalities exist between different categories of firms in the chances for sources to have been produced or preserved. The data situation favours large, stable, formally organised and often hierarchically structured firms – which were typically to be found in the inland cities of Europe – to small, flexible and informal network-like enterprises associated with the maritime centres of the Mediterranean, Atlantic, North Sea and Baltic. Although the latter organisations individually did only account for a very small share of overall European trade and banking, as a collectivity they controlled several important connections within the network. As a result, several biases can be observed in the firm sample put together. Nevertheless, in so far as possible a varied sample has been compiled consisting of firms with different geographical origins, not only from the core zones of the European world-economy, but also from a number of more peripheral areas in order to give a not too one-sided account of the network.

A second difficulty related to the application of the interlocking network model to a historical case study is caused by the use of historical sources, with the associated problems of reliability, fragmentary preservation, etc. In order to somewhat retain the extensive character of data collection of the interlocking network model, only secondary historical literature has

been consulted. This means that the information used for reconstructing the business networks of the firms in the sample has already been filtered and manipulated at two different levels – of source production and preservation and of interpretation by historical scholarship – at the moment it is being collected.

Manipulation of the information does not end here, but is carried on in the process of quantification of the firm networks for the production of firm-city matrices. Problems related to the lack of intersubjectivity and to the difficulty of streamlining multifarious information into simple quantitative business values comparable across firms, have been met by the production of a relatively large firm sample (in which possible errors of scoring are being evened out) and by the use of four different scoring methods of different complexity. The utilisation of different scoring systems has the additional advantage that it allows to check for the impact of a particular scoring method on the outcomes of calculations (of total business values, connectivities, etc.) to which the (ordinal) data were subjected. These impacts appear to have been not always negligible.

Despite all these methodological difficulties, the analyses carried out on the produced firm-city matrices generally returned plausible outcomes which confirm the results of existing historical research on related topics. This provides an indirect indication for the credibility of the produced data matrices.

The principal strength of the interlocking network model is the connection it allows to make between a subnodal level of agents producing the network, a nodal level of cities, and the overarching level of the network itself, avoiding a reification of cities and structures.

The agents producing the particular city network under investigation are long-distance commercial and banking firms from Latin Christian Europe. The organisation of these enterprises was strongly influenced by the commercial revolution of the 13th century, during which transnationally operating businessmen became increasingly sedentary, making use of representatives to carry out business transactions abroad (although travel remained important). The at first sight paradoxical effect of this sedentarisation process was a higher efficiency in the organisation of commerce and banking. An interesting parallel can be drawn between the 13th-century commercial revolution – which was partly provoked by a road revolution – and the reorientation towards a global scale of operation of business service firms, stimulated by an ICT-revolution during contemporary globalisation (although one should guard against anachronistic comparisons here). While the commercial revolution constitutes the starting point of our analysis, the arrival of joint-stock companies at the end of the 16th century,

inaugurating a new revolution in the organisation of business enterprise, represents the end point.

International merchants and bankers can be considered to have been crucial for urban development in medieval and early modern Europe. They were the principal motors behind city-ness, a process linking cities across long distances in cooperative networks, through the production of flows of people, merchandise, capital, and information (contained in business letters). Other elements such as innovations, but also the plague for instance, were often spread along with these commercial flows. At the same time however, these agents were producers of town-ness: they invested in local industries, in real estate in their home town and the surrounding countryside, etc. Often investments in town-ness were more secure but less profitable than investments in long-distance trade and banking (including government finance), which can be related to the more static character of town-ness compared to the dynamism and flexibility of city-ness. From the point of view of the agents the distinction between town-ness and city-ness is somewhat artificial, which is witnessed by the fact that firm networks not only included cities which were linked to the firm headquarters via a long-distance network, but also places in the hinterland of the headquarter city of the firm (as has been illustrated for the subnetwork of Venetian firms).

Moreover, town-ness and city-ness appear to mutually influence each other. On the one hand, central places are characterised by a population concentration (concentration of consumers and retailers) and by the existence of markets to which goods produced in the hinterland of the central place converge. As a result, central places offer favourable opportunities for wholesale merchants as supply or sales markets. In other words, town-ness generates/attracts city-ness. On the other hand, city-ness also generates town-ness. Many central functions are created by the presence of long-distance merchants and bankers for example. City-ness not only produces markets attracting consumers from a hinterland, but also promotes the development of an entire commercial, financial and transport infrastructure (banks, bourses, money- and insurance markets,…). Moreover, cities with strong transnational connections tend to develop into centres of information exchange. These infrastructures not only facilitate the working of the network, but also provide central functions for the hinterland.

The spatial business strategies of the agents producing the interlocking network have been investigated via principal components analysis, which has proven to be a suitable statistical technique for exploring historical data thanks to its fuzziness and flexibility. Principal components analysis has demonstrated that late medieval and 16th-century European

transnational business enterprises did not all develop one and the same spatial strategy, nor that their strategies had an entirely individual character in which no common patterns could be observed. Instead, a limited number of distinct spatial strategies can be determined which were shared between different firms with a same geographical background. Rather than a single network multiple overlapping networks existed, just as in the present-day world city network in which multiple globalisations coexist.

These different strategies surface most clearly in the twelve-component solution of the principal components analysis, in which two components grouping Tuscan firms (respectively from the 14th and 15th century and from the 16th century), and one component each for firms from southern Germany, the Low Countries, Castile, England, Genoa, the German Hanse, Venice, France and Catalonia can be identified, as well as a weaker component to which Dutch firms (which also belong to the more general Low Countries component) are clustered. Portuguese business organisations did not form their own component, and instead they loaded more or less equally on the 16th-century Tuscan and Low Countries components. Very similar patterns emerge again and again in various solutions of the exploratory principal components analysis, demonstrating the robustness of this result. Since the majority of these components straddled two or even three centuries, it appears that the spatial strategies of most of these trading nations did not change significantly between 1300 and 1600 (with the exception of the Tuscan and Genoese nations). In addition to this primary structure in the data, a number of secondary structures has been detected, including separate components for Hamburg firms, Lyon firms, etc.

Several explanations can be given for this striking phenomenon of trading nations with their own particular networks. On the one hand, institutional factors such as the organisation of foreign merchants with a common ‘nationality’ (including factors such as shared language, customs, or cultural background) in separate merchant guilds, or the role of the state definitely did play a role. On the other hand geographical factors can be invoked, such as common incentives for merchants from the same city to search for complementary markets (e.g. supply markets for raw materials or outlets for manufactures of the local industries of the home city, such as the Florentine or Swabian textile industries for instance), or to operate as intermediaries in the trade between neighbouring regions (e.g. Italians becoming middlemen in the trade between the Levant and western Europe). Finally war, religious persecution, exile, etc. created diaspora communities which often became strongly involved in international trade or banking.

In the 16th century however, distinctions between the spatial strategies of different nations (especially those from southern Europe) appear to have become smaller, indicating a proceeding integration within the European network. The principal incentive was a shift of the centre of gravity of the European city network from the Mediterranean to the Atlantic, forcing southern European firms in general to transfer parts of their activities to the latter region. The beginning decline of the role of merchant guilds in the major commercial centres of western Europe in the 16th century can be related to this as well.

The spatial strategies of the different trading nations have been analysed through the computation of factor scores identifying articulating and primary field cities, as well as through the calculation of connectivities or total business values. Moreover, the firm-specific data were confronted with more general information on the networks of the different merchant nations. Indeed, the one-sided focus of the interlocking network model on a single type of information (business networks of individual firms) is hard to reconcile with the need for combining as many different types of complementary information which is characteristic for historical research.

Although case- and context-specific factors played an important role (see for these the discussions of the individual nations in chapter two), several analogies can be drawn between evolutions in the spatial strategies of different merchant nations. A striking chronological sequence can be observed for instance in the rise, reorientation or degeneration of the networks of various nations. This sequence may have been set in motion by a number of developments which took place beyond Europe, and which resulted into a decline of the trade routes between the eastern Mediterranean and the East via central Asia and via the Persian Gulf around the middle of the 14th century, only leaving the route through the Red Sea and Egypt intact. As a consequence of this, during the late 14th and 15th century the western link in the trade between Europe and Asia became increasingly monopolised by the Venetians, who were the privileged European trading nation in Alexandria, causing the decline of Catalan trade and forcing the Genoese to reorient their trading network towards western Europe (Abu-Lughod, 1989, 359-360). This restructuring took place during the phase of financial expansion of the European world-economy between ca. 1350 and ca. 1450, and led to the first systemic cycle of accumulation (ca. 1450 – ca. 1640) dominated by Genoese capitalism, which – thanks to its westward turn – strongly contributed to and profited from the expansion of the Atlantic economies (Arrighi, 1994, 85-88).

The material expansion in the European world-economy during the first phase of this systemic cycle of accumulation (ca. 1450 – ca. 1560) allowed several Atlantic trading nations

– Castilians, Portuguese, and (somewhat later) Flemish – to enter the stage, while southern German finance, with its strong connections to Antwerp, rose to power as well in this period. Although the final decline of the Florentine and Venetian nations should be situated after 1600, the networks of these Mediterranean nations probably began contracting already in the early 16th century as a result of competition from the new Atlantic arrivals. At this time also Hanseatic commerce was in crisis, although a revival took place during the second half of the century. This Hanseatic revival as well was characterised by a shift towards the Atlantic, with Lübeck being overtaken by Hamburg with its strong Iberian connections. In the end, especially the latecomers on the European commercial and financial stage – the Dutch and the English (extending their networks during the second phase of the Genoese systemic cycle, ca. 1560 – ca. 1640) – profited from this shift to become the new economic powers after 1600 as the key players in respectively the second and third systemic cycles of accumulation observed by Arrighi (1994, 6-7).

The structure and dynamics in the European city network as a whole have been investigated principally through the interpretation of overall connectivities calculated separately for each of the three centuries between 1300 and 1600. The use of such overall connectivities entails a serious risk due to the important biases in the century-specific firm samples. Nevertheless, outcomes of this connectivity analysis are largely in accordance with other research on the structure of the European trade network in this period, for which this study offers convincing empirical support.

A first observation is that very many places were – in one way or another – connected to this network, as is witnessed by the large number of locations included in each of the century-specific business value matrices (respectively 595, 766 and 709 places for the 14th, 15th and 16th centuries). Among these not only large cities can be found, but also small towns and even rural areas producing for an international market (e.g. the English wool region). Most of these places were weakly linked to the network, appearing in no more than one or two firm networks, while there was a tendency towards concentration of wholesale traders and transnational bankers in a number of more important centres (the century-specific business value matrices respectively contain 66, 110 and 201 places belonging to the networks of more than two firms).

These tendencies towards concentration can be related to agglomeration effects. International trade and banking could often more efficiently and more cheaply be conducted in large staple markets or transport hubs. Moreover, in important market places such as the

Rialto in Venice or the bourses arising in several European cities there was a strong convergence of information coming from all parts of the world. In analogy to the present-day world cities, medieval and 16th-century 'world cities' can be considered to have been production centres of information. That information was crucial for the management of late medieval and early modern business enterprises is witnessed by the size of some of the preserved business correspondences (e.g. of Francesco Datini).

However, from these large centres merchants or their factors regularly travelled to a variety of regional or even local markets, periodic fairs, production regions, harbours, etc. This *ad hoc* character of many of the nodes, and the fact that merchants were highly mobile and not bound to a particular place, produced a great deal of dynamism and flexibility in the network. Not much attention has been paid to the lower levels of the network in this holistic study of the European city network however. Regional case studies (for instance of particular city regions) could meet this objection.

These different nodes – large and small – had often very different functions and were used complementarily by merchants. Antwerp and Bruges for instance, rather than being competitors in a struggle in which Bruges had the upper hand until it was 'defeated' by Antwerp around 1500, were complementary markets, and although most merchants were permanently established in Bruges up to the end of the 15th century, they regularly travelled to the fairs of Antwerp. As a result Bruges and Antwerp simultaneously featured among the major nodes in the European city network in the 15th and 16th centuries.

An in depth study of the major nodes in the network (those with connectivities amounting to at least one-fifth of the average of the top three connectivities) has confirmed this impression of a rather horizontally structured network: connectivity rankings of cities rose or sank according to the scoring system used, indicating that rather than strong hierarchies, more or less horizontal levels existed in the network (this was also the case for the nation subnetworks). Three of these levels have been discerned, consisting of cities which I have named alpha, beta and gamma cities. Since boundaries between these levels were much more robust than those within the levels, some hierarchical tendencies can be observed in the network.

The basic spatial structure of the European city network more or less corresponded to Christaller's traffic principle. The major nodes in the network were lined along a number of commercial arteries (often rivers) running across the continent, such as the Rhine and the Rhône, or the different roads leaving from southern Germany in various directions (e.g. Venice – Augsburg – Nürnberg, Nürnberg – Leipzig – Wrocław, Nürnberg – Frankfurt –

Cologne – Antwerp,…). Maritime trade routes as well consisted of chains of harbours connecting the extremities.

The major dynamics in the network have been described by Braudel (1984) as a succession of dominant capitalist centres at the heart of the European world-economy: Venice – Antwerp – Genoa – Amsterdam – London. Although Venice and Antwerp indeed appear as the best connected cities respectively of the 15th and 16th century, this was not the case for Genoa. Although Genoese bankers played a dominant role in the 16th-century network, Genoa as a city was only one of several nodes (and perhaps not the most important one) in the vast network of the Genoese diaspora community, members of which were to be found in all commercial and financial centres of Europe, including Sevilla, the Spanish royal court, Antwerp, the fairs of Piacenza,… A more fundamental critique however is the fact that Braudel's simple succession of capitalist centres only offers a very reductive view on a much more complicated and moreover horizontally rather than hierarchically structured network. The description in hierarchical town-ness terms of a network that was in fact more organised according to principles of complementarity and cooperation almost by definition results in a distorted picture.

A model that much better fits the actual dynamics in the network, developed by Herman van der Wee (1963), describes a cyclical alternation between emphasis on continental trade and maritime trade within the network. After the economic boom of the 12th and 13th centuries during which a thriving continental trade was conducted in various fairs, including those of Champagne, crisis set in during the 14th century, which was related to an increasing uncertainty of overland roads. As a result, a shift towards maritime trade occurred, which was centred on the Mediterranean in the south and the Baltic in the north, both of which networks were linked by sea via Bruges. In the 15th century the centre of gravity in the network returned to the continent, where a revival of fairs was experienced basically everywhere, but particularly along the principal trade routes. Although continental trade held its own during the 16th century (especially in the first half of the century), a shift towards maritime trade took place again, this time not centred anymore in the Mediterranean and the Baltic, but in the Atlantic. This trend was further emphasised during the 17th century, when the concentration of international trade in a small number of maritime centres, especially Amsterdam and London, coincided with a new economic downturn on the European continent.

The two-component solution of the above mentioned principal components analysis allowed to distinguish between two partly overlapping subnetworks: a stable Mediterranean

subnetwork existing from the 14th to the 16th century (which had links with north-western Europe via cities as Geneva and Bruges), and a rising 16th-century Atlantic-German subnetwork. Rise and decline of individual cities within these subnetworks often occurred in waves: cities appear to have risen or declined as a network, not as individual cities. Examples are the upswing ca. 1400 of a network of continental fair cities and other centres along the principal overland trade routes, the ascent ca. 1500 of several Atlantic and North Sea harbours, or the relative decline of a part of the Mediterranean subnetwork more or less at the same time (affecting cities as Barcelona, Bruges, Geneva, Avignon, Florence,…).

Both subnetworks were much larger than just the core zones to which they are often reduced. The Mediterranean subnetwork for instance consisted of more than just Venice or even north-central Italy. Instead the whole of the north-western Mediterranean appears to have been a very dynamic and strongly integrated zone. Idem for the Atlantic subnetwork, which included not only Antwerp or the Low Countries. Basically the whole European west coast from Cádiz to Hamburg saw the emergence of dynamic cities around 1500. The obvious conclusion is that networks imply many cities, not just one or two.

Cities that had strong affinities with both subnetworks, notably Milan, Venice, Genoa, Lyon, Antwerp, London, Sevilla, Medina del Campo and Valladolid had a particularly important function as hinge cities. This role of connector between the two subnetworks was not only taken up by physical nodes which featured as contact points, but also by firms operating simultaneously in both subnetworks (these were the hybrid firms of the principal components analysis). In the 16th century, especially Genoese firms appear to have been the principal intermediaries between the Mediterranean and the Atlantic.

Finally, a confrontation of connectivities with urban population figures (only carried out for the 14th century) not only has allowed to detect a number of biases, but also to investigate the relationship between city-ness and urban demographic development. This relationship was far from perfect. Cities which can be described as ‘overconnected’ (in comparison to their population figures) were often commercial or financial gateways, such as harbours, fair cities, etc. Typical ‘overpopulated’ cities on the other hand were capitals and other court cities, which despite their particular attraction to businessmen as centres of consumption had a relatively low connectivity in comparison to their often very large population sizes. In some regions specialisation between different cities occurred whereby some assumed the role of gateway, while others specialised in industrial production, administration, etc. In the Low Countries for instance this resulted in the development of a

polycentric city region, in which the gateway Bruges was much better connected than the production centres marketing their textiles through the gateway.

Not all possibilities offered by the interlocking network model have been exhausted in this dissertation yet, and a number of additional analyses could be interesting options for further research. Firstly the connectivity versus population exercise carried out for the 14th century could be repeated for the 15th and 16th centuries. Moreover, results could be improved by adding a number of extra firms to the sample in order to eliminate some of the biases which have become visible during the writing up of this project, although in most cases improvements will be hampered by a lack of data. Other suggestions for further research are a Q-mode principal components analysis – carried out on the objects (cities) instead of the variables (firms) – on the business value matrix, looking for regional tendencies in the network for instance, or an investigation of power relations within the network, allowing to distinguish between control and command cities (with strong concentrations of headquarters) on the one hand, and gateway cities (so-called places to be) on the other hand (for these two analyses, see Taylor, 2004, 87-93, 149-175).

Connectivities could be used for carrying out a number of regional analyses, in which lower levels in the network can be studied in more detail. Interesting case-studies would be city regions (polycentric as well as monocentric, for instance in the case of commercial centres and their outports). A much more challenging project would be to trace the evolution between this late medieval and 16th-century network and the present-day European city network. Many of the cities playing a prominent role in this study still nowadays are important world cities, indicating a certain tenacity in urban patterns.

By way of conclusion it can be stated that this application of the interlocking network model to a historical case study – despite a number of methodological difficulties in implementing the model – has yielded several original insights, the most important of which is perhaps that dynamically functioning and preponderantly horizontally structured transnational city networks are not limited to our contemporary globalised world, but can also be found in historical societies.

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Appendix I

Example of a data fiche: The Botti, ca. 1550 – 1568

Botti, ca. 1550 – 1568

The Botti came originally from Cremona, from where they were exiled in the early 15th century. Subsequently, the family established itself in Florence where the Botti became active in commerce. At the end of the 15th and the beginning of the 16th century, Simone di Matteo Botti was a partner in the Capponi company in Pisa. Further, nothing is known about the business of the Botti until the middle of the 16th century, when the sons of Simone Botti, Francesco (d. 1558), Matteo (d. 1565), Simone (d. 1566), Jacopo (d. before 1563) and Giovambattista (d. 1568) were active in the main commercial and financial centres of western Europe. At the same time, the Botti were partners in several companies of the Affaitadi, Capponi, Guadagni and Rinuccini. It is during this period (ca. 1550-1568) that the Botti family reached its apogee. After the death of Giovambattista Botti, the last of the sons of Simone, in 1568, no traces can be found anymore of the Botti in the world of commerce. Matteo di Giovambattista, the only heir of the sons of Simone di Matteo, was still a child when he inherited the commercial and banking interests of his father and uncles, and when he finally became old enough, he never turned to business but instead adopted an aristocratic lifestyle (Point-Waquet, 1978, 690-692, 694-697, 713).

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Source material:

No private archives of the Botti have been preserved. As a result, the business of the Botti is known only indirectly. Nevertheless, the history of this family can be reconstructed via notarial records and governmental and juridical archives (Point-Waquet, 1978, 690-691).

Size: Large

The Botti disposed of large amounts of capital, but the volume of the capitals invested by the Botti can not be reconstructed from the notarial sources (Point-Waquet, 1978, 691, 693).

Main activities:

- Commerce: The Botti were involved in trade in a large variety of merchandise. In Sevilla, they were engaged in the slave trade with the New World (Kellenbenz & Walter, 2001, 26; Point-Waquet, 1978, 692).
- Finance: The Botti were involved in banking. They traded in bills of exchange and provided loans, and they were among the guarantors of the dowry of Lucretia de' Medici, daughter of the grand duke of Tuscany. The Botti also invested in real estate in and near Florence (Point-Waquet, 1978, 692-695).
- Industry: The Botti invested *in accomandita* in a wool company and a *battiloro* company in Florence (Point-Waquet, 1978, 693).
- Shipping: The Botti appear to have been engaged in shipping and shipowning (Point-Waquet, 1978, 692-693).

Network of the Botti:

The sons of Simone Botti were in person or through their capital present in the main financial and commercial centres of western Europe around the middle of the 16th century. While Matteo and Simone were established more or less permanently in Florence, Francesco, Jacopo and Giovambattista travelled regularly between Spain, Antwerp and Italy. Not much is known however about the organisation of the business of the Botti, and about the relations between their different business establishments (Point-Waquet, 1978, 691, 693-694).

Table A.1.1. Network of the Botti, ca. 1550 – 1568

City	R	Score				Period	Type of presence	References
Florence		8	4	3	1	>1548-1568	Matteo and Simone Botti appear to have been established more or less permanently in Florence or Italy. As a result, Florence constituted a stable node in the business network of the Botti. In Florence, the Botti were involved in banking and manufacturing. Simone di Simone Botti invested *in accomandita* in a wool company of Vincenzo Manovelli in Florence in 1559, and in a *battiloro* company with Luigi Mormorai in 1561. Manovelli and Mormorai both were nephews of the Botti brothers. At Simone's death in 1566, his shares in these companies were taken over (and increased) by Giovambattista.	Point-Waquet, 1978, 691-694
Sevilla		6	3	2	1	>1542-1556<	Representation. Francesco, Jacopo and Giovambattista Botti travelled regularly between Spain, Antwerp and Italy. In Spain, the Botti (notably Jacopo) were especially active in Sevilla. The banking activities of Jacopo Botti in Sevilla were considerable. He was an important creditor of the bankers Iñiguez and Lizarrazas. Among his clients in 1549 were several merchants trading with the Indies, and important personalities such as Hernando Pizarro. Jacopo was constantly in contact with the Affaitadi in	Kellenbenz & Walter, 2001, 17, 26, 44, 47; Lohmann Villena, 1968, 40; Point-Waquet, 1978, 691-694

							Sevilla. The Botti exported goods from Sevilla, e.g. to Genoa and Florence.	
Bari		5	3	2	1	>1554<	Representation. In 1554, Matteo di Simone invested in an *accomanda* with "Baldassare Del Portico e Benedetto Buonaparte e compagni", active in Bari and the kingdom of Naples.	Point-Waquet, 1978, 691-692
Medina del Campo		5	3	2	1	Mid 16th c.	Representation. In Medina del Campo, Francesco Botti was a partner in the firm of "Ippolito Affaitadi, Jacomo de Bardi et compagnie".	Point-Waquet, 1978, 691, 693
Antwerp		4	2	2	1	>1556<	Representation. Francesco, Jacopo and Giovambattista Botti travelled regularly between Spain, Antwerp and Italy. In Antwerp, the Botti had contacts with the Affaitadi. In 1556, Francesco Botti advanced 6,000 ducats for a loan to the English king at the fairs of Antwerp.	Point-Waquet, 1978, 691, 693-694
Ancona		3	2	2	1	Mid 16th c.	Representation.	Point-Waquet, 1978, 691
Cádiz		3	2	2	1	>1561<	Representation. In 1561, Jacopo Botti was in Cádiz as the representative of a French company trading with Spain.	Point-Waquet, 1978, 691-692
Genoa		3	2	2	1	Mid 16th c.	Exports by the Botti from Sevilla to Genoa.	Point-Waquet, 1978, 692
Granada		3	2	2	1	Mid 16th c.	Representation.	Point-Waquet, 1978, 691
Lyon		3	2	2	1	>1565<	Representation. In 1565 Matteo di Simone Botti invested 2,000 lb. tourn. in the cloth industry of Lyon, under the name of the Guadagni, Rinuccini and Capponi. The Botti do not appear to have been established durably in Lyon however.	Point-Waquet, 1978, 691-692, 691 n. 12
Marseille		3	2	2	1	Mid 16th c.	Representation.	Point-Waquet, 1978, 691
Rome		3	2	2	1	Mid 16th c.	Representation.	Point-Waquet, 1978, 691
Valladolid		3	2	2	1	>1556-1558<	Representation. Giovambattista (from 1556-1558) and Jacopo were in contact with the Affaitadi company in Valladolid.	Point-Waquet, 1978, 691, 693
Venice		3	2	2	1	Mid 16th c.	Representation.	Point-Waquet, 1978, 691
Calais		2	2	1	0	Mid 16th c.	Jacopo Botti was in relation with the Affaitadi in Calais as merchant-shipowner during calm periods in the French-Spanish war.	Point-Waquet, 1978, 693
Santo Domingo		2	2	1	0	>1548<	In 1548, Jacopo Botti was involved in a shipment to Santo Domingo. Already in 1544, Jacopo and Giovambattista Botti advanced 175 ducats for fitting out a ship to the Americas.	Point-Waquet, 1978, 692

Pera		1	1	1	0	>1548<	Export of cochenille from Sevilla to Florence for re-export to Pera in 1548.	Point-Waquet, 1978, 692

+ Since no account books of the Botti have been preserved, and the reconstruction of their network has been based especially upon notarial records, the network is probably only very partially known.