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Bernd Wurpts

Networks into Institutions or Institutions into Networks?
Evidence from the Medieval Hansa

Bernd Wurpts

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Reading Committee:

Katherine Stovel, Chair

Steven Pfaff

Edgar Kiser

Program Authorized to Offer Degree:

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University of Washington

Abstract

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Bernd Würpts

Chair of the Supervisory Committee:
Prof. Katherine Stovel, Ph.D.
Department of Sociology

This dissertation combines three articles in historical network research. The common theme is that all chapters bring a network perspective to a famous institution in economic history, the medieval Hansa (alternately known as Hanse or Hanseatic League). My dissertation chapters show that network theory and social network analysis can make great contributions in key areas of historical sociology like institutional change. By specifying relational mechanisms and processes in combination with the analysis of primary data, network approaches offer a good alternative to institutional approaches in economics, economic history and sociology.

In the first paper, I give an overview of features and benefits of social network analysis for economic history, summarize best practice studies from historical analytical sociology, illustrate

network concepts and methods using the Hansa case, and offer a case study of one of the oldest systematic trade records from Northern Europe. The analysis of publicly registered trade partnerships in 14th century Lübeck, center of the medieval Hansa, shows a high prevalence in kinship ties among traders and potential changes in trade partner selection. Micro-level structures in the economic organization of Northern Europe show surprising similarities to the wealthier Southern European city-states.

Dealing with a coinciding time period, my second paper analyzes the emergence of the medieval Hansa after the Black Death. Using some of the oldest relational datasets from Northern Europe, including elite kinship networks and agency relations established in last wills and testaments, I apply network analyses to show how individuals responded to the most deadly plague in human history and established unprecedented amounts of ties across trade groups and political organizations. Thus, network coping after external shocks may set the stage for organizational innovation by activating preexisting relations and establishing new formalized relations. I hypothesize that institutional entrepreneurs generated a more formalized and persistent collaborative group, the Hansa, resulting from recombinations of practices from politics and the legal domain triggered by participation in overlapping small group rituals.

Jumping to the early 16th century, my third paper investigates how economic and political actors contributed to important religious institutional change, namely the early diffusion of the Protestant Reformation. Using participation data from the Hansa Diets, I find that historical embeddedness of Hansa towns likely reduced some of the uncertainty related to risky collective action and thereby contributed to the success of the early Reformation in Northern Europe. Statistical analyses show that a combination of strong and weak ties fostered complex diffusion in early modern Northern Europe. The history of social networks (e.g. past collaborations, alliances,

and the prospect of future interactions) is likely an important feature of social organization with profound implications for economic and institutional development.

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DEDICATION

To my parents

Chapter 1.

INTRODUCTON

This dissertation is a combination of three separate articles. Chapter 2 is forthcoming in an edited volume (Wurpts 2018) including possible final revisions, chapter 3 will be submitted for peer-review soon, and chapter 4 was published in early spring (Wurpts, Corcoran, and Pfaff 2018). Major links between these chapters are 1) empirically, a focus on an important historical case from economic history which I call “medieval Hansa,” and 2) theoretically, a focus on social networks and institutions. As an international audience of readers may not be familiar with the case, I start with a brief description before continuing with the scholarly motivation and a chapter overview.

1.1 INTRODUCTORY NOTES ON THE CASE

I study the medieval Hansa (Latin), Hanse (German) or Hanseatic League (English) which was a famous organization of long-distance traders and towns in Northern Europe from the 12th to 17th century. Hansa towns stretched along the coast from the Netherlands through Germany, Poland, to the Baltic States. Hansa merchants spoke the historically important Low-German language which somewhat integrated the Northern regions culturally until the Early Modern Period. Shipping of bulk and luxury goods from East to West interconnected Hansards economically. Trade regions spread as far as from England and Belgium to Norway and Russia. Visitors of Venice may also know about the great Fondaco dei Tedeschi, a centrally located trade post of German merchants on the Grand Canal. Common goods of trade ranged from necessities such as grain, fish, and salt to luxuries such as precious cloth and fur. Politically, the Hansa was held

together by its only institution often called Hansa Diets, assemblies of Hansa delegates, which marks one of the most successful institutions in history as it persisted over centuries, e.g. 1358-1669.

At the center of the Hansa was the famous commercial town Lübeck which was a maritime society similar to the perhaps better known Italian towns, Venice or Genoa (Nolan and Lenski 2015). Lübeck had considerable political autonomy and represented an example of an early Northern European city-state. After 700 years, the town lost its autonomy when Nazis merged it with Prussia in 1937. Other important Hansa towns such as Hamburg and Bremen maintained their independence as federal city-states in Germany until today. The Hansa still reverberates in the names and identities of many towns in the North Sea and Baltic regions as well as in modern product names such as Lufthansa, a prominent German airline (e.g. Hammel-Kiesow 2008a).

While the Hansa case was predominantly a case from German history, nationality was not perceived or enacted in the Middle Ages when trade was municipal. Karl Polanyi (1944/2001:66) stated, “[t]he Hanse was not German merchants; they were a corporation of trading oligarchs, hailing from a number of North Sea and Baltic towns. [...]. The trade of Antwerp or Hamburg, Venice or Lyons, was in no way Dutch or German, Italian or French. London was no exception: it was as little ‘English’ as Luebeck was ‘German.’”

1.2 SCHOLARLY MOTIVATION

My dissertation relates to a line of research associated with Georg Simmel (1908) and more recently Harrison White and his students (e.g. White, Boorman, and Breiger 1976). These scholars developed an approach that I call “social network research.” Within social network research, historically oriented studies focus on social relations as important agents of social and institutional change. Early works framed their motivation of study as an alternative to class-based explanations

in Marxism (Gould 1991, Bearman 1993). More recent works see their network studies as alternatives to functionalist explanations in economic history (Padgett and McLean 2006). The present dissertation follows somewhat in the footsteps of the latter. Chapter 2 regards social network analysis as an alternative to classical methods in economic history. Chapters 3 and 4 are specifications of functionalist explanations or vague operationalization of concepts in economic approaches to economic history, e.g. new institutional economics.

An important feature of outstanding works in social network research is that they have analyzed historical cases based on extensive relational micro-level data (e.g. Padgett and Ansell 1993). While important contributions have been made using cases from Italy, England, France, and the United States, my dissertation adds an important German case study to the literature. Perhaps even more important than the specific national context is a complete lack of important micro-level studies of pre-modern institutions from Northern Europe. Previous studies on pre-modern institutions using extensive social network datasets exclusively focus on Italian cases. This is not surprising as economic development in Europe was likely highest there at least up to the time of the early modern period. In the Italian city-states, notaries recorded large numbers of written documents far exceeding record keeping in other regions of Europe during the Middle Ages. The Hansa is the only case of a pre-modern economic institution in Northern Europe for which extensive records survived.

This dissertation attempts to fill the gap of missing micro-level studies on pre-modern economic institutions from Northern Europe, and contributes to classical themes in sociology about the origins of capitalism and the modern world (Weber 1927/1981). In particular, my dissertation follows a Weberian tradition by trying to understand development of economic and political institutions. Some parts will (in modest ways) follow Max Weber's early dissertation

work which focused on the early organization of Italian trade. Weber's final work, *General Economic History*, dedicates an entire chapter to the Hansa case in which it is described as an organization that contributed to the development of markets, e.g. by standardizing goods and trade practices, and at the same time acted as a closed institution that tried to monopolize markets.

Simmel also discussed the case, but less systematically. He pointed out that Hansa merchants were travelers and connected otherwise separate social circles. This dissertation somewhat unites Simmel's and Weber's streams of thought and uses modern social network analysis methods to determine whether networks come from institutions or vice versa. The title of this dissertation asks: Networks into Institutions or Institutions into Networks? While a finite answer to this "chicken-and-egg" problem may not be given, I explore interesting new aspects of how these may be causally linked.

In order to study causal linkages between networks and institutions, I use a case study approach and focus on concrete institutions using primary data that I collected and digitized. In some ways, my dissertation also follows a third sociologist from the early stage of the discipline, Werner Sombart (1902/1916-1924), who used the Hansa as a counter case to modern forms of capitalism and thereby stimulated debates about the qualities of pre-modern trade in terms of the magnitude of trade, trade practices, and spirit of entrepreneurs. Without the means of modern computer technologies, Sombart shows detailed analyses of empirical Hansa data to underline his argument that would greatly benefit from today's computational capabilities.

The analytical approach of this dissertation is based on social networks, concrete social relations between nodes or actors (e.g. Granovetter 1985, Wasserman and Faust 1994). Nodes and actors can be persons, groups, organizations, towns, or other units that may be categorized as individuals. Similarly, social relations can be various types of social ties such as kinship and

marriage ties, trade partnerships, connections through shared meetings, etc. (see also section 2.1). All of these relationships constituted the Hansa as an organization of multiplex ties where multiple domains such as trade, kinship, and politics were deeply intertwined (e.g. Selzer 2010). Social network analysis allows me to disentangle multiple webs of relations among Hansa elites and non-elites over time—before, during and after important moments of institutional change. This dissertation offers insights about different types of network ties in terms of their content and meaning, their duration, complexities of regulation and ways they were established and dissolved. Social contexts in which network ties are generated can also vary in terms of the speed and degree of formalization or ritualistic character.

Another reason why this dissertation uses a network perspective is that it is theoretically relevant for the study of institutional origins as formulated in the title question: Networks into Institutions or Institutions into Networks? I focus on the social networks of Hansards as these have been found to be important agents in the diffusion of innovations (e.g. Centola 2015), as key triggers in the emergence of organizations and markets (e.g. Padgett and Powell 2012), as well as drivers of large-scale economic transformation (e.g. van Dooseelaere 2009). While I defined features of social networks, I should also clarify the second major term, institution. Here, roughly two views are usually taken by scholars: 1) institutions as regularities of behavior (e.g. Greif 2006), and 2) institutions as organizations (e.g. Powell 1990). My dissertation relates to both approaches by using somewhat different cases of institutions in the following chapters.

The general case of the Hansa is difficult to categorize in sociological terms as it was neither exclusively a network of merchants, nor was it a city league or state (e.g. Spruyt 1994). Classifications of the Hansa as an informal institution (e.g. Greif 2006) ignore the fact that many Hansards were also elites in legitimate political office. Taxonomies such as generalized or

particularized institutions (e.g. Ogilvie 2011) fail to account for the fact that the Hansa was likely both dependent on time and context.

Categorizations as merchant capitalists¹ or merchant empires² are somewhat helpful as they relate the Hansa to other groups of traders like the Dutch or the English and their merchant companies (e.g. Adams 2005, Erikson 2014). These works aim to determine why merchant empires rise and fall. Pichierri (2000) has posited an answer to this question for the Hansa case by using narrative methods and long-term description. Pichierri analyzes collective identities and multifaceted affiliations in a loosely coupled organization and sees the Hanse as an organizational model for Europe.

This dissertation zooms into specific moments in the long history of the Hansa and analyzes important institutional changes within the organization (Chapter 2 and 3) as well as outside the organization (Chapter 4) that were likely shaped by social relations. Recording practices of trade partnerships studied in chapter 2 may be understood as regularities in behavior of economic actors, chapter 3 considers institutions as organizations with fixed written procedures, and chapter 4 is a mix of both as the emerging Protestant faith involved new regular behaviors as well as organizational change. In the next section, I give an overview of these chapters.

¹ According to Karl Marx, in merchant capitalism, profits are made in the sphere of circulation (van Zanden 1993:3). Van Zanden (ibidem:4) understands merchant capitalism as “the phase in the development of capitalism in which the merchant-entrepreneur dominated.” In pre-capitalist modes of production, traders made profits from exchange based on differences in prices between regions. They worked with surpluses from local production only in contrast to the merchant-entrepreneur who intervened in the production process which means profits were based on the difference between prices in purchase and sales. According to Dobb (1947/1963:17), the appearance of large-scale trading does not mark a distinctive period of merchant capitalism. As long as traders are intermediaries between producers and consumers they will likely not turn into a radical, dominant class. “Since its fortunes will tend to be bound up with the existing mode of production, it is more likely to be under the inducement to preserve that mode of production than to transform it.” (ibidem:17f.) He dates this to begin in England in the second half of the 16th century.

² The Hansa is repeatedly mentioned in Tracy’s (1991) edited volume on merchant empires. It is discussed in a full chapter in Scammell’s (1981) book on maritime empires.

1.3 CHAPTER OVERVIEW

Chapter 2 is the opening chapter of a forthcoming (as of August 2018) book on historical network research. During conferences in Mannheim (Germany) and Barcelona (Spain) in 2014, I made contacts with a group of historians who asked me to contribute an article to their new edited volume titled, “Power of Networks: Prospects for Historical Network Research” (Routledge). Initially, I was invited to contribute a paper on historical network research as it applies to economic history including reflections on best practice and challenges. Later changes in the publisher and directions of the edited volume meant for me to add a second part to the paper which demonstrates how to conduct historical network research using empirical data. As I had done a lot of data work related to the Hansa case, I decided to use some of these data for this book chapter. The result can be seen here as chapter 2 which may slightly differ from the forthcoming published version.

The paper starts with a brief introduction into network analysis including features and benefits as well as a summary of selected exemplary studies from historical sociology. In the second part of the paper, I use the Hansa case to illustrate network concepts and methods including network visualizations, descriptive methods, and statistical network modeling and show how network analysis can contribute to a further understanding of important trade data from medieval Lübeck. Empirical analyses suggest that kinship between traders appeared more often than we would expect by chance. There is partial evidence for increasing homophily between traders regarding their background from elite families. Comparisons with results from best practice studies from medieval Genoa suggest surprising similarities in the micro-level structures of trade organization to the wealthier Italian town. Challenges of historical network research and ways to get started with historical network research are discussed in the conclusion.

Chapter 3 is about important institutional changes in the Hansa organization, namely the emergence of Hansa Diets. Generally, I aim to better understand how a new market-supporting institution emerges and propose that exogenous shocks may affect social networks and local patterns of tie formation. Exogenous shocks can disrupt existing settled ways of doing things and create opportunities for recombination and the emergence of new institutions. This work adds to current debates about the origins of new organizations and markets (Padgett and Powell 2012) by studying a pure case of an exogenous shock, the pandemic Black Death in 14th century Europe. The Hansa case is relevant in this context because historical sources suggest that only a few years after the Black Death, the decentralized trade network with relatively rare political meetings developed persistent tendencies towards political centralization (Hansa Diets). This organizational change could suggest that short term events such as epidemics may have long-term consequences.

In order to study the association between the plague and the emergence of Hansa Diets, I gathered large amounts of historical data and transcribed or digitized them for modern data analysis. Like in chapter 2, I use network visualizations, descriptive methods, as well as statistical network modeling techniques. In addition, I use statistical regression models and detailed comparisons of historical practices in Europe and within Lübeck using primary and secondary sources. The fruit of these efforts is a potential new micro-mechanism of institutional change, network coping. Network coping highlights the importance of interactions of networks with local institutions. I find that social networks respond to external threats by using spiritual and non-spiritual coping mechanisms. Network responses based on local institutions of inheritance regulation in the Hansa regions likely led these to a different path of institutional development compared to the regions of Southern Europe, e.g. publicness of property regulation. In Northern Europe, the plague caused large numbers of cross-cutting networks and interactions of multiple

network domains within and across small-group rituals of will preparation. This chapter shows that complex network processes after exogenous shocks may catalyze institutional emergence.

Chapter 4 looks at important institutional changes outside the Hansa that were likely related to the social networks of Hansa elites in Northern Europe. In the early 16th century, economic and political actors of the Hansa likely contributed to the early diffusion of Protestantism in Northern towns during times of high risk and uncertainty about the consequences of adopting the new faith. This chapter shows that the Hansa was not only important for economic development in terms of trade expansion, but also contributed to the success of the Protestant Reformation which is one of the most prominent events in world history and marks a key moment in the developments that led to modern (Western) capitalism (Weber 1904/05). I offer the first network study on the diffusion of Protestantism and add to recent literatures on the role of networks in complex contagions by emphasizing historical embeddedness. To understand the structure of the network, I use descriptive measures of the topology of the Hansa Diets, and I use weighted network procedures to study edge depth. The paper promotes a network approach for the study of institutional change in economic history and exemplifies new ways to analyze complex associations between strong ties and weak ties (e.g. new generalized centrality measures) and demonstrate how to use them. This chapter can be read as a prototype for how to study temporality in cross-sectional research designs. Chapter 4 is published at the peer-reviewed journal, *Social Science History*.

Chapter 2.

SOCIAL NETWORKS IN THE ECONOMY: CHALLENGES AND BEST PRACTICE FROM HISTORICAL SOCIOLOGY

This paper claims that social network analysis is an innovation that should be taken up in economic history. Important features of economic organization could be missed (or gotten wrong) if scholars are not taking a network perspective. The paper starts with a discussion of features and benefits of social network research in an historical economic context. It continues with short summaries of three selected best practice studies from historical analytical sociology. These studies investigate economic networks in various historical periods and exemplify how useful, flexible and widely applicable the network approach is. In addition, these applications are complemented by the author's own work related to the medieval Hansa, Hanse or Hanseatic League. My application includes an illustration of network concepts, methodology and an empirical case study related to the Hansa. Social network analysis is applied to one of the oldest systematic trade records from Northern Europe (Saß 1953, Cordes, Friedland, and Sprandel 2003) and inquiries reveal striking similarities to micro-level structures observed in medieval Genoa earlier in time when feudal warrior-cultures prevailed (van Doosselaere 2009). Thus, studies which focus on wealth and economic output may overlook important similarities between societies and overstate the distinctness of economic arrangements that are potentially associated with economic development. The paper concludes with notes on challenges in network research applied to the Hansa trade and suggestions for ways to get started with new research projects in historical networks more generally.

2.1 FEATURES AND BENEFITS OF THE SOCIAL NETWORK APPROACH IN ECONOMIC HISTORY

Economic history is a particularly obvious field for social network analysis³ because the economy produces many types of suitable data. Relational data are produced in the work process (as a by-product) but usually not thought of as network data. States collect tax data on income and estates, companies record their transactions, and individual merchants often document who they trade with. These recording procedures were established many centuries ago and offer a rich arsenal of data for network researchers. Historians can use their case related knowledge and access to primary sources to extract various types of social relations from original documents. Many historical books also include tables and appendices with lists suitable for network analysis. Trade records, membership lists, event attendance data, etc. can be transformed into network data and analyzed with social network techniques.

New computer technology allows the extraction, storage and analysis of diverse types of relational information as well as unprecedented amounts of data. Entire text corpora can be turned into computer readable data and all types of networks may be extracted from these automatically, depending on the qualities of written documentation. Handwritten original documents or complex printed materials are still very challenging to handle for computers and often require humans as coders. But, with increasing precision, printed documents can be digitized using scanners or modern OCR software (optical character recognition) which makes these much more readily accessible for modern data analysis and has already led to the creation of large historical databases. Leading network scholars argue that large digital collections of historical information ‘Big Data

³ Social network analysis can be defined as the set of tools commonly used by network scholars to study the structure of social relationships among a set of actors. Standard introductions to methods of social network analysis are: Wasserman and Faust (1994); and much less technical Scott (2000).

structures can revolutionize historical social sciences.’ (Bearman 2015:4) The merits may be particularly huge when it comes to identifying causal mechanisms and processes in the long run. Bearman argues that the usual work of historians, writing narrative sentences about the past, may be less affected by the data revolution related to digitization of large amounts of archival data (Bearman 2015:2).

Nevertheless, economic historians who are looking for a fresh view of their historical cases of interest may find their best alternative to established research procedures in social network analysis (Wasserman and Faust 1994). The network approach offers an additional perspective to common statistical aggregations in economic history. It shifts the focus from the characteristics of individuals, or actors in the widest sense, to the relations and structures among them. Social scientists who study economic history with methods of social network analysis underline the importance of social structure and relations for economic phenomena.

In the last decade, sociologists produced a number of high quality studies of social networks in the economy and often focused on patterns of trade (e.g. Erikson and Bearman 2006, van Doosselaere 2009). Social network analysis is a particularly suitable methodology for the analysis of exchange or transaction data in general and for studying relational processes like those related to flows of trade goods. In economic history, scholars who study trade volumes may shift their view from aggregating capital to what trade really is, namely flows of valued goods and resources. Focusing on amounts of capital gives a reduced picture of the economy and particularly on trade as an inherently relational process often connected to other domains like kinship and politics. The network approach is uniquely suited to analyze trade and questions related to flows, content and rates of flows.

Other main benefits of using social network analysis in economic history are related to the capabilities of compelling and elucidating visualization. Perhaps the most prominent and simple form of network visualization is a (network) graph depicting a set of nodes (persons, organizations, etc.) and a set of lines indicating existence of relations (kinship, trade, etc.) between them. The creation of network graphs and the use of network tools in general mean that researchers clearly define the set of actors (nodes) and types of relations (lines) which constitute the social network under investigation. This requirement of defining nodes and lines in social network analysis leads to potential gains in objectivity. Many traditional historical studies do not clearly define their network as the object of study and therefore remain metaphorical and vague.⁴ Furthermore, social network analysis offers a set of standardized network measures which can be used for a formal, numeric summary of a network compared to mere visual interpretations of graphs and are particularly helpful for comparisons of networks. While many networks cannot be compared across studies, the comparison of network measures seems particularly fruitful for historical research when the same location or very similar structures are observed over time.

Two broad types of network analyses are connectivity and positional methods (Gould 2003). Both methods can be used on various levels of analysis to describe the network which may be considered as a first step in the identification of patterns in social structure and/or social mechanisms (Ylikoski 2015). Simple descriptive procedures on the individual node level include counting the number of connections of individuals (degree), how far they are in terms of relational distance (closeness), or the extent to which they are located on shortest paths between actors (betweenness). These centrality measures can be used to understand activity in networks, prestige,

⁴ Burkhardt (2014:17) sees an urgent need for a more precise network notion in the historical sciences: ‘It is not enough to have the feeling that there might be a network or a linkage. If I [Burkhardt] talk about a network, I need to be able to prove that it existed. And the base of proof for a network analysis is found in empirical data collection.’

social influence, and/or opportunities to control information flows (Wasserman and Faust 1994:169-219). Other connectivity methods look at larger units of analysis on the group-level and investigate phenomena like the cohesion within subgroups including cliques or k-cores (ibidem:249-290). At the total network level, connectivity methods include measures like centralization or network density to capture hierarchy and overall cohesion in a network (ibidem:164, 180f.). On the other hand, positional methods look at more abstract role structures by studying nodes with similar connections. This approach focuses on the absence of ties rather than connections themselves. Methods like blockmodels identify structurally equivalent actors (White, Boorman, and Breiger 1976). These and many other descriptive measures can be used to inform researchers about structures of relations impossible to reveal with other methods. An increasing amount of network studies also combines descriptive network measures with statistical procedures such as regression models (Agresti and Finlay 2009).

While descriptions and visualizations may be one step in analysis, particularly at the exploratory stage, many network studies go further and point to specific effects particular network structures or relational processes have on various economic outcomes of interest (Bixler 2015:65). In this way, the network perspective helps to make theoretical contributions, particularly those highlighting social structures and relational dynamics as causal agents. Most ambitious studies from historical sociology follow the paradigm of “analytical sociology” which is particularly interested in the mechanisms and processes that link the micro level to macro outcomes (Hedström and Bearman 2009). ‘An analytical historical sociology would focus on explaining why phenomena happen and how they happen, rather than relying only on description and interpretation.’ (Barkey 2009:712) This approach may share similarities with ontological theories in history which also focus on underlying mechanisms (Lorenz 2011:21). Braudel recognized a

“brotherly correspondence” between history and sociology, but also noticed a lack in actual dialogue between sociologists and historians (Braudel 1980:64, 71). This trend, so it seems, has changed partially due to a group of historical network scholars in sociology.

To illustrate this point, a ground-breaking study by Padgett and McLean (2006) can be referred to in which they argue that economic historians who studied the invention of the partnership system confuse explanations of origins and genesis with explanations of consequences. The paper demonstrates that the social network approach, including network theory and methods, may be used to tackle established arguments and get around functional explanations. Padgett and McLean show how the application of network thinking in combination with quantitative analyses of historical data may add to the understanding of key phenomenon in economic history. Their unrivaled database of relational information from medieval Florence captures multiple relational domains that exist beside each other and overlap via occupations of multiple roles. The relative impact of network domains is analyzed systematically using quantitative techniques, e.g. multiple regression. Network scholars like Padgett and McLean emphasize the role of social relations and analyze how these unfold in the period leading up to the phenomenon of interest at a certain moment in history. Thereby social network methods may not only help solve theoretical puzzles, but could also be used to answer more concrete questions in history. The network approach offers means and perspectives to develop new research questions but also answer old ones (Gould 2003:242).

Finally, network concepts can be very useful for studying social and economic change and/or stability. Concepts from sociology or economic history may be expressed in network terms and analyzed in network structures or meanings of ties. This allows researchers to objectively analyze patterns of social change using concrete network terms and measures. Historical change

can be understood in terms of changes in “ideal types” of social organization, for instance. The great Max Weber stated that “(t)he construction of abstract ideal-types recommends itself not as an end but as a *means*. Every conscientious examination of the conceptual elements of historical exposition shows however that the historian as soon as he attempts to go beyond the bare establishment of concrete relationships and to determine the *cultural* significance of even the simplest individual event in order to ‘characterize’ it, *must* use concepts which are precisely and unambiguously definable only in the form of ideal types.” (Weber 1949:92) A recent study of trade networks has, for instance, observed an institutional change in trade organization among traders to Bergen (Norway) during the Late Middle Ages. Observing concrete relationships among traders in selected time periods ranging from 1360 to 1510, Burkhardt finds that in the late 14th century trade partnerships existed predominantly among family members which changed within the next century in favor of short-term transactions with many different, unrelated traders. Increases in the principle of “Treu und Glauben” (equity and good faith) or even a substitution of the family ties in medieval long-distance trade organization show the cultural significance of changes in social networks (Burkhardt 2009:189, 219, 365). In the next section, a set of selected studies from sociology that use a network approach to study social change and economic development using network categories as analytical tools will be described.

2.2 SELECTED APPLICATIONS: BEST PRACTICE STUDIES

In the early 2000s, Roger Gould published an important article on the state of the art in historical network research in sociology (Gould 2003:242). In order to avoid redundancy, best practice studies published in the decade thereafter have been selected. This selection includes three case studies from European and world history spanning a period of about 800 years. The studies differ by period of investigation, geographical location and in terms of the types of social relations at the

center of analysis. It is striking that these studies differ in the types of network categories or ideal types they emphasize in relation to the characteristic historical period. The first study uses the sociological concepts brokerage and closure in the context of industrialization, the second study focuses on legitimacy of ties in the context of globalization, and the third study analyzes categories from economic history such as patronage and feudalism through a social network lens by using local configurations such as network stars. All these studies explain changes at the level of the larger economy (macro) through the application of lower level network structures and relational mechanisms (micro- or meso). To commence, the historically most recent period will be examined.

Hillmann and Aven (2011) are interested in the question of how economic development is possible in the absence of strong public institutions. The authors present a historical case study that focuses on entrepreneurship in late imperial Russia (1869-1913); a case of late industrialization due to a lack of reliable market-supporting institutions. Hillmann and Aven are interested in business networks and underline the fact that economies based on informal institutions such as reputation, associated with network closure, may stabilize but not develop. Network brokerage on the other hand, may attract the resources and information necessary to bridge local economies. Empirical analyses are based on a complete list of share partnerships and joint-stock companies including information about characteristics of thousands of companies and individual founders. Network data are derived from shared affiliations of founders and are studied over time.

Using multivariate OLS regression analysis (Agresti and Finlay 2009), the authors find that previous business success had a positive effect on the amount of capital raised by a company. In other words, reputation matters for capital mobilization. For the second part of their analysis, the authors use network methods combined with statistical multivariate models and find that network

fragmentation, a characteristic expected for emergent societies, did exist in the business network in Russia during this period. Finally, Hillmann and Aven go on to investigate whether the network location, core vs. periphery, is of importance for capital mobilization. In other words, they ask whether reputation works similarly well in closed and bridging network positions. The authors find that reputation effects are about twice as high in the network periphery compared to the network core. They also find that individual network reach and brokerage measured as constraint was higher in the core than in the periphery and that this was beneficial for capital mobilization on average. This study is best practice because concepts like reputation, brokerage and fragmentation are operationalized in a clear manner. Aspects of time in networks are considered carefully and the authors also allow for various aspects that might affect causal interpretation, particularly aspects of individual heterogeneity. Overall, the quality and completeness of data are impressive and enable a complex investigation of the problem at hand.

Emily Erikson's (2014) book on the Early Modern English East India Company is another exemplary network based study of an important period in economic history. Erikson analyses how malfeasance of actors affected larger patterns of trade (see also Erikson and Bearman 2006). She argues that the opportunistic behavior of employees connected otherwise loosely integrated commercial regions and increased information flows between Asian ports and England. For data analysis, the author uses information about communication between ships and between captains. Information about voyages is directly drawn from the ship logs and includes reliable information about the paths of the ships. Overall, the data include 264 ports in the East Indies including 1,480 ships or 4,725 voyages for the period 1601-1835. Erikson analyses voyages between ports and how malfeasant voyages affect the overall trade structure. She takes out the non-legitimate trade routes from the overall trade networks for the 58 periods of a length of 4 years. Taking out the

malfeasant voyages leads to a reduced network in each period and lowers network density. As network density reduces automatically when connections are taken out, she compares taking out the malfeasant voyages with taking out randomly selected legitimate voyages.

Erikson finds that taking out the private trade connections disconnects the entire network into separate components in periods around 1712, 1720, and 1728 while taking out the legitimate “matched” voyages does not disconnect the network at all. Moreover, to verify her findings using formal methods instead of network visualizations, Erikson uses a modified network integration measure to further assess different effects of the removal of private trade vs. legitimate trade from the network. She finds that private trade had a greater impact on network integration than legitimate trade and that the removal of private trade leads to network fragmentation. The English East India Company profited from private traders as they promoted communication in Asia and between Asia and England. This study can be considered as of highest quality because of the completeness of the data which perhaps allows a full understanding of the macro phenomenon of a first global trade network using micro level relational logics. Erikson elegantly uses the different meanings of ties in her historical context building on legitimacy ideal types. Besides linkages between theory and data, the study includes methodological innovations.

The research of van Doosselaere (2009) on the transition from feudal to mercantile organization in medieval Genoa is a wonderful example of historical network research on the Middle Ages. Van Doosselaere focuses on commercial dynamics and observes a change in trade partner selection starting at the end of the 13th century which contributed to the rise of a mercantile oligarchy. For empirical analyses, the author uses data which are rougher than those used in the previous studies due to decentralized recording practices and problems of survival of records. However, the available data from medieval Genoa are among (if not) the oldest surviving trade

records of this magnitude and degree of completeness. The author analyzes thousands of equity associations in the time period 1154 to 1315. These associations, called commenda(e), were limited to single voyages or arrangements of short duration in which resources were pooled among two or more partners. Van Doosselaere (2009:63, 72) finds an increasing rarity of this type of contract at the end of his observation period in addition to increasing capital values and variation in monetary values of partnership ties. In analyses of trader attributes, he confirms previous findings in history regarding a wide but declining integration of women in the medieval economy and disconfirms previous research by emphasizing the importance of changing “aristocratic elites” for the development of Mediterranean long-distance trade instead of “new men” (van Doosselaere 2009:85, 94, 99). Van Doosselaere then shifts the focus from attributes to relations and studies network change of commendae over time comparing network measures.

Network graphs for selected periods of varying lengths (10-26 years) show large numbers of components because the connections between operators in the samples show low commercial connection. The author calculates degree centralization for each network and compares this with an ideal type of feudal social organization resembling a star-like shaped network. Network analyses show that network centralization declines over time in the period of observation. Large traders were mainly unconnected in the early period which changed in later periods. Thus, during the 13th century, elite collaboration stretched beyond politics and military and increasingly included commerce as well. Another finding is that families who would dominate Genoa in the Renaissance were not very prominent in volumes of trade but in network betweenness centrality, thus network control, during the early periods of investigation. To analyze the integration or cohesion of the network over time, the author uses connectedness indices and interprets his empirical findings, “as feudal-like control over the network declines, the trade network’s

integration decreases sharply, before commercial ties knit the whole back together to form a more integrated – yet more decentralized – trade architecture.” (van Doosselaere 2009:110) Finally, van Doosselaere looks at status and occupational homophily in partner selection by coding for each pair possible combinations of binary attributes and calculating point correlation statistics for the selected periods. Findings are that status homophily in partner selection was relatively low until the end of the 12th century and then increased steadily by the early 14th century. In other words, aristocrats were more likely to be partners with other aristocrats at the end of the period of observation compared to the beginning. This study impresses due to its high ambition to study large scale social change in economic history.

To sum up briefly, the selected sociological studies add to our understanding of how social relations may have contributed to historical economic development and social change more generally. They carefully link the conceptual part with the empirical measures and data they have. All studies have in common that they tell history by forward looking not backward looking regarding concrete social structures and relational processes as main agents of change. All studies take a sociological perspective on historical developments by emphasizing concrete social ties and their potentially different cultural meanings. Instead of adding complexity to history and more detail to specific cases, the authors strive for abstraction, generalization, and explanation. The best practice studies presented here benefit from detailed case related knowledge and the use of primary and secondary data in combination with the creative applications of tools from social network analysis. By carefully balancing sociology and economic history these studies contribute to a better understanding of historical economies and the major social forces underlying them.

2.3 APPLICATION OF SOCIAL NETWORK APPROACH: CASE STUDY OF MEDIEVAL HANSA TRADE

2.3.1 *Illustration of network concepts and methodology*

The analytical power of the social network approach should further be demonstrated by an example from the author's own research through an elaboration of a classic analysis of trade. One of the classical sociologists, Georg Simmel (1908/1992), argued that in the case of the medieval Hansa, traders traveled to sell their goods in other towns and thereby built connections between localities and overlaps in social circles. More recently these ideas have been developed under the label of the brokerage concept which underlines the advantages or disadvantages "brokerage" entails for individuals, groups and outcomes like economic development (Stovel and Shaw 2012). To illustrate the brokerage concept, network graphs are used in Figure 1 including connections between traders and markets.

The graph on the left is a "two-mode network" named after the different types of nodes it includes. Lines in the graph indicate relations between traders (primary nodes) and towns (secondary nodes) (Opsahl 2013). The hypothetical example shows that four out of five Hansa merchants travel to one town only, e.g. traders A and B trade in town/market 1. Merchant C travels to both markets and therefore connects otherwise unconnected markets. This structural location of merchant C designates her as a "broker". We can imagine how brokers such as Hansards contributed to the integration of economies during the Middle Ages. While the graph in Figure 1 (left) illustrates an integrated economy, we can also imagine how taking out the broker, trader C, might swiftly create a local economy and disintegrate markets.

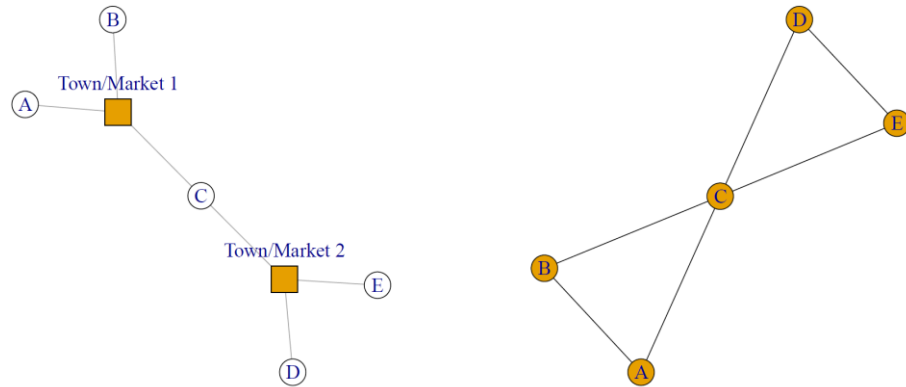


Figure 1. Left: Two-mode network of persons/traders (circles) linked to towns/markets (squares). Right: One-mode projection showing relations between traders through shared affiliations. Figure produced in R using igraph (Csardi and Nepusz 2006) package and Fruchterman Reingold layout.

While the two-mode network shows how merchant C connects markets, the corresponding one-mode projection shows how shared affiliations may also create connections between individuals. Simple matrix multiplications between two-mode networks lead to one-mode networks characterized by one type of nodes (Breiger 1974). The two-mode network of traders and towns may be projected into a trader network or town network. Projecting the two-mode network (left) into a one-mode network of traders (right) results in a single component in which all traders are connected allowing communication at least in principle (Scott 2000:102). One might infer how network brokers may promote transmission of information and enable groups to mobilize, coordinate and act together, such as the medieval Hansa did over centuries (Selzer 2010). While the network graphs are based on an artificially constructed network dataset, scholars could use empirical data to evaluate the extent of overlaps in medieval social circles. Collaborations between medieval towns in the Hansa regions are observable in the records of the Hansa Diets (1356-1669), for instance, and indicate political and economic ties between northern regions. In some of my own research, together with Katie Corcoran and Steve Pfaff, I show that historical

embeddedness among Hansa elites likely contributed to the early adoption of Protestantism in Northern Europe (Wurpts, Corcoran and Pfaff 2018).

2.3.2 *Empirical analysis of historical trade*

Instead of analyzing market integration based on social connections across towns, the following short study focuses on registered trade from a single town in Northern Europe. In certain (very modest) ways, the present analysis follows in the footsteps of Max Weber, one of the founders of sociology, who wrote his dissertation on Italian partnerships and could not extend it with a study on German commercial towns (Kaelber 2003:36). From contemporary research, the work of van Doosselaere on medieval trade in Genoa, as described above, seems to be an appropriate reference point and case of comparison. Important institutional differences such as the mostly absent notary system in Northern Germany along with differences in recording practices of trade led to lower amounts of data in the North, but otherwise the two regions had very similar legal structures of trade partnerships during the 14th century (Hammel-Kiesow 2008b:241). In this application of network methodology I aim to answer whether the micro-level patterns of social relations and partner selection observed in medieval Genoa also formed the basis of economic organization in the Northern German town Lübeck.

Lübeck was among the largest towns in the Holy Roman Empire during the Late Middle Ages and had status as an imperial town. In the 13th century, Lübeck was the most important loading place and supply port for the crusades to the European Northeast (von Brandt 1949:154). Here we can see a similarity to the Italian town Genoa which also served as a major port in the Crusades which had started much earlier in Southern Europe. In Genoa military expeditions caused growth in the local economy as well as involvement of the feudal nobility in commerce (van Doosselare 2009:30).

Located close to Baltic and North Sea, the Northern German town Lübeck was also the designated “head” of the medieval “Hanse” (German) or “Hanseatic League” (English) (Dollinger 1989, Hammel-Kiesow 2008a). The Hansa (Latin) was one of the most famous and long-living governance institutions in economic history (e.g. 1358-1669) and at the same time a large (perhaps decentralized) trade network across medieval borders. Hansa trade was predominantly in bulk goods but also in luxury goods which were often transported via ships in the Baltic and North Sea regions.

In 1350, Hansa regions including Lübeck were struck by the plague, Black Death, which caused tremendous death tolls and population decline. One of the economic effects was that the plague seems to have led to a concentration of wealth in the hands of a few. There was also a likely decline in demand for consumer goods whereas the demand for luxuries increased (Dollinger 1989:85-88). The plague seems to have had an impact on the development of early Hansa trade because it might have caused a breakdown in the trade with bulk goods (Hammel-Kiesow 2008a:60).

For data analysis, information from the “Societates” register as recorded in the town hall of Lübeck (Germany), 1311-1361, was extracted using the published version by Cordes et al. (2003) as well as an unpublished handwritten transcription by Saß (1953) from the city archive in Lübeck. The societates register recorded trade partnerships, included voluntary recognitions of obligations and cancellations of these debts. The register is among the earliest sources of systematically recorded trade in Northern Europe. According to Cordes, it includes only one type of organization called ‘Widerlegung’ (Cordes 2003:12ff.). This German word refers to the merging of capital and also marked the foundation of a new association. The register was likely to have been initially created for a small group of capital providers in medieval Lübeck. This group

instructed in almost every transaction a new capital leader who was then sent on trade voyages with vast amounts of capital, e.g. in Mark silver or bullion (Cordes 1998:111, Hammel-Kiesow 2008b:223).

Using traditional methods from economic history, Sprandel identifies 17 big investors with equity participation in four and more partnerships or extensions of partnerships (Sprandel 2003:1ff.). The top four list of partnership participation is: H. Mornewech (22 partnerships), C. Attendorn (9 partnerships), J. Morkerke and E. Pape (both 8 partnerships). At the level of partnerships, Sprandel finds that numbers of partnerships declined in the observed period from 1311-1361. In his analysis of capital size of partnerships by groups of small, big and very big investments, Sprandel finds that small partnerships declined first (Sprandel 2003:7). Over time, the relative size of entries shifts to larger associations. Ultimately, Sprandel argues that this recording practice declined due to the decrease in use by important entrepreneurs and due to increasing written private book keeping. He supposes that the diffusion of merchant books in the Hansa towns may have been the reason why the societates register expired. The intense use of the register declined in the 1330s due to the resignation of the assumed initiators and a new generation of wholesalers with preferences for private book-keeping (Hammel-Kiesow 2008b:223, Cordes 1998:111f.). To illustrate the decline of societates and the increase of relative capital value, scatterplots have been shown, including fitted lines in Figure 2.

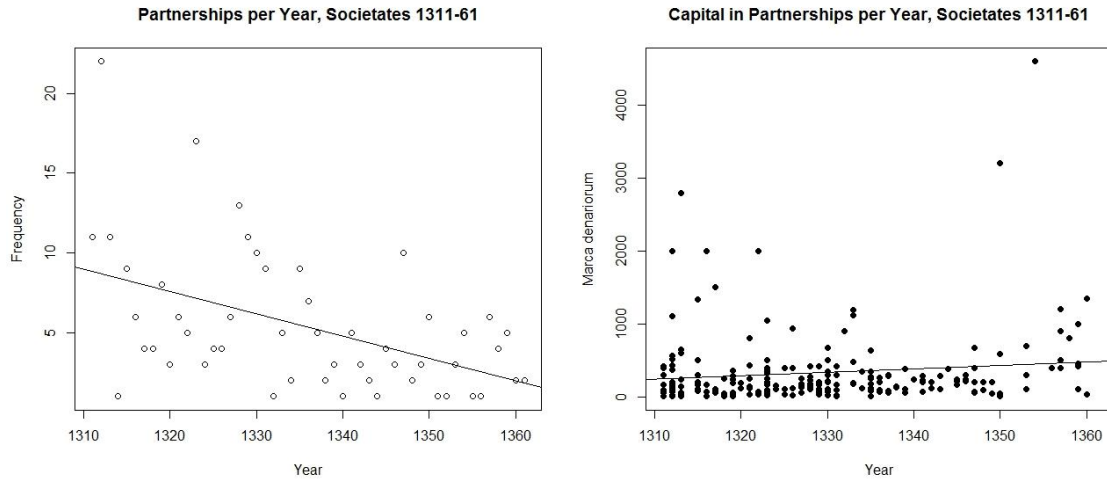


Figure 2. Frequencies of partnerships per year (left) and size of partnerships per year (right). Figures produced in the statistical programming software R.

In a next step, traditional economic history is extended by using social network analysis. The data in the societates register has been treated as two-mode data similar to the example in Figure 1, where actors are linked to one another through joint partnerships. Analyses include all 279 entries in the societates register including 477 individuals connected by 597 partnership ties in the Cordes et al. dataset and 467 individuals linked by 605 ties in the Saß (1953) dataset. While the start of the partnerships are recorded, the end of relations between traders is often unclear. The duration of ties varied between one-shot collaborations and multi-year associations. As the observation period spans 50 years, issues like mortality of merchants have to be considered for interpretation.

Furthermore, interpretations need to acknowledge potential changes in meanings of ties over time, e.g. different sets of obligations and opportunities. Van Doosselaere (2009:75) states that agency relationships emerged in the 14th and 15th century in Genoa and had relatively strict guidelines compared to previous cooperative partnerships in which travelers had substantial autonomy. While his analysis of commendae ends in 1315 and cannot capture this process, the

present dataset of societates records seems to reflect these changes as increases in the complexity of ties can be identified in the 1330s and 1340s (Cordes 2003:13). Cordes (2003:43) also observes increases in numbers of cancellation receipts since about 1350 and relates this to potentially changing business practices as responses to the plague. The Black Death likely increased the need for written preservation of evidence.

As node attributes, 32 traders who had “dominus”⁵ status in the Cordes et al. data and 29 “domini” in the unpublished Saß data were identified. Many traders in the societates register were born into old councilor families, some of them would become councilors later, but were not part of the city council themselves during the period of observation (Fehling 1925). To capture these traders, a distinct category “council family background” was coded, including 83 nodes in Cordes et al. data and 79 nodes in Saß data. Overall, 294 different last names in the datasets from Cordes et al. and Saß were identified, thus, traders from almost three hundred different families used the register to secure trade partnerships. The cumulative merchant network of the societates register, 1311-1361, is depicted in Figure 3. Node colors mark “dominus” status in black and other nodes in grey. A general visual impression is that the merchant network is fairly fragmented. Many isolated partnerships of size two (dyads) characterize the networks but a few hubs stand out and connect relatively large components.

Besides fragmentation, the network is characterized by inequalities insofar as some traders have substantially more partnership ties compared to other traders (van Doosselaere 2009:104). At the center left of Figure 3, one large component includes H. Mornewech, the most prominent user of this register as described by Sprandel. Mornewech was a central, influential node in the trade

⁵ Not coded as dominus here were two cases in which traders were marked as dominus and were identified as clerics plus one case of a one woman labeled domina. These individuals likely did not have much political power in regards to city and Hansa politics.

network and had “dominus” status as marked by a black color. Most of the partners he traded with did not themselves trade with each other, which manifests in a structure resembling a network star. Most other active traders identified by Sprandel possess a similar ego-network structure. This trade structure resembles the feudal type of organization as described by van Doosselaere in his study of commerce in medieval Genoa (van Doosselaere 2009:104-107). Many of the larger components look similar to those centralized structures observed in medieval Genoa more than a century earlier when warrior cultures prevailed.

Cumulative Merchant Network, 1311-1361

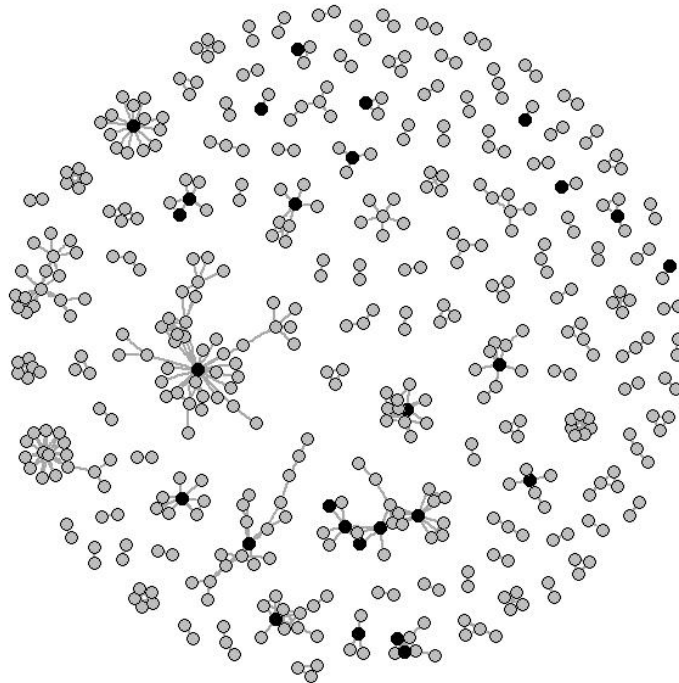


Figure 3. Cumulative merchant network, 1311-1361. Dataset: Saß (1953). Figure produced with the igraph (Csardi and Nepusz 2006) package (Fruchterman Reingold layout) in the programming language and software R. Node color black indicates “dominus” status.

Another large component that is located at the center bottom shows a different pattern and includes multiple traders with “dominus” status. This component includes H. Pape who acts like a broker and connects otherwise disconnected groups of traders. The interesting difference to the

previous structure is that this councilor traded with other councilors as well indicating a potentially different type of partner selection among societates users. As H. Pape started to use the register in 1342 which is 7 years after the last entry of H. Mornewech, this observation could indicate a potential change in trade organization over time such as a trend towards status “homophily” as observed by van Doosselaere (2009:104-107, 112) in late medieval Genoa.⁶

In order to investigate (potential) homophilous tie patterns over time, a slightly more dynamic perspective is taken and the data is subset into two periods, based on observations from the historian Cordes who distinguishes a main period (1311-1339) and a late period (1340-1361). Cordes (1998:111) uses this split because he finds a decline in societates use at this time, as well as a change in character of the entries at the beginning of the 1340s.⁷ Moreover, while network depiction in Figure 3 leads to interesting first interpretations, these impressions are mere visual ones. As a step to quantify and generalize the finding of a potential change in partner selection, quantitative measures are calculated in order to assess whether nodes tend to connect to nodes with similar characteristics. To empirically measure “homophily”, assortativity measures (Newman 2003:2)⁸ from social physics and S14 (Gower and Legendre 1986)⁹ as used in van Doosselaere’s

⁶ Sociologists use the term “homophily” in general when they describe the often-observed pattern that individuals tend to interact with similar others (McPherson et al. 2001). For a more recent review including literature from economic sociology and organization studies see: Rivera, Soderstrom, and Uzzi (2010): 94-97. Individuals have been found to prefer homophilous ties because these have expressive benefits and often include trust. Heterophilous ties to partners with different attributes and capabilities are frequently preferred in contexts of collaborations or economic production.

⁷ The early period includes 322 vertices and 342 edges (density=0.007) whereas the late period contains 151 vertices and 255 edges (density=0.023) in the Cordes et al. dataset. The dataset based on Saß (1953) includes 329 vertices and 373 edges in the main period and 153 vertices connected by 232 edges in the late period. There are 23 and 9 traders with dominus status in the early and late period, respectively. The average number of connections per node (mean degree) is 2.12 in the early period and 3.43 in the late period. A look at the triad census shows 105 complete triangles in the main period and 242 in the late period of the societates register.

⁸ See also for how to calculate this in R: Kolaczyk and Csardi (2014:66-67).

⁹ In order to calculate S14, I created the 2 by 2 matrix including pairs of attributes of adjacent nodes. The attribute pairs consider whether a trader has the attribute (1) or does not have the attribute (0). The present binary attributes are council membership (1=yes, 0=no) and having a last name of a councilor (1=yes, 0=no). Each partnership tie between trader A and trader B is coded as one of these alternatives: A(1)/B(1), A(1)/B(0), A(0)/B(1), A(0)/B(0). Across the entire network this is summarized in a 2 by 2 table where the cell entries indicate the total number of ties having each type of configuration. This “mixing matrix” was produced in R using code from babelgraph.org, published on April 16, 2012 by Gary, accessed on September 10, 2016, <http://www.babelgraph.org/wp/?p=351>. Alternatively, the mixing

study of medieval Genoa are calculated. The corresponding values are correlations between binary attributes that trading partners might share. In assortative networks, nodes with high status (labeled “dominus”) are linked to other nodes of high status. Similarly, positive S14 values indicate a tendency for homogenous partnerships correcting for differential participation in trade by people with different attributes. Both measures vary between -1 (completely disassortative) and 1 (perfect assortative mixing).

Table 1 shows the assortativity coefficients and S14 values for the characteristics “dominus” and “council family background” in the main and late period of the societates register. The attribute “dominus” serves as an indicator of status, power, and wealth. “Council family background” captures the quality of family background and whether a person stems from an established council family, e.g. old elites. In Table 1, it can be seen that assortativity coefficients for the attribute “dominus” are close to zero in all periods and across datasets. There is likely to be no assortativity regarding “dominus” status, e.g. current political and economic power. There is no evidence that “patricians” are more likely to trade with each other during this period, which contrasts with the findings for Genoa at roughly the same time. Whereas there is no correlation between the attribute “council family background” of connected nodes in the main period of the societates register (1311-1339), there is a positive association in the late period 1340-1361 ($r=.53$). This suggests that over time there may have been changes in partner selection related to old elite families, a potential similarity to what van Doosselaere found for Genoa. Correlation coefficients suggest that family status was not a prevalent selection criteria in the main period, however, the data show that similarity in family status often characterized partnerships in the late period. Note

matrix can also be calculated in statnet (see Harris 2014:43). S14 values were calculated in R based on the formula presented in van Doosselaere (2009:113), and Krackhardt (1990:350). Assortativity coefficients were calculated using the assortativity function in the igraph package.

that the assortativity measures from “social physics” (Scott 2011) are similar (if not identical) to the S14 values as used in the sociological study of Genoa by van Doosselaere, as well as other social scientists before. Furthermore, the results are stable across datasets which provides some confidence. Status homophily in medieval Lübeck during the period 1340-1361 roughly corresponds to values found for the period 1269-96 in medieval Genoa (van Doosselaere 2009:113).

Table 1. Assortativity coefficients and S14 values for main period (1311-1339) and late period (1340-1361) of societates trade register. In each cell, first coefficients are based on Cordes et al. (2003) data followed by coefficients in parentheses based on Saß (1953) data. All numbers were calculated in the programming language and software R. Assortativity was calculated with the igraph (Csardi and Nepusz 2006) package.

	Assortativity		S14	
	Main period 1311-1339	Late period 1340-1361	Main period 1311-1339	Late period 1340-1361
Dominus, city council member	-0.132 (- 0.106)	0.021 (- 0.023)	0.125 (0.125)	0.021 (0.021)
Council family background	0.002 (0.059)	0.525 (0.464)	0.020 (0.020)	0.528 (0.426)

In order to further look at homophily between traders listed in the societates register, Exponential Random Graph Modeling (ERGM) is used as a more rigorous test than the previously presented correlation measures (Robins et al. 2007).¹⁰ “ERGM is a tool for examining patterns of relationships [...] and identifying how the characteristics of the network members and larger social forces can explain or predict the observed patterns of relationships.” (Harris 2014:5-6) This tool is similar to general linear models and logistic regression, but more realistic because it does not require the assumption of independent observations and can capture various dependencies in social

¹⁰ The software package to estimate ERGMs in R, as used in this paper, is Statnet: Mark S. Handcock, David R. Hunter, Carter T. Butts, Steven M. Goodreau, and Martina Morris (2003). statnet: Software tools for the Statistical Modeling of Network Data. URL <http://statnetproject.org>.

life. ERGMs can help answer the question whether ties between traders with council family background, as observed above in the late period, appear more likely than would be expected by chance. The hypothesis that traders born into council families in Lübeck are more likely than expected to trade, can be tested for each time period. After various tests with model fit parameters like AIC and BIC, as well as goodness of fit tests, the following terms were selected that seemed to work best across time periods and dataset: edges, nodefactor, nodematch, gwdegree. Edges captures network density, nodefactor shows categorical variables, geometrically weighted degrees “account for the decreasing degree distribution in observed networks” (Harris 2014:27), and nodematch captures homophily (ibidem:55).

Table 2 shows the estimates from exponential random graph models for main and late period and for each dataset separately. The “edges” coefficients reflect densities of the networks in each period. Negative signs indicate that densities are below 50% as observed in most social networks (ibidem:46). Among the coefficients for individual attributes, positive and significant results for “dominus” in the late period in both datasets ($p < 0.05$ and $p < 0.01$) were found. There is a higher likelihood for councilors and other powerful individuals (domini) to form ties compared to others during the late period of the register, but no significant pattern exists in the main period. In addition, coefficients for “homophily” depict log-odds of the presence of ties between actors with same characteristics. The results from the ERGMs mostly confirm the previous results in Table 1. There is evidence that domini or councilors do not tend to interact with each other or are even less likely to trade with each other than we would expect by chance. This is true for all datasets and across time periods. Results for traders with council family backgrounds cannot be fully repeated across datasets using ERGMs. While the Cordes et al. dataset shows the expected pattern that traders from old town elites did not trade with each other in the early period but were

more likely to do so in the late period ($p < 0.05$ and $p < 0.01$), the same coefficients are not statistically in the Saß dataset. Thus, using ERGMs, only partial evidence for homophily between Hansards from old council families in the late period was found.

Table 2: Exponential random graph models for main period (1311-1339) and late period (1340-1361) in societates trade register. In each cell, first numbers are coefficients and second numbers in parentheses are standard errors. All numbers were calculated in the programming language and software R using the Statnet (Handcock et al. 2003) package.

	Cordes at al. (2003) data		Saß (1953) data	
	Main period 1311-1339	Late period 1340-1361	Main period 1311-1339	Late period 1340-1361
	Coeff. (S.E.)	Coeff. (S.E.)	Coeff. (S.E.)	Coeff. (S.E.)
Edges (constant)	-4.92*** (0.61)	-4.34*** (0.35)	-5.02*** (0.54)	-4.69*** (0.34)
Homophily				
1. Kinship (all names)	3.57*** (0.19)	4.22*** (0.27)	3.76*** (0.17)	4.79*** (0.27)
2. Council family background	-0.38* (0.19)	0.52** (0.20)	-0.20 (0.17)	0.06 (0.22)
3. Dominus, councilor	-0.94 . (0.52)	0.23 (0.26)	-0.85 . (0.49)	0.12 (0.26)
Structural terms				
• Gwdegree	0.79** (0.26)	-0.64** (0.24)	0.61** (0.23)	0.18 (0.27)
Categorical variables, Main effects				
A. Dominus/councilor	0.22 (0.53)	0.41* (0.21)	0.28 (0.48)	0.62** (0.22)
B. Council family Background	-0.31 . (0.17)	0.05 (0.13)	0.01 (0.15)	-0.18 (0.16)
Fit: AIC, BIC	3586, 3648	1973, 2024	3764, 3826	1772, 1824
Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1				

In the first row of estimates capturing homophily, it can be seen that there is a strong propensity for “kinship” among traders with the same last name – broadly defined – to trade with each other compared to traders with different names. All coefficients of “kinship” are highly statistically significant ($p < 0.001$) and show in a positive direction. Thus, the results confirm the

impressions of Burkhardt who observed that traders to Bergen were mostly related via family ties (Burkhardt 2009:189, 219, 365). Hansa trade in the 14th century was to a large extent family trade and therefore based on close, personal relations including trust. Finally, if results based on the published Cordes et al. data are taken more seriously than the unpublished Saß dataset, network statistics may indicate potential changes in partner selection which could have contributed to increased capital and wealth accumulation among elites (Dollinger 1989:88). Linking Sprandel's finding of increasing capital size with the finding of increased "status homophily" may extend the perspective on how wealth may have been accumulated during the 14th century (besides the effects of the plague). While Sprandel treats the decline in the use of societates as simply the end of a particular practice, my analyses indicate that it was perhaps the breeding ground for the linking of political and economic domains, and a model for the subsequently powerful medieval Hansa which engaged in both politics and trade (Padgett and Powell 2012).

2.4 DISCUSSION AND CONCLUSION: CHALLENGES OF SOCIAL NETWORK RESEARCH IN ECONOMIC HISTORY

Social network analysis is an innovation that should be taken up in economic history. If studies are not taking a network perspective, they fail to reveal the underlying relational micro-structures of economic organization that reflect broader cultural patterns, for instance. In the present case study of medieval Hansa trade I could show that the Northern German town Lübeck had relatively similar micro-level structure than the richer Italian town Genoa. Thus, studies that are focusing on wealth and economic output miss crucial similarities between societies. Traditional methods of economic history are unable to identify relational patterns and therefore overlook important features of societies. The present case study showed that differences between Northern Europe and Southern Europe may have been smaller than previously assumed by historians. Features of

local economic organization in Lübeck in the first half of the 14th century correspond to similar structures in Genoa more than 100 years earlier. There may be reason to believe that the warrior culture that characterized the Italian town during the times of the Crusades somewhat persisted in Lübeck when Genoa was forming a mercantile oligarchy. Thus, the previous results may be interpreted as micro-evidence for the backwardness of economic organization in the North. However, there is also evidence that this changed potentially about a decade before the Black Death and in the following decades.

I hope the reader is convinced that economic history is a particularly suitable field for social network analysis due to the relational topics like trade but also due to the large stocks of data available even for periods far back in history. The network approach brings new insights to economic history by potentially offering new answers to old questions or new perspective on historical data stimulating new questions and research. Network studies in sociology have already made substantial contributions to the study of economic history using the network approach. They were particularly successful when they pointed to mechanisms and processes driving social change. In my short application of the social network approach, I have investigated briefly how changes in partner selection as a distinct network process may have contributed to concentration of capital and wealth in medieval Lübeck (Dollinger 1989:88), an outcome that was noted by historians, but has not been explained well.

While the network approach has many benefits, specific challenges of historical network research should not be ignored. One of the greatest challenges in historical studies is related to availability and quality of data. Historians can only work with documents that survived over time and can be read with sufficient clarity (Ewert and Selzer 2015:164). Only careful interpretations of data limitations and bias help researchers to overcome these issues. Data limitations have

consequences for the types of questions that can be answered which means that questions are more source dependent in historical research compared to more contemporary research which can even design a study to answer a question of interest. My own case study, including an analysis of one of the oldest systematic trade records in Northern Europe, the societates register, has data limitations as well, particularly regarding the identity of individuals. Names were not standardized in the Late Middle Ages which is problematic for the identification of unique individuals (nodes). I have tried to deal with this problem by using two different transcriptions of the original medieval documents in order to increase reliability. The two datasets used were well suited because they were extracted by experts with a 50 year gap between recordings.

One of the biggest problems for social network analysis more generally is related to missing data. Results are misleading, for instance, if key bridging actors are not included in the data but a key feature of the “true” network. In that case observed network fragmentation does not correspond to the actual historical constellations and network representations, measures and conclusions become misleading. The extent of measurement bias depends on network measures and features of networks (Smith and Moody 2013). Missing data in the case study presented above refers to trade in the town of Lübeck that took place during the period of observation but was not recorded in the societates register. As the number of partnership entries in the register decreased over time, missing values become a substantially meaningful issue in relation to the use of the recording practice besides the methodological aspects already mentioned that related to the network structure. Historical studies covering long time spans need to reflect the meaning of missing values and potential changes could indicate interesting research questions themselves.

Another issue in social network research is related to visualizations. My case study on Hansa trade indicates that network visualizations may be problematic when they are cumulative

and cover several years or decades. Some individuals may die or exit a network within the period of observation while others join (Burkhardt 2014). Dates of birth and the death of persons and their social relationships offer a challenge; researchers have to make decisions to either hide or show the dead (Lemercier 2015:206). Many practical considerations to deal with issues like duration of ties e.g. decay functions or the continued importance of old ties, demand researchers to have sufficient information available. However, historians in particular face the problem that available sources do not always provide information about the start or end of relationships. ‘Yet assigning an infinite duration to ties because we lack precise information is just an arbitrary choice among others, and generally not the best: Do the oldest always have the highest social capital? It is unlikely.’ (Lemercier 2015:195)

A final problem relates to aspects of validity and the meaning of network ties. Researchers should ask themselves about the meanings of ties, whether ties existed at all, or if these are an artefact of coding. Network methods might be misleading if a hypothesized tie between two actors does not mean a tie for the relevant actors themselves but only to the researcher. Consider the example above in Figure 1, the hypothetical illustration of Hansa traders connecting medieval markets. Here, connections between traders (right graph) are not directly observed in the data but simply inferred from their trade activities in Hansa towns/markets (left graph). In the historical case of the medieval Hansa, it is likely that traders who traded in the same, relatively small towns and markets knew each other, particularly if they traded similar or related goods. It is an established finding in social science research that spatial proximity and shared social foci serve as important predictors of tie formation (Rivera, Soderstrom, and Uzzi 2010:105-107). This gives confidence to use the two-mode approach for the Hansa case without observing actual interactions or relationships among traders.

In addition, Gould noted that network ties should actually represent something meaningful, e.g. information flows between two nodes A and B (Gould 2003). Researchers should be explicit about what they think network ties do, depending on their research question and knowledge about the case. The meaning of network ties is the key to the understanding of social processes as drivers of social change. In my Hansa case study, network ties constitute trade partnerships and manifest a capital transfer which usually involved risks for the parties involved. This aspect links the type of ties under investigation to topics such as economic development and the rise of the “efficient” West. North and Thomas considered Italian “societas” and commenda as contractual arrangements “designed to provide capital and a working partner by a voluntary association, to spread and reduce risks, and to improve information flows.” (North and Thomas 1973:54) Because long-distance trade meant various uncertainties, traders in medieval Lübeck used the societates register to gain more legal certainty. Network ties establishing partnerships in these official records may be characterized by a lack of trust among partners.

It is in these instances of interpretation of meanings in which traditionally working (economic) historians may make important contributions. The methods training historians have, e.g. critical assessment of sources and hermeneutics, sensitizes historians for questions of meaning. Similarly, historians are particularly trained in the handling of fragmentary written records which is helpful in the context of missing network data. This expertise is very valuable and historical sociologists may very well learn from historians in these regards. Nevertheless, recently, network experts in sociology have started to pick up tie meanings as a research topic in the context of Renaissance Florence. Gondal and McLean (2013:123) argue ‘that tie-meaning leaves traces in the structure of a network: particular meanings of a given type of tie are more likely to manifest in certain micro- and macrostructural network configurations than others.’ The cultural turn in

network research has produced a number of valuable studies on what networks are or how networks and culture are related (White 2008, Fuhse 2009, McLean 2017).

The more we know about the quality and content of social relationships the better and the more detailed methods can be applied, such as the application of weighted network measures (Opsahl, Agneessens, and Skvoretz 2010).¹¹ It is also here where historians could apply their case related knowledge for the appropriate use of tie weights, e.g. in the selection of relevant events in two-mode data. For the present case of the societates register, the application of monetary values as tie weights would be a logical next step due to the focus on capital distribution of preceding economic historians (Sprandel 2003).¹² While monetary values could potentially explain distrust among partners, it is striking that this official recording practice attracted many traders from the same families. It seems plausible to understand this pattern not as a lack of trust among family members, but rather due to the fact that these worked with non-family members in larger partnerships.¹³ Triadic patterns of interactions or even larger constellations in the context of partner selection of nodal attributes offer a potential for new research. Most studies of partner selection from sociology focus on dyadic mechanisms (Rivera et al. 2010).

To conclude this article, a few simple steps for starting a new historical network project can be pointed out. Begin with a detailed look at the data from the historical case of interest to see what is available, how systematic it is, and then think about what can be done with it.¹⁴ Scholars who are not tied to a particular case may be encouraged to search for data that is as complete as

¹¹ For an application of weighted ties in the context of the medieval Hansa and the early diffusion of Protestantism see: Wurpts, Corcoran, and Pfaff (2018).

¹² Due to space limitations these analyses cannot be presented in this paper.

¹³ For a discussion of more reasons why medieval traders used official recording procedures see: van Doosselaere (2009:103).

¹⁴ Here I want to thank Prof. Henning Hillmann for some general remarks made in correspondence when I was developing one of my studies. Also, a helpful introduction for the planning stage of network research is: Robins (2015).

possible and includes various types of social relations as well as information about the attributes of individuals. Other scholars tied to a particular case may think about which types of relations can be identified in their historical documents and whether attributes of individuals are available. Alternatively, which different types of meanings can the ties in the data have and which structures can be expected for these in a given period? In an exploratory stage, scholars may look for interesting patterns on various levels of analysis (individual, group, or total network). Do the observed network patterns support or contradict existent histories or can these be specified? If the data is subset into multiple periods, are there changes in the observed patterns? Does the pattern historians have found stay the same if the split in periods is changed? Does the data allow an annual split rather than larger periods?

After data exploration and ideally the identification of an analytically or historically interesting pattern, researchers may continue by making sure findings are reliable. Network scholars need to make sure that observed patterns deviate from what could be expected by chance. Visualizations may conceal or overemphasize patterns which could be supported by descriptive and multivariate statistics. Statistical models as those described in the selected best practice studies section are a good way to handle this and may account for alternative explanatory factors and confounding. A threat to most network arguments and scholars is the structure vs. agency question. Network arguments may address whether the observed structural patterns are caused by individual attributes. The mere partitioning of networks into periods may also have an impact on the results. Detailed knowledge about cases is mandatory for carrying out historical network research not only to make decisions about meanings of ties or their duration but also to take into account and interpret other exogenous factors. The aim of a network based study, however, should be to identify

interesting endogenous, relational structures and processes that matter in the economy. Social network analysis offers new opportunities to economic history to find these patterns.

Chapter 3.

NETWORK COPING AND INSTITUTIONAL EMERGENCE: THE BLACK DEATH AND THE EMERGENCE OF THE MEDIEVAL HANSA, 1358

3.1 INTRODUCTION

While social networks have been discovered as important agents in endogenous institutional change (e.g. Padgett and Ansell 1993, Padgett and McLean 2006, Hillmann 2008, Padgett and Powell 2012, Nee and Opper 2015, Lazega, Quintane, and Casenaz 2017, DellaPosta, Nee, and Opper 2017), there is only few research on network responses to exogenous shocks during critical junctures¹⁵. While it can be argued that exogenous shocks themselves are not a novel field of study for scholars of emergence, we believe that previous studies do not really study truly exogenous factors. In a recent overview Johnson and Powell (2017:180) state that studies on “emergence of novelty” consider “social upheavals, technological disruptions, and regulatory change [that] can disturb the status quo and signal opportunities for new practices and new organizations”, however, we doubt that these are truly exogenous factors as all of these are man-made and a product of potentially “poised” social contexts. We study the emergence of the medieval Hansa (Hanse, or Hanseatic League), one of the most important, durable, and perplexing institutions in the history of Europe after one of the most deadly events in human history, the Black Death (Great Mortality) in the 14th century.

¹⁵ Critical junctures have been popular in comparative-historical analysis of path-dependent institutions with analytical focuses on “decisions and choices of key actors” during comparatively short extents of time and the “selection of one institutional solution over others that were available during the critical juncture” (Capoccia 2015:150).

While Italy was the leading trade center in Southern Europe through the 16th century, the Hansa was preeminent in the North (Mikl-Horke 1999:234). Both a trade network and a political entity that dominated the political economy of Northern Europe for several centuries, the Hansa never consolidated into a state.¹⁶ We consider a critical period in the Hansa's history, namely the emergence of formalized meetings called Hansa Diets (Hansetage or Tagfahrten). These meetings began in 1356-1358, and brought together delegates from towns across the Northern regions of the Holy Roman Empire to discuss issues of both economic and political nature. In the absence of a powerful government, the diets served as a coordinating arm of Hansa trade, facilitating conflict management and cooperation, market development and standardization as well as the exercise of military and political power in the Baltic and North Sea region (Weber 1927/81, Dollinger 1989, Pearson 1991:76, Spruyt 1994, Pichierri 2000, Greif 2006, Hammel-Kiesow 2008a, Selzer 2010, Jenks 2013, Wubs-Mrozewicz 2017).

Prior to the beginning of the diets, the Hansa had been primarily a reciprocal trading network, maintained through the existence of established trading centers in foreign cities. Certainly a few political events happened before regular diets were established, mostly in the form of boycotts and blockade of ports. But it was not until the Black Death hit Europe that trade and politics began to be deeply intertwined in the activities of the Hansa (see Figure 4). Thus, an existing and reasonably stable trade network developed a fundamentally new organizational form

¹⁶ Historians have argued about what the Hansa was for decades or even centuries now. Characterizations vary on a continuum ranging from purely economic considerations of the Hansa as a decentralized trade network (i.e. Ewert and Selzer 2007, von Brandt 1963, Rörig 1933) to hierarchical, political conceptualizations of the Hansa as a state alternative (Spruyt 1994, Wernicke 1983, Zimmern 1889, Koppmann 1870). Hammel-Kiesow (2008a:10) introduces a broad definition: The medieval Hansa was an organization of Low German long-distance traders and about 70 large and 100 to 130 small towns in which these merchants had citizenship. Goals of this organization were economic (promote trade) and political (mutual support and protection). Elsewhere the Hanseatic League was defined as a virtual organization which aimed to generate real capital using social capital. Hansa traders completing trade activities over sea and land formed social ties and networks. The underlying principles were "trust, mutual reciprocity and norms of action" (Molgaard and Goldback 2007:310 cite Onyx and Bullen 1997).

within a period of only a decade or so. In this paper, we ask, what caused the emergence of this new form of Hansa governance, and why did it occur at this point in time? The answer, we claim, can be found in dramatic changes in the networks of agency relations involving property regulation, changes triggered – demographically and spiritually – by the outbreaks of Black Death that struck Northern Europe.

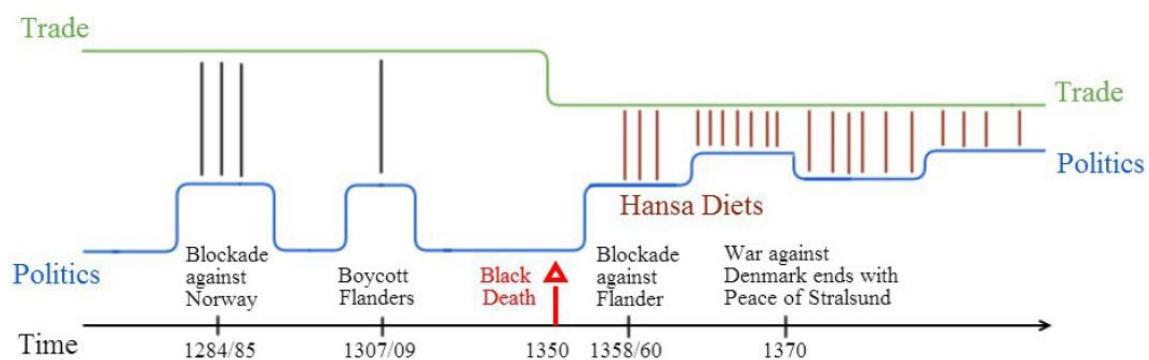


Figure 4. Crucial economic and political events in the Hansa region, 1280 - 1400.

While the Black Death has been described by economists, historians, and historical sociologists as one of the main causes of social changes in Europe between 1300 and 1600 (Brenner 1976, Gottfried 1983, Epstein 2000a, Cantor 2001, Borsch 2005, Pamuk 2007, Lachmann 2013:16-30 for an overview, Jedwab, Johnson, and Koyama 2016), detailed explanations of how the plague may have changed formal institutions are exceedingly rare. We are surprised that the temporal coincidence of the Black Death and the first Hansa Diet has not led others to investigate the claim that the emergence of the Hansa may have been related to the plague’s consequences on social structure.

We evaluate our argument empirically by providing several layers of evidence and establish causality by triangulation (“detective work”, see Padgett 2011:469). Central to our

analysis is the search for the process that generated Hansa emergence by reflecting on changes in the network of ties among elites and non-elites before, during, and after the plague (Padgett and Powell 2012). We begin our investigation with a comparison of medieval long-distance trade in Northern Europe and the Italian city-states, focusing on crucial institutional differences related to the legal regulation of property transfer and levels of cooperation between these in many regards similar cases, e.g. maritime societies (Lenski 1966:191). We then adopt a case-within-case design (Gerring 2007) and examine changes in network structure in the town of Lübeck, a crucial node in the Hansa trade network and the central site for Hansa politics (Jenks 1992). Using both process tracing (George and Bennet 2005) and the tools of social network analysis (Wasserman and Faust 1994), we discover a remarkable change in the overall connectivity in the network produced by last wills and testaments after the plague in Northern Germany. Statistical analysis of the population of Lübeck's city councilors reveals that those most deeply embedded in the network of executors were most likely to be involved in the formation of this new organizational form.

Thus, our analyses suggest that the plague may indeed have contributed to the emergence of the Hansa, but in complex ways. Rather than simply causing a replacement of traders and political elites, we provide multiple strands of evidence that the plague-related explosion of wills increased the connectivity within and between Hansa towns and served to increase Lübeckians' awareness of others' property. We suspect that the increase in network connectivity, e.g. horizontal and hierarchical ties linking regions and local trade groups, combined with increased reciprocal relations, triggered new collaborations around conflict management and regulation of trade. Unlike in Italy, where execution of wills was private and professionalized, the plague created new combinations of roles for Northern German elites, allowing the recombination of logics from existing political practices with practices from the legal domain.

Our account of how the Hansa emerged combines various strands of network theories of innovation and invention (e.g. Burt 2005, Vedres and Stark 2010, Padgett and Powell 2012) and points to a new micro-mechanism: network coping. We offer an alternative explanation to prominent accounts of institutional change in economics and economic history (e.g. North and Thomas 1973, Greif 2006).

3.2 THEORY

3.2.1 *New Institutional Economics: “why” institutions emerge*

As somewhat customary in economic sociology, our theoretical overview starts with a look at relevant accounts of institutional emergence in economics (Granovetter 1985, Beckert 1996). Important contributions have been made in so-called “new institutional economics” which adapts neoclassical economic theory and tries to explain economic behavior as constrained by actual institutions (Coase 1984, Nee 2005:49f). In new institutional economics, institutions promote exchange and can be considered as preconditions of markets (Quack 2009:127). The general logic of many studies is that institutions come into being as efficient answers to economic problems.

In a foundational work, North and Thomas (1973) claim that the primary motor of institutional innovation between 900 and 1700 was the external factor population growth. The key term “institutions” means property rights so that the focus is on legal arrangements in economic development. According to North and Thomas’ model, the most efficient institutions are selected out of a set of suitable institutional arrangements. For our period of interest they claim that population growth up to the peak in the 13th century led to advancements in institutions and positive economic development. In the following 14-15th century population decline caused a regression in institutions, thus hampering overall growth. In North and Thomas’s view, a primary example is the medieval Hansa:

“While the bonds of manorialism were dissolving in the countryside, the same force of declining population was adversely affecting trade and commerce. Contracting markets lessened the incentive to reduce market imperfections. With the exception of Italian banking, where the great Medici bank in Florence was flourishing, the institutional arrangements now being devised were more ‘defensive’ in nature, designed chiefly to maintain existing markets, to monopolize trade, and to prevent entry (and competition). The Hanseatic League appears to have been such a defensive arrangement on an institutional level and the rise of craft guilds in towns reflected the same trend locally.” (North and Thomas 1973:13)

North’s (1981) property rights approach brings in information costs, transaction costs, costs related to contract enforcement, and uncertainty into neoclassical analysis. The central figure of analysis is the ruler (or state) who defines the rules that regulate competition and cooperation (North 1981, see also Nee 2005:59) and can intervene in how efficient the economy works.

Economic institutions are further distinguished in North (1990) as “rules of the game” and man-made “constraints that shape human interaction”. Constraints can either be “formal” rules or “informal” norms and conventions. An important function of institutions is to provide a basis for trade through stable reductions in transaction costs. Institutional change in North's view happens slowly and incrementally. However, small events may have big path-dependent consequences when they lead entrepreneurs to lock-in on a new institutional trajectory. While changes in tastes may be important for institutional change, main drivers of change are adjustments of entrepreneurs to changes in relative prices. Traditional institutions will develop into lower cost institutions when the incentives for innovation are given.

Another central line of research on the origins of market-supporting institutions in economics is the research of Avner Greif. In his dissertation work Greif (1989) studied a group of Jewish traders called Maghribi who were engaged in the risky business of long-distance trade

during the 11th century.¹⁷ The system that developed to organize the distribution and marketing of goods was through flexible “agency relations” in which merchants (principals) worked with multiple traders (agents) who were selling goods on their behalf. Agency relations decreased the costs of exchange by diversifying risks, made profits from the competence of the agent and by switching exchange traversing places, merchandise and time.

A problem inherent in agency relations is that there are often strong information asymmetries between principals and agents and that agents have incentives to be dishonest.¹⁸ Agency relations depend upon trust between principal and agents which can be provided via selection, monitoring and sanctioning. Maghribi merchants sent correspondence letters across places with trade related information and selected only traders from the same group as agents. They acted collectively to cease commercial relations with traders who were dishonest. Thus, an important aspect in the organization of early trade was trust and this could be provided via reputation mechanisms in networks of traders.¹⁹

Greif (1994) emphasizes cultural beliefs and suggests that cultural differences, e.g. individualist vs. collectivist orientations in societies, affect types of prevalent economic institutions, e.g. for the enforcement of commitment in principal-agent relations. Societies with collectivist beliefs such as the previously mentioned Maghribi merchants from the Middle Ages, preferred to do business with each other through informal contracts secured by collective enforcement via information sharing in social networks. On the other hand, more individualistic

¹⁷ The Maghribi traded by boats and caravans from North Africa across the Mediterranean and many aspects of trade such as sales prices and dates were unknown, many goods did not survive the voyages or were often damaged in transit, and there were always opportunities for theft and stealing by captain or crew.

¹⁸ For instance, an agent could make profits on goods by selling for high prices in a distant market and then not transfer these profits to the principal by reporting lower sales prices.

¹⁹ Max Weber (1954/1980:372) already pointed that “[m]uch of the system of commodity exchange, in primitive as well as in technically differentiated patterns of trade, is possible only on the basis of far-reaching personal confidence and trust in the loyalty of others. Moreover, as commodity exchange increases in importance, the need in legal practice to guarantee or secure trustworthy conduct becomes proportionally greater.”

Genoese long-distance traders relied mostly on formal contracts and contract enforcement through legal systems. Differences in economic institutions between Genoese and Maghribi traders are explained by their differences in cultural beliefs which may promote different patterns of endogenous institutional developments and these depend on societal organization such as the predominance of horizontal ties (Maghribi) vs. vertical relationships (Genoese).²⁰

While endogenous factors gained much attention in research on institutional development, other important research underlines exogenous aspects. La Porta et al. (1997, 1998, 2008) claim that legal institutions are key for evolving financial markets due to their variation in capacities to protect investors. Former colonies with a tradition of British common law had better legal protection of investors compared to countries who inherited Roman law or French civil law from their colonizers.

Finally, economists Dimico et al. (2017) find that new inefficient (harmful) institutions may emerge due to exogenous shocks to markets in adverse institutional environments. Exogenous shocks were likely central for the emergence of the notorious Sicilian Mafia in the 19th century. The authors find that discovery of citrus as an effective medication increased the demand for lemons and revenues for Sicilian towns who were already dominant in international citrus fruits markets. “The extraordinary revenues that certain producers received, combined with the general political insecurity and weak rule of law, provided an ideal breeding ground for the emergence of a mafia that provided protection and acted as intermediaries.” (Dimico et al. 2017:1113)

²⁰ Economic historian Goldberg (2012:357f.) argues against Greif that “it is impossible to argue that the Italians in general, or the Genoese in particular, had a stronger preference for institutionalized trust and for securing contracts through a legal system than did Islamic or Jewish players.” In support of economic historians Lopez and Lane who studied Genoa and Venice, Goldberg finds in her study of Geniza merchants that the control of the state and the control of violence was the main difference between Islamic and Italian traders in the 11th and 12th century, and not differences in use of contracts and legal systems (ibid:358f.)

3.2.2 *Sociology: “why” and “how” institutions emerge*

Alternatives to economic accounts of institutions are important as explanations in economics do not successfully answer how new institutions emerge. For instance, “North takes up the question of the emergence of institutions from a functionalist perspective: institutions are brought into being “in order to reduce uncertainty,” that is, to make agents’ worlds predictable enough to afford recognizable opportunities for effective action.” (Arthur, Durlauf and Lane 1997/2015:100) The same functionalist logic has been applied to the Hansa case. Political scientist Spruyt (1994:109) regards the Hansa as a “confederation of towns” and claims that it “emerged as an alternative institutional solution to the sovereign state.”²¹

Sociologists have developed alternative theoretical approaches such as the “political construction” approach (Bartley 2007). In this approach institutions are regarded as settlements of conflicts among actors. Institutions are results of processes of negotiation and institutional entrepreneurs “build” institutions (DiMaggio 1988), an idea that was recently incorporated by network scholars such as Lazega et al. (2017, see below). As we have seen, this paper uses a network approach for analyzing institutional emergence. Exogenous shocks as catalysts of institutional change have been emphasized by historical institutionalists (e.g. Thelen 2003, Pierson 2004), but did not gain much attention from network scholars of institutional emergence.

The explanation of variation in macro-level arrangements and structures via social mechanisms has been at the core of analytical sociology (Hedström and Bearman 2009). Our study aims to add to the literature of networks as agents of macrosocial change by combining approaches focusing on cohesion, brokerage and cross-cutting networks with more recent literature on

²¹ See also a critique of functionalism in economic history by Padgett and McLean as described in chapter 2, section 2.1.

institutional emergence (see Erikson 2017 for an overview). By combining these literatures, we are able to specify a new micro-mechanism for institutional change that points to the qualities of social responses after exogenous shocks: network coping.

Brokerage, cohesion, and cross-cutting ties. Network theorists have spent much effort to specify the structural conditions of successful organization, innovation and invention as well as clarifying the underlying mechanisms. Burt (2005) sorts some relevant cases of successful institutions into his framework of closure and brokerage.²² For example, Greif's Maghribi traders are important examples of social capital (that means trust and cooperation) produced by network closure. Network closure is a function of the numbers of contacts, the numbers of connections between contacts, or a central person connecting contacts indirectly (ibidem:26). Hierarchy plays likely a more prevalent role than density to construct closure, according to Burt (2005:139f.). As one source of evidence he points to Greif's observation that sanctioning of Maghribi traders was not done through dense networks with other traders but through public appeals to the religious communities they were embedded in.

A central claim in Burt's work is that performances, e.g. innovation or compensation, are maximized for combinations of high closure and high brokerage. Again, he cites Greif's Maghribi traders as an example of a "cohesive group with diverse external contacts" and points to the fact that traders were located in different cities. He calls that a "structurally autonomous group" which means that individuals are strongly connected and have far-reaching bridge relations. The group is characterized by "a strong reputation mechanism aligning people inside the group, and a strong vision advantage from brokerage outside the group." (Burt 2005:141)

²² Brokerage is discussed in chapter 2, section 2.3.1. Brokerage is also discussed in chapter 4, section 4.1.1.

Another example of a structurally autonomous group Burt cites is a set of delegates from leading prominent institutions in Northern Italy's "civic" communities, our comparative case. Putnam (1993) finds better local government in the Northern "civic" regions of Italy compared to "uncivic" Southern regions and considers this as a result of differences in "social capital". Social capital is important for the coordination of actions and means trust, norms and networks as features of social organization. Putnam finds that civic regions have more voluntary associations, engagement in community issues and clubs and have more trust and law obedience. Political participation is much higher in civic regions compared to uncivic regions where few people engage in associations, corruption is widely spread and social order is weak.

A structural feature of the civic regions is that they are characterized by horizontal ties whereas uncivic regions include more vertical ties, e.g. organized hierarchically. Thus, closure exists in civic regions and increases cooperation through reputation mechanisms. "Dense networks increase the potential costs to a defector in any individual transaction, foster norms of reciprocity, improve the flow of information about trustworthiness of individuals, and embody past collaborative success that can serve as a template for future collaboration." (Putnam 1993:173-174, cited from Burt 2005:130).²³

Another important study from historical sociology highlights the role of multiple networks for collective action. Gould (1995, 1991) investigates an urban revolt, the Paris Commune 1871, and finds that these events followed principles of Paris neighborhood organization and identity. Hostile acts by the government led to revolt as a collective response in which neighborhood

²³ The literature on brokerage and closure relates to important comparative cases for this study, though some of its findings seem contradictory. How can it be that Greif's work posits more formal contracting in Genoa is a consequence of vertical ties, however, Putnam argues that Northern regions in Italy were characterized by horizontal ties? One reason could be Putnam's emphasis on politics rather than economics which is what Greif studies. It doesn't seem like Putnam considers the economic organization in the Northern towns.

identities were salient. Mobilization resulted from the joint influence of informal networks from neighborhoods and formal networks established by military organizations as these contributed to solidarity and commitment in the social movement. According to Gould, short-term events may lead to collective action by mobilizing networks, arranging interests, and framing controversies. Gould (1991:728) hypothesizes that solidarity and commitment are greatest when groups are mobilized “in ways that largely follow the contours of indigenous social structure but also generates some interaction across pre-existing boundaries”. Gould’s scenario somewhat resembles Burt’s ideal type of a structurally autonomous group, but with the additional distinction of formal and informal ties (multiple networks). An important take-away is that short-term events may have an impact on more than one network which in turn may have consequences for group outcomes such as collective action.

Network innovation and emergence. The impact of external events on networks is further examined by Uzzi and Spiro (2005). Their context of study is the Broadway musical industry in which the authors study creative success of musical production teams based on the network structure of creative artists. The authors look at small world network structures of collaborations and analyze their effects on success and creativity.²⁴ What makes this study somewhat interesting for our context is that an external shock, upcoming Hollywood and television, was disruptive to the collaboration networks of the musical industry. Thus, this study marks one of the few network studies underlining historical impacts on networks and the related uncertainties of building

²⁴ Small worlds are highly locally clustered and at the same time show short path length. Thus, small worlds show high connectivity between actors and these actors tend to know each other well through past collaborations or shared third parties. Uzzi and Spiro (2005) expect and find that the small worlds may positively impact the circulation of creative materials between clusters and give credibility and value to new material in new contexts, however this works up to a certain threshold only as networks may become a liability when the material becomes more homogeneous with increasing connectivity and more cohesiveness leads to the sharing of more common rather than new information.

network ties. Uzzi and Spiro (2005:497) conclude that “the rising uncertainty in partnering and network building experienced by creative artists instigated a rise in the propensity of artists to form random links.” As a response to network uncertainty, the findings somewhat contradict the classical expectation that actors would tend to connect with strong ties (Granovetter 1985), results indicate the opposite.

It follows from these studies that social network structure is an important source for institutional developments (see also Hillmann 2013 for a review). Network structures may affect how ideas can be imported and implemented and thereby contribute to innovations. A recent extension by Vedres and Stark (2010) focuses on the generation of knowledge using a different perspective of recombination. Building on Simmel's and Schumpeter's work, Vedres and Stark claim that truly new ideas are not flowing around outside of groups but need to be generated. Their central argument is “that entrepreneurship in the business-group context is driven by the intersection of cohesive groups where actors have *familiar* access to *diverse* resources for recombination.” (Stark and Vedres 2010:1151) Their concept of “intercohesion” points to the importance of overlaps of cohesive network structures or locations in which structures fold together. A structural fold clarifies the structural underpinnings of innovation in the sense of recombination. Familiarity and diversity for access and action might be achieved via intercohesion – instead of brokerage and closure – which refers to memberships in multiple cohesive groups. Stark and Vedres expect that intercohesion would lead to better performance for business groups. But they also assume that this leads to instability which then might affect creative destruction. Members leave groups and become available again later which then builds a source for recombination.

A network theory that has been specifically developed to explain the emergence of markets and organizations is the groundbreaking work by Padgett and McLean (2006) which is somewhat repeated in Chapter 6 of Padgett and Powell (2012) from which we report here. Padgett studies the emergence of a new organizational form in history of financial capitalism: the partnership system in which a single controlling partner made a set of legally separate partnership contracts with branch managers in different locations or industries. The network explanation of emergence includes three steps 1) transposition, 2) refunctionality, and 3) catalysis (see Padgett 2012:178ff.). Transposition refers to the transfer or intersection of roles across domains. Bankruptcies, plague etc. in 14th century Florence brought an infusion of new men resulting into political struggles and co-optation of (cambio) bankers into high political office (city council). This biographical transposition led to organizational refunctionality, the perception of new purposes for old practices and tools, e.g. bankers brought master-apprentice logic of contracts and careers with them, and adapted these to new international trading setting (Padgett 2012:181, 186). For novel innovation to become transformative invention: the same political process that induced organizational innovation also rewired social embedding of partnership into surrounding networks, thereby altering contextual feedbacks that reproduced that invention (188). Catalysis refers to the restructuring of elites: the medieval dominance of father-son relations became supplemented/supplanted by Renaissance economic relations between in laws increasing social embeddedness of economic partnership in marriage (191).

A more individualistic network theory of institutional emergence has been proposed by Nee and Opper (2015) who underline the importance of multiplex social relations for endogenous institutional change. The authors take a rational choice perspective and point to the importance of social exchange in spatial proximity and close-knit cluster structures for the emergence of private

manufacturing economy in China. Nee and Oppen compare two regions in contemporary China. The regions that adopted capitalism first were those in which governmental restrictions were low and incentives for new capitalist business were highest. DellaPosta, Nee, and Oppen (2017) attack economic theories and criticize important contributors in institutional economics who are skeptical of endogenous institutional change from below. They disagree with North (1981) who emphasizes free-rider problems and states (or rulers) as only drivers of change as well as Greif (2006) who emphasizes cultural beliefs adapted to political contexts that prevent change at the micro-level. Instead, the sociologists “argue that bottom-up institutional change emerges from an interplay between these factors: the utility gain associated with decoupling from institutional equilibria, proximity of individual actors with other potential deviators over local and regional spaces, and expected sanctions the state will pursue in defense of an existing order” (DellaPosta, Nee and Oppen 2017:37f.).

Another recent contribution to the network literature on institutional emergence looks at patterns of tie formation. Lazega et al. (2017) study the construction of the Unified Patent Court, a new institution for the transnational regulation of intellectual property in Europe. In this research, social networks are observed in various types of interactions between judges representing different countries and legal cultures at the moment of an institution building event, the Venice Forum. Lazega et al. analyze networks of institutional entrepreneurs using exponential random graph models and find a “collegial oligarchy” as key for institutional framing. The authors underline the importance of leadership selection for consensus building as well as normative alignments regarding the decisions of this oligarchy. Thus, institution building is conducted by elites but a complex network process at the same time.

Synthesis of literature and unique contribution. The previous literature suggests that network locations and structures may be important preconditions for innovation as these may be important channels of information and promote implementation. Similarly, social networks may contribute to the recombination of existent ideas or the repurposing of tools and practices across domains. The expectation of sanctions and establishments of consensus are further important mechanisms in institutional change and institutional emergence. External events may affect group solidarity and commitment, change patterns of tie formation and innovative success.

Padgett (2012:115) states that “foundational organizational inventions in early capitalism and in European state formation were intimately related” and that the “causal engine for emergence always is feedback between politics and economics”. Our analyses extend this argument in two ways. First, we bring in the sphere of law (and religion). Second, while Padgett considers war as a necessary but not sufficient condition for restructuring reproductive networks, our focus is on an alternative external shock, the plague as an important disruptor that loosened up medieval systems. Another extension we make to the recent literature on the emergence of organizations by Padgett and Powell (2012) is that we offer an additional micro-level mechanism of institutional emergence: network coping. Networks respond to external shocks and may contribute to the establishment of network conditions for innovation and cooperation by 1) generating horizontal ties between organizations across regions and vertical ties within towns, 2) producing information flows across local trade groups and mutual awareness of uncertainties in property transfers, and 3) new recombinations of practices across network domains as emphasized by small group rituals.

Our focus is on agency relations (or relational instruments) that have been considered as important economic institutions that can rely on different structures of social organization. While previous studies focus on the embeddedness of agency relations (e.g. Greif 2006), our paper

underlines that different social structures can result from agency relations (see also Erikson and Bearman 2006). We offer a case study in which agency ties aggregate into small collaborative groups of “executor gemeinschaften” established in medieval Northern European last wills and testaments. These reproductive groups acted locally and supra-locally and were embedded in hierarchies of town councils witnessing will making and handling cross regional property claims. The context in which these groups were established, the Black Death, likely generated sufficient emotional energy for group solidarity and a shared focus on the administration of property transfer large numbers of group rituals (Collins 2005).

We hypothesize that particularly political elites embedded in “interaction ritual networks” - repeated participation in distinct will making rituals - were more likely to become institutional entrepreneurs compared to others with less attention on legal matters of property regulation. External shocks may generate the ideal network structures for emergence by folding network domains in a short amount of time. Actors located at the intersection of multiple network clusters of coping are more likely to recombine established practices than others. The recombination of practices seems particularly fruitful for new challenges actors face after exogenous shocks. We prefer the recombination terminology over the repurposing as it allows the merging of practices from distinct domains rather than the one-side import of practices from one domain into another. Thus, in many ways we follow Schumpeter (1934:14) who said that “it is always a question of changing the existing state of satisfaction of our wants, of changing the reciprocal relations of things and forces, of uniting some and disconnecting others. Technologically as well as economically considered, to produce means to combine the things and forces within our reach.”

3.3 HISTORICAL BACKGROUND

3.3.1 *Medieval Hansa Trade*

During the Middle Ages much of Europe fell under the rule of the Holy Roman Empire (hereafter HRE), which was composed of a mishmash of dynastic and ecclesiastical territories. Though the HRE was territorially large, it was internally split into a number of feudal states, and imperial control was extremely weak. Merchants who sought to engage in long-distance trade were largely left alone by their local lords and had little central support in their dealings with capricious foreign kings or attacks by pirates. Against this background, during the 13th century northern German traders from towns including Hamburg and Lübeck formed a loose commercial network of Baltic and North Sea trading stations that enjoyed special trading privileges. Exploiting interregional price differences, these merchants primarily traded commodity goods like grain and herring, but also luxuries like furs and cloth.

While the earliest Hansa trade was characterized by traders travelling in convoys with their goods and relying on other traders (their Hansa or Hanse) for mutual protection in insecure waters and foreign trade ports (Friedland 1991:21, Weber 1981:213), regular interregional trade developed in the late 13th century (Hybel 2002) and Hansa merchants stopped traveling with their goods, instead working with younger Hansards living in foreign ports who acted on their behalf (Ewert and Sunder 2011:3).²⁵ Nevertheless, long-distance Hansa trade involved joint efforts by trading partners who invested in goods and arranged voyages. Typically Hansa merchants had multiple trade partnerships, many of which lasted for decades (Ewert and Selzer 2007:50) and

²⁵ The transition from itinerant to sedentary merchant in the late 13th century did not just happen in the case of Hansa merchants. Similarly Italian merchants organized their business from headquarters in Lombardy or Tuscany and created branches in towns like Bruges or London. There is a debate whether more efficient business organization (e.g. de Roover) caused this change or the need to protect interests in Italian cities that were in turmoil due to factional struggles (see Hunt and Murray 1999).

were reinforced by kinship, marriage, and friendship (Selzer and Ewert 2001:144, Wurpts 2018). Thus, by the early fourteenth century the Hansa was a large and highly decentralized web of bilateral trade relations that linked ports in Northern Europe into a small world (Ewert and Selzer 2007:52, Watts 1999).

Befitting its decentralized structure, this early trading network had no central governing body. Nevertheless, these early merchants and their partners engaged in some recognizable collective actions. For instance, many of the trading towns in the North Sea and Baltic region participated in a war against Denmark in 1227 (Pichierri 2000:26), while the first “Hansa-like” coordination of Low-German speaking merchants was their successful effort to move their trade place (Kontor) in Flanders to Aardenburg in 1280. In 1284, a group of Wendish towns including Lübeck started an effective blockade of grain exports against hunger-struck Norway in an attempt to gain trade privileges there (Hybel 2002:226f., see also Friedland 1991:64).

The fact that merchants could not directly oversee their agents on the route suggests to some scholars that the Hansards should suffer from the well-known principal-agent problem studied extensively by Greif (2006) and others. Among the benefits and long-term consequences of the overall Hansa trade network were significant reductions in transaction, information, and organization costs, as well as solutions to problems of adverse selection and moral hazard related to principal-agent relationships (North 1981, North 1990, Selzer and Ewert 2001, Greif 2006, Ewert and Selzer 2015:190). However, as Jenks has argued,²⁶ agency problems were not actually all that acute in the Hansa network, since commercial apprenticeships, the web of trade

²⁶ While much previous work emphasizes reputation and sanctions as important *ex ante* mechanisms solving commitment problems, Jenks (2013:201) argues that these theories are one-sided when they assert that “private-order and public-order institutions exist solely to sanction malfeasance.”

partnerships, and the transparency of trade all offered positive incentives for agents viz. principals (Jenks 2013:203ff.).

While 14th century trade practices in the North Sea and Baltic region were legally similar to other European trading regions (Hammel-Kiesow 2008b:241), the Hansa differed from the highly developed Italian trade in several critical respects. First, unlike other merchant groups, the Hansa traders exhibited high levels of cooperation and solidarity that transcended their towns of origin. While economic historians debate whether the early Hansa was an efficient institution that promoted economic growth in pre-industrial Northern Europe (Friedland 1991:77, Greif, Milgrom, and Weingast 1994, Greif 2006, Wubs-Mrozewicz 2017) or an inefficient system of exchange (Weber 1927/1981:216, 234f., North and Thomas 1973:13, Ogilvie 2011:418), most historians agree that the relational basis of Hansa trade was not simply a social component that supported economic activity, but rather the core principle of Hansa trade itself.

Thus, while Italian merchants frequently squabbled and fought, there is little evidence of intra-Hansa conflict (Pichierri 2000:63), even during the early period before the diets facilitated conflict management, coordination and collective action.²⁷ This cooperative spirit in the north was likely facilitated by a rough shared climate which made traders more vulnerable at sea and lower overall profit margins keeping inequality relatively low (e.g. Spruyt 1994). Classical distinctions describing Mediterranean trade as luxury trade and Baltic and North Sea trade as bulk trade are likely too simplistic (e.g. Postan 1973:93, Tarrow 2004:453) or a matter of definition as some social strata relied on many goods for a mannerly urban life (Goldberg 2012:21). Types of luxuries

²⁷ Lack of conflict extended to relations between the Hansa towns, which were much more peaceful compared to late medieval Italian city-states with their frequent factional violence. Only the rise of powerful oligarchs stemmed the factional violence in towns such as Venice, Florence and Siena (Muir 2001:46) a level of local political control that never emerged in the Hansa towns.

were somewhat different and perhaps more profitable in the South and exchange practices potentially more modern than in the North. Italians had overall more resourceful exchange partners and were more likely to use physical force and conquest as means to generate wealth.²⁸ Further, Italian merchants from Genoa, Venice, and Florence each had their own foreign trading posts where they lived and interacted only with their own fellow citizens, whereas Hansards from throughout the North worked and lived together in Hansa “Kontore” (factories) in foreign ports, forging horizontal ties with other Hansards and laying the foundation for a shared identity.

Second whereas in the Italian city-states a professional class of notaries recorded private partnerships, account books, and other types of business contacts (Hammel-Kiesow 2008b:241; Epstein 1984:3), notaries were for the most part absent in the North until several centuries later. Rather than privately recording transactions with a notary, in the Hansa towns any transactions that were recorded to increase legal certainty were publicly registered in town halls by clerics or town councilors.²⁹ The absence of professional notaries exposed local elites in Northern regions to information about business affairs in a way that did not occur in the Southern regions.

3.3.2 *The Emergence of a Political Hansa*

In response to weak social order and high uncertainty, in the first half of the 13th century towns throughout the HRE began to unite to ensure mutual protection and safe passage over roads. Many regional unions and confederations of towns formed all across Germany in the following century, mainly to deliberate over matters of common interest in security, politics and economics (Johanek 2000:304). While some urban leagues (e.g. Swabish and Rhenish leagues) were effective at

²⁸ There were likely large and trade imbalances between Genoa and the Levant (Hunt and Murray 1999)

²⁹ There is evidence from Danzig, for instance, that public registration included many different types of agreements like trade records, authorizations, and last wills (Wubs-Mrozewicz 2017:76), similarly the town hall in Lübeck recorded trade between capital investors and traders (Wurpts 2018).

securing peace where local kings were weak, their short-term economic goals and inferior status (compared to the overlords of cities) precluded any efforts to form effective state-like institutions (Moraw 1989:644).

In the 14th century, a great famine and the Black Death contributed to widespread social, economic, and political instabilities throughout Northern Europe. The Golden Bull of 1356 forbade the formation of new city leagues. Even so, in 1358 the medieval Hansa (Hanse or Hanseatic League) started to form as a “confederation of mutual consent” (Wubs-Mrozewicz 2017:60) including towns engaged in the established trade routes around the Baltic and North Sea.³⁰ The first Hansa Diet took place in Lübeck on January 20, 1358, and included representatives from the towns Goslar, Hamburg, Rostock, Stralsund, Wismar, Brunswick, Thorn, and Elbing (Poeck 2010). While the Hansa included 52 cities by 1360 (Thompson 1931/1960:154), many more towns joined the alliance and the organization grew up to the middle of the 15th century, ultimately involving 200 trading towns from the Northern regions of the Holy Roman Empire which included areas of countries we know as Netherlands, Germany, Poland and the Baltic states.

Hansa Diets grafted a political body onto the existing supra-regional trade networks and established an institution of conflict management with additional legal capacities over foreign trade places. Through these diets and other coordinated activities with written procedures and increasing fixed recording practices, the medieval Hansa maintained a high degree of political power in support of its trade networks for over a century and a half and continued to exist until the last diet met in 1669. The Hansa Diets were the Hansa’s only long-lasting formal “institution”. Delegates (Rathssendeboten) to the diets were city council members and merchants from the cities and towns that made up the medieval Hansa. Delegates, who were often related to each other through family,

³⁰ It was in this early period of the diets, in the decade after the Black Death, that the name "Hansa" began to be used.

friendship, or commercial ties, represented the interests of their cities but also often pursued their own commercial interests (Poeck 2010:509f).

At the diets, delegates discussed strategies for the maintenance of Hansa privileges and how to control competitors, determined common political activities (e.g. negotiation, blockade, war), regulated trade, and established common standards. Hansa Diets offered opportunities for mediation and arbitration of conflicts among individual traders, as well as a platform to mediate conflicts between Hansa towns. Agreements between delegates were recorded in the increasingly institutionalized minutes, called *Hanserecesse* (Behrmann 2002). All decisions that were recorded were unanimous, and many decisions obligated cities or towns to contribute resources to support Hansa activities. Hansa Diets resembled a parliamentary convention that asserted control and legal authority over the *Kontore* (Fink 2011:177), however, the Hansa lacked capacities to enforce their policies in non-participating towns.

As an alliance of towns, the Hansa could not easily be classified by Roman law (which caused repeated conflicts with foreign authorities, e.g. about liabilities (Cordes 2004). Compared with all other traditional associations and urban leagues in medieval Europe, the Hanseatic League was unique in terms of its political and economic power. Some scholars classified the alliance as a state alternative (Spruyt 1994) or a state of towns (Pichierri 2000); regardless, the Hansa was unique in that it was a leaderless (quasi-)formal institution that survived for over three centuries (from 1358-1669).

3.3.3 *Accounts of Institutional Emergence*

We are particularly interested in the transformation process of the Hansa from a network of merchants into a persistent political alliance. Most historians agree that the formation of an effective political coalition was inexorably linked to the establishment of Hansa Diets beginning

in Lübeck in 1358 (Selzer 2010:51). The Hanseatic political alliance is critical because it enhanced the levels of solidarity and helped resolve conflicts among Hanse merchants from different Hanse towns (Hammel-Kiesow 2008a, Selzer 2010, Wubs-Mrozewicz 2017) and thereby further strengthened the network of trade. But while the Hansa became a strong and durable state substitute, arguably better organized confederations of towns in southern Germany failed to create a durable trading group (Johanek 2000:305), and though the northern Italian city leagues enjoyed military and economic benefits, they also never consolidated to protect trade (Epstein 2000b).³¹ Thus, we are left to ask, what caused this dramatic change in organizational form, at this moment in this place?

Temporally, the first Hansa Diets took place in the context of disputes about property involved in foreign trade. Confiscation of merchants' property in foreign lands was a widespread problem during this period, and Hansic traders had previously tried to respond with various blockades against foreign towns. In 1351, disputes in Flanders between Hansa merchants and English merchants resulted in confiscation of goods in England (*Versammlung zu Lübeck. – 1352 Jan. 6*; Koppmann 1870, HR:61). Collective punishments by the English king caused grievances among Hansards who sought compensation from the king of Flanders (who had punished English merchants for their disputes with the Germans, thereby causing the actions of the English king) (Selzer 2010:46). The general situation was discussed at the first diet in Lübeck in 1356/1358 and the delegates decided to embark on their third blockade against Flanders. During this embargo the Hansards moved their Flemish Kontor to Dordrecht, located on the territory of the HRE, (likely)

³¹ Friendly relations between Italian city-states before 1200 ended when expansionists reached the borders of their former allies. Northern Italy had ca. 300 city-states in the twelfth century, most of which were consumed by larger city-states such as Florence, Milan or Venice by the fourteenth century (Epstein 2000b, see also Mikl-Horke 1999:213f.). As Epstein puts it, “Contrary to Romantic imagination the most famous of these associations, the Lombard League, first established to resist Frederick I and later resurrected against Frederick II, was never meant to be a stable federation of independent city-states like the north European Hansa; it was simply a military alliance [...]” (Epstein 2000b:283).

with the aim to pressure the count of Flanders for better trade privileges (Friedland 1991:142, Noodt 2000:154, Ewert and Sunder 2011:13); this tactic was successful and resulted in new trade privileges for Hansards in Bruges, Flanders.

Economic historians have generally interpreted the emergence of the Hansa as an example of coordination in response to threats to common trading interests. Greif's classic explanation (2006) highlights the demands for security to support trade:

It was not until the middle of the [fourteenth] century, when the cost of providing security around Bruges rose drastically, that a new level of cooperation among German towns was needed to force Bruges to provide the security required to support efficient trade. The Hansa's relations with Bruges deteriorated around 1350, mainly because Bruges was not ready to compensate the Germans for their damages in Flanders from the war between England and France. The Hansa responded by strengthening its internal organization. In 1356 the German Hansa held its first Diet, which determined that the *Kontor* of Bruges should be operated according to the Diet's decision. Apparently recognizing the need for coordination among towns, the *Kontor* accepted the decision. (Greif 2006:107)

Echoing Greif, Selzer points to decreasing profit rates, ultimately concluding that "what started in 1351 as an initiative of several associations of Low German merchants in Bruges was ended in 1360 by the Hanse" (2010:50, own translation). Thus, the standard general argument is that in the context of interconnected disputes over trade, new organizational form emerged to resolve conflicts, enhance solidarity and mobilize common efforts to protect property rights. But, this standard account fails to explain why this particular trade dispute triggered this important innovation in organizational form, when many prior trade disputes had failed to do so. The answer, we suggest, may be found in a subtle restructuring of network relations in the wake of the Black Death.

3.3.4 *The Black Death in Europe*

The Black Death was an infectious disease³² causing horrible discoloring of tissue and high levels of mortality that spread through Europe in the years 1347-1353. Estimates of the demographic effect of the Black Death indicate that 20 to 50 million died in Europe (Alfani and Murphy 2017:318, Cantor 2001:7, Hatty and Hatty 1999:83, Schwartz 1996:104) with local mortality rates ranging from 30 percent to 60 percent of the population (Alfani and Murphy 2017:318, Jedwab et al. 2016:13, Byrne 2012:45, 108f., 322, Kelly 2005:112, Harrison 2004:22, Cantor 2001:7, Putnam 1993:131, Thompson 1921:566). Northern Germany was one of the regions in Europe that was hit hardest by the plague (Dollinger 1989:85ff.).³³ Death tolls are unknown for the Baltic town of Lübeck, however, as we discuss later there was a 2000 percent increase in will-making between 1349 and 1350.³⁴

The plague first struck Italy in 1347, probably brought in by Genoese long-distance traders. The deadly disease spread from Italy to France, Spain and England and reached the northern regions of the Holy Roman Empire including (modern) Germany and the Low Countries (Byrne 2012:44). Hansa traders and their network of merchants and towns likely played an important role in the diffusion of the disease and were an important causal agent in the transmission of the Black Death in Northern Europe (Hatty and Hatty 1999:83, Benedictow 2004:186, Molgaard and

³² The disease was bubonic, pneumonic or septicaemic plague possibly in combination with other diseases such as anthrax or hemorrhagic fever (Byrne 2012:52,321, Kelly 2005:113,160, Harrison 2004:23, Cantor 2001:14, Hatty and Hatty 1999:96).

³³ Bremen had probably the most deaths. Overall estimates are that about ¼ of the population died in Hansa towns. Kelly (2005:261) presents estimates for the mortality in two Northern German towns Hamburg and Bremen – later part of the medieval Hansa – as approximately 66 percent and up to 70 percent, respectively. However, these high mortality rates may be related to faked documents and were partially corrected to lower numbers of ca. 33 percent for Hamburg (Noodt 2005:56, Schwartz 1996).

³⁴ Potter (2001:27) cites von Brandt's (1979) estimates of death tolls in 1350 at about one third of the population. Lutterbeck (2002:17) mentions that between 1350 and 1388 several epidemics of the plague diseased the city of Lübeck. In 1350 about a fourth of the population did not survive the epidemic and in 1367 about a sixth of the population died. The plague hit Lübeck in 1350, 1358, and 1367 (Ibs 1994:84).

Golbeck 2007). Gómez and Verdú (2017) show that centrality in trade networks and transitive relations among towns increased their vulnerability to the Black Death via multiple infections which likely also explains high mortality in Hansa towns.

Though they feared contagion, medieval Europeans had little comprehension of disease and no effective treatment for the plague. Their only responses were intense prayer, confining the sick, escape, and blaming scapegoats (Cantor 2001:196). Throughout Europe, infected people were often abandoned by neighbors and even family members (Kelly 2005:81) which produced tremendous psychological terror for plague victims since isolation meant they would not receive important religious rituals before death (Byrne 2012:1). Healthy people tried to appease god following their religious beliefs and traditions. Religious rituals of individual and collective repentance were used to convince god to stop the pestilence (Hatty and Hatty 1999:86f.). Many protective measures were pursued in towns across Europe, though they were largely ineffective and led to further suffering and resignation among survivors (Byrne 2012:164, Kelly 2005:153).

Mortality struck across all social strata and demographic groups including rich and poor, young and old (Cohn 2007). Cantor (2001:125) claims the Black Death was particularly unsettling for great families who were abruptly unnerved and their safety endangered, their affluence and social status weakened. The core of gentry life, marriage, production of progeny, and inheritance, were all shaken by the high death tolls. Moreover, the work force was reduced across occupational groups, with sometimes advantageous results for survivors. For instance, many peasants left their farms, animals, and crops behind, resulting in higher wages for peasants, workers, and women in many regions after the Black Death (Thompson 1921:567, Pamuk 2007:294, Byrne 2012:44f.).³⁵

³⁵ In response, sovereigns in Western Europe changed laws to regulate wages and commodity prices and controlled class behavior via sumptuary laws, a trend that was based on fear and anxiety rather than economic or political rationality (Cohn 2007:481).

Byrne (2012:232) reports that “merchants tended to fare better than other occupations. [...] Surviving merchants [...] profited from prices inflated by the deaths of competitors, at least in the short run”. A redistribution of the wealth of plague victims fueled demand for luxury goods, imports and domestics, due to higher disposable income. More income also stirred trade investments and commerce within regions (Pamuk 2007:295, Byrne 2012:128). The period between 1350 and 1400 was a phase of industrial and commercial growth for Holland’s economy (van Zanden 1993:20 cites H.P.H. Jansen). Recent quantitative research finds “cities that belonged to the Hanseatic League grew rapidly in the wake of the plague and [...] there is some evidence that cities in the larger European monarchies whose trade may have been less restricted by internal tariffs also grew faster.” (Jedwab et al. 2016:34).

While many historians note that the plague caused abandonment and disruptions of social relations, there are also reports of loyal behavior of kin and companions during the Black Death. Smail (1994:42) finds that “municipal institutions, notably the council, the courts, and the notaries, did not fold up ... [and that] those who survived the plague knew how to recreate the social networks on which they depended for friendship, credit, and assistance.” Among the short term consequences of the Great Mortality were not only death, fear, and resignation, but also tremendous human resiliency: “Enough notaries, municipal and church authorities, physicians, and merchants stepped forward to keep governments and courts and churches and financial houses running—albeit at a much reduced level.” (Kelly 2005:95). There were differences between societies in terms of their capacities and strategies to cope with hazard. Institutions developed in other domains often affected the capacities to cope with hazards (Curtis, Bavel, and Soens 2016).

3.3.5 *The Black Death and Social Change*

Besides the short-term effects like high mortality, tremendous fear of death, and increased needs to provide for family, soul, and a good death, the “Great Mortality” was associated with long-term macro changes in various domains including economics, politics, demography, and culture. The Black Death is considered as a critical juncture that contributed to large scale institutional divergence between geographic regions setting Northern Europe on an overall more favorable path of economic development. Small distinctions between feudal regimes in Europe related to distribution of powers led to the intensification of serfdom in the East whereas institutions improved in the West (Acemoglu and Robinson 2012, Brenner 1976).³⁶ Feudal economies were set on higher paths of economic growth because the plague intensified political and economic tensions that had been increasing over many generations, leading to a Schumpeterian moment of “creative destruction.” The plague increased the speed of important institutional changes, particularly state formation or political centralization (Epstein 2000a). There were also important demographic changes after the Great Mortality insofar as Europe evolved from a premodern demographic system to a modern one (Herlihy 1997). Higher demand for female labor contributed to a broader adoption of the European Marriage Pattern (EMP) resulting in higher human capital investments. Differences in inheritance systems led to higher female labor participation in north-western Europe compared to the South (de Moor and van Zanden 2010). Finally, changes in material culture, e.g. increased attachment to things, after the Black Death had economic consequences insofar as new enthusiasm for preservation slowed down exchange by keeping possessions away from the marketplace (Cohn 2012:1000).

³⁶ Critics point out that “[...] Brenner hardly does justice to the Baltic area and its cultural and economic significance to northern and eastern Europe during the middle ages, which can be paralleled by that of the Mediterranean for southern Europe.” (Wunder 1988:97)

3.3.6 *Institutional Differences in Regulation Practices*

Clearly social institutions helped medieval Europeans cope with the impact of the Black Death, and thus regional differences in the character of institutions were consequential for the plague's effects. For example, as we noted earlier, Northern and Southern regions differed in how local institutions regulated and recorded trade (though not in terms of underlying trade law). Similarly, the historical literature on the Black Death reveals an interesting (and potentially consequential) difference in the institutional practices governing the regulation of last wills and testaments, practices that became increasingly important in a time of widespread mortality. In the South, notaries were situated between the legal system and the public, and their services were vital when disease struck a city, while in Northern Europe either clerics or city councils certified testamentary dispositions (Guzzetti 2007:19).³⁷ We believe that if these institutional differences were strong enough to differentially affect social networks and interactions across domains (e.g. Padgett and Powell 2012), this could offer a plausible micro-mechanism that explains institutional change after the Black Death.

Providing for one's family was part of a good death, and necessitated the arrangement of a last will. In the Italian town and commune Genoa, will making ("redaction") relied on professional notaries who produced many other types of records for living and often built careers with established customer circles (Epstein 1984:8).³⁸ Other Southern European regions such as southern France and Spain had similar notarial systems. With no developed cadre of notaries to certify wills and testaments, the German practice of relying on small group of witnesses from town councils

³⁷ Notaries started to spread north of the Alps during the Renaissance (Guzzetti 2007:19).

³⁸ In Genoa, primogeniture was mostly absent, at least from 1150-1250, as studied by Epstein (1984:82). However, the choices of heirs had a vertical focus on lineal descendants (patrilineage) for the preservation of the patriarchal family in medieval Genoa. This stood in contrast to horizontal spread of heirs including spouses and children without concern for gender in Northern towns such as Douai in the southern Low Countries where legacies also spread more widely among communities (Kittell 1998:67ff.).

was more centralized compared to the clustered notary system in Italian towns that relied on hundreds or thousands of notaries (e.g. Putnam 1993). Many Northern German towns along with Visby on Gotland held the legal rules of the imperial city Lübeck (lübisches Recht). Lübeckian law followed the form of canonical testaments and required the presence of witnesses, in this case two city councilors, for the establishment of a testament.³⁹ Moreover, in a comparative study of Genoa (Italy) and Douai (Flemish until 1300, then French until 1368), Kittel (1998) finds the two towns showed dissimilarities in testamentary practices insofar as Roman Law holding in Genoa prescribed notaries to be complemented by witnesses whereas customary law in Douai required aldermen who were holding governmental positions and were acting as public and authentication authorities using clerks as writers (Kittell 1998:52). “The relatively private nature of the Genoese testamentary process is, in fact, one reflection of a split between private and public domains which was more pronounced than that found in Douai.” (Kittell 1998:66) We conclude that the organization of private property regulation as made in last wills differed between the North and South of Europe insofar as these rituals were more privately organized in the South and more public in the North. Thus, in the North the local coping mechanisms associated with the Black Death were more closely linked to the actions of the political elites in their roles as regulators.

Another important feature of wills in Northern towns is that they required the identification of a *provisor* (Latin)⁴⁰ also referred to as *vormund* (German) (*executor or guardian*⁴¹) who was responsible for ensuring that the testator’s wishes were carried out (and that any debts were paid).

³⁹ Freedom of testation existed for “well earned” (wohlgewonnen) property which included the non-inherited landed property and the complete properties of movables (Landau 1997:61). The legal order of succession of inherited property was tacitly presupposed and wills were limited to dispositions of “well-earned goods” in favor of individual receivers (von Brandt 1964:7).

⁴⁰ Noodt (2000:67) gives some detail about the appointment of provisors. She states that provisors had the same legal position as guardians and that their tasks were not limited to implementation of testaments. Other terms used in the 14th century such as executors did not have legal qualities but were related to the habits of writers.

⁴¹ Ewert and Selzer (2015:171) translate vormund as “guardian”.

Potter, whose dissertation focused on wills in medieval Lübeck, writes, “One of the most important consequences of a testament was the appointment of *vormunder*. It was the job of the *vormunder* to locate, preserve, and distribute all of the testators’ goods according to the terms of the testament.” (Potter 2001:125f) *Vormunder* paid debts, distributed bequests, managed assets, took over guardianship of minor heirs and participated in court cases. Their duties extended longer periods of time, e.g. years or decades (ibidem:129).⁴² “The *vormunder* were the will’s executors, and they would have been the testator’s closest and most reliable male associates because they were going to be entrusted with looking after his family as well as his goods” (ibidem:201).

Testators chose their executors (as far as we know) on a voluntary basis following local norms. But, Lübeck Law restricted the selection of executors to male residents with citizenship rights (Potter 2001:228).⁴³ “Relationships between testators and executors were very rarely kinship-based.” (Ewert and Selzer 2015:172) Meyer (2002) finds in a sample of 15th century traders to Bergen that in 90 percent of executor choices there is no evidence of a personal relationship between testator and provisor, and that 75% of traders named at least one other trader to Bergen as his executor of will.

Persons of means faced two problems when designing their wills: assuring the temporal continuation of (life and eternal) rents and mediating potentially conflicting interests of family, kin and economic partners (closeness and distance) (Litschel 2010:385). In the absence of strong rules governing the enforcement of property rights, one way to solve these problems was to appoint a group of executors. In his study of the 15th century Hansa town Lüneburg, Litschel (2010) found

⁴² Using records of disputes Potter (2001:190f) estimates the “level and duration of responsibilities which it [a will] imposed upon the *vormunder*” and found a range from 1 to 48 involvements in transactions and a length ranging from one 1 to 25 years. Average numbers are 4.5 years and 3.7 transactions. Most of these transaction were related to the allocation of rents and real estate, but also a decent number of acquisitions and selling following instructions in a will.

⁴³ Paragraphs 162 and 186 in the town law from Lübeck include the requirement of two councilors as witnesses and the appointment of executors of a will (Korlén 1951:129, 137).

that most testaments appointed a pluralistic and cooperative *gemeinschaft* of executors – 3.55 persons on average with mostly one family member or relative only – creating an external, regenerative institution that persisted via cooptation often fusing execution of wills and guardianship. In contrast, in Italian towns such as Genoa where the range was from 1-3 executors depending on wealth, “less than half of the extant wills name an executor” during the period 1150-1250 (Epstein 1984:221). Moreover, Genoese wills predominantly included nearest kin as executors (Epstein 1984:227), which differs from evidence from Northern towns. Douai in the Southern Low Countries had also larger numbers of executors than Genoa and executors were mostly non-relatives (66%). “The presence of aldermen and other influential people suggests that Douaisian testators may have used the office of executor to maintain or to extend social networks [... and that] gaps in customary practice could be filled by consensus of the executors [in order to reduce conflict... and which] by virtue of its status as public knowledge, was more enforceable.” (Kittell 1998:78).

Ultimately, will making in Lübeck can be described as a form of collective behavior based on reciprocity and old customary law that favored family rights over individual rights (Potter 2001:243). Writing about Lübeck in the mid-fifteenth century, Potter found substantial coordination among people who wrote and rewrote wills (Potter 2001:167). “In Lübeck the entire testamentary process was built around the needs and priorities of the community and the family group. A will was not the product of a single individual working in isolation and making all the decisions for the future of his family. It was a document which embodied the needs and objectives of the group, and it expressed the deepest values of Hanseatic culture.” (ibidem:248).

The practice of naming an executor added new information to an existing relation, revealing the testator’s private financial circumstances and obligated executors to ensure that his

family and heirs were provided. In economic history, social relations such as testator-executor relations have been discussed as relational instruments (Alfani and Gourdon 2012). In the absence of formal protection of property rights, merchants and entrepreneurs used ritual protection and publicity in order to make their business ties stronger. The establishment of public formalized ties meant that responsibilities were created and that transgressions could be socially sanctioned and cause economic losses. “In other words, ritualizing a tie meant bringing about trust where it was lacking, for example, when information was asymmetric or when institutions were inefficient in guaranteeing good behavior.” (Alfani and Gourdon 2012:1006).

Structurally, medieval will making generated connected affiliation networks that resemble contemporary collaborative teams (Uzzi and Spiro 2005). When elites were involved in multiple wills, the resulting network created a “small world” with dense overlapping clusters –like those Uzzi and Spiro found beneficial for creativity and cooperation in production teams (Uzzi and Spiro 2005:493).⁴⁴ It is to the emergence of these potentially generative networks that we now turn.

3.4 CASE AND DATA

3.4.1 *Lübeck: The Head of the Hansa*

Since our aim is to improve our understanding of why the more formalized and cooperative Hansa organization formed in Northern Germany at this particular time in history, we follow many other historical treatments of the Hansa and center our empirical analysis on the town of Lübeck. Founded in 1158/59, Lübeck is near both the North and Baltic Seas and lies on the route to the (formerly) important trade town of Visby on the island of Gotland (Sweden). Perhaps due to its central location, Lübeck hosted the vast majority of Hansa Diets (Jencks 1992) and is frequently

⁴⁴ In spite of the structural similarities, actual interactions among executors were likely far less intensive than modern work teams, involving only occasional meetings and shared long-term obligations of executors.

referred to as the “head of the Hansa.” Luckily for us, Lübeck is also one of the best documented historical sites in the North.

Lübeck was a commercial town (van Brandt 1979) that relied predominantly on long-distance and wholesale trade.⁴⁵ The population structure of Lübeck --like other Hansa towns-- was relatively equal with a relatively large fraction in the upper class (e.g. in the 15th century, 26% of 24,000 Lübeckians were classified in the upper class (Friedland 1991:92)). The bourgeoisie was more open and permeable in Northern towns compared to the closed patriciates in Southern Germany and the South of Europe (Friedland 1991:163, Mikl-Horke 1999:228).

From 1226 onwards, Lübeck held the status of Free Imperial City (*freie Reichsstadt*), and thus a city council was responsible for the governing internal and external affairs of the city. This included negotiations with other cities, travel to kings and princes, and the leadership of the armed fleet. In the second half of the 13th century, the council gained unrestricted responsibility for all aspects of public administration including jurisdiction over disputes. The city council represented the circle of the highest elites and a mix of mostly patrician-like citizens (or pensioners) and active merchants, predominantly the prestigious group engaged in long distance trade to Flanders, England, Norway and Russia.

3.4.2 *Data*

Our analyses utilize primary data on fourteenth century Lübeckian elites, published by Hansa historians. We have coded information from last wills and testaments (von Brandt 1964/1973a),

⁴⁵ Following economic historian Goldberg’s (2012:214) terminology one could classify the central Hansa town either as emporium or metropolis. A market is a place of exchange of locally produced goods that integrates marketing areas. Markets can be organized horizontally or vertically (see also *ibid*:242). An emporium is a center of collection and distribution of goods that are produced outside the region and buyers also come from outside the region rather than from a close hinterland dependent on the town. A metropolis is a great city which acts as markets for large hinterlands and as emporia connecting regions (Goldberg 2012:214).

personal and relational characteristics of Lübeckian city councilors and Hansa delegates (Lutterbeck 2002, Fehling 1925), and individual participation at Hansa Diets (Poeck 2010).

Will Data

From the 1,021 last wills and testaments recorded during the period 1278 to 1363 and published by von Brandt (1964, 1973a), we identify 2,551 unique individuals who served as witnesses, testators and/or executors of wills. Because our focus is on the period immediately before and after the plague, we limit our network analyses to subset of last wills and testaments recorded from 1340 until 1359 (wills numbered 178 -811 by von Brandt).

We extracted the names of all testators, executors and witnesses in order to establish a list of unique individuals and the set of testator-provisor relations between them.⁴⁶ Since names in medieval documents were not standardized, we also used individual identifiers such as “son of” (Sohn von) or “the older” (der Ältere), occupational information, and streets or other locational information as well as additional lists of councilors from Lübeck (Fehling 1925, von Brandt 1964/1973a, Lutterbeck 2002) to help with the identification of unique persons in this key group.

We aggregate will data into five-year time periods and examine network structures and patterns of tie formation before the Black Death (1340-44, 1345-49), during and in the immediate aftermath of the Black Death (1350-54), and during the period of Hansa emergence (1355-59). We limit our gaze to the formalized relation of testator-executor as recorded in each last will or

⁴⁶ The two series of publications by von Brandt include two name registers including persons listed with first and last name and persons with additional information such as occupation. Unfortunately, these registers did not have clear distinctions between heirs and provisors as merely witnesses (Z) and testators (italic) were (more or less) clearly labelled. Thus, we needed to check each will separately and could not use automatic text reading procedures and simply extract information from this register to build the dataset of executors of wills. Also, as the creation of the register could have included errors, we started with the names listed in the wills and then used the register for purposes of name standardization not to find the set of persons to be included in the dataset. Overlaps of names mentioned in both publications complicated identification of unique persons which is why we looked for further potential clues about identity in the context of the timing of wills as well as their content. For a discussion of the problem of identity see also Noodt’s excursus (2000:112ff.).

testament. These relations are directed ties in which the person who made a will, called testator, chose a number of persons as *provisors* to execute it.

Beyond this relational information, we coded four individual attributes from the last wills and testaments. First, if individuals were members of the city council or not (1=councilor, 0=not; from van Brandt). Second, we use a variable based on the designation of testators as “sick” and coded the variable “sickness” as a dichotomous variable as well (1=Sick, 0=Not). Third, last wills and testaments differed in their lengths and number of clauses. In many (but not all) cases the numbers of clauses is an indicator of wealth and/or status of a testator. Higher numbers of clauses in wills also indicate higher involvement in networks and institutions in regards to property relations. We simply count the number of clauses in each will to create a discrete variable “clauses.”⁴⁷ Fourth, as an indicator for trade involvement and need for legal regulation we coded whether or not the testator mentions at least one trade partnership (1=Yes, 0=No). Finally, for all four attributes, our coding reflect time changes of individual traits in case of multiple wills, e.g. councilor status and sickness. Changes in attributes within periods are not considered.

City Council Data

Next, in order to assess the extent to which embeddedness in last wills and testaments mattered for Hansa involvement, we zoom into the structure of Lübeck’s city council, which played a major role in organizing early Hansa activity and hosted many events. From Lutterbeck (2002) and Fehling (1925) we constructed the kinship and marriage network between councilors, and coded several individual level attributes. We recorded political status within the council (mayor: yes or not), citizen acquisition (yes or not), trade activity (yes or not), age (year of entry into council), number of family ties in the council, and the number of testator and executor roles.

⁴⁷ If an individual wrote multiple wills during a five-year period, we used the highest number of clauses.

Hansa Diet Participation

Finally, we draw information on participation in Hansa Diets from Poeck's (2010) list of Hansa Diet attendees. For each individual in our will and council data, we record the number of Hansa events attended. Since the first Hansa event listed by Poeck was held in 1356, we include attendance at diets during the period 1356-1399. For statistical analyses, we limit our dataset to those councilors who could have attended Hansa Diets in the 14th century.

3.5 EMPIRICAL ANALYSES

3.5.1 *Rise of Wills as Proxy for Impact of Plague in Lübeck*

In the absence of death records (which have not survived), historians often rely on the volume of last wills and testaments to assess the impact of the Black Death across Europe. While the volume of wills and testaments may be viewed as evidence of high mortality, they are of course not direct evidence of plague or epidemic.⁴⁸ For instance, Noodt (2005:65) argues that high numbers of last wills and testaments may simply reflect panic among the population rather than actual pestilence.⁴⁹ Regardless, Figure 5 reports the frequencies of wills produced in Lübeck during the period 1278 to 1363, and reveals a clear peak in 1350 (indicated by a vertical red line). Prior to 1350, Lübeckians wrote an average of about six wills per year, but in 1350 this jumped 129 testaments, suggesting either a massive outbreak of plague or fear of such an outbreak. After this peak year, the rate of testaments writing settled at a much higher level than during the pre-plague period (an

⁴⁸ The only direct contemporary evidence about the plague mentioned by Noodt (2005:57) is a certificate issued in Lübeck on March 20th 1350 in which it says that “pestilencia horribilis” would go through the world and potentially restrain a payment by note in Bruges. However, analyses of councilor deaths show that mortality likely did not come to the central Hansa town before summer. The only chronicle from the town that survived was written more than a generation after the “pestilence”.

⁴⁹ Testaments were not only made in cases of sickness but also because of fear and particularly due to fear of legal uncertainty and threats of property loss (Ibs 1994:84, cites A.v. Brandt 1973b).

average of 34 testaments per year (Ibs 1994:87, cites von Brandt 1964a and 1973a/b). Since 1358 was the date of the first Hansa Diet, we mark it with an orange vertical line.⁵⁰

Ultimately, while the increase of wills meant regulation of private property transfer across generations, for family and friends, charity for spiritual and worldly reasons, the making of wills also served recording of partnerships for legal purposes. We depict numbers of wills with at least one trade partnership in Figure 5 in grey color. We can see that the plague also meant an increase in the recording of trade associations with formal means.

⁵⁰ Ibs suggests that the increase in testaments in 1358 may have been related to the blockade against Flanders, though he also reports that a second bout of plague hit Lübeck in the same year.

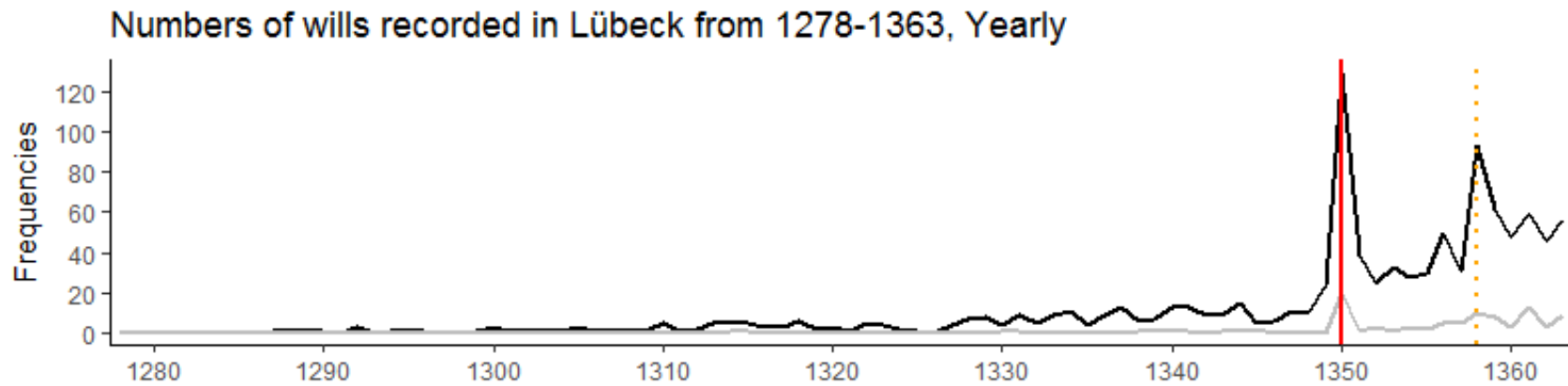


Figure 5. Time series line plot shows frequency distribution of testaments (wills) in Lübeck per year from 1278-1363 in black color. Frequencies of wills in which at least one trade partnerships is mentioned are depicted in grey color. The first vertical line (red) marks the year of the Black Death and the second vertical, dotted line (orange) marks the year of the first Hansa Diet (Data source: von Brandt 1964/1973a).

3.5.2 *Change in Connectivity of Testator-Provisor Networks During/After Plague*

Clearly there was a rise in concern about death among Lübeckians in the early 1350s. But did this change the structure of relations infused with deep knowledge of one another's property? We address this question by examining the structure of testator-executor networks, before, during and after the plague (Figure 6). Nodes in these networks are individuals who wrote or were named in wills during the period, and ties between them reflect the directed relation of being named as an executor.

The network graphs in Figure 6 reveal that before the plague, writing a will was a relatively rare ritual that produced isolated groupings. However, starting during the period of the Black Death, testator-executor networks became substantially bigger in network size and more connected. The number of vertices tripled and the number of links quintupled with the onset of the plague. Connectedness measures are extremely low (0.024 and 0.027) for the two periods before the Black Death, with a sharp increase during the plague years (0.569) that persisted into the early years of the diets (0.60).⁵¹ Thus, after 1350 we observe the emergence of a much larger group of individuals interconnected via wills, and hence with increased access to knowledge about the local distribution of property and economic activity.

⁵¹ Numbers calculated with the sna package in R (also in statnet): connectedness calculates measures developed by Krackhardt (1994).

Last wills and testaments from Lübeck

Testator-Provisor Networks

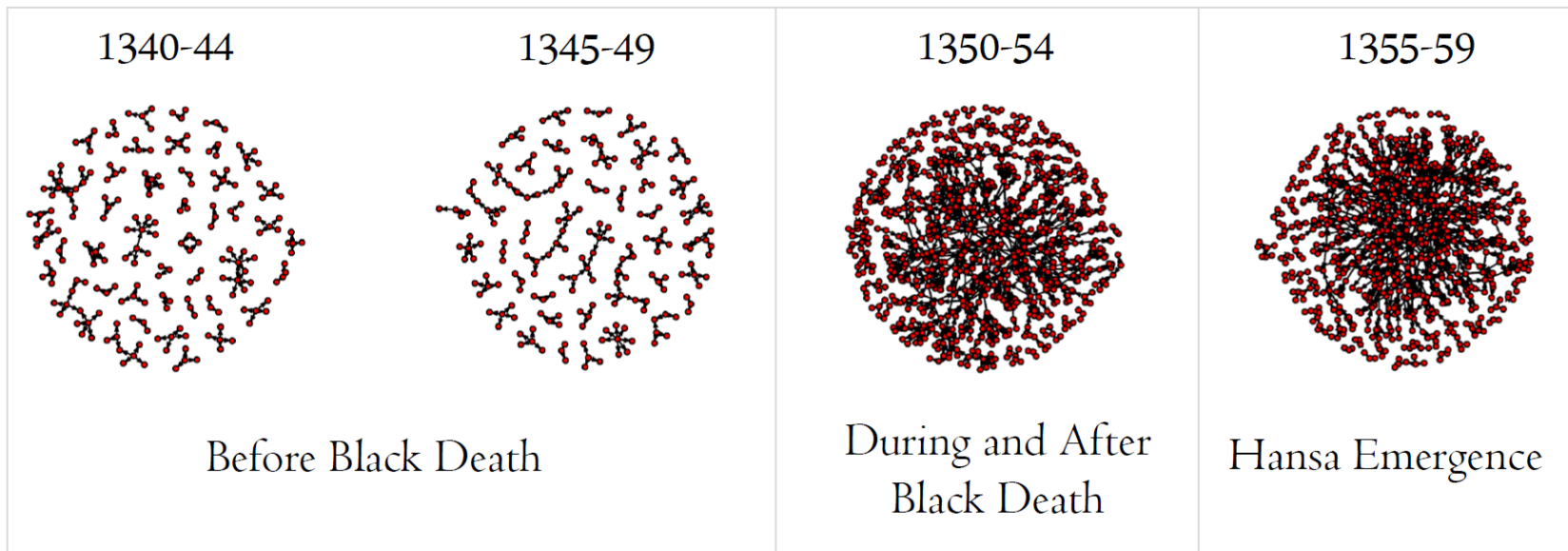


Figure 6. Lübeckian testator-executor networks before, during, and after the outbreak of the Black Death.

While the evidence from Lübeck shows that connectivity in networks produced by will making increased in the central Hansa town, there is also evidence that property ties increased between Hansa towns during this period. Peters (1939:30) documents 252 official correspondence letters considering inheritance claims from other towns across regions were addressed to the council of Lübeck in 1350-56, many of which linked Lübeck's citizens with "old Germany" and the "colonial areas" (Peters 1939:32).

In addition, we find evidence in the wills from Lübeck that these generated interactions between towns through the bequests. A comparison of the previous 5-year time slices reveals 56 and 73 places outside Lübeck in the two pre-plague periods, followed by 175 places mentioned during and immediately after the plague, and 142 locations in the Hansa emergence period. Many places that were participants at the early diets were mentioned in the wills from Lübeck. Increasing numbers of "founding towns"⁵² became connected to Lübeck via wills. During the time of the Black Death at least 2/3 of the founding town were connected to the head of the Hansa through bequests. This somewhat underlines capacities of wills to affirm ties across towns, and the fact that multiple relations existed and bridged regions, e.g. informal kinship ties and new formalized property relations.

Network analyses of all wills and places show that overall connectivity grew, but the founding towns don't seem super central. Further analyses considering founder towns only suggest that the plague brought in new towns into the mix (see Figure 7). Also, connectivity between founding towns increased. Some places were connected to Lübeck's elites through multiple wills. The network graph of Hansa emergence period at the far right of Figure 7 reveals a relatively large

⁵² As "founding towns" we refer to the 16 towns or places at first three Hansa events in Poeck (all events in 1350s): Anklam, Braunschweig, Bruegge, Demmin, Dortmund, *Elbing*, Goslar, Gotland, Greifswald, Hamburg, Livland, Lübeck, Rostock, Soest, Stralsund, Thorn, Wismar.

component of founding places connected by wills. This structure is connected by six wills only. A closer examination indicates that elites with close ties to the city council made “bridging” wills at the time of the Hansa foundation, thus connecting multiple founder towns from the early diets.

Last wills and testaments from Lübeck

Wills-Places Networks

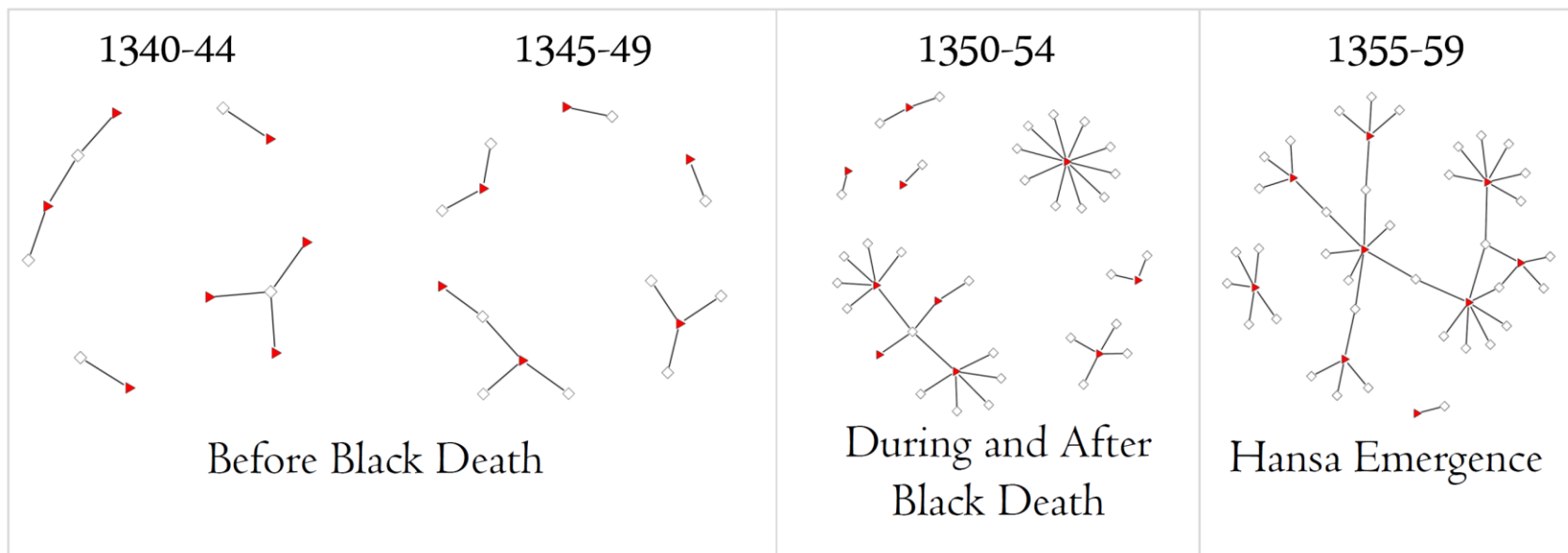


Figure 7. Lübeckian wills-places networks before, during, and after the outbreak of the Black Death. Reduced network with towns from the early Hansa events in 1350s only. Red triangles are “founder towns” and white squares are last wills and testaments.

We view the increase in relations concerning personal property to be consistent with the idea that the combination of the Black Death and the Northern German relationally based practices governing last wills and testaments enhanced the diffusion of information concerning economic matters, and possibly increased social cohesion among elites and traders. Preexisting relationships between towns in Northern Europe were reaffirmed in their social and legal association. The broad impact of the plague connected an entire community of otherwise disparate groups of traders within the central Hansa town, and stimulated interactions across towns.

3.5.3 *Changes in Patterns of Tie Formation Producing High Connectivity*

While these descriptive analyses are suggestive, we deepen our investigation with exponential random graph models (ERGMs) (Lusher, Koskinen, and Robins 2013) that allow us to examine the micro structures that underlie the observed changes in network connectivity over time.⁵³ Similar to logistic regressions, ERGMs predict a network of binary outcomes – presence or absence of a network tie – from various common network features and nodal covariates. The advantage of ERGMs over logistic regression is that they relax the standard assumption that actors are independent and thus can capture complex network dependencies (Lusher et al. 2013:34ff).⁵⁴

Our ERG models include arcs, dyadic terms such as reciprocity and two-paths, and weighted in-degree and out-degree terms.⁵⁵ The arc (or edges) terms are similar to the constant in logistic regression, and reflect basic propensities for tie occurrence and capture network density. Reciprocity captures the tendency of two testators to nominate each other as executors of wills. “Two-paths” measures the number of paths of length two in the network, meaning that a person

⁵³ To estimate ERGMs we use the statnet package in R (Handcock et al. 2003, Morris et al. 2008).

⁵⁴ We use cross-sectional models for each time period instead of longitudinal ERGMs because the set of nodes changes substantially over time and also the size of the networks changes dramatically.

⁵⁵ It was not possible to include all endogenous and exogenous factors in all models due to the low prevalence of some network structures or attributes in some periods.

was involved in two wills. Weighted in-degree terms capture the number of times a person is named as an executor, and out-degree represents the number of executors named by a testator. Table 3 provides a summary the network predictors we include.

We also include four individual attributes in our ERGMs: “testator sickness” (yes or no), “maximum numbers of clauses” (count variable), “trade partnership(s)” (yes or no), and “council membership” (yes or no).⁵⁶ In Table 4, we report estimates (and standard errors) from ERGMs of testator-executor networks for each of the four time periods. Positive (negative) estimates display that more (less) of a configuration is in the network than expected, controlling for other effects in the model (Lusher et al. 2013:41).

⁵⁶ Information for attributes sickness, numbers of clauses, and trade partnerships is given for testators only which is why we use sender effects for these only. For councilors we have information as testators and executors, so we estimate parameters for sender, receiver and homophily in this group.

Table 3. Substantive interpretations of the structural configurations in ERG model.







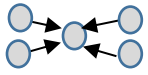
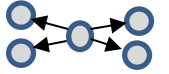
Ergm Term (Statnet)	Parameter	Graphic	Interpretation
edges	Arc		Similar to intercept in linear regression, propensity to form a tie
nodeofactor, nodeocov	Sender		Propensity to send a tie based on testator (sender) attributes
nodeifactor	Receiver		Propensity to receive a tie based on executor (receiver) attributes
nodematch	Homophilous Interaction		Propensity for homophilous nominations based on node attributes
mutual	Reciprocity		Propensity to form reciprocal ties
twopath	Two-path		Propensity for directed paths of length two, connectivity
gwidegree(decay=1, fixed=TRUE)	Popularity (in-degree)		Propensity for centralization on in-degree, popularity spread
gwodegree(decay=1, fixed=TRUE)	Activity (out-degree)		Propensity for centralization on out-degree, activity spread

Table 4. ERG models predicting tie formation: last wills and testaments from town Lübeck, testator-provisor ties (directed).

	1340-44	1345-49	1350-54	1355-59
	Before Black Death	Before Black Death	During and After	Hansa Emergence
Parameter	Estimate (SE)	Estimate (SE)	Estimate (SE)	Estimate (SE)
Actor relation effects (exogenous)				
Sender: Testator sick	0.42* (0.16)	0.69** (0.18)	0.06 (0.05)	-0.05 (0.08)
Sender: Number clauses	0.08*** (0.01)	0.08*** (0.01)	0.01*** (0.00)	-0.00 (0.01)
Sender: Trade Partnerships	0.43 (0.30)	-1.11** (0.41)	0.08 (0.08)	-0.30 (0.19)
Receiver: Councilor	1.27 (2.00)	1.44. (0.82)	0.66 (0.48)	0.98*** (0.24)
Sender: Councilor	--A	0.42 (0.49)	-0.09 (0.41)	0.53** (0.18)
Homophily (Councilor)	1.96 (1.70)	0.44 (0.47)	0.06 (0.46)	0.64** (0.22)
Structural effects (endogenous)				
Reciprocity	-1.68 (1.32)	--A	3.42*** (0.44)	4.33*** (0.26)
Two-paths	-3.66*** (0.41)	-5.23*** (0.63)	-0.39*** (0.04)	-0.19*** (0.02)
Popularity spread (in-degree)	13.65*** (1.48)	14.92*** (1.13)	1.48*** (0.23)	0.31 (0.19)
Activity spread (out-degree)	1.57** (0.60)	1.54*** (0.37)	-2.77*** (0.11)	-3.00*** (0.10)
Arc (edges)	-16.94*** (2.09)	-16.82*** (1.03)	-5.61*** (0.49)	-5.35*** (0.26)
BIC	1871	1711	12162	11940

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1. --A: at smallest attainable value

Our results show that most network parameters are statistically significant ($p < 0.001$) in all four periods. However, the direction and or magnitude of several of the structural terms change beginning in 1350 when the Black Death hit Lübeck. While the arcs (edges) terms show basic propensities for tie occurrence, we use these as mere control variables in our comparisons due to differing network size and composition (Lusher et al. 2013:42, Krivitsky, Handcock, and Morris 2011). One of the most dramatic changes we observe relates to reciprocity (mutuality), where the coefficients change from negative and non-significant or absent values in the pre-plague periods to positive and statistically significant after 1350. This means that once the plague arrived, testators and executors become (much) more likely to reciprocate each other's nominations than would be expected by chance. Parameter estimates for two-paths are negative across models suggesting that we observe fewer 2-paths than chance, however, the effect approaches zero, suggesting an increase in connectivity across local subgroups. In-degree parameters are positive in all four periods, and statistically significant in all but period of Hansa formation. The pattern of results suggests that during the period Hansa emergence period (1355 – 59), executor roles were relatively evenly distributed among Lübeck's elites, controlling for other factors. The out-degree distribution is statistically significant in all periods, yet flips from positive before 1350 to negative with the onset of the plague, revealing that testators are relatively equal in their numbers of nominations of executors of wills (Lusher et al. 2013:42-44).

During the period of Hansa emergence, an individual covariate that complements the structural changes becomes statistically relevant: during only the final period, councilors are more likely to be involved in the will network, and to nominate other councilors as executors of their wills. Thus, councilors began to taking on multiple roles in Lübeck, forming a new kind of elite that was responsible for regulating matters across various domains of medieval life.

To sum up, we used ERGMs to better understand the underlining micro-level processes that produced the dramatic changes in size and connectivity of testator-provisor networks at the onset of the Black Death. These models confirm that the overall propensity to create ties through wills increased sharply when the plague hit medieval Lübeck, and that the resulting networks concerning governance of property transfer were more highly connected than in earlier periods. Beyond what was evident in our visualizations, the ERGMs reveal particularly high rates of reciprocity – mutual helping behavior – during the Black Death and Hansa emergence period. Reciprocity reflects the tight bonds one might expect in the face of horrors, fears, and other uncertainties caused by plague. Interestingly, this rise in reciprocity coincided with a decrease in network centralization, pointing toward the emergence of a community of equals with shared knowledge about matters concerning the disposition of private property. Therefore our findings suggest that the Black Death triggered both a sheer increase in will making and changes in the micro-processes by which Lübeckians engaged each other in this intimate ritual. This newly connected and decentralized network was deeply integrated with the city council, and therefore linked disparate groups and domains. Though these changes in networks of private property regulation happened quickly, we believe they had enduring consequences.

3.5.4 *Impact of Plague on New Men in City Council*

Peters (1939), who also analyzed the social structure of 14th century Lübeck, reports that in 1350 eleven out of twenty-seven councilors died. High mortality creates vacancies, and if these vacancies were filled by new men (*homines novi*) who differed from the traditional elites, we might expect subsequent political innovation (Padgett and Ansell 1993, Padgett 2010). The question is, were these vacancies in fact filled by new men, who might have altered the existing logics or been organizational entrepreneurs?

During the medieval period, citizenship was a status that was extended sparingly, and we can view the number of new citizens as an indicator of the introduction of fresh blood into local communities with potential ties to their former hometowns. During the first half of the fourteenth century, Dollinger reports that an average of 175 men were granted citizenship in Lübeck each year. However, in 1351, immediately after the height of the plague, a whopping 422 men were granted citizenship in Lübeck. But were these new men welcomed in the city council, the traditional decision-making body of the town?

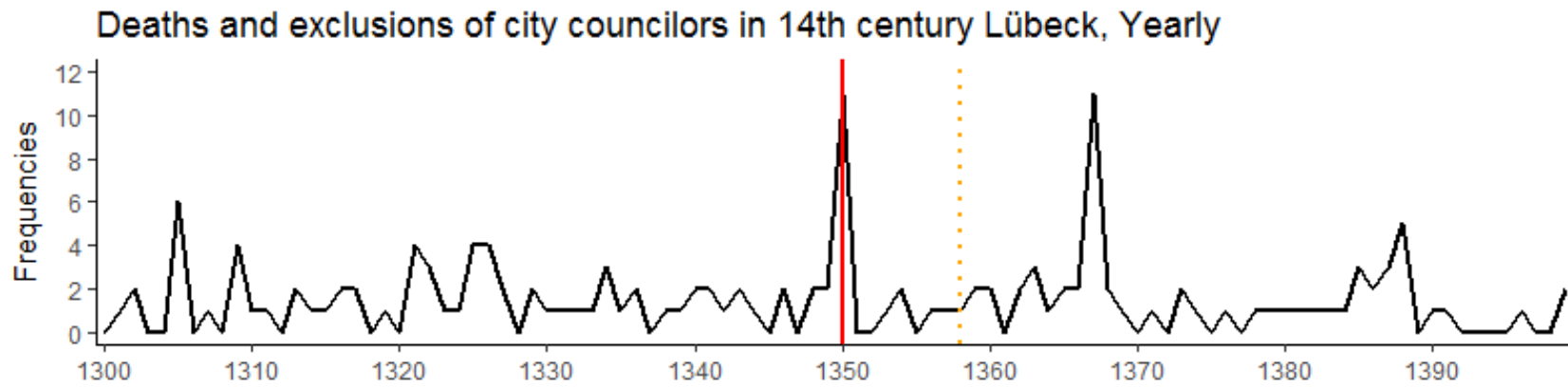


Figure 8. Frequencies of deaths and exclusions per year in Lübeck’s city council during the 14th century (black). The first vertical line (red) marks the year of the Black Death and the second vertical, dotted line (orange) marks the year of the first Hansa Diet.

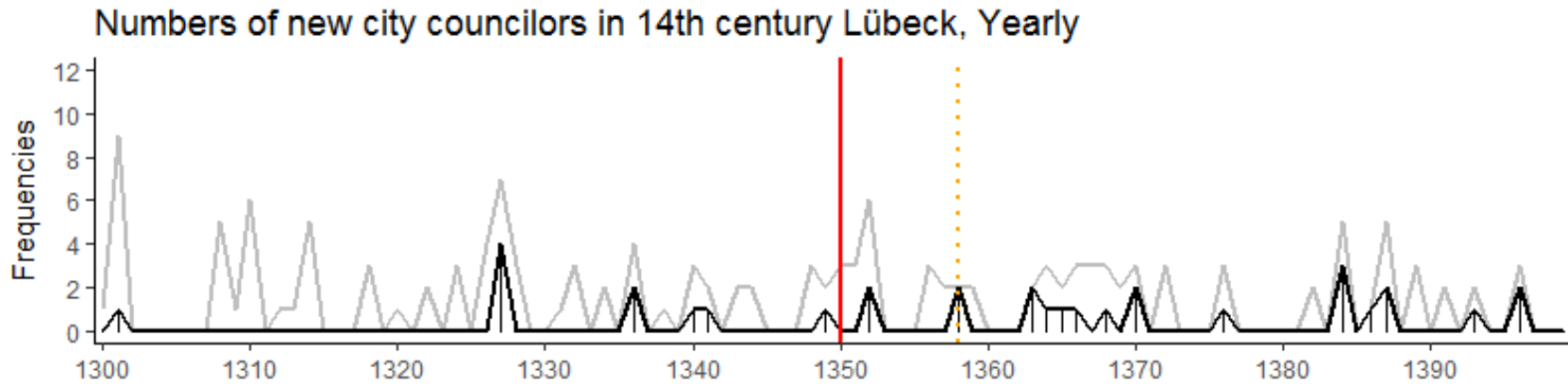


Figure 9. Frequencies of new councilors per year in Lübeck (grey) and numbers of new citizens among these (black). The first vertical line (red) marks the year of the Black Death and the second vertical, dotted line (orange) marks the year of the first Hansa Diet.

Drawing on data from Lutterbeck (2002) and Fehling (1925) covering the entire fourteenth century, we present frequencies of councilors who left the city council by death or exclusions (Figure 8) and numbers people who joined the council including new citizens (Figure 9). We certainly observe the steep increase in mortality among city councilors associated with the plague in 1350 in Figure 8, but it doesn't appear that the Black Death led to an immediate substitution of old elites by an unusual influx of new men. Figure 9 shows that new citizens appear in noticeable numbers beginning in the 1320s and remain a small fraction of the council until shortly after the plague, when their presence increases somewhat, though more gradually than earlier in the century. Changes in the composition of the city council in Lübeck at the time of Hansa emergence do not appear as strong considering the fluctuations over the century, and thus it is hard to make the case that this was sufficient to trigger a new form of political coordination of long-distance trade.

3.5.5 *Was there a rise in connectivity of kinship and marriage in the council?*

Another possible source of innovation could be plague-related disruption of the kinship and marriage network that had traditionally provided the basis for the reproduction of the city council. Medieval elites had always been connected via ties of kinship and marriage, and one might ask whether the structure of these relations changed in the wake of the plague as well. Did the plague affect the social structure of the city council and disrupted existing patterns of family networks? Peters claims that this was not the case: in spite of the large number of vacancies caused by the plague, in the two years following 1350 only three men who were unconnected to the council via kinship or marriage came into the council (Peters 1939:111).⁵⁷

⁵⁷ For the Hansa town Bremen, Schwartz (1996:107) reports that a patrician group existed in Bremen that came into the council before 1330 and may have excluded other more democratic groups in the council at the time of the plague in 1350.

Seeking to assess Peters' assertion more systematically, we use Lutterbeck's (2002) data together with Fehling's (1925) data on city councilors and their social relations to construct the kinship and marriage network within the council over a longer period of time, in order to determine whether there was a change in the structure of family networks of the city council after the Black Death. In Figure 10, we present changes in the city council networks, focusing on family ties between members of the council.

Here each node represents a city councilor and lines indicate a kin or marriage relation to another councilor. We color coded "new entrants" in yellow and other "active" councilors in grey for each time period. In addition to new entrants, we marked another special category of new men, "new citizens", as triangles. White dots mark dead or excluded councilors so that old family connections are considered as well.

Lübeck City Council Family Networks

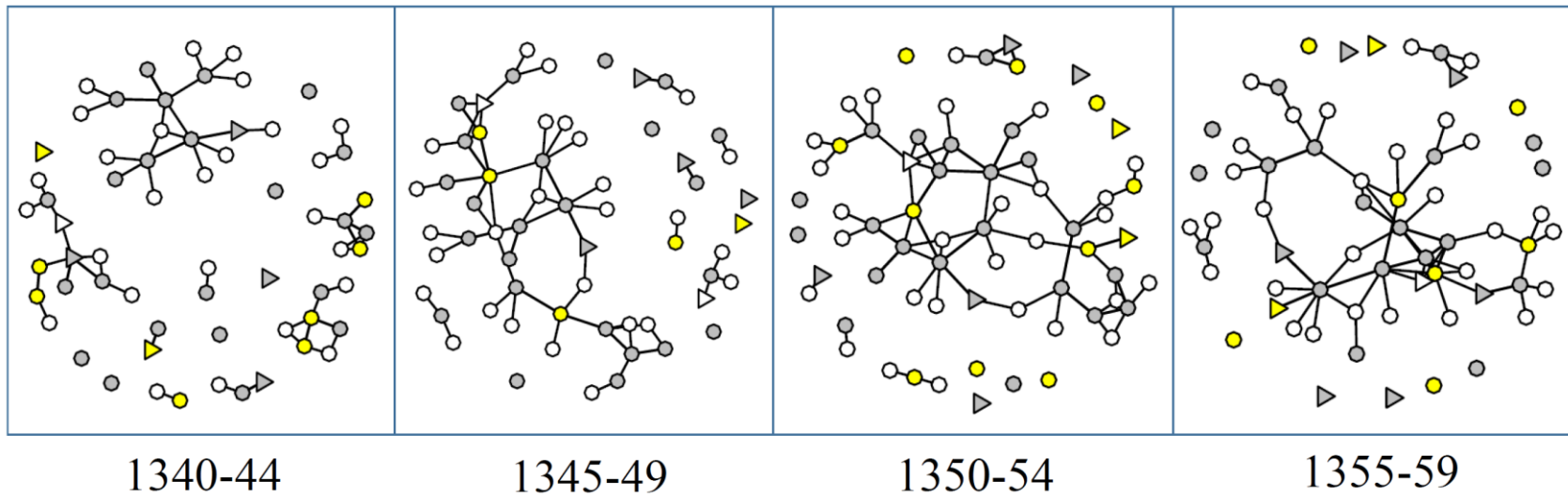


Figure 10. Family ties among Lübeck's city councilors including kinship and marriage for selected periods. Grey circles mark active councilors and white circles inactive (dead) councilors. Yellow color marks new entrants into the council in each period. New citizens are nodes shaped as triangles.

The depictions of the family networks of Lübeck's city governance structure show evidence of changes and continuity in the family networks among city councilors before, during or after the Black Death. First, we observe an increase in the size of the largest component, particularly in the second time period (1345-49). This large component that evolved before 1350 was likely not a response to the plague. As this large component mostly survives the external shock our results may rather be interpreted in terms of persistence at the core of the family network as described by Peters (1939) and Dollinger (1989).⁵⁸ Similarly, the role of new citizens does not seem to change as openness to wealthy immigrants was common practice before the plague.

But, there was likely a second independent trend towards more new men who were (initially) not connected to other elite families. The share of new entrants unconnected to other council families via marriage or kinship (isolates) increases dramatically during the plague period and persists in the period of Hansa emergence. We observe an overall strong increase in councilors that appear as isolates which is highest during the period of Hansa emergence. These latter results speak somewhat against the findings of continuity in elite organization stressed by historians.

Based on this evidence, we conclude that changing composition of the patrician governing institutions were likely causally related to the emergence of the Hansa Diets. The persistence of old family networks with established practices of governance was combined with an influx of new men with potentially new ideas. As wealth was the predominant driver for recruitment into the council and wealth was derived almost exclusively from trade, it is likely that these new men had an interest in a new social arrangement for the regulation of trade (if not for themselves, then for their families). Thus, our results from Lübeck somewhat confirm findings from other contexts in

⁵⁸ Also consider that information about councilors and their social relations increased over time which means that early periods, e.g. 1340-44, somewhat underestimate the true extent of family ties.

which new men entered elite organizations and contributed to organizational invention (e.g. Padgett 2012).

3.5.6 *Models of Hansa Participation*

We are now in a position to turn to the question: were those who were most deeply embedded in the network of will preparation more likely to be institutional entrepreneurs (DiMaggio 1988) involved in early the Hansa Diets? To relate changes in the structure of relations concerning private property among Lübeck's city councilors to the emergence of the Hansa, we estimate negative binomial Poisson models with serving as a Hansa delegate as the dependent variable (Poeck 2010).⁵⁹ We regress data measuring how many 14th century Hansa Diets were attended on selected personal and relational attributes for the 84 city councilors for whom personal characteristics and network position is available (Lutterbeck 2002, Fehling 1925). Based on prior historical and theoretical arguments, we consider alternative explanations about Hansa participation focusing on kinship ties, political position, and the possibility of brokerage reflected in being a migrant to Lübeck.

The results presented in Table 5 indicate that three factors mattered for subsequent Hansa involvement: 1) status as a mayor in the council, 2) immigration, or the fact that councilors acquired citizenship in Lübeck at some point in their lives (rather than being born citizens), and 3) the number of times the councilor was named as an executor in last wills and testaments. More precisely, the variable "executor roles" has a statistically significant coefficient estimate of 0.51, which means that for each additional executor role a councilor held, the expected log count of Hansa events he attended increases by 0.51. To look at incident rate ratios we exponentiate the

⁵⁹ Because our dependent variable is a count variable with overdispersion, we estimate negative binomial models (Venables and Ripley 2002, Long and Freese 2006).

coefficients. For every additional will for which the councilor served as an executor, there is a 66% increase in the number of Hansa Diets he attended. For comparison, the incident rate for mayors is 7.43 times the incident rate for non-mayors, and the incidence rate for naturalized citizens is 4.00 times the incidence rate for native Lübeckians, holding the other variables constant.

Table 5. Negative binomial Poisson model predicting numbers of Hansa events attended by councilors from Lübeck, 1356-1399 (N=84)

Domain	Variable	Coefficient (Standard Error)
Politics	Mayor (1= Yes, 0=No)	2.01 (0.41)***
Immigration	Citizenship Acquisition, New Citizen (1=Yes, 0=No)	1.39 (0.42)**
Testator roles	Executors nominations sent to X persons (Range: 0-7)	0.03 (0.10)
Executor roles	Executor nominations received by X persons (Range: 0-7)	0.51 (0.13)***
Family	Number of family ties (Range: 0-10)	0.14 (0.09)
Economics	Trade (1=Yes, 0=No)	0.59 (0.38)
Age	Entry Year into Council (X-1326)	0.03 (0.01)**
	Intercept	-2.63 (0.70)***
	Theta	0.44 (0.10)
	2 x log-likelihood	-383.21
Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1		

Results of this model reveal that multiple factors increased the involvement of Lübeck's elite in the Hansa Diets. While some factors such as political power (e.g. mayor status) and connections to other Hansa regions (e.g. immigration status) reflect established roles for diplomacy and opportunities for brokerage and mobilization across towns, this evidence also indicates that key Hansards took over agency roles of property regulation as enacted in small, persistent collaborative groups. These opportunities for recombination of practices across domains made the institutional founders distinct from other councilors.

3.5.7 *Hansa Diets: Recombinations from Political and Legal Domains*

The history of the political Hansa is recorded in the so-called Hanserecesse which include meeting notes and correspondences describing agreements made by Hansards.⁶⁰ While the title of the documents is Hansa Diets (Hansetage), the assembled records start with documents from 1256 including contracts about disputes between Hansa towns. Thus, written communication and administrative procedures related to diplomacy and contracting were long in place before the first Hansa Diets. What changed in the 1350s is that there was a shift in the documentation from recording of decisions towards proceeding minutes of gathering events including protocol elements. According to Behrmann (2002:467) participants started to know they would get together again in the future, and documented the course of the current diet.

Behrmann (2002) finds that starting in the 1350s, e.g. 1356, records show not only the name of the town which attended a meeting but also specific names of attendants from each town including first and last name. In 1358, Hansa records were composed in popular speech, not Latin; for the first time towns and envoys assembled to discuss matters of towns; for the first time there

⁶⁰ The authoritative version of the Hanserecesse was edited and published by Koppmann in 1870. Most Hansa histories rely on these documents which also include the names Poeck (2010) designated as "Herren der Hanse".

was adoption of a resolution in detailed form; and in each clause appears the term “Dudesche hense” (German Hansa). The adoption and increased use of the Hansa term in the historical documents has been interpreted by historians as a main indicator of organizational change. Behrmann (2002:458) sees in the assemblage of Lübeck a novel phenomenon. The first Hansa Diet produced a decision text that should bring the authority of the present councilors to the mind of the German merchants in Bruges and at the same time appeal to their solidarity (Behrmann 2002:457f.).

More generally, Hansa documents were recorded by a clerk who wrote down the decisions reached by Hansards which were likely made via consensus, but with a fixed order of presentation following the status of a town. Hanserecesse, the legal documents of the medieval Hansa, made known (trade) regulations and other standards which the towns were expected to coerce (Potter 2001:103f). Hanserecesse served as means for conflict management and dispute resolution (Wubs-Mrozewicz 2017).

Based on the previous discussion of last wills and testaments in Northern Europe, we recognize some similar features in the structure of the Hanserecesse and in how the Hansa operated. First, the recording practice in group settings of face-to-face interaction in form of minutes written down by a clerk is one similarity. Second, names are recorded properly and towns are represented by two officials is another similarity of documentation. The purpose of meeting minutes is a third similarity insofar as executor gemeinschaften and Hansa delegates were supposed to be informed about decisions and be able to make references in future meetings. Expectations about a shared shadow of the future was common to both Hansa delegates and executors of wills who would collaborate with others in persistent groups. Forth, the logic of cooptation already existed within councils, however, was not existing in the economic domain of

trade regulation. Persisting groups of executors were already common in the sphere of private property regulation. Fifth, the fact that we did not learn about fixed regular gathering procedures, e.g. dates, for executor *gemeinschaften* suggests that these small groups assembled on demand just like the Hansa Diets. Sixth, there is an obvious functional similarity in the purpose of wills and also of the Hansa Diets, namely dispute resolution and conflict management. It seems further plausible that the first meetings in Lübeck were taking place in parallel of (non-reported) separate meetings related to the regulation of private property as indicated by the large number of correspondences going to the council in the years after the Black Death. While we do not have direct evidence for this, we believe that practices from the legal domain were likely adopted into the political realm and recombined with established practices from council meetings and diplomacy. The product of this combination were the more ritualistic and administrative meetings called Hansa Diets constituting the central institution of the medieval Hansa.

3.6 DISCUSSION

3.6.1 *Summary of argument*

Before elaborating on the theoretical implications of our study, we summarize the complex set of events and changes in social networks that we believe led to the formation of a political arm of the existing Hansa trade network in the aftermath of the Black Death. It is certainly well documented that the Black Death caused dramatic increases in mortality, as well as fear of death and a new desire to provide for families after death. While the horrific impact of the Great Mortality was similar in many areas of Europe, there were striking regional differences in the local institutions available to respond to this new threat. Long before the plague hit, Southern Europe had an established notarial system with notaries certifying last wills and testaments in private settings, while Northern regions had more public modes of regulating property transfer that involved

legitimization by local government officials. In Hansa towns, local town law required the presence of city councilors as witnesses and nomination of trusted individuals to execute last wills and testaments. The greater public involvement in Northern institutions increased the odds of institutional spillover and transformation.

In our case study of medieval Lübeck, the center of the Hansa trade network, we find clear evidence of an increase in the recording of last wills and testaments around 1350. We also find larger numbers of wills including regulation of trade partnerships and that testators showed new patterns of tie formation, particularly strong increases in reciprocity at the onset and in the aftermath of the Black Death. These relational changes at the micro-level produced a large connected network that facilitated the diffusion of inheritance and trade related knowledge and mutual awareness of property among the city's elite. Additional historical evidence shows a parallel increase in communication between city councils of Hansa towns related to inheritance claims and large numbers of bequests from Lübeck with wishes to distribute property across regions. Thus, based on preexisting informal relations between towns, responses to the plague created a new supra-regional organizational field or network.

The plague triggered an increase in the ritual will writing, and in doing so created a newly extended network of formalized relations and a community of elites with long-term consensual obligations to one another. In so doing, the plague filled a hole in an otherwise underdeveloped legal systems, and provided a model that Hansards would continue to follow in Hansa Diets for several centuries. Men deeply involved in the network of wills adopted consensual norms central to this ritual and used them when establishing the new political Hansa organization. In this sense, the plague may have catalyzed a wider demand for public regulation of property related issues including trade. The recombination of practices from the legal domain (testaments) and political

domain (diplomacy) led to the ritualistic and administrative character of the Hansa Diets and thereby provided the preconditions for long-term persistence of the organization. Combinations of practices across domains were favored through a shared focus of attention on administration in overlapping small group rituals, e.g. “interaction ritual networks”, and new men in the city council with an interest in trade regulation and unprecedented opportunities to steer politics through the vacancies produced by the plague.

3.6.2 *Limitations of study*

First, it is obvious that studies of the Middle Ages are limited due to incomplete record keeping and uneven survival of records. Unfortunately, we are unable to determine the extent to which Lübeck’s city councilors were engaged in actual Hansa trade during the period we study.⁶¹ Implicitly, we believe that wills connected groups of traders, but absent firm evidence this point remains speculative. Similarly, we are unable to estimate the wealth of Lübeck’s elite due to a lack of systematic recordings of possessions of testators, but numbers of paragraphs may be a sufficient proxy in many cases. Nevertheless, we cannot rule out plague-related changes in the concentration of wealth as a possible micro-mechanism for organizational innovation. And, the general problem of unstandardized names in medieval records creates difficulties in the identification of unique individuals.

A second type of limitation concerns our causal argument. The isolation of the interaction between local institutions and networks in the Hansa towns as the single cause for emergence of the diets is likely insufficient. Our comparative discussion of Italian towns and traders and Hansards shows differences that could offer alternative causal paths such as potentially very high

⁶¹ The societates records from the previous chapter represent only a tiny fraction of overall trade from Lübeck. The more systematic poundage lists from 1368/69 record trade about a decade after the first Hansa Diet. Trade involvement in available lists was coded by Lutterbeck and could be considered in councilor analyses.

solidarity in foreign trade places among Hansards. Similarly, we cannot exclude institutional isomorphism as other permanent, aristocratic institutions, e.g. English parliament or imperial Hofstage, could have served as role models (DiMaggio and Powell 1983).

The final limitation of our study relates to the generalizability of our findings. The Hansa has been described as a market-supporting institution and particularized institution, but also as an alliance, city league, federation, hierarchical organization, institution of conflict management, merchant empire, state (alternative), virtual organization, organizational field, and network form of organization. While it may be impossible to definitively determine what class of entities any study of the Hansa can make inference about, we do not believe this undermines our contribution, which simply identifies an important causal pathway for institutional change. Based on our careful analysis of historical data, we are confident that the Black Death provided an important trigger for fundamental changes in elite social networks, changes which spilled from the realm of private property to the regulation of trade, and ultimately led to the emergence of a newly centralized and politically capable organization: the medieval Hansa, Hanse or Hanseatic League.

3.6.3 *Theories of Institutional Emergence and Institutional Change*

While social networks have been discovered as important agents in institutional change (e.g. Padgett and Ansell 1993, Padgett and McLean 2006, Hillmann 2008, Padgett and Powell 2012, Nee and Opper 2015, Lazega et al. 2017, DellaPosta et. al 2017), there is only few research on social relations in the context of critical junctures and truly exogenous shocks. By focusing on the macro consequences of legal institutions and practices, we follow in the footsteps of classical economic and legal historians (Weber 1967:137, Maitland 1911/2003:83, Larned 1894:1027, 1448). Our account of how the Hansa emerged combines various strands of network theories of innovation and invention (e.g. Gould 1991, Burt 2005, Vedres and Stark 2010, Padgett and Powell

2012) and points to a new micro-mechanism: network coping. We offer an alternative explanation to prominent accounts of institutional change in economics and economic history (e.g. North and Thomas 1973, Greif 2006). Our work is somewhat more credible as a critique of Greif and North compared to Nee and Opper (2015) or DellaPosta et al. (2017) as we are studying the same case using primary data.

Our results show that “local institutions” were likely important motors of social change which is somewhat in line with the research by Hopcroft (1994, 1998) on local economic institutions in late medieval and early modern England. Following a rational choice approach, sociologist Hopcroft extends research in new institutional economics that focuses on the state as a sufficient provider of market-supporting institutions, by pointing to the importance of local institutions and how they shape costs of transactions. Hopcroft (2001:157) reflects that “institutional legacies, historical contexts, and timing that were vital for outcomes lie outside the rational choice model”. We believe that a network approach to economic development does not share these issues and may therefore be a relevant alternative to previous sociological approaches to economic change, state formation, or religious change.

Furthermore, we agree that local institutions were important for development, however, binary distinctions such as “local” and “state” institutions seem somewhat problematic as this presumes that domains are clearly separated. The same holds for the prominent distinction between “informal” and “formal” institutions which can mistakenly reflect contemporary settings into the historical past. Similarly, one major takeaway from our study is that the separation of domains assumed by Padgett and colleagues (e.g. Padgett and McLean 2006) does not hold universally, across time and place. Our research shows that local institutions affect the types of interactions between network domains. Particularly public institutions may lead to more interactions between

domains or melt their distinction and thereby enhance the odds of institutional change. While some authors simply deny the boundaries between spheres such as intimate and economic (Zelizer 2005), we believe that these are historically grown following developments such as trade expansion and monetization (Silver 1990), but also as a response to non-linear events when they catalyze chains of interaction in previously non-dominant spheres of action.

The original network theory of institutional emergence by Padgett and McLean identifies three mechanisms that produce organizational emergence: transposition, refunctionality, and catalysis. Transposition refers to situations in which individuals and their biographies are mobilized or co-opted, refunctionality means that practices and tools are repurposed, and catalysis relates to changes in other network domains necessary for innovations to become inventions (Padgett and McLean 2006). While Padgett and McLean show how bankers took permanent positions in city councils (transposition) and then used banking practices in international contexts (refunctionality), our research suggest that quasi groups such as executors of wills with long-term obligations to one another may play a similar role as triggers of institutional change. Thus, we broaden the scope of the transposition mechanisms relative to the classical study. In certain ways, our paper reflects the double-edged character of rituals found to be important for collective action in the context of institutional emergence (Pfaff and Yang 2001). We also add to the refunctionality mechanism of the original study insofar as repurposing may not always be a one-way street. Schumpeter's work on recombination is a helpful alternative to images of practices as imports. We find that new organizational forms may develop as a result of recombination of practices from overlapping domains. External shocks may intensify overlap and produce potentially important group contexts creating opportunities for transposition, refunctionality and recombination. Future research may look at the conditions under which practices are recombined or repurposed

(imported). Moreover, it is to be determined whether the speed of transpositions is an important factor for the establishment of the preconditions for refunctionality or recombination.

Furthermore, our study reinforces the importance of reciprocity and multiplex social relations as an important micro-mechanism of organizational emergence as recently been highlighted by Nee and Opper (2015). While Nee and Opper adopt a rational choice perspective and point to the importance of spatial proximity and close-knit cluster structures for the emergence of the private manufacturing economy in China (see also DellaPosta et al. 2017), we go beyond rational choice assumptions and argue that mutual helping behavior after the plague does not need to rely on rational calculation, but may reflect mutual obligations, emotions, loyal behavior, and altruism.

Similarly, Putnam (1993:124) famously identified a divergence in Italy during the Middle Ages which resulted in disparate political regimes as responses to the same general problem which was “violence and anarchy endemic in medieval Europe” and contained vertical hierarchies in the South and “horizontal collaboration” in the North. According to Putnam (1993:124), the origins of the Northern “communes” in towns such as Florence or Venice, “sprang originally from voluntary associations, formed when groups of neighbors swore personal oaths to render one another mutual assistance, to provide for common defense and economic cooperation.” Thus, the classical study on the emergence of republicanism may be based on similar network processes: semi-formalized relations and reciprocity.

Ultimately, Putnam (1993:129) writes that “In sum, in the communal republics of northern medieval Italy, vast improvements in economic life, as well as in governmental performance, were made possible by the norms and networks of civic engagement.” However, the origins of the emergence of these decisive norms and networks in the north and their absence in the south remains

unexplained.⁶² We believe that our case study offers a compelling account of why a civic culture emerged in the far north of Europe, and reveals how institutional and network factors together can illuminate our understanding of the causes of institutional divergence.

While classical network studies of institutional change occasionally refer to exogenous shocks as important factors (e.g. Padgett and Ansell 1993, Padgett and McLean 2006), we believe these do not emphasize these shocks and disruptions of social networks sufficiently. We hope that this study stimulates more research on how exogenous shocks may trigger social change via social networks.

⁶² An argument held against Putnam's account is his emphasis on the political system despite the importance of the legal system for conflict mediation in towns such as Venice. "The ways in which judicial culture assisted accumulation of social capital depended considerably on local contexts." (Muir 2001:61)

Chapter 4.

THE DIFFUSION OF PROTESTANTISM IN NORTHERN EUROPE: HISTORICAL EMBEDDEDNESS AND COMPLEX CONTAGIONS IN THE ADOPTION OF THE REFORMATION

4.1 INTRODUCTION

In 2017 many towns in Europe celebrated the 500-year anniversary of the Protestant Reformation (officially, the *Lutherjahr* in Germany). The Reformation has often been treated as an epoch-marking event separating the Late Middle Ages from the early modern period. Another separation is the geographical division of Europe by religion. Since the 1600s, a line runs through the middle of Germany, separating a Protestant North from a Catholic South. Why did Protestantism become particularly dominant in Northern Europe?

The Reformation has been a topic of interest in sociology at least since Max Weber (1904-1905/1978). Like Weber, most social scientists have focused on the consequences of the Reformation, but a growing literature interested in major historical transitions and institutional change has begun to analyze the factors that caused it. In a review of the literature, Becker, Pfaff, and Rubin (2016:41) offer the following list as established factors related to the origins of the Protestant Reformation: “advances in information technology (the printing press); outside threats (the Ottomans) that sidetracked the attention and resources of the papacy and Habsburgs; the heterogeneous and decentralized nature of the HRE [Holy Roman Empire]; and networks of sympathetic university students and intellectuals placed in strategic locations throughout the HRE.”

The aim of this study is to explain why the Protestant Reformation was particularly successful in the northern region of the HRE. The HRE was a loose electoral monarchy based on a confederation of principalities and cities. Cities had substantial autonomy in deciding whether to retain the Roman church or institute a different religious regime (Cantoni 2012; Pfaff and Corcoran 2012; Rubin 2014). Medieval German town-law (*Stadtrecht*) provided for self-government, the right to tax, and town councils with binding powers. The north was characterized by weak, relatively poor princes and many medium-sized commercial cities. Because of the lack of centralization, there was no decisive crown interest that could determine whether Protestantism or Roman Catholicism would prevail (Kohler 1990; Neuhaus 1997; Nexon 2009). The Protestant movement in this place and time provided a unique opportunity for civic elites to decide whether to retain or overthrow the local Catholic monopoly.

Why were Northern German towns among the early adopters of the new religion even though local elites initially opposed the Reformation? In explaining the coming of the Protestant Reformation, economic historians have long argued that it was driven by “an immense expansion of commerce and finance” in the decades before 1517 (Tawney 1926/1954:73; see also Becker et al. 2016). Economic accounts suggest that development fostered social diversification and, with it, shifting demand for new spiritual goods that the Roman Church was slow to deliver (Ekelund et al. 1996, 2006; Pfaff and Corcoran 2012). Moreover, Protestantism was putatively appealing to merchants and burghers because it was good for business and easier on the pocketbook. It promised an end to restrictions on labor and commerce; lowered the financial cost of achieving salvation; ended tax exemptions for the clergy and religious foundations; and promised to rationalize laws and civic governance (Ekelund et al. 1996).

Previous studies claim that members of the medieval Hansa (or Hanseatic League), an association of merchants and trading cities that had extensive ties within northern Germany and abroad, were more prone to reform compared with other cities in the HRE.⁶³ This is because trade, economic growth, and commercial development putatively made cities more likely to adopt Protestantism (Cantoni 2012; Ekelund, Hébert, and Tollison 2006; Rubin 2014; Sombart 1915; Tawney 1926/1954). However, detailed data on economic development and flows of trade between cities are unavailable for the sixteenth century, leading to a heavy reliance on proxy measures in multivariate analyses. Recent studies have included an indicator variable for membership in the Hanseatic League (or medieval Hansa) to capture the effects of trade (Cantoni 2012; Dittmar and Seabold 2014; Kim and Pfaff 2012; Pfaff and Corcoran 2012; Rubin 2014). Depending on model specification, most analyses find a positive (if not always statistically significant) association between Hansa membership and the institution of reform.

But why did the Hansa matter? Previous studies include a measure of league membership in lieu of some other unmeasured variable. For Dittmar and Seabold (2014), membership is a mere control variable. Cantoni (2012:513) treats Hansa membership as indicative of “the likely preponderance of trading activity,” similarly, Pfaff and Corcoran (2012:762, 767) use it to capture “the relative importance of trade in a city’s economic activity,” as well as the “prominence of merchant guilds.” Rubin (2014:275) uses membership as a proxy for “better access to information flows and greater wealth.”

⁶³ The broadest definition of the Hanseatic League (or, Hansa) is as an organization of Low-German speaking long-distance traders and the towns in which they had citizenship (Hammel-Kiesow 2008a). The Hansa was a trade confederation that relied on the subsidiary organization of the self-governing city, “not a town league nor a guild, but [which] relied on town administrations and local (as well as alien) guilds in order to function” (Wubs-Mrozewicz 2012:10). Trade privileges were the backbone of the organization and mutual aims included the protection of trade routes; standardization of goods and prices; and procedures and practices governing in- and out-group relations. Hansa merchants traded over large distances stretching from Northern Russia to the Mediterranean Sea.

The inconsistent significance of Hansa membership in multivariate analyses and the way in which membership serves as a proxy for a host of relationships call the meaning of the variable into question.⁶⁴ Was there something specific about the league, its members, or their relations that made them more apt to reform than other towns? The inconsistent performance of the Hansa membership variable across studies is just one reason to question the association between the Hansa and the adoption of Protestantism. A second reason relates to the geographical distribution of Protestant towns in central Europe that roughly corresponds to the areas of Hansa activity. A recent study observes that “[w]hile the cities lying North-east of the Muenster-Erfurt axis are all Protestant, the cities in the south-east and Austria are mostly Catholic” (Curuk and Smulders 2016:24). Curuk and Smulders argue that the Reformation succeeded in the north due to prevailing market inefficiencies (particularly in unmet agricultural potential) reinforced by the Catholic Church. As the inefficiencies were particularly large in the northern regions, regional rulers had greater incentives for (institutional) regime change compared to their counterparts in the south.

While Curuk and Smulders point to important environmental differences between the Protestant and Catholic regions, it is unclear whether local authorities were interested in expanding market potential or were aware of relative market inefficiencies. The emphasis on the rational incentives of “regional rulers” ignores the diversity in types of rulers and how decision making was reached in early-sixteenth-century cities. In fact, the primary locus of religious decision making, particularly early in the Reformation, was in the cities, not in the territorial principalities. Historians have shown that the main thrust of the popular movement that propelled Protestantism

⁶⁴ Another problem is that the variable is coded from different sources, including Dollinger (1970), Pagel (1983), and Jacob (2010). These sources do not agree on all cities enjoying membership and generally refer to the membership as it existed in the fifteenth century, rather than employing measures more proximate to the eve of the Reformation.

took place in cities in the 1520s (Blickle 1992; Brady 1998; Mörke 2005; Ozment 1975; Schilling 1988; Scribner 1986).

Our unit of analysis is a sample of large cities in central and Western Europe encompassing the HRE collected by Rubin (2014). The data including 753 cities in central and Western Europe show that about 11 percent of all cities had adopted the Reformation by 1530. The temporal prominence of the Hanseatic towns is conspicuous in that more than a fifth of all the cities that had reformed by 1530 were members of the Hansa, a sizable share because the northern regions of the HRE were less densely urbanized than the south. Moreover, while the adoption of Protestantism was highly mixed in other commercially advanced parts of the empire such as the southwest and along the Rhine, nearly all the northern towns ultimately adopted it—generally in advance of the princes in whose territories these cities were located.

Whereas a very high proportion of Hanseatic towns reformed in regions, such as along the North and Baltic seas, the adoption of Protestantism was more mixed among the Hansa towns along the Rhine and in interior areas. Moreover, the urban Reformation does not appear to have resulted from a sudden shift toward Protestantism once a “critical mass” of adopters had been reached but rather suggests a steady rate of adoption as Protestantism diffused across the HRE. The uneven pattern of adoption among Hanseatic cities may be understood in terms of the relational structure of the league. Every city had to determine the contentious issue of unseating the Roman Church in favor of Protestantism. But this does not mean that membership in the league had no effect on the process of deciding. It is not that the individual traits of Hansa towns similarly disposed them toward Protestantism but rather that the *relations* among them facilitated the diffusion of “evangelical” ideas and enabled the social influence that made the adoption of Protestant reforms more likely. Analyzing a large sample of cities, we propose that the network

relations between Hansa cities increased their odds of reform compared with other cities and predict which Hansa members would reform and which would remain Catholic.

The present article is the first study of the Protestant Reformation using social network data (except Tulchin 2010). We have assembled new data for Hansa towns regarding their participation in Hansa Diets and merged these with the data set collected by Rubin (2014). We reveal the importance of social relations in the adoption of the Protestant Reformation and why the structure of relations among Hanseatic towns was especially favorable to diffusion. We propose that the social relations between Hansa towns as generated by their participation in Hansa governance facilitated the exchange of Protestant ideology and exerted an influence on highly involved members to adopt reform. While other studies on the adoption of the Reformation emphasized power dynamics and imitation (Cantoni 2012) or the importance of change agents as brokers (Kim and Pfaff 2012), we highlight historical embeddedness of elites during times of uncertainty as an additional social explanation for complex diffusion. Our study differs from the previous ones by emphasizing the importance of strong and weak ties across regions established before times of institutional change such as the early stage of the Protestant Reformation.

4.2 SOCIAL NETWORKS AND COMPLEX DIFFUSION

Geographers have begun to use network methods to understand the various patterns of associations between towns in Europe using quantitative data (e.g., Rozenblat and Melançon 2013). The centrality of a town within the urban network not only depends on various factors such as population size, but also on the activities and characteristics of personnel (Comin 2013). While density and connectivity between towns, regions, and countries has likely increased over time using new technologies (Castells 1996) and global economic markets (Sassen 1991), the integration of European networks is not a new phenomenon. Towns in the HRE have been

connected through Hansa traders at least since the Middle Ages (Simmel 1908/1992), but studies of town networks and diffusion in the early modern period have been rare.

Sociologists have studied the adoption of new products and behaviors for a long time and often focused on specific elite groups such as doctors or managers. A common key feature of innovations is the uncertainty related to the consequences of adoption. Social contacts such as colleagues may mitigate uncertainties and thereby influence the adoption process (e.g., Coleman et al. 1957). Among network scholars, the problem of uncertainty has been theorized most prominently by Granovetter (1985) who points to the importance of network ties and “social embeddedness” for economic action. One of the key ideas is that if economic actors are uncertain about the quality of goods and services, they prefer information from close contacts (strong ties)—those with whom they have repeated interactions—over those from acquaintances (weak ties). Yet doing so can produce negative consequences, as one’s close contacts often provide redundant information (Granovetter 1973). While the famous strengths of weak ties argument relates information flows in social networks to the intensity of social interactions, strategic actors may actively generate their network positions by adding and deleting network contacts and thereby gain better positions in markets. Burt (1992) argues in his “structural holes theory” that actors who have otherwise unconnected social contacts may gain advantages if they act as brokers. Brokers who have many social contacts that are not connected among each other have better access to information and could benefit from having a knowledge advantage. Benefits can also be gained if information or other resources are controlled by strategic actors who position themselves between others. Structural holes theory posits that it is the structure of social relations that has a causal impact on the flow of information among actors—rather than the strength of ties. Actors with “sparse” networks have more access to and can better control the flow of information compared to

actors with dense networks. For instance, towns whose connections are limited to a cohesive cluster tend to have less access to new market information compared to towns engaged in multiple regions including foreign places.

An important extension of this line of thought was made by Centola and Macy (2007), who point out that Granovetter's weak tie argument may be limited in scope. In particular, many types of collective behavior entail different levels of cost and risk that cannot be established through simple information transfer. Weak ties may be effective but only in simple contagions with low thresholds of infection, such as disease transmission or information exchange. Complex contagion, by contrast, is when costs and risks are higher and individuals have higher thresholds of adoption. The adoption of the Reformation, whose benefits were diffuse and that entailed substantial political and economic risks, is an obvious example of the complex contagion problem.

According to Centola and Macy, complex contagions are more demanding on the network insofar as multiple sources are required to provide sufficient affirmation or reinforcement to lead to adoption. They further underline the subtle distinction between "multiple exposures" such as repeated contacts with the same individuals and "exposure to multiple sources," which refers to contacts with more than one person who has adopted a behavior (ibidem:707). To trigger adoption in complex diffusion, individuals need to have "multiple sources of activation"—what they also call "wide bridges." Centola and Macy (ibidem:729) conclude that "complex contagions may favor spatial networks not only because the ties between nodes are physically short but also because the bridges between neighborhoods are structurally wide. While spatial proximity can make the connection relationally strong, it is the width of the bridge that makes the connection structurally strong for the propagation of complex contagions."

While social relationships may span across neighborhoods, network ties may also connect economic organizations across regions. Davis and Greve (1997) consider the role of network ties and geographical proximity by examining the adoption of two initially controversial governance practices. They underline the importance of “legitimacy” and perceptions of “acceptability” among decision makers for the spread of practices and structures. Using data on corporate interlocks and business location, the authors find variation in the adoption of business innovations. They conclude that “both the social ties among firms—structural embeddedness—and the norms of directors—cultural embeddedness—conditioned how quickly and in what direction the field of large corporations adapted” (34).

Davis and Greve discuss cultural and structural embeddedness as distinct entities with different effects on diffusion processes. Their perspective may neglect how culture and politics are results of social relations developed in the past. Zukin and DiMaggio (1990) highlight the interpersonal context of economic action, particularly patterns of repeated network ties. They emphasize cultural and political embeddedness, defined as the manner in which economic institutions and decisions are shaped by shared meanings and the struggle for power in the state and between social classes. Cultural embeddedness may be particularly important in explaining “long-term or dramatic historical change” (17), such as the Reformation.

More recent literature picks up on dynamic aspects of diffusion, showing how network topologies, interaction patterns, and individual locations are not constant, but change over time. Centola (2015) analyzes the association between network origins and complex diffusion. Rather than being driven entirely by the efficient spread of information through weak ties, complex diffusion is facilitated by social structures in which groups enjoy moderate levels of consolidation and in which group members have many cross-cutting social ties. Social structures of this kind

provide enough social homophily to create meaningful collective identities without being so cohesive as to eliminate extralocal ties. Societies with high levels of consolidation show high correlations between social categories so that an individual's position in one category allows us to predict her position in another. For instance, knowing someone's neighborhood may lead to an accurate prediction of her occupational class in a highly consolidated society.

Using network simulations, Centola finds that societies with high consolidation are poorly integrated across groups in terms of shared norms and practices, as the underlying network structure produces highly segregated communities. Reduced consolidation increases the number of cross-cutting ties across social circles that enhance social diffusion. However, if consolidation is very low and networks are highly intersecting, diffusion of practices and norms may fail due to the underprovision of social support and reinforcement for adoption. Complex social diffusion is most likely if a society is moderately consolidated.

We argue that complexity in diffusion is not restricted to the risks and uncertainties related to the innovation or new practice, but also to the ways network ties affect the diffusion process. Recent literature on intraorganizational teams has begun to link network topologies to the experiences of the actors with each other in past interactions. Grund (2016) finds that team players who know each other from past interactions tend to interact more frequently with each other. Network experience positively impacts patterns of interactions in teams. Such experiences may affect complex social diffusion as well. Network experiences in dyadic interactions have similarities to the strength of ties.

Trust networks were at the origins of European cities (Blockmans 2010). Strong ties have the advantages of including trust that is important when reinforcement is necessary in complex diffusion. Studies on network diffusion focus on the processes during the spread of an innovation

and ignore the quality of past interactions. Interactions are historically embedded with cognitive, cultural, social, and political content. Organizational age and repeated interactions before an event provide the relational foundations (including cultural and political embeddedness) that enhance complex diffusion. Past collaborations and alliances provide affirmation and social reinforcement and could affect the collective adoption of a new practice. Historical embeddedness matters for complex contagions and institutional change.

4.3 HYPOTHESES

While previous research has shown that Hansa membership is associated with the adoption of the Reformation, we focus on the relational structure of the medieval Hansa. Based on research on diffusion in social networks (Davis and Greve 1997) we expect that if the Hansa organization was important for diffusion in the early stage of the Reformation, then its network structure would be characterized by high density. Moreover, according to Centola (2015), complex diffusion works best in networks that show some amount of clustering but that are not totally segregated.

Hypothesis 1: *The Hansa network of towns is expected to show high density, medium amounts of clustering, and small characteristic path lengths.*

Based on the literature on networks and diffusion, our general prediction is that more “central” towns in the Hansa network will be more likely to adopt the reform using mechanisms such as information flow, social influence, and reinforcement. How we define central and how this relates to adoption is specified in a set of hypotheses testing different network mechanisms through different network measures.

Generalized Centrality. Generalized centrality measures “enable researchers to set the relative importance between the number of ties and tie weights” (Bonacich 1987; Freeman 1978; Opsahl, Agneessens, and Skvoretz 2010:246). Generalized degree centrality captures the involvement of a node (i.e., a connection point) in the network. Opsahl, Agneessens, and Skvoretz (2010) argue that the involvement of a node in a network can be measured either by counting the number of ties in a binary network or by taking the sum of the weights in a weighted network considering the frequencies of interactions. To take both aspects into account, Opsahl et al. develop a generalized degree measure with a tuning parameter, α , regulating the relative importance of each. Closeness and betweenness centrality identify and measure lengths of the shortest paths in a network. The assumption is that actors relationally closest to all others receive information faster, which may have advantages in decision making. Similarly, actors located between many others may better control information flow to the extent that they are located on shortest paths. Communication can spread using multiple paths simultaneously as information is often divisible (Borgatti 2005; Estrada 2012:142). Opsahl et al. (2010) point out that longer chains of strong ties may spread information faster than shorter weak ties and that transmission is more probable if interactions are more frequent. The quality of resources flowing through paths with fewer intermediaries is likely higher compared to paths with more intermediaries. This complexity in the relative weight in numbers of ties and tie strength is also captured by a tuning parameter α in generalized closeness and betweenness measures.

Our hypotheses regarding the complex association between tie strength and numbers of ties are linked to the tuning parameter that varies between 0 and 2. When the alpha parameter is close to either 0 or 1 then the tie weights or the number of ties are irrelevant, respectively. If α is set to 0, the generalized measure equals Freeman’s (1978) measure using a binary network and tie

weights are not considered. If α is set to 1, the generalized measure captures tie weights only, but not the number of ties. Other values of the tuning parameter α consider combinations of both numbers of ties and tie weights. In the range between 0 and 1, numbers of ties and weights are positively valued. For values higher than 1, the tuning parameter gives negative values to number of ties and positive values for tie strength (Opsahl et al. 2010:250). While our measures do not allow us to capture previous exposure by other network partners, which has been found to be relevant for diffusion (Valente et al. 2015), generalized degree measures better capture the features of the local network structures of towns and can therefore better predict the network susceptibility of a town compared to classical centrality measures. Following Centola (2015), we expect that towns that not only are embedded in clusters but also show many connections beyond these are more likely to adopt reform compared to other towns. While a “good mix” of strong and weak ties may reduce the likelihood of overembeddedness (Uzzi 1997), we argue that tie weights are slightly more important in the context of the networks derived from Hansa event data. Applied to the generalized centrality measures this means that tie weights are relatively more important than numbers of ties. This is related to the fact that tie weights capture the interactions between towns at Hansa Diets that could lead to the spread of important information regarding the Reformation.

Hypothesis 2: *The more frequently a town attends Hansa Diets and the higher the number of towns it is connected to, the more likely reform is adopted: Optimal tuning parameter for generalized degree centrality is expected to be $0.5 < \alpha < 1$, which captures the fact that tie weights are more important than numbers of network ties.*

Hypothesis 3: *Towns with longer paths composed of stronger ties are more likely to adopt reform compared to towns with shorter and weaker ties: Optimal tuning parameter for generalized*

closeness and betweenness centrality is expected to be $\alpha > 1$, which captures the fact that tie weights are more important than numbers of paths.

Generalized Degree Centrality. We expect a positive association between involvement in the Hansa network and the adoption of the Reformation. Net of the common social, economic, and political variables that have been used to explain the Reformation, we expect that the greater the involvement of a city with other members of the Hansa organization, as measured through joint participation in diets, the greater its odds of adopting Protestantism.

Hypothesis 4: *The higher the involvement of a town in the Hansa town network (degree centrality), the more likely the town adopts the Reformation by 1530.*

Closeness and Centrality. While degree centrality offers a powerful and intuitive way to capture the involvement and activity of a node in a network, it is limited insofar as it only captures the neighborhood of a node. Other measures such as closeness and betweenness centrality consider information about the total network (Freeman 1978; Opsahl et al. 2010:245). We believe that both measures may have been relevant for adoption of reform. Closeness centrality captures relational distances between towns. Towns that are relatively close to other towns in terms of relational distance could get new information quicker as information travels through the shortest paths. Conversely, towns that already have information could distribute information faster if they are closer to other towns on average (Estrada 2012:140; Freeman 1978). Using optimal tuning parameters, we can see whether the shortest paths were most important or whether longer, “thick” paths contributed more to Protestant adoption.

Hypothesis 5: *The shorter the relational distance of a town to other towns in the Hansa network (closeness), the more likely it adopts the Reformation by 1530.*

Another classical measure, betweenness centrality, captures brokerage aspects. Towns in structural locations between other towns may either promote or impede communication between nodes. The fraction of information that goes through a town may be higher if it is positioned on many short paths between towns. Whether the shortness of paths mattered relative to thick ones is also an empirical question.

Hypothesis 6: *The higher the brokerage potential of a town in the Hansa network (betweenness), the more likely it adopts the Reformation.*

4.4 THE CASE: COMPLEX DIFFUSION AND THE PROTESTANT REFORMATION

Why would an organization of practical, worldly traders like the Hansa have facilitated the diffusion and adoption of Protestantism at all? One school of thought in explaining the Reformation suggests that demands for greater piety, a reformulation of communal ritual and public morality, broader inclusion, and greater clerical accountability drove the Protestant movement to challenge the political and ecclesiastical establishment in many cities (Blickle 1992; Mörke 2005; Ozment 1975; Postel 2006). Another school of thought emphasizes how the contending political interests of burghers, urban patricians, and regional princes decided the issue of the urban Reformation

(Brady 1998; Dixon 2000; Schubert 1996; Tracy 1986).

Trade and commercial development was another substantial factor. In the German speaking towns of the HRE where Luther's movement first took foot, long-distance trade had mushroomed

since the twelfth century. Besides land-based trade, much of which was directed toward Italy, there was a great upsurge of trade in the Baltic and the North Sea regions. Hansards were mercantile capitalists who profited by carrying mostly small cargoes to retail centers that stretched northward to Bergen in Norway, westward to Bruges and London, and eastward to Novgorod. Hansards coordinated security from piracy and predation, set prices, and controlled the output of key commodities.

The eminent Reformation historian Heinz Schilling (1983) sees the Hanseatic cities as standing forefront of the early Protestant movement because of favorable internal conditions; a mixture of ambitions toward greater civic autonomy from the territorial princes; struggles between burghers and patricians; and latent anticlericalism. Schilling goes so far as to argue for a “special type of Hanseatic City Reformation” (444). He proposes that robust institutions of civic governance and de facto autonomy from regional princes made Hansa towns eager to assert their prerogatives and open to influence from the middling class of citizens (445). If so, then Hansa cities would be comparable to the free and imperial cities that have long been shown to have been especially prone to adopt Protestantism for the same reasons (Moeller 1972).

The main difference between Hansa cities and other self-governing towns stemmed from the extent of their involvement in trade, which generated the prosperity that made independent action possible. As Schilling (1983:453–54) notes, this autonomy was crucial for the early Protestant breakthrough: “In the earliest stage of the North German Reformation the religious and political lines were quite clear...all the territorial rulers took the side of the old church. Consequently, a successful Lutheran Reformation meant at least demonstration of municipal independence from territorial tutelage, in most cases even a real short-term expansion of the town’s autonomy based on the medieval tradition and privilege.” More recently, Rubin (2014:272) also

suggests that the Hansa towns were more prone to reform because of relatively open polities, noting that: “In the northern Hanseatic cities, it was largely the middling bourgeoisie, who were wealthy but had little political power within the cities, which encouraged the Reformation as a means of confronting the established powers.”

Other historians have rejected Schilling’s argument noting that, although some Hansa towns such as Hamburg eagerly embraced the Reformation, others, such as Lübeck, came to it tentatively and despite much elite hostility (Postel 2006). A few, such as Cologne (the “German Rome”), remained resolutely Catholic (Scribner 1976). A leading historian recently declared that there is no Northern pattern in the response to Protestantism at all: “The introduction of the Reformation in the Hanseatic cities was not achieved at the same time, in the same way, or under the same conditions. Every city determined the matter itself” (Postel 2009:138–39). The northern cities were simply predisposed toward the ideas of Luther and his followers by virtue of their social structures and commercial development (Postel 2006).

To understand how the Hansa is implicated in the diffusion and adoption of Protestantism, it is necessary to consider the history, institutions, and incentives that informed the reaction to the early Reformation. The Hansa began with the establishment of Lübeck as a city in the middle of the twelfth century. It became the “head” of the organization as the main coordinator of common activities, including the negotiation of trade privileges in foreign lands and peace treaties with foreign rulers or rival towns. Lübeck also became the host of most of the gatherings of the league, the Hansa Diets, to which members sent representatives and that met regularly from 1358 through 1669.

Hansa Diets governed the organization’s foreign trade outposts (*Kontore*) and set trade policies. Most of the delegates were city councilors from their respective cities and active or former

long-distance traders. Delegates at Hansa Diets were likely members of a Hansa elite that not only had access to the councils in one city but also in other Hansa towns. These men were not only political representatives but often relatives and friends to each other, linked by ties of kinship, marriage, and business (Poeck 2010). Relations between Hansa delegates involved trust based on family ties or repeated interactions in multiple domains such as trade and politics. As city councils in central Hansa towns like Lübeck showed high levels of closure based on co-optation (e.g., Peters 1939), it can be argued that the institution of Hansa Diets was relatively stable and its character persisted over time.

Nevertheless, in the early sixteenth century, the Hansa was coming under enormous pressure, chiefly as a consequence of the rise of ambitious territorial states, but also as a result of growing differences among its members (Postel 2009; Seier 2012). The Hansa lost members who had failed to maintain trade privileges or lost their political autonomy to rising territorial princes. At the same time, maintaining exclusive trade privileges abroad, the other key component of Hansa organization, was becoming outmoded as a way of doing trade in the sixteenth century. As the center of northern trade shifted from the Baltic and the North Sea to the Atlantic, the domination of many trading centers by German merchants was increasingly resented (Tawney 1954 [1926]:63). Despite the efforts of the Hansards to maintain ethnic exclusivity in trade, foreign rulers began to close Hansa trade centers and eliminate their privileges in favor of their own local mercantile groups.

Hansa leaders tried to reform the organization in response to these challenges to become a stronger and more effective confederation of cities (Selzer 2010). The outbreak of the Protestant movement occurred at the same time as these efforts to reorganize the Hansa (Hammel-Kiesow 2008a:110; Seier 2012). The Lutheran movement posed a challenge as confrontational and

disruptive groups within the towns insisted on ecclesiastical and secular reforms. In July 1525, the Hansa Diet meeting in Lübeck passed a resolution restating its rejection of the “dangerous sects” inspired by Luther (Postel 2009:131–32). Echoing the condemnation and repressive measures announced in the 1521 Edict of Worms announced by Emperor Charles V, the organization’s delegates resolved to ban the printing and sale of Luther’s works; forbid Protestant preaching and house churches; and insist on the retention of Catholic priests and sacraments. Offenders would be punished by imprisonment or exile.

This resolution marked the first time that questions of faith had ever been taken up as part of the official agenda of the Hansa, a reflection of the extent to which Hansards feared Protestantism’s manifold “threats to the ecclesiastical and secular order” and to the league’s unity (ibid., 132). Protestant reforms threatened the preponderance of the patricians and the mercantile elite that had dominated the Hansa, and they were potentially bad for long-distance trade. Nevertheless, popular pressure compelled a number of Hanseatic cities, including Hamburg, to adopt Lutheran reforms in the early 1520s (Postel 2009).

Why would the Hansa as an institution have come out against the Protestant movement so forcefully, particularly when it had already made substantial inroads in some important members such as Hamburg and Rostock (Postel 2006)? There are two apparent reasons. The first has to do with the threat to trade posed by religious disputes that, in the context of the sixteenth century, inevitably must become political conflicts. As the emperor and pope opposed Luther’s movement, the adoption of Protestantism might cause costly confrontations or interruptions of trade. Being seen on the side of the new heresy might compromise the interests of Hansards not only in the empire but also abroad. Protestant partisanship invited embargo or retaliation and could endanger merchants in foreign ports hostile to Luther (Veltmann 2005). To the extent that reform movements

created uncertainty and discord among cities and territories, prudent businessmen would tend to oppose them.

Second, the Hansa model was predicated on coordination among member cities to enforce a commercial policy that established exclusive trading privileges; enforced retail monopolies; forbade credit and joint ventures with outsiders; and defined standard weights, measures, and product lines. In his discussion of the Hansa, Weber (1981 [1927]:235) notes that “[i]ts internal policy was directed toward the dominance of a market aristocracy, and especially in the sense of suppressing the craft guilds.” A movement “from below” must have seemed a threat to the elite interests upon which was premised the functioning of the Hansa.

In fact, the Protestant movement triggered a political crisis. Like all medieval German cities, the Hansa towns were oligarchical republics dominated by wealthy patricians and leading merchants (Korell 1980:33). The Hansa organization may have been so hostile toward the Reformation because of the adversarial way in which it was introduced in many towns; a contentious Protestant movement embraced by the “middling classes” of burghers, and especially by guildsmen, directed against the ruling oligarchies and demanding inclusive reforms (Blickle 1992; Brady 1999; Scribner 1986; te Brake 1998).

Despite the hostility of the Hansards, the movement quickly reached the “common man” in the North German towns. The spread of Reformation ideas was hastened by noisy preachers and public sermons, often held outside of churches and beyond the town wall (Scribner 1984; Veltmann 2009:148–49). An important theme of this preaching, and of subsequent pamphlet publishing, was the use of the local Low German (*Plattdeutsch*) language in preaching and worship, which was pitched as the idiom of the common folk of the city. Schilling (1983) observes that members of the Hansa, with their “many transterritorial connections” not only had extensive

social ties to each other but were developing a common culture, making them prone to mutual influence. Asche (1999) reveals a distinctive Low German *Kulturraum* in the sixteenth century that united many Hansa towns. This culture was characterized by a distinctive regional language; patterns of trade and business relations; intermarriage; and, for long-distance traders, formative experiences as foreign merchants living abroad in socially encapsulated Hanseatic trading enclaves (the *Kontore*) (Pichierri 2000; Selzer 2010).

Hansa towns not only demonstrated the interaction patterns between towns based on homophily (e.g., regional proximity, similar trade goods, kinship relations in councils and trade, similar economic and political interests) but also consolidation (e.g., options for mobility), and therefore offered the perhaps ideal network structure for complex diffusion such as the Protestant Reformation. Medieval towns were moderately segregated so that different occupational groups, for example merchants and craftsmen, lived in different parts of the towns. However, city councilors and wealthy merchants usually lived in prestigious streets close to the town hall. Hansa towns often allowed social mobility, something that is not very common in other regions. Jahnke (2014) shows how fraternities, marriage, and business contacts helped new men move up the social ladder and into the city council. Compared to the contemporaneous Italian city-states with closed elite groups (Puga and Trefler 2012), there was much more openness in Hansa towns, another condition that is favorable to complex diffusion (Centola 2015).

4.5 DATA AND METHODS

To assess whether social networks among Hansa towns mattered for the early diffusion of the Reformation we calculate descriptive network measures of the total cumulative Hansa town network from 1492 to 1516. We treat the position of Hansa towns within the Hansa network as city attributes and evaluate the extent to which a town's network position affected its likelihood of

reform. Descriptive statistics for all variables are provided in Table 6, and their Pearson's correlation coefficients are reported in Table 7.

Table 6. Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Protestant Reform by 1530	753	0.11	---	0	1
Ln(Pop)	753	1.74	0.9	0	5.42
Press	753	0.23	---	0	1
Market Potential	753	19.32	6.54	5.92	85.9
Ln(DistWitt)	753	6.18	0.76	3.04	7.27
Ln(DistZurich)	753	6	0.64	2.52	7.04
Independent City	753	0.06	---	0	1
Lay Magnate	753	0.88	---	0	1
Bishop	753	0.31	---	0	1
Water	753	0.65	---	0	1
University	753	0.07	---	0	1
Degree Generalized (α 0.5)	753	0.39	2.63	0	29.29
Betweenness Generalized (α 0.1)	753	0.22	2.57	0	45.27
Betweenness Generalized (α 1.1)	753	0.52	5.36	0	88.78
Closeness Generalized (α 2.0)	753	1.05	11.46	0	164.22

Table 7. Pearson's correlation coefficients

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. Protestant Reform by 1530	1														
2. Ln(Pop)	-.17	1													
3. Press	-.02	.44	1												
4. Market Potential	-.13	.17	.16	1											
5. Ln(DistWitt)	-.39	.13	-.09	-.24	1										
6. Ln(DistZurich)	-.12	-.04	-.25	-.57	.46	1									
7. Independent City	.22	.13	.12	.1	-.19	-.36	1								
8. Lay Magnate	-.18	-.12	-.17	-.17	.23	.35	-.66	1							
9. Bishop	-.13	.39	.34	.01	.17	-.07	.03	-.18	1						
10. Water	.08	.07	.18	-.02	-.13	-.13	.07	-.01	.08	1					
11. University	-.06	.34	.37	.04	.03	-.05	0	-.01	.25	.09	1				
12. Degree Generalized (α 0.5)	.23	.12	.09	-.03	-.19	.01	.19	-.15	.02	.07	.03	1			
13. Betweenness Generalized (α 0.1)	.21	.09	.1	-.03	-.12	.01	.22	-.15	.06	.05	-.02	.77	1		
14. Betweenness Generalized (α 1.1)	.16	.12	.13	-.01	-.11	0	.23	-.2	.09	.03	.03	.73	.81	1	
15. Closeness Generalized (α 2.0)	.2	.09	.09	-.05	-.13	.02	.13	-.07	.01	.06	.03	.89	.78	.65	1

4.5.1 *Dependent variable: Reform*

To test our hypotheses, we examine the propensity of cities in central and Western Europe to institute reforms up through 1530. Our study is limited to the early Reformation, from 1517 to 1530, the period in which religious reform was driven by an urban social movement and in which the interests of territorial rulers played the least role in determining whether towns adopted the Reformation (Blickle 1992; Moeller 1972; Mörke 2005; Postel 2006, Scribner 1986; te Brake 1998). Our dependent variable and control variables are drawn from Rubin's data set (see Rubin 2014 for further details on these measures). The dependent variable is coded 1 for cities that are Protestant in 1530 and 0 otherwise. This variable was coded from historical atlases and the *Catholic Encyclopedia* (ibid.). A city receives a value of 1 "if it accepted the Augsburg Confession, Catholics were forced to flee, or the encyclopedia explicitly states the Protestantism was accepted" (ibidem:283).

4.5.2 *Independent variables*

Hansa Network. Our network measures are generated from Poeck's (2010) list of Hansa delegates and towns attending Hansa Diets. Poeck's list includes 34 towns attending 29 events in the period from 1492 to 1516. Towns are attending 5.74 events, on average, with a standard deviation of 7.99, a minimum of 1, and a maximum of 26 events. Average attendance at events is 6.93 towns with a standard deviation of 4.24. The smallest event has three towns and the largest event has 23 towns.

The cumulative Hansa town network shows a connection between towns through joint participation at one or more Hansa Diets in the 25-year period before 1517, the year of the Reformation. Town-by-town networks are one-mode projections derived from shared affiliations

of Hansa delegates “representing” Hansa towns at Hansa Diets (Breiger 1974). Poeck’s data include information about how many events each pair of towns has attended, and how many other towns attended these events. This information is used to estimate the strength of collaborations between towns following Newman’s (2001) procedure for weighted collaboration networks. Higher weights are assigned to repeated collaborations and collaborations of smaller size (Opsahl 2013).

To characterize the total Hansa town network, we first calculate topological properties following Centola (2015:1312). For the cumulative social network of towns represented by individual delegates at Hansa Diets from 1492 to 1516 we calculate a clustering coefficient and path length. Other characteristics of the total network related to diffusion are calculated as well, for example density, diameter, cohesion, and centralization.⁶⁵

To describe the structural locations of individual towns in the cumulative Hansa town network, we calculate a set of “centrality scores” that distinguish nodes from each other (Freeman 1978; Robins 2015:183; Wasserman and Faust 1994:169ff.). Nodes that are not in the Hansa network have a centrality score of 0.⁶⁶ Prominence or activity of town is measured as “degree centrality” that captures the numbers of connections for each town. “Betweenness centrality” captures brokerage potential and the importance of towns for connecting the Hansa network using short paths. “Closeness centrality” is a measure for relational distance that sums the shortest paths between a Hansa town and all other towns.

⁶⁵ As these are standard measures, we refer to the standard literature on network methods such as Wasserman and Faust (1994). For these and other network calculations and visualizations we used the R packages “igraph” and “tnet.”

⁶⁶ There was also a set of Hansa towns in Rubin’s (2014) data that did not attend Hansa Diets during the time of observation as recorded in Poeck’s (2010) list. Conversely, Poeck’s data include towns that were not included in Rubin’s data, for example smaller towns. For network calculations, we considered all Hansa towns included in the Poeck data. In statistical analyses, Hansa towns that were not recorded in Poeck’s list were assigned a 0 like other non-Hansa towns.

While the previous measures apply to binary networks and merely distinguish between absence and presence of a relationship between nodes, more refined centrality scores can be calculated for weighted networks. Opsahl et al. (2010) propose a generalized degree measure that considers numbers and weights of ties. This measure captures how strong the ties of a node are to other nodes and how many connections or different paths it has. Moreover, the authors develop a shortest distances algorithm and refine closeness and betweenness measures by considering numbers of intermediaries and weights of ties. This has special implications for diffusion in networks, according to Opsahl et al., if networks include strong ties. For instance, in some situations short paths of weak ties (of length 1) may be slower and less likely for information flow compared to longer paths of strong ties (of length 4). Based on these weighted one-mode networks of Hansa towns, we calculate second-generation centrality measures (ibid.). Using second-generation centrality measures is a useful strategy as the number of ties, the basis of Freeman's (1978) measures, may not be as important as having strong ties in complex diffusion. We calculate generalized degree centrality measures considering numbers of ties and tie weights. The relative importance of these is determined by an optimized tuning parameter. To find the optimized tuning parameter alpha, we calculate maximum significance levels of alpha in probit models predicting adoption of reformation in a sample of 63 Hansa towns. Similarly, we calculated closeness and betweenness centrality using Opsahl et al.'s (2010) second-generation measure for weighted networks including corrections for disconnected components. Optimal tuning parameters were also calculated for these.

4.5.3 *Control variables*

Hansa Membership. This variable is coded as 1 if the town is a member of Hansa and 0 otherwise as identified by Dollinger (1970, 1989).

Printing Press. We control for the presence of a printing press in a city, as this has been found to have facilitated the adoption of Protestantism (Rubin 2014). This variable is coded as 1 if there was a printing press in a city prior to 1500 as identified in either Febvre and Martin (1958) or Clair (1976).

LN(natural logarithm) Population. As is standard in early modern historical analysis, we use population size as a proxy for a city's economic development. Population size is measured in thousands of persons, which is logarithmically transformed. The population data came from Bairoch (1988) either for the year 1500 or from linearly interpolating the population using data from prior to 1500 or from data after 1500.⁶⁷

Market Potential. We also control for market potential, which captures a city's proximity to large cities. It is "the sum of other city's population divided by their distance to the city in question" (Rubin 2014:275).

Distance to Wittenberg and Zurich. Previous studies have shown that, net of local conditions, ideological influence through spatial diffusion helps explain whether cities in the HRE adopted Protestantism (Becker and Woessmann 2008, 2009; Pfaff and Corcoran 2012; Rubin 2014). To capture the spread of demand for both the Lutheran and Zwinglian branches of the Reformation, we calculate the distance of each city to both Wittenberg and Zürich.⁶⁸ The distance to Wittenberg

⁶⁷ Rubin (2014) also gave values of 1,000 to four cities with printing presses but no population data to include in the sample all cities with printing presses.

⁶⁸ Distances "were calculated as the crow flies, using city coordinates and the distance formula (and translating degrees into miles)" (Rubin 2014:285). Bairoch (1988) identified the city coordinates.

and distance to Zurich variables were logarithmically transformed. Because these variables are generated based on Wittenberg and Zurich, both cities were excluded from the models.⁶⁹

Political Regimes. Previous studies have shown that civic autonomy, and especially freedom from princely or ecclesiastical interference, helped to determine if a city adopted Protestantism. Prior scholarship suggests that free and imperial city-states (*Reichs-und Freistädte*) tended to favor the Reformation (Moeller 1972). As such, we control for a binary variable in which 1 represents an “independent Free Imperial City in 1517” and 0 otherwise (Rubin 2014:275). The independence of a city was determined based on Jacob (2010). We also include a binary variable for whether a city was a part of a “lay” magnate (it was neither free nor subject to an ecclesiastical lord) and a binary variable for whether a bishop or archbishop resided in the city by 1517 (Cheney 2017).

Water. We control for whether a city is on a body of water (1 = yes, 0 = no), which can affect the diffusion of information. Data for this variable “were collected by searching Google Maps and determining each city’s access to water” (Rubin 2014:284).

University. Lastly, we include a control for whether the city has a university by 1450 (1 = yes, 0 = no).

4.5.4 *Data limitation*

While the historical records from the Hansa Diets 1492–1516 give us a deeper understanding of the cumulative relational structure of the Hansa political network until the eve of the Reformation, we lack information about the network structure of the medieval Hansa during the actual adoption

⁶⁹ Because Mainz was “the birthplace of printing” (Rubin 2014:271), it was also excluded from the sample.

period as well as detailed information on the year of adoption in each city. The available data limit our analyses to a cross-sectional model. Using panel data from a later period, Cantoni (2012) examines the dynamic aspects of adoption as being partly driven by the adoption of neighboring regions.

Our network measures may overestimate the embeddedness of towns that stopped attending Hansa events after our period of observation. However, we believe that changes in the Hansa network are small in our period of investigation that ended in the year 1530. Data limitations do not permit us to disentangle the problem in diffusion studies identified by Burt (1987) in that adoption could be caused by cohesion or structural equivalence. Towns may have reformed because towns with similar trading partners, allies, or enemies outside the Hansa have done so. Finally, Nyköping in Sweden was not a Hansa town but rather was the contemporaneous seat of the Swedish crown. It was included in the network because of the close ties between the Swedish monarch and the Hansa, its hosting of a Hansa event, and the interactions it fostered between Hansa towns. For similar reasons, we include a few Hansa towns that attended events but left the Hansa afterward.

4.6 RESULTS

4.6.1 *Topology of Hansa Network and Position of Hansa Towns*

We use descriptive network measures to assess the cumulative Hansa network in the 25-year period before the Reformation. In Figure 11, we depict the town \times town network with weighted edges using Newman's (2001) procedure for weighted collaboration networks. The network includes 34 Hansa towns connected through 29 Hansa events. Towns with a high number of shared events may be characterized as having "strong ties," and towns with only a few interactions in the 25-year period are linked through weak ties (e.g., Granovetter 1973). We observe that all Hansa

towns listed by Poeck (2010) for the period from 1492 to 1516 are connected into a single network component. Non-Hansa towns may be considered as isolates because they did not attend Hansa events. Not all towns have the same number of connections as indicated by the number of lines. Some towns have a higher centrality in the Hansa network. Some actors also seem to show equivalence in positions constituting “social roles” (Hanneman and Riddle 2011:341).

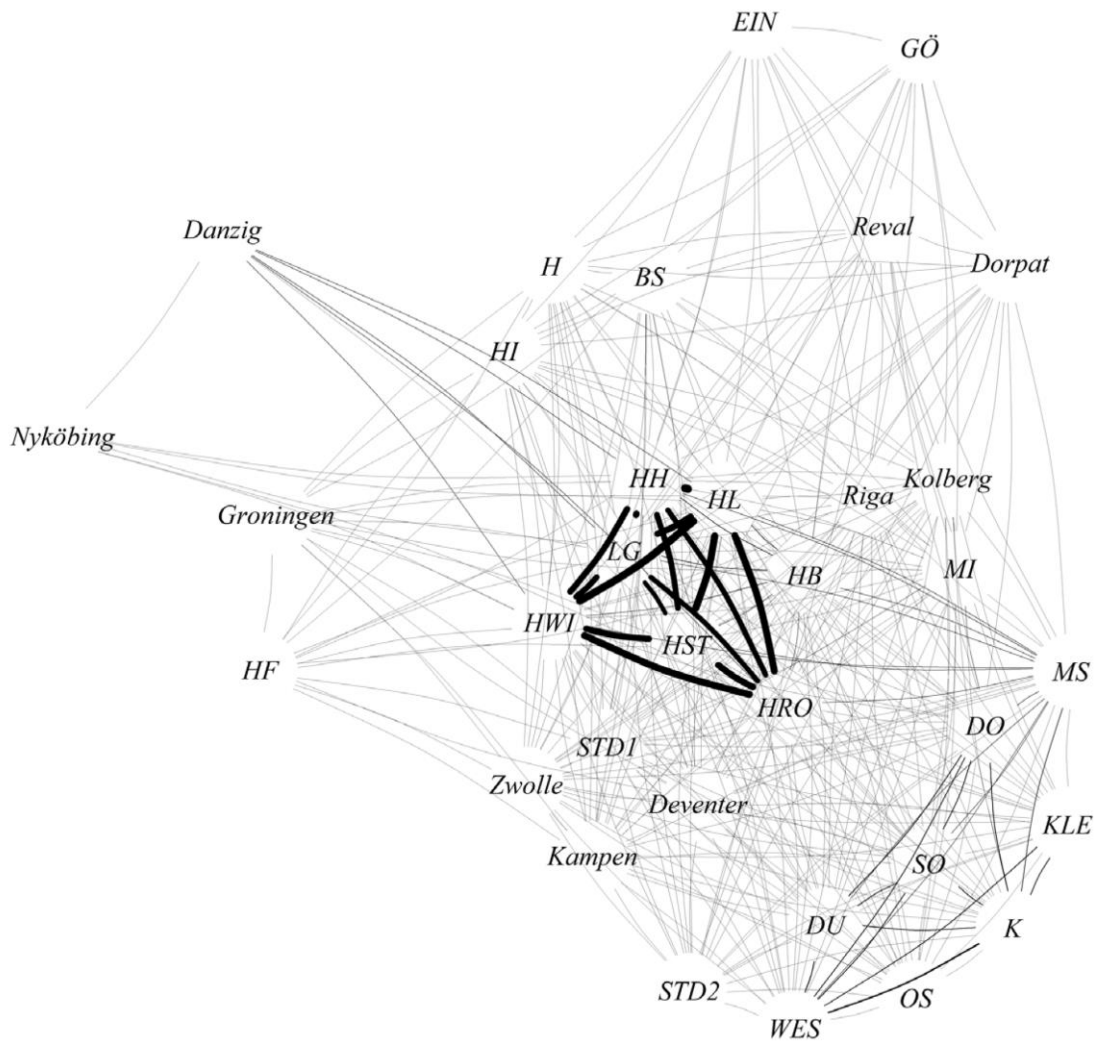


Figure 11. Cumulative Hansa town x town network 1492-1516, weighted edges. German towns are labeled using their official German license tag. Names of non-German towns are written in full words.

Hansa towns varied strongly in numbers and types of events they participated in, for example location and size of events. Consider the position of Hamburg (HH in Figure 11), which was perhaps the center of the Reformation in Northern Germany relative to the position of Cologne, which remained Catholic. The graph in Figure 11 locates Cologne (K) at the periphery whereas Hamburg is located at the center of the network, embedded in a dense, regional cluster of mostly coastal towns. Previous research measures Hansa membership using dummy variables that assign the same value to Hamburg and Cologne (both 1=Yes) and ignore their differences in historical embeddedness. Our network data show that Hamburg is connected to more towns than Cologne through at least one joint Hansa event (degree: $33 > 22$). Hamburg was also more deeply involved as is evident when all interactions are counted for each town (weighted degree sum: $149 > 41$). Figure 11 shows how this is reflected in differences in numbers of ties as well as in strengths of ties as marked by the width of lines. We calculate a generalized degree of 10.49 for Cologne and 27.55 for Hamburg ($\alpha = 0.5$) suggesting that the Northern German town and center of the Northern Reformation was much more deeply embedded in Hansa politics despite Cologne's large size and economic importance. This relationship is obscured if we use a binary Hansa membership variable as a proxy as in previous studies of the Protestant Reformation.

The core members of the Hansa appear to have had a substantial structural potential for cohesion and solidarity. The size of the total network of diet-attending Hanseatic cities is small, reinforcing the small group character among the "core" members involved in Hansa politics and governance. This structure may be hidden by binary measures that suggest a larger structure by including non-attending towns in the Hansa group.

Although we identified a wider group of 73 Hansa towns in the overall data set, we limit the network analyses to 34 towns active in Hansa events in the 25-year period before 1517 and

linked through 390 ties of joint participation. To characterize the features of the urban network, we start with two features that have been considered as key in urban studies: density and centralization. Neal (2013:119) states that network density and centralization characterize functional polycentricity in urban networks. The cumulative Hansa town network depicted in Figure 11 shows a relatively high density (density = 0.695) and moderate levels of hierarchy (centralization = 0.32) in the simplified (binary) network. This network structure suggests a moderate to high functional polycentricity score of 0.47. Modern urban networks that show the characteristic horizontal linkages of polycentric networks are Southern California and the Randstad region in the Netherlands (ibidem:120). A recent empirical study of the period from 1986 to 2006 found that research collaboration among European cities have a network density of 6 percent, a diameter of 4, and an average path length of 2 (Comin 2013:181).

The distance of the Hansa network is relatively short with a diameter of 2 and an average path length similar to those reported by Centola (2015) susceptible for complex diffusion (distance = 1.301). Both measures suggest that information traveled relatively quickly in the Hansa town network. Finally, clustering is another factor considered by Centola and may be important particularly for complex diffusion. The Hansa network shows high transitivity (global clustering coefficient = 0.83). Using Opsahl's (2013) clustering coefficient for two-mode networks, we get a slightly lower coefficient of 0.73. These coefficients describe the density of the local neighborhoods, which is even higher than the density of the total network. Generally, Hansa towns seem to be highly "embedded in dense local neighborhoods" (Hanneman and Riddle 2011:346).

These descriptive findings confirm our expectation that the structure of the Hansa network fits the criteria for complex diffusion. The structure enabled the spread of information through multiple channels in the early years of the Reformation; it also offered multiple opportunities for

support and reinforcement, particularly at the center of the network. By contrast, cities on the edge of the network such as Cologne (Köln), Deventer, and Soest had less such support, an additional factor that may account for why towns on the Westphalian perimeter of the Hansa were more prone to remain Catholic (Scribner 1976).

4.6.2 *Multivariate Results*

Individual Hansa towns differed dramatically in their involvement in Hansa politics and attendance of Hansa events. This different activity creates various network positions in our cumulative network. Engagement leaves traces in the form of connections between towns indicating a shared history and potential interpersonal communication between Hansa delegates. The different numbers of connections of towns in Figure 11 illustrate this and reveal a central “core” of towns highly interconnected by many events, particularly Bremen (HB), Hamburg (HH), Lübeck (HL), Lüneburg (LG), Rostock (HRO), Stralsund (HST), and Wismar (HWI). All other towns seem to be peripheral but differ in levels of Hansa involvement and numbers of connections to other towns.

To assess our hypotheses, we estimate a series of binary probit regression models on reform, a categorical variable (Long 1997). All models use robust standard errors clustering by territory, which takes into consideration that reform may have spread more quickly within territories due to spatial proximity.⁷⁰ In our analysis of the diffusion of the Reformation, we consider the social and political embeddedness of Hansa towns based on the history of attendance at Hansa events. The network structure of each individual town has important implications for the Reformation process due to potentially varying information flows and social reinforcement.

⁷⁰ Other than free and imperial cities that are considered to be their own territory, our coding of territories follows Rubin (2014).

To determine if the network structure variables can account for the effect of Hansa membership, we compare the Hansa membership effect between models with and without the network structure variables and test whether the Hansa membership coefficient is significantly reduced using Seemingly Unrelated Estimation (SUEST). Suest handles the possibility of the cross-equation correlation of errors by simultaneously estimating a Huber-White sandwich covariance matrix (see Clogg, Petkova, and Haritou 1995).

We analyze how social embeddedness affects the adoption of the Protestant Reformation among towns by focusing on their structural position in the Hansa network of towns using generalized centrality measures. Opsahl et al. (2010:50) note the difficulty of determining the exact tuning parameter and suggest that finding optimal alpha parameters may be a potential area for research. We calculate the maxima for each measure over the range of alpha values in probit models predicting reform. We use the alpha parameter with the highest levels of significance calculated in the sample of Hansa towns only. Figures 12 through 14 show the significance levels of all three generalized centrality measures across alpha. The optimal tuning parameters are 0.5 (degree), 2.0 (closeness), and both 0.1 and 1.1 (betweenness). Thus, we find support for hypothesis 2 about the importance of tie strength and numbers of ties. Evidence for the hypothesis 3 is mixed.

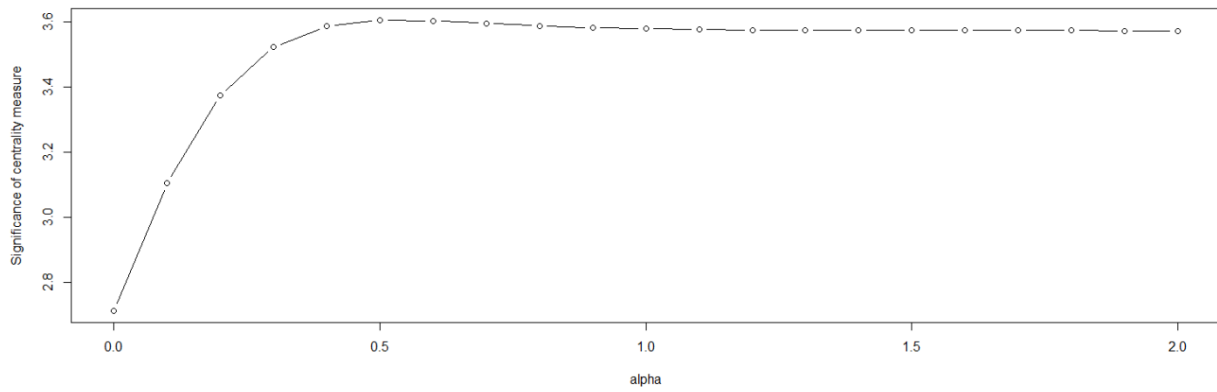


Figure 12. Significance levels of generalized degree centrality across alpha parameters.

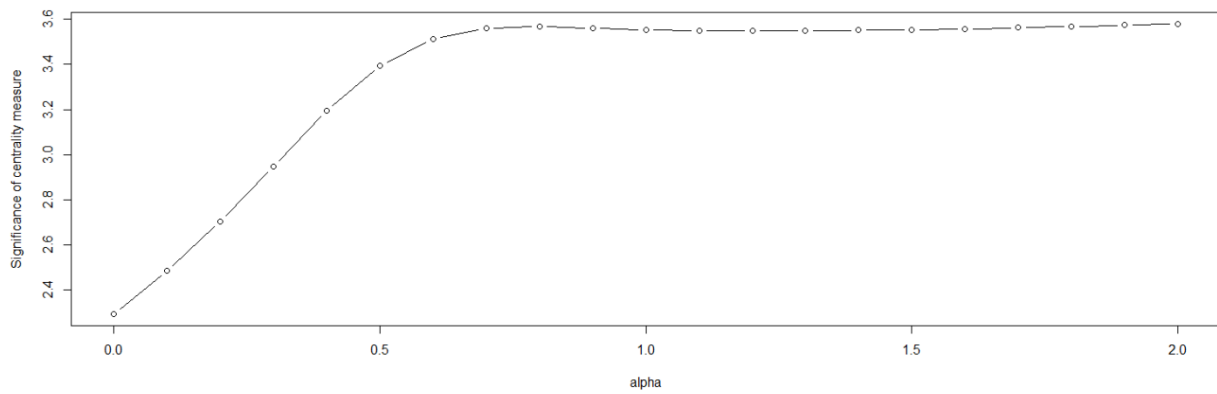


Figure 13. Significance levels of generalized closeness centrality across alpha parameters.

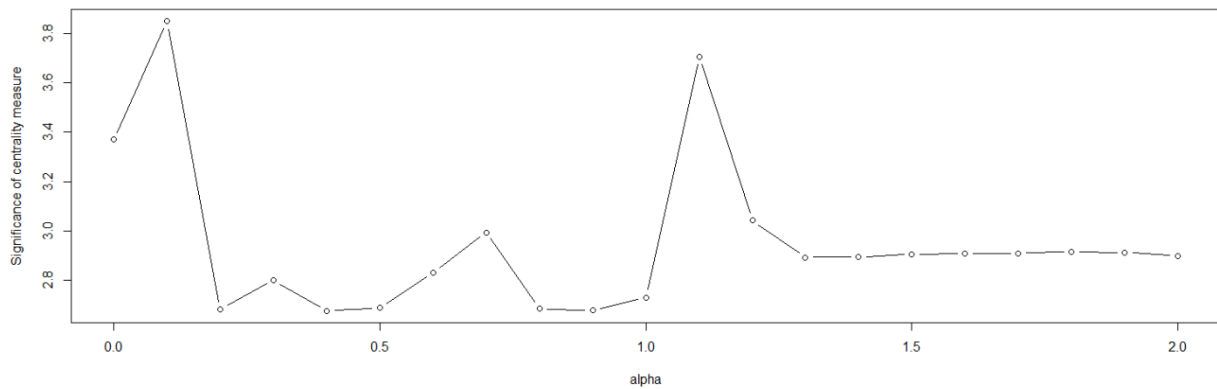


Figure 14. Significance levels of generalized betweenness centrality across alpha parameters.

Tables 8 and 9 show the results from probit regressions of adoption of Protestant Reformation by 1530 on covariates. Results are based on the sample of 753 towns in Europe (Table 8) as compiled by Rubin (2014) as well as results for a reduced sample of only Hansa towns (Table 9). Our analyses show that all network variables are statistically significant and show in the direction expected by our hypotheses. These results hold across all alpha values as depicted in Figures 12 through 14. In the tables, we show results for the maxima we found only. In Table 8, model 1, Hansa membership significantly increases the likelihood of reforming by 1530. In model 2, when Generalized degree centrality ($\alpha = 0.5$) is added, the coefficient for Hansa membership is no longer statistically significant, which indicates that generalized degree centrality completely explains the significant relationship between Hansa membership and reform. According to test results, each of the other structural measures significantly reduces the relationship between Hansa membership and reform: Betweenness Generalized ($\alpha = 0.1$) [$\chi^2 = 5.11$, $p < .05$], generalized betweenness centrality ($\alpha = 1.1$) [$\chi^2 = 3.37$, $p < .10$], and generalized closeness centrality ($\alpha = 2.0$) [$\chi^2 = 4.00$, $p < .05$]. Across models 2 through 5, the coefficients indicate that favorable structural positions in the Hansa network of towns increase the likelihood of reform by 1530. This is also the case in Table 9, which estimates models for Hansa towns only. Thus, we find support for hypotheses 4 through 6: Having more connections to other Hansa towns (degree), being relationally closer to other Hansa towns (closeness), and occupying positions with brokerage potential (betweenness) increase the odds of adoption.

An interesting finding is that printing press is not statistically significant in our models. As we are analyzing the early stage of the Reformation, this suggests that informal social relations may have been particularly decisive during this stage of the diffusion process over the spread of printed materials. There is good historical evidence to suggest that preaching and debates played

a substantial role in spreading the early Protestant movement (Hannemann 1975; Kim and Pfaff 2012). In later stages of the Reformation, as analyzed by Rubin (2014), formal means of communicating information and influencing political elites may have been more important as Rubin's (2014) findings suggest.⁷¹ Our statistical models confirm this interpretation because our Hansa network measures are no longer significant if we regress adoption in 1560 on our covariates (results not shown). Hence, in generating early waves of adoption, our findings suggest that social influence and social reinforcement may be more important in complex diffusion than are formal channels.

⁷¹ The results may also be due to the fact that we do not use an instrumental variable approach for estimating the effect of the printing press on reform as we merely control for it. Rubin (2014) finds statistically significant effects for the printing press primarily in models using an instrumental variable analysis.

Table 8. Probit regression predicting Protestant reform by 1530. Unstandardized coefficients displayed (robust clustered SE by territory)

	Model 1	Model 2	Model 3	Model 4	Model 5
Ln(Pop)	-0.28*	-0.37**	-0.33*	-0.32*	-0.33*
	(0.14)	(0.14)	(0.14)	(0.14)	(0.14)
Press	0.13	0.11	0.07	0.06	0.06
	(0.24)	(0.24)	(0.25)	(0.25)	(0.25)
Market Potential	-0.25***	-0.25***	-0.25***	-0.25***	-0.24***
	(0.06)	(0.06)	(0.07)	(0.06)	(0.07)
Ln(DistWitt)	-1.01***	-0.98***	-0.98***	-1***	-0.98***
	(0.18)	(0.18)	(0.18)	(0.18)	(0.18)
Ln(DistZurich)	-1***	-1.06***	-1.06***	-1.06***	-1.02***
	(0.27)	(0.27)	(0.27)	(0.27)	(0.27)
Independent City	0.33	0.25	0.15	0.21	0.24
	(0.38)	(0.39)	(0.41)	(0.39)	(0.39)
Lay Magnate	-1.06**	-1.06**	-1.1**	-1.08**	-1.11**
	(0.36)	(0.36)	(0.37)	(0.36)	(0.37)
Bishop	-0.48*	-0.51*	-0.56*	-0.56*	-0.48*
	(0.23)	(0.24)	(0.25)	(0.25)	(0.24)
Water	0.11	0.06	0.09	0.11	0.08
	(0.17)	(0.17)	(0.17)	(0.17)	(0.17)
University	-0.29	-0.39	-0.21	-0.26	-0.41
	(0.41)	(0.43)	(0.42)	(0.42)	(0.42)
Degree Generalized (α 0.5)		0.07**			
		(0.02)			
Betweenness Generalized (α 0.1)			0.11**		
			(0.04)		
Betweenness Generalized (α 1.1)				0.03**	
				(0.01)	
Closeness Generalized (α 2.0)					0.01**
					(0.004)
Constant	16.11***	16.39***	16.34***	16.48***	16.11***
	(3.17)	(3.17)	(3.19)	(3.22)	(3.17)
N	753	753	753	753	753

Note: *** $p < .001$; ** $p < .01$; * $p < .05$; + $p < .10$.

Table 9. Probit regression predicting Protestant reform by 1530 in Hansa towns.
Unstandardized coefficients displayed (robust clustered SE by territory).

	Model 6	Model 7	Model 8	Model 9	Model 10
Ln(Pop)	-1.35** (0.46)	-1.71*** (0.46)	-1.51** (0.49)	-1.71** (0.51)	-1.58** (0.47)
Press	1.04+ (0.62)	1.03 (0.67)	0.49 (0.69)	0.51 (0.65)	0.92 (0.67)
Market Potential	-1.16*** (0.27)	-1.44*** (0.31)	-1.46*** (0.32)	-1.53*** (0.34)	-1.58*** (0.36)
Ln(DistWitt)	0.04 (0.4)	0.17 (0.45)	0.04 (0.42)	-0.09 (0.43)	0.42 (0.5)
Ln(DistZurich)	-13.84*** (3.78)	-17.2*** (4.27)	-17.48*** (4.24)	-18.01*** (4.34)	-19.57*** (4.85)
Independent City	0.16 (0.75)	-0.72 (0.86)	-1.39+ (0.83)	-1.24 (0.76)	-0.57 (0.85)
Lay Magnate	-3.23*** (0.82)	-3.98*** (1)	-4.03*** (0.92)	-4.25*** (0.98)	-4.11*** (1.03)
Bishop	-1.9** (0.73)	-2.19** (0.75)	-2.47** (0.73)	-2.62*** (0.75)	-2.28** (0.79)
Water	0.8 (0.52)	0.51 (0.58)	0.42 (0.59)	0.5 (0.57)	0.56 (0.59)
University	-0.4 (0.73)	-0.83 (0.59)	0.43 (0.66)	-0.11 (0.85)	-0.99+ (0.55)
Degree Generalized (α 0.5)		0.09** (0.03)			
Betweenness Generalized (α 0.1)			0.12*** (0.03)		
Betweenness Generalized (α 1.1)				0.05*** (0.01)	
Closeness Generalized (α 2.0)					0.02*** (0.01)
Constant	107.87*** (28.99)	133.47*** (31.92)	136.28*** (32.3)	141.95*** (33.59)	148.99*** (35.81)
N	63	63	63	63	63

Note: *** $p < .001$; ** $p < .01$; * $p < .05$; + $p < .10$.

4.7 CONCLUSION AND IMPLICATIONS

Previous social-scientific research on the adoption of the Reformation finds that the motives that propelled the institutional reforms in the cities varied from place to place but can be summarized, usually in some combination, as being linked to “piety, power and the purse” (Pfaff and Corcoran 2012). In the present study, we go beyond these factors to analyze how social diffusion facilitated by the social network relations between cities explains why some cities were more prone to embrace reform. The association between network ties and social diffusion in our sample of Hansa towns provides evidence for both simple and complex contagion. Our analyses show that historically embedded networks may offer the ideal structural conditions for the spread of new controversial religious and governance practices. While scholars of the Reformation have drawn on network concepts focusing on change agents (Hannemann 1975; Kim and Pfaff 2012), no previous study has used relational network data. Our operationalization of a new network data set based on medieval Hansa Diets allows us to consider the network structure of towns up to the eve of the Reformation. We analyze weighted event data from Hansa Diets from 1492 to 1516 using generalized centrality measures, and point to the complex association between tie weights (i.e., the strength of ties) and numbers of ties in network diffusion. Using optimal tuning parameters for simple adoption models, we show that a combination of strong ties and weak ties mattered for adoption.

Taken together, our results suggest that there is a general disposition favoring reform across Hansa towns. Existing social-scientific accounts would suggest that the reason behind this pattern lies in the greater wealth and commercial development of Hansa cities compared with other cities in the HRE. Our findings cast doubt on this interpretation. As a control for an economically derived demand for reform or as a proxy for the relative importance of commerce or mercantile interests

in city governance, the inclusion of Hanseatic membership as an indicator variable in previous studies may be misleading; mere membership tells us little about the odds of reform as more involved Hansa cities are largely responsible for this association.

Our study finds that Protestantism took off in the northern regions of Germany, in part, because structures of social relations and shared cultural identity enhanced solidarity among Hansards. This, in turn, contributed to the rapid diffusion of Protestantism across cities. Of course, one reason that Hanseatic cities may have influenced each other in adopting Protestantism is that it was in their collective interest to have a single religion. Once towns began to adopt the Reformation in the early 1520s, there would have been pressure on other Hansards to do the same. Religious differences had the potential to threaten the social glue—such as the cross-cutting ties of friendship and intermarriage that linked cities urban elites and Hansa delegates—upon which economic union was predicated. The religious sphere was highly intertwined with civic affairs, trade, and commerce, particularly as burghers were tightly linked through corporate groups such as guilds and religious confraternities (Richardson 2005; Selzer 2010).

Organizational structures like the Hansa, which cut across subgroups and across localities, are particularly apt to provide opportunities for complex diffusion. The Hanseatic cities were densely connected through multiple relations of kinship, marriage, trade, and politics. This promoted not only cultural similarity but also fostered institutions and organizational ties that made the flow of information and influence more efficient than in more socially isolated regions of the HRE. The extensive social ties among Hansards across cities and their joint involvement in governance enhanced the susceptibility of the Hansa cities to the diffusion of Protestantism.

Hanseatic structures may have been efficient because they overcame parochialism but, ironically, did not overcome relational segregation by making membership exclusive (Centola

2015:1315). The reason is that without moderate consolidation there are no meaningful groups and without them the exercise of social influence is less salient. Exclusive organizations like the Hansa inadvertently promote complex diffusion within their network by making group membership highly salient. This reinforces the social influence that other's behavior in the network can have on potential adopters. At the same time, the overlapping ties and the bridges across social locations create a structure especially favorable to information brokerage and extralocal influence (ibidem:1322; see also Burt 2005).

The Hansa created cross-cutting connections between the otherwise discrete medieval social circles that ordinarily segregated groups and regions. Because transportation was expensive and traveling was dangerous, late medieval urban economies were largely local in scale, chiefly dependent on adjacent agrarian areas for which they served as a market for manufactured goods (Nicholas 2003; Rozman 1978; Russel 1972). More extensive, cross-cutting urban networks developed through long-distance trade relationships of the kind that the Hansa actively promoted. The Hansa became a supraregional network of local elites who interacted both at home and abroad. In addition to trade relations, ties between Hansa cities were generated through participation in the governing institutions of the organization.

Our study finds strong support for our relational explanation of the Hansa cities and the coming of the Reformation. While previous research on networks and diffusion pointed to the importance of network topologies, these studies have begun to include aspects about the origins of networks (Centola 2015). Our study suggests that social, economic, and political embeddedness of social relations influenced Protestant diffusion. Although we find clear evidence of spatial diffusion from the ideological centers of the nascent Protestant movement in the negative relationship between reform in a city and distance from Wittenberg and Zürich, our findings also

suggest that there was diffusion through network relations (and these relationships remain significant in our models that include our measures of spatial diffusion). Future work in the comparative and historical social sciences should consider relational processes alongside political economy if we wish to arrive at reliable and general explanations of major institutional changes.

4.8 MINI GLOSSARY

Centralization: Measure used to capture hierarchy in a network considering the distribution of the numbers of ties. If all nodes have the same number of ties, centralization is 0, and if all ties are linked to the central node, centralization is 1 resembling a network star (Wasserman and Faust 1994:177).

Characteristic path length: Network measure that reports how many ties must be passed through to navigate between any two nodes in a network, on average (Centola 2015:1314).

Clustering coefficient: Network measure of the number of closed triads divided by the number of two paths. A closed triad is a structure in which three nodes are all connected to each other. Two paths have only two ties between three nodes (Centola 2015:1311).

Degree centrality: The number of ties a single node has to other nodes. For instance, Hansa towns with a network degree of 20 established the same amount of (unweighted) ties to other Hansa towns in at least one shared event in the period of observation.

Density: Network measure of connectivity or cohesion based on the number of observed ties divided by the number of possible ties.

Diameter: The largest distance between any two pairs of nodes in a network.

Functionally polycentric: “A network is functionally polycentric when it contains a large number of edges (it is dense), and when these edges are evenly spread among the nodes (it is not centralized).” The polycentricity score can be calculated as follows: $\text{Density} * (1 - \text{Centralization})$ (Neal 2013:119).

Graph: Visualization of a network including nodes and lines representing actors and ties.

Isolates: Nodes that do not have any ties are unconnected, which means not part of the network.

Networks: Structures that include nodes (actors, e.g., organizations) and ties (relationships, e.g., collaborations).

Total network: Networks can be analyzed at the nodal level, subgroup level, and aggregate level. The total network is the all-encompassing set of nodes and ties that can be described by global measures such as density.

Chapter 5.

CONCLUSION

This dissertation is a contribution to historical network research in sociology that focuses on pre-modern institutions. My aim is to point to an important but often not sufficiently considered Northern European case that was a prominent player in economic history over centuries contemporaneous with the famous maritime societies in Italy and before the rise of the Dutch and English. Thus, I hope to fill a gap in historical sociology and neighbor disciplines by offering this case study of the medieval Hansa, Hanse or Hanseatic League.

While other maritime societies and groups of traders certainly existed before the Hansards, e.g. the Frisians (Pye 2015), the present case offers unrivaled amounts of written documentation suitable for scholars interested in economic development in Northern Europe, the regions in which western capitalism and our modern world emerged. I believe there is a need for a study like mine because scholars of similar periods and regions are often not aware of the amount of data that survived and has been made available by historians. While historians have interpreted many sources related to the Hansa case, there is not much systematic analysis using modern computational social science methods.

My research expands classical, narrative treatments by Max Weber or Werner Sombart, for instance, by applying modern social network analysis to large stocks of data unavailable to the classics that can now be used to make concrete statements about this case and more general statements for sociology. Considering the reactions of other scholars at the various conferences I attended in the past years, I believe that my research enhances existing knowledge especially by

using primary historical micro-level data. Here I use a fraction of the data, mostly published but also unpublished sources, which I could gather in the past years.

Besides the Hansa case and related knowledge, my research offers insights regarding the largest epidemic in world history, the Black Death. My research shows how individuals responded to the horrific events using established legal practices as coping mechanisms. Detailed readings of various historical literatures related to the Black Death and Hansa case suggest interesting institutional differences between regions in Europe in terms of the legal practices of inheritance regulation during the time of the plague which have gained only few attention by historians and no attention by sociologists as far as I know. Particularly sociologists interested in the development of institutions may gain from this as these legal differences offer tangible sources to analyze patterns of social relations for the study of macrosocial change. The study of legal institutions in general deserves more attention. It is surprising that Nobel laureates such as North write about legal institutions as important for economic development, but detailed studies of these institutions on outcomes of interest remain scarce (except Carruthers and Ariovich 2004).

This dissertation specifically addresses three issues of relevance for sociologists. First, I study one of the potential key moments in the emergence of the spirit of capitalism, the diffusion of Protestantism in Northern Europe. Second, I study the emergence of one of the most successful institutions in economic history, the medieval Hansa. Third, I offer a first comparative study on the micro-level structures of trade in medieval Italian city-states with a Northern European city-state. Let me say more about each chapter and the scholarly contributions in the following sections before closing with general lessons from my work.

5.1 SUMMARIES, CONTRIBUTIONS AND FUTURE DIRECTIONS

5.1.1 *Chapter 2: Social Networks in the Economy: Challenges and Best Practice from Historical Sociology*

My second dissertation chapter is a penultimate draft of the opening chapter of a forthcoming book on historical network research. During conferences in 2014, I made contacts with a group of German and European historians who asked me in April 2015 to contribute an article to their edited volume titled “Power of Networks: Prospects for Historical Network Research” (Routledge). The paper offers an impression to historians how analytical historical sociologists do research, which types of questions they are interested in and which methods they use. The paper identifies key features of historical network research, reflections on challenges in historical network research and how to start a new project. To illustrate best practices I summarize selected papers published in the last decade, I further explain key concepts and methods and demonstrate historical network research using empirical data from 14th century Lübeck.

I consider as one major contribution the fact that I am working with historically unique data that have not been analyzed using network techniques. More precisely, I use two different transcriptions of trade partnership data from early 14th century Lübeck, in Northern Germany. These data are important and historically unique as they represent perhaps the first systematically recorded trade in Northern Europe, 1311-1361. The data I use in the article were published trade records in Latin language and an additional unpublished dataset based on the same trade records which I got during a stay at city archive in Lübeck, Germany, during the summer 2013. None of these data were accessible in digital form. The published sources were transcribed and digitized; the unpublished sources were photographed and paid by myself at an unfunded trip to Lübeck in 2013. These photographs were then transcribed and digitized by hand.

A main finding is that there was a very high likelihood that medieval trade was family trade. This finding is not new, however, my study is the first one to show this using empirical data and advanced statistical analyses, e.g. ERGMs. To certain extents, my study offers an example for a comparative case study using methods of historical network research. I compare the findings of van Doosselaere (2009) who wrote the key book on Genoese trade with my findings from Lübeck and extend his methodology with a second network correlation algorithm and use more rigorous and up-to-date ERGMs. Another interesting empirical finding is that homophily between elites seems to match findings for medieval Genoa about 100 years earlier. It strikes me that the social organization in the first half of the 14th century in Lübeck showed the same structures as the warrior cultures in Genoa during the time of the Crusades. This finding could either suggest a persistent warrior culture in the North or economic backwardness. There is evidence though that changes towards oligarchical mercantile organization similar to those in Genoa started in the decade before the plague.

Let me note that based on the data developed for this paper combined with data developed for the next chapter, I gave a talk at Sunbelt 2016 titled “Trade networks and institutionalization failure, 1311-1361”. In future work, I hope to go back to this paper and do some additional analyses using modern statistical techniques of analyzing multiplex networks in order to show a more reliable test of the hypotheses presented at the conference. I thank Vincent Buskens for pointing me to this potential direction of future work.

5.1.2 *Chapter 3: Network Coping and Institutional Emergence: The Black Death and the Emergence of the Medieval Hansa, 1358.*

The “plague paper” is the oldest of my dissertation chapters. An early version has existed since May 2014 and early versions were presented at Sunbelt 2014, INAS 2014, and EUSN 2014. My plan is to submit the paper to a peer-reviewed journal in the near future.

This chapter applies and extends network theories of innovation and invention and offers an alternative to neo-institutionalist accounts of institutional change as well as rational choice models in sociology. I analyze the emergence of the private order and economic institution called “Hansa,” which was a prominent economic player in Northern Europe for over three hundred years. The mature Hansa (known alternately as Hanse or Hanseatic League) emerged in the second half of the fourteenth century, built from pieces of an existing decentralized trade network and short-term, local political ties transformed into a powerful and persistent, supra-local institution in which trade and politics were discussed at more or less regular Diets. Drawing on diverse archival records from the city of Lübeck, as well as the minutes from the early Hansa Diets, I argue that this transformation was triggered by a wave of mortality that struck Northern Europe in the 1350s. Prompted in part by acute fear of death, longings for salvation, and uncertainty around property transfer, the onset of the plague produced a dramatic (and durable) increase in the execution of wills and testaments and thereby created a mass of agency relations in small group rituals generating persistent collaborative groups. Rather than simply causing a replacement of traders and political elites, I provide multiple strands of evidence that the plague-related explosion of wills increased the connectivity within and between Hansa towns and served to increase Lübeckians’ awareness of others’ property. Unlike in Italy, where execution of wills was private and professionalized, the plague created new combinations of roles for Northern German elites, allowing the recombination of logics associated with the regulation of private transfer and existing

political practices regulating the economy. My work suggests that increased regulation of private property likely led to the centralized regulation of trade in Northern Europe through the emergence of the political institution medieval Hansa.

My work somewhat extends literatures on the formation of novelty and social capital (e.g. Coleman 1988, 1990; Padgett and Powell 2012) by pointing to exogenous shocks as an important factor. By using a truly exogenous shock that was not “humanly designed”, I offer one of the few case studies that shows how social structures respond to unexpected events outside of the scope of effective healing. In extension of previous network literatures on institutional emergence, I specify a new micro-mechanism: network coping. Network coping is a somewhat useful new term we hope others will help us develop. My work shows that non-spiritual coping mechanisms to outside threat existed already in the Late Middle Ages, a period that is often associated with religious conduct. I underline the importance of local differences in the regulation of exogenous shocks and that these may have unexpected consequences. While sociologists and economic historians have long emphasized the productivity of agency relations for economic and political development, my study extends that scope to formalized legal relations: executors of wills. An important feature of this type of agency relations is that it establishes small collaborative groups (executor *gemeinschaften*) and that the duration of the relationships is not limited to a single lifetime. Agency ties that exceed the lifetime of those who established them have not gained much attention in the scholarly literature.

Finally, let me say that this work uses extensive amounts of historical records that were coded by myself. This chapter uses a combination of data from Lübeck’s city council, last wills and testaments, information from Hanserecesse, and other data sources. The result of this work is

not limited to this paper, but also to the generation of new datasets related to a historically important case from Northern Europe.

For future research, it would be exciting to explore the association between external shocks and social change further and potentially in modern contexts. One obvious scenario would be to look at another highly destructive case such as World War II. The eminent German historian Ian Kershaw finds in his book *THE END* that half of the losses the Germans suffered in WW II happened in the last 10 months. While not as quick as the Black Death, the Second World War killed tremendous amounts of people in Germany within a relatively short amount of time. These destructions of human life and social relations may be perceived as another stage for social change. Prominent sociologists found that a lot of important institutions have their origins in the post-World War II era. The United Nations, founded in 1945 is one of the most prominent examples at the international level. As a Fulbright alumni, I need to mention that the Fulbright Program for the promotion of mutual understanding was also a result of the war and founded in 1946. It would be interesting to explore further which types of organizations were a result of this shock, at the local, national and global level. Questions that come up immediately, was organizational change largest in areas with the biggest losses of human life? If, not, why? Which particular market supporting institutions were developed after WW II? How did this happen? Can network theory help us explain these developments? If not, why?

5.1.3 *Chapter 4: The Diffusion of Protestantism in Northern Europe: Historical Embeddedness and Complex Contagions in the Adoption of the Reformation.*

In this paper I use network theory to explain the adoption of the Protestant Reformation. I use new historical data on the connections between Hansa towns which allow us to conduct the first social network study of the Protestant Reformation. Based on an analysis of cities in Central and Western

Europe between 1517 and 1530, I find evidence for diffusion through both simple and complex contagion. My operationalization of network data based on medieval Hansa Diets points to the complex association between tie weights (i.e., the strength of ties) and numbers of ties in network diffusion. Using optimal tuning parameters for simple adoption models, I show that a combination of strong ties and weak ties fostered Protestant adoption in northern cities.

Sociologists have used important events in history to show new ways of doing comparative historical sociology or underline the strength of a certain perspective that might better explain the outcome than others. In this paper I do both. First, by using modern computational social science methods and new generalized centrality measures: the use of alpha parameters is relatively unspecified territory and I offer potentially the first sociological study applying this technique and suggesting how to work with them. Second, I show how our network approach is better suited to explain the early diffusion of the new religious faith and question a central variable in previous research from sociology and economic history.

I believe the paper points to a potentially fruitful new concept: historical embeddedness. Historical embeddedness emphasizes how interactions from the past shape societal developments such as the expectations about the future. This means that the history of a network matters for developments such as the diffusion of a new religion and can contribute to large scale social change such as the Protestant Reformation analyzed in my forthcoming paper. Economic actors that are deeply historically embeddedness may be more susceptible for change.

Prominent studies of diffusion claim that the exposure of contemporaneous network contacts is an important condition for adoption of innovations. My study suggests that looking at past interaction patterns allows us to make relatively good predictions about complex contagions. It is still to be determined whether or not past interactions are as good as predictors as

contemporaneous ones. This paper argues that a long shared history may be just as important as contemporaneous exposure as these types of ties likely include trust, shared experiences of collaboration, alliances, and so on. It may be worthwhile to look further into the aspect of relationship duration and how this relates to adoption and other behavior changes.

So far, the implications I used were related to work of Zukin and DiMaggio (1990) and the various dimensions of embeddedness. I also put some emphasis on the aspects of trust that arises from repeated interactions in the past and network topologies (e.g. Centola 2015, Grund 2016). It may be worthwhile to explore other potential routes. One starting point could be to think about whether the classical embeddedness perspective makes sense for organizations which are so important in modern market and which may persist over time across generations. Historicizing the embeddedness concept means to be sensitive to the lifetime of social relations. These are relatively short for individuals, but potentially endless for organizations and markets. The classical embeddedness-concept needs a historical extension particularly if long-term trends in markets, e.g. labor markets, are of interest to economic sociologists. For instance, old boys clubs persist via exchanges between elite universities and promote inequalities in labor markets. Understanding inequalities in labor markets therefore needs to go beyond the focus on cognitive, cultural, social, or political dimensions, but need to consider that elite schools are historical organizations with reciprocal relations over centuries. Patterns of interaction between groups and individuals that persist over generations may have logics that go beyond the immediate reduction of uncertainty as classical embeddedness concepts suggest. Historical embeddedness may thereby help better understand long term trends such as increasing income and wealth inequality.

5.2 GENERAL LESSONS

This dissertation started out with a chicken-and-egg question in the title: Networks into Institutions or Institutions into Networks? Previous analyses lead me to the preliminary answer that networks produce institutions and these offer the context (events, rituals) for networks to generate new institutions.

Let me state briefly how I get to this answer: Chapter 3 and 4 mostly affirmed the first half of the initial question, namely networks into institutions. Both chapters highlighted different temporalities in this process. In chapter 3 we saw that relatively quick network processes can contribute to institutional emergence. The networks that were established relatively fast in the aftermath of the Black Death take shape in larger numbers of overlapping small-group rituals and persisting collaborative groups. In chapter 4, we saw that rather long-term network processes can facilitate institutional change. Historically embedded Hansa regions were integrated by multiplex relations that likely reduced uncertainties related to risky adoption of a new religion. Networks of Hansa delegates produced events and practices that were themselves institutions thereby enabling network diffusion. Here again institutional change was enabled by small-group meetings in which attendants shared a common focus of attention allowing them to generate consensus towards new challenges and practices.

I recommend further inquiries into how groups come out of networks or the social contexts in which interactions happen as these may be the frames and/or pool of resources that can be transformative. It is not enough to delegate agency to the social ties embedding social systems, as ties are constructed and maintained in social contexts that differ in meaning, are more or less formalized, etc. Local institutions generate differing patterns of ties. External shocks may influence the resulting patterns of association at the local and macro-level. This study suggests that

the interplay between local institutions and social networks may be a fruitful area for research for scholars interested in institutional emergence, divergence and long-term social change.

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VITA

Bernd Wurpts was born in Aurich, Lower Saxony (Germany), where he went to Gymnasium Ulricianum and completed his civilian service at the county hospital. Bernd was trained as advertising merchant in Wuppertal and Düsseldorf, North-Rhine Westphalia (Germany), before beginning his studies at the University of Leipzig, Saxony (Germany). In Leipzig, his major was sociology and his two minor subjects were psychology and communication and media studies. During his Magister Artium (M.A.) studies, Bernd spent a year abroad as an exchange student at the University of Arizona, Tucson (USA), where he studied at the graduate level. After finishing his M.A. degree in Leipzig with distinction, Bernd moved to Seattle, Washington (USA), where he will soon receive his Ph.D. after seven years in summer 2018. In September, he will begin his first academic position as Oberassistent at the University of Lucerne, Lucerne (Switzerland).