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Deus Vult!
Military Capacity and Economic Development in the Teutonic-Order State

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Flavio Malnati †

Abstract I investigate how a state can foster early economic development via its military capacity, before the birth of modern states. For three centuries, the Teutonic Order, a monastic-military organization, ruled East Prussia, in contemporary Northern Poland. To support an enduring military campaign against the pagan tribes of the area, the Teutonic Order organized a centralized state to mobilize settlers, merchants, and resources. Using a regression discontinuity design across East Prussia's borders, I document how those territories experienced higher economic development than their neighbours when they were controlled by the Teutonic Order in the 13th - 15th century. I find that after the military defeat of the Order the border areas do not show any discontinuity in economic development. My analysis of mechanisms shows that development in the Order's state was not only in the interests of the military and religious elites, but also of merchants and settlers. I suggest that the military capacity of the Order drove development through the mobilization of people and resources. Nevertheless, this research suggests that a decisive military defeat can undermine the state's ability to drive development if it does not have other forms of capacity.

Keywords: Early Development, State Capacity, Northern Crusades, Institutions

JEL Codes: N33, N43, N53, N73, N93

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1 Introduction

"War made the state, and the state made war" is the famous Charles Tilly quote that connects war to state building and state capacity (Tilly, 1975, 42). However, if the bellicist theory of the state helps us to highlight its origins, there is neither a unique explanation of the mechanisms that link war, state, and economic development, nor a common consensus on when, historically, state capacity started to affect economic development. A broad literature links war and the Military Revolution to the rise of the modern state (Besley and Persson, 2010; Cantoni, Mohr, and Weigand, 2019; Cox, Dincecco, and Onorato, 2022; Gennaioli and Voth, 2011; Mangini and Petroff, 2022), parliamentarism (Cox, Dincecco, and Onorato, 2023; Schönholzer and Weese, 2020), urban institutions (Becker, Ferrara, Melander, and Pascali, 2020; Blaydes and Paik, 2016; Schönholzer and Weese, 2020) and, indirectly, to economic development. However, there is no empirical evidence in the literature that causally connects a state's organizational capacity to raise and mobilize an army with economic development before the large scale technical and institutional changes which characterized the Military Revolution [1] and the birth of the modern state.

I focus on the rise and fall of the Teutonic-Order state as a military power in Prussia during the Northern Crusades to study how pre-modern states operated on economic development. Before the Military Revolution and the birth of modern states, state capacity did not necessarily require the rise of a bureaucratic apparatus or a tax collection system. Instead, state capacity in a pre-modern state needed to mobilize resources, settlers, and merchants in a conquered area to support a military campaign and military elites, i.e., its military capacity (Blaydes and Paik, 2016; Epstein, 2000). This mechanism paves the way for centralization of resources and market integration within a territory, thus fostering its economic development. I focus on a situation at the border of traditional Western Europe. Thus, I investigate state military capacity as one possible mechanism for transmission of early economic development from Western Europe to Central-Eastern Europe.

From the 13th century, Western Europe began a political, religious, and military expansion eastward. The Baltic region and, in particular, East Prussia, a region in north-east contemporary Poland, were inhabited by several Pagan tribes, and subject to a series of military expeditions named the Northern Crusades. The Teutonic Order was invited to East Prussia in 1226 by the Duke of Mazovia [2], a region bordering with East Prussia in the south, after the failure of earlier campaigns again the Pagan tribes. Compared to previous expeditions and other principalities of the area, the Teutonic Order had a higher organizational and military capacity and a mandate from both the Holy Roman Emperor [3] and the Pope, the most important temporal and religious authorities in Europe. Thus, they succeeded in mobilizing military elites, men, and resources

[1]The Military Revolution describes a series of technological changes in the military technology which changed the warfare in Europe and, consequently, the state's structure and the society, starting from the 16th century (Gennaioli and Voth, 2011).

[2]From 1138, the Kingdom of Poland was fragmented into different autonomous political entities or principalities claiming the throne. The Duchy of Mazovia was one of the main principalities. Only at the beginning of the 14th century the kingdom was unified in a single political entity (Davies, 2005).

[3]The Holy Roman Empire at the time was a political entity with its center in contemporary Germany. However, it also encompassed multiple territories that are now part of several other countries, including the Czech Republic, Austria, the Netherlands, Belgium, Italy, and France. It was the most relevant neighbor for medieval Poland from a political, military and religious point of view.

from neighboring countries to support the economic and military conquest of Prussia. Thanks to its military mission and its military and monastic characteristics, the Teutonic-Order state was highly centralized at the time. Additionally, the Teutonic state contributed to the spread of representative urban institutions in the area, which attracted settlers and merchants from the Holy Roman Empire. I can thus evaluate the economic impact and persistence of the centralizing effect of the Teutonic-Order state and the decentralizing effect of the spread of town charters following the settlers' movements (Christiansen, 1980; Czaja and Radziminski, 2016; Górski, 1977).

I compare regions that were conquered by the Teutonic Order with their neighboring areas using a regression discontinuity design, with the distance from the border as the forcing variable. I repeat the RDD for seven centuries (11th - 17th centuries) to evaluate the evolution of treatment over time. Thus, the Teutonic-Order territories in East Prussia represent the treatments, while the neighboring territories of medieval Poland represent the control group. I measure economic development through the number of historical buildings, town charters and the Magdeburg-Law cities, i.e., cities whose town charter was based on the Magdeburg Law, a specific town charter introduced to Eastern Europe by German merchants and settlers. The number of buildings measure the concentration of fixed investments in a geographical area, while the town charters and the Magdeburg Law measures the spread of urban institutions, granting autonomy to urban autonomy centers and economic elites.

I find a hump-shaped trend in economic development, which shows that economic development persisted as long as the Order's state retained its military capacity in Prussia. Furthermore, I verify that the potential confounding variables run smoothly across the borders, thus providing empirical support for the causal interpretation of the RDD model. I then reclassify the buildings by function (mainly civil, religious, or military) to analyze the main channels of development. Consequently, I rule out the idea that resource extraction by the religious and military élites drove development in Prussia. Rather, the Order acted more in the direction of a social planner in the interests of the merchant and settlers' elite.

I exploit the region's leading commercial and communication routes to show how the higher development of the Teutonic-Order territories followed from the Order's capability to mobilize men (including pilgrims and merchants) and resources to support the military campaign. In the final part of the mechanisms' analysis, I separate the channel of the town charter spread, from that of the Order's central state. The central state channel drives the results, but it declines after the military collapse of the Order. However, the town charter's channel persists and grows after the fall of the Order. This comparison highlights how military capacity granted by a central state is not enough for sustainable economic development, which requires the more persistent action of institutions granting autonomy to economic actors.

My paper contributes primarily to the literature investigating the causal relation between state capacity and economic development (Acemoglu, García-Jimeno, and Robinson, 2015; Dell, Lane, and Querubin, 2018; Dincecco and Katz, 2016; Dittmar and Meisenzahl, 2020; Rogowski, Gerring, Maguire, and Cojocaru, 2022). My setting offers the opportunity to study the dynamic effects of state capacity over economic development during and after the treatment. Thus, I can assess the impact of the Order's military capacity as a continuous treatment and also its persistence after the Order's collapse.

This study also relates to papers defining state capacity, and its origin in the state-building process. Several papers trace state capacity back to the ability to extract fiscal resources (Cantoni, Mohr, and Weigand, 2019; Dincecco and Katz, 2016), information collection from the society (Brambor, Goenaga, Lindvall, and Teorell, 2020; D'Arcy and Nistotskaya, 2017; M. M. Lee and Zhang, 2017; Sánchez-Talanquer, 2020; Suryanarayan and White, 2021) and the bureaucracy capacity (Acemoglu, Moscona, and Robinson, 2016; Garfias, 2018; Rogowski, 2018; Suryanarayan, 2021). All these studies require the existence of a bureaucratic modern State. [4]

My study proposes an additional notion of state capacity, linked more to military organization, to trace state building back to the transition from a medieval to a modern state model, and before the Military Revolution. Military capacity can operate in a pre-modern state as it consists of the capability to mobilize military elites for a military campaign and support military conquest through the attraction of men and resources. Furthermore, in the analysis of the mechanisms, I disentangle the economic effects of resource mobilization and market integration as described by Epstein (2000) from the effects of representative institutions (Becker, Ferrara, Melander, and Pascali, 2020; Blaydes and Paik, 2016; Cox, Dincecco, and Onorato, 2023; Schönholzer and Weese, 2020).

Finally, this study is in line in a broader sense with the "Little Divergence" literature, which defines and investigates the drivers of early economic development in Western Europe (Cantoni, Dittmar, and Yuchtman, 2018; Grosfeld and Zhuravskaya, 2015; Malinowski, 2016; Raster, 2019; Voigtlander and Voth, 2013a; Voigtländer and Voth, 2013b). I introduce state capacity as a possible driver for economic development, but at the same time, I extend the study of economic development to a milieu of the Western European frontiers, perhaps highlighting a possible mechanism of differential early development between Western and Eastern Europe.

After briefly introducing the historical setting in section 2, I describe the relevant data and the regression discontinuity design of the main empirical model in section 3. I also verify that the data support the assumptions necessary for the causal identifications of the model. In section 4 I employ the expansion of the Teutonic Order in an RDD setting to show how the rise and fall of the Order's power drove economic development in Prussia. In section 5, I analyze the main possible channels (resource extraction, resource mobilization and market integration, and the institutions channel) that connect military capacity to economic development and its persistence during and after the collapse of the Order. Section 6 concludes.

[4] In this paper, the definition of modern state is aligned with Max Weber's definition as "a human community that (successfully) claims the monopoly of the legitimate use of physical force within a given territory" (Weber, 1946, pg. 78). The modern state is characterized by bureaucracy, a professional, hierarchically structured, and impersonal organization (Weber, 2015).

2 Historical Background

2.1 The Teutonic Order and its State in Prussia

The Teutonic Order was a monastic military order created in the Holy Land in 1191 during the Holy Land Crusades.[5] Its members were characterized by Germanic ethnic ties and connections with the Holy Roman Empire. The monastic rule and the statute were modeled on the Templar and Hospitaller knights and, in general, the preaching of Bernard of Clairvaux about the ideal of knighthood. Although it is not easy to have a complete picture of the Order's effective membership, the majority belonged to the *Ministeriales* class (the "knights-servants" at the service of another nobleman) and, from the 14th century, to the *Wohlgeboren* (the low Germanic nobility). Their vows included "chastity, renunciation of property, and obedience to God and the Blessed Virgin Mary." (Max, 1890, pg. 127) The experience and limits of the previous waves of Crusaders in Prussia influenced the Teutonic Order. Therefore, the Order was not necessarily tied to a general idea of knighthood and a temporary Crusade but rather to a specific and more permanent commitment to a mission and mandate in a specific region, which continued after a specific Crusade (Christiansen, 1980; Czaja and Radziminski, 2016; Querengässer, 2021).

Multiple historical reasons contribute to the fact that the Teutonic-Order organization and state had higher military capacity than its neighboring territories. First, the campaign of the Teutonic Order in Prussia also assumed the character of armed colonization that, contrary to other military expeditions in the area, was driven by a well-organized and systematic elite movement from Western Europe. In 1231, just seven knights of the Order, supported by knights supplied by Konrad of Mazovia, founded a temporary stronghold in Thorn/Torun (Czaja and Radziminski, 2016). Since then, a restricted number of Teutonic-Order knights (700 in Prussia during the 14th century, 300 in 1453) led regular raids on the periphery of East Prussia. The Order recruited the European nobility in order to support and participate in these raids twice a year, alternating the summertime "building raids" and the wintertime "devastation raids" (Querengässer, 2021). The practice of calling the nobility was named *"Preußenreisen"* and established precise and consolidated itineraries from Western Europe to Prussia (Paravicini, 1989), initially for military men, then for pilgrims, merchants and settlers moving to Prussia.

Parallel to the summertime raids, the Order extended its zone of influence by building new fortifications, initially in timber and later in brick. "No state or other military Order created such a unique pattern for its castles as did the [Teutonic] Order" (Querengässer, 2021, pg. 19). At the institutional level, the Teutonic Order supported the colonization and movement of German settlers, and merchants, who adopted the most modern contemporary legal and administrational institutions, including the knight service, authority over ecclesiastical institutions and systems of chartering settlements and founding towns (Czaja and Radziminski, 2016). Following the

[5]The Holy Land Crusades and the Northern Crusades are different historical episodes. The Holy Land Crusades (1096-1270) refer to the Crusades to reconquer the Holy Lands from the Seljuk Empire and from the Arabs. The Northern Crusades (1147-1410) refer to the expeditions against the pagan population living on the east side of Elbe river, or more generally in North-Eastern Europe (Christiansen, 1980).

example of several towns in the Holy Roman Empire, the Magdeburg Law [6] (or Magdeburg Rights), the Magdeburg town charter, was used as the model for the town charters in the Order's state. The Madgeburg Law as a town charter granted privileges to townsmen in the form of economic, political and judiciary autonomy. Furthermore, these privileges were grounded in the well consolidated collections of rights, customs, and sentences that constituted the German-Saxon Law (Czaja and Radziminski, 2016; Harreld, 2015; Lück, 2018). Finally, during the Northern Crusades, the Teutonic-Order state in Prussia was characterized by a strong ideological and religious discourse. Religion, in the context of a Crusade, internally and externally legitimized the actions of the Teutonic Order, even after its complete conquest of East Prussia (Czaja and Radziminski, 2016; Querengässer, 2021).

2.2 East Prussia and the Teutonic Order

At the beginning of the 13th century, the region of modern day Poland was the frontier of Western Europe and Catholic Christendom. The Vistula river divided the region between a christianized south-western region and a north-eastern region still inhabited by Pagan populations. East Prussia, immediately on the east side of the Vistula, was one of the last regions to be converted. Figure 1 shows how the division between East Prussia and the rest of Poland already existed before the 13th century and reflected a political division. Except for Chełmno Land, Prussian territory was divided among several pagan tribes of Baltic ethnicity and culture. Conversely, the west side of the Vistula and Mazovia on the south-eastern side was divided into political entities that derived from the fragmentation of the Polish kingdom in the 12th century. Since the 10th century, Prussian tribes and Polish principalities had contended the borders, which were not precisely defined, and for supremacy over Chełmno Land (Christiansen, 1980; Urban, 2003).

[Figure 1 about here]

At the beginning of the 13th century, the fight between Prussian tribes and Polish principalities increased in intensity and was framed within the more general phenomenon of the Northern Crusades, a series of military expeditions to convert the Pagan tribes living in Prussia and the Baltic Region. The campaigns saw the direct and indirect participation of a broader range of actors, including the the Pope, the Holy Roman Empire and, in general, the participation of Germanic-origin crusaders. However, the crusaders were more undisciplined than professional warriors, who would be capable of settling a permanent garrison during the winter (Christiansen, 1980), and their expeditions resulted in temporary raids that were inefficient for conquering and converting the Prussians.

In 1226, the Duke of Mazovia invited the Teutonic Order to fight the East Prussian tribes. This appeal came after an unsuccessful campaign against these tribes, culminating in a raid on the

[6] In particular, the Teutonic Order adopted a specific variation of the Magdeburg Law named the "Kulm Law", from the name of Kulm/Chełmno city inside the Teutonic-Order state. The main difference between the Magdeburg and the Kulm Law is that in the former the Magdeburg court worked as the main judicial center for legal cases in the cities adopting the Magdeburg Law, while in the latter the Kulm/Chełmno court worked as the main judicial center. Thus, the system was particularly centralized, without losing connection with German Law. The Kulm Law cities were not dependent on the city of Magdeburg for the solution of any legal disputes, but on the city of Kulm/Chełmno, which was part of the Teutonic-Order state.

capital of Mazovia by the East Prussians. The Duke gave the Teutonic Order Kulm/Chelmno and several small estates (Czaja and Radziminski, 2016). The 1235 Golden Bull from Emperor Friederik II and a Protection Bull from Pope Gregory IX in 1234 granted a formal mandate for the presence of the Order in Prussia. The temporary coincidence of the two spiritual and temporal authorities in providing a mandate to the Order was not common; it was the product of the diplomatic ability of the Grand Master, and was certainly not forecast by the Polish principalities. In 1295, With the end of the last Prussian Uprising, the Order concluded and consolidated its conquest of East Prussia.

There is no clear historical evidence about the real intention of the Duke of Mazovia. However, it is difficult to imagine he would have forecasted a relatively rapid takeover of East Prussia by the Order, nor the rise of a competing and powerful military state entity on the borders of Mazovia. In 1308, the Order conquered Gdansk on the west side of the Vistula. The takeover of Gdansk inaugurated a new phase of the Teutonic Order, characterized by a more aggressive stance against its neighbors, including the pagan Duchy of Lithuania, but also Christian Polish principalities and, later, the Kingdom of Poland. The 14th century represented the peak for the Teutonic Order in political and administrative terms.[7] Ultimately, the Battle of Grunwald (1410) and the Thirteen Years' War (1454-1466) not only determined significant territorial losses for the Order (including Chełmno Land), but also the institutional, economic, and political collapse of the Order's state in Prussia. In 1525, the Grand Master gave up his title to become the duke of Prussia, secularizing the remaining territories of the Order in Prussia under the formal authority of the King of Poland.

3 Data

3.1 Data Sources

I introduce a novel dataset accounting for the flow and stock number of new buildings constructed in Medieval Poland during each century analyzed, from the 11th to 17th centuries. The number of buildings measure development, specifically fixed investments as in Cantoni, Dittmar, and Yuchtman (2018). As a primary source, I employ the "Immovable Buildings" dataset collected by the Polish National Institute of Cultural Heritage (Narodowy Instytut Dziedzictwa [National Institute of Cultural Heritage], 2020b). The dataset includes 71,470 observations, for constructions or buildings of historical importance for the government of Poland. It classifies each observation by spatial position and social function and covers 10 centuries, from the 11th to 20th centuries. I restrict the period of analysis to the 11th to 17th centuries. Furthermore, I reclassify the building categories in the dataset into six macro categories (religious, military, civil, cultural, and palace/mansion). As in Figure 2, I aggregate the observation into a 20x20km grid. At the time of the conquest of Prussia, no common administrative division existed

[7]Nevertheless, several setbacks perhaps anticipated the defeats in the following centuries: the war against Poland (1326–1332), a Christian kingdom, contributed to partially delegitimizing the Order's mission. The strategic victory of Polish troops in the Battle of Płowce in 1331 blocked the advancement of the Order in Kuyavia, and was a setback to the Teutonic Order's expansion in Poland. It also contributed to stabilizing the borders in East Prussia on the Vistula and Chełmno Land territory. Furthermore, after the conversion of Lithuanians to Christianity in 1387, in 1403–1404 Pope Boniface VIII stopped "the Litauenreisen," the campaign against Lithuania (Paravicini, 1989; Querengässer, 2021).

between the Teutonic-Order state and its neighboring territories. Thus, I choose a 20x20km grid to replicate the size of a municipality (Gmina) in modern Poland, or a Parish, as a basic administrative unit in the Kingdom of Poland and the Polish-Lithuanian Commonwealth (Instytut Historii im. Tadeusza Manteuffla Polskiej Akademii Nauk (IHPAN) [The Tadeusz Manteuffel Institute of History of the Polish Academy of Sciences], 2021).

[Figure 2 about here]

I measure urban development by counting the number of town charters in a geographic area during a century. I collect the data from Najgrakowski (2009), and form in a dataset of the cities that received a town charter in Poland. A town charter measures both urban demographic development (Buringh, 2021) and qualitative development (Bosshart and Dittmar, 2021) in the form of increased institutional autonomy for the town. Specifically, it states the act of foundation of a town, signalling the passage from a village (or group of villages) to a town. These acts also determine a clear separation between urban space, characterized by the free market, and the countryside, characterized by the Feudal Law (Lück, 2018). I measure the Magdeburg-Law spread as a particular type of town charter based on Saxon-German Law, which granted townsmen (originally German merchants and settlers) specific economic, political, and institutional freedoms (Lück, 2018). As the spread of the Magdeburg Law is linked to the spread of German settlers and German institutions it provides a good measure of the spread of settlers and merchants from the Holy Roman Empire within the more general diffusion of urban institutions and autonomy. I rely on two primary sources to study the propagation of Magdeburg Law: the Deutsches Städtebuch, edited by Erich Keyser and digitalized by Cantoni, Mohr, and Weigand (2020), and the Magdeburg-Law database collected and managed by the Zentrum Für Mittelalterausstellungen Am Kulturhistorischen Museum Magdeburg [Center for medieval exhibitions at the cultural history museum in Magdeburg] (n.d.). The two sources collect the cities that adopted a town charter according to the Magdeburg Law or another law deriving from the Magdeburg Law (Lübeck or Kulm/Chełmno Law) with information about the year of adoption and the type of town charter. For the historical buildings, I geolocate the observations in both datasets, and aggregate them in a 20x20km grid.

I use historical atlases and books as the primary sources to identify the geographical and historical variation of the Teutonic-Order state. For the territory within the Teutonic-Order state, I mainly rely on the seminal work of Christiansen (1980), and on the specialized publications by Pluskowski (2012), and Czaja and Radziminski (2016). For Poland, I employ Olczak, Ajdacki, and Banach (2006) to draw the border of the Piast Poland in the 10th and 11th centuries, the fragmentation of the realm from the 12th to 14th centuries, and for the reunified Kingdom of Poland in the 14th and 15th centuries. From the 16th century, I mainly rely on the Instytut Historii im. Tadeusza Manteuffla Polskiej Akademii Nauk (IHPAN) [The Tadeusz Manteuffel Institute of History of the Polish Academy of Sciences] (2021) digitization project of the Kingdom of Poland's borders.

For the potential confounding variables, I rely on several sources to encompass the majority of dimensions that can estimate the economic potential of East Prussia compared with its neighbouring territories. For land suitability measures and the presence of Luvisol, I rely on the Global Agro-Ecological Zones version 4 (GAEZ v4) database created by the Food and Agriculture Organization of the United Nations and the International Institute for Applied Systems Analysis (Food and Agriculture Organization (FAO), & International Institute for

Applied Systems Analysis (IIASA), 2021). Barley, rye, and wheat represent the land's suitability for agriculture as their cultivation represented the leading economic sector in the Middle Ages. Luvisol is a type of land with high clay content, making the ground particularly fertile. Combined with land suitability, it is an indicator for heavy plough suitability (Andersen, Jensen, and Skovsgaard, 2016). I use the Copernicus data for the navigable rivers (European European Environment Agency (EEA), & Copernicus Land Monitoring Service (2019b)) and altitude and slope (European European Environment Agency (EEA), & Copernicus Land Monitoring Service (2019a)), and Holterman et al. (2021)'s project for the street network, as it reconstructs the main communications network in the Holy Roman Empire, the Baltic, and Medieval Poland. The combination of river access, river distance, street access, and street distance represent the accessibility of main communications routes and are a proxy for suitability to trade. Similarly, slope and altitude could be obstacles to both trade and agriculture. To control for social and demographic development before the Teutonic Order's invitation, I use the archaeological dataset from the Narodowy Instytut Dziedzictwa [National Institute of Cultural Heritage] (2020a) as a proxy. The number of observations is 7,796, characterized by spatial position and time period (Prehistoric and Stone Ages, Bronze Age, Iron Age, and High Middle Ages). I separate the sites by period, and I aggregate the number of archaeological sites in a 20x20km grid. Thus, I can calculate the number of archaeological sites in a certain square from a certain time period, proxying the demographic and chronological evolution of a geographical area.[8]

3.2 Descriptive Statistics

Table 1 summarizes the descriptive statistics for the main outcome variables that measure economic development, i.e., the constructions built in a given century (12th, 13th, and 14th centuries). I restrict the sample to 50 km from the 13th century borders, to have more homogeneity between the treatment and control groups. Tables A1 to A9 report the descriptive statistics, applying different distances (20 km, 100 km, 200 km) from the borders. A comparison of the 12th century and the following centuries shows a general increase in buildings in the regions in question, independently of their function. This evidence is in line with the general development of the area, starting from the 13th century. Similarly, there are no town charts for the 12th century as the German settlers' movements only began at the end of the century and were more extensive from the 13th century.

[Table 1 about here]

Table 2 summarizes the descriptive statistics for each possible confounding variable. I restrict the dataset to observations within 50 km of the 13th century border. In appendix A, tables A10 - A12 show the descriptive statistics for the possible confounding variables, adopting a different distance from the border (20 km, 100 km, 200 km). The region considered was highly suitable

[8]Links. NID: https://mapy.zabytek.gov.pl/nid/; Davide Cantoni: http://davidecantoni.net/; Zentrum für Mittelalterausstellungen E. V.: https://magdeburg-law.com/; FAO-GAEZ: https://gaez.fao.org/; Instytut Historii PAN im. Tadeusza Manteuffla: https://atlasfontium.pl; European Environment Agency: https://www.eea.europa.eu/en; Viabundus: http://www.landesgeschichte.uni-goettingen.de/handelsstrassen/index.php

for both barley, wheat, and rye.[9] The terrain is flat, and does not present relevant altitudes. This evidence aligns with the morphology of Northern Poland. The region also has good access to rivers and the major communication routes. As a consequence, the area is suitable for economic activity and supporting urban growth. Due to the irregular time period of each age, it isn't easy to trace a demographic trend by examining the presence of archaeological sites. However, according to the archaeological evidence, the area started to be populated during the Iron Age, and does not show signs of demographic decline in the Middle Ages when compared to the Iron Age.

[Table 2 about here]

4 Regression Discontinuity Design

4.1 Empirical Model

To identify the impact of the development of the Teutonic-Order state on economic development, I adopt regression discontinuity (RD) as the main identification design, developed by Angrist and Pischke (2008), G. W. Imbens and Lemieux (2008), and D. S. Lee and Lemieux (2010). For the main empirical application of the RD to historical and geographical contexts, I follow Dell (2010), Dell, Lane, and Querubin (2018), and Grosfeld and Zhuravskaya (2015). I consider the following empirical specification:

$$Y_s = \beta Teutonic\_Order_s + f(Distance\_border_s) + X_s' + \epsilon_s \quad (1)$$

Y_s denotes an outcome variable measuring economic development. I use a 20x20km square of a grid covering all of Medieval Poland as the main unit of observation. As the main outcome, I use the stock and flow number of buildings, the number of town charters, and the number of of town charters according to the Magdeburg Law in a 20x20km square during a century. I repeat the RDD model for each century, starting from the 11th, two centuries before the Teutonic Order's invasion, until the 17th,[10] to study the evolution of economic development over time. $Teutonic\_Order_s$ is an indicator function, equal to 1 when s is part of the 13th century Teutonic-Order territory, and 0 otherwise. $f(Distance\_border_s)$ is a non-linear polynomial, controlling for the distance in kilometers from the cut-off. For this specification, I use a second-order polynomial. Therefore, the 13th century borders represent the cut-off. $X_{s,t}'$ is a set of covariates. In particular, I control for the presence of Iron-Age and High Middle-Ages' archaeological sites as a proxy for socio-demographic development in the periods

[9]Following Andersen, Jensen, and Skovsgaard, 2016, I reclassify the suitability index as a dummy variable, where each point on the map is classified as 1 when its suitability index is classified as good or more (SI>55). Then I average each point score within a given square unit.

[10]The choice of the 17th century is because this was the last century of the Duchy of Prussia. The secularization of Prussia led to the creation of the Duchy of Prussia, formally under the Kingdom of Poland. Progressively, the Duchy gained more independence and power in the area. In the 18th century, the ascension of the Duke as the king of Prussia opened a new phase of conquest in the region. However, by this century, the kingdom was a totally different entity, politically and institutionally. Thus, I conclude the analysis before the 17th century.

before the Crusades. I also control for the presence of Luvisol as a proxy of heavy plough and agricultural suitability, and for altitude as a proxy for the Polish region's morphology. I apply the optimal bandwidth for RDD proposed by Calonico, Cattaneo, Farrell, and Titiunik (2017) and G. Imbens and Kalyanaraman (2012). I cluster the standard error by combining the territories of the Prussian tribes for East Prussia and the division in dioceses during the 11th century for the rest of Medieval Poland. This division represents the main level of variation for clustering. A consolidated religious and administrative division, prior to the Teutonic Order, between a Christian Poland, divided in dioceses, and a pagan East Prussia, divided in tribes, historically justifies this level of clustering. Furthermore, from a political perspective also, this division seems the most stable for territory and is robust to the main political changes in Medieval Poland before the Northern Crusades. In section 5.5, I verify the robustness of my results, applying the Conley HAC standard errors (Conley, 1999, Conley, 2008).

4.2 Main Assumptions

The main assumption behind the RD identification strategy is that the borders are set arbitrarily by the Teutonic Order and the Polish principalities. Thus, potential confounding variables should be smooth across the borders as the cut-off. Historical research supports the evidence that the stabilization of the border by the Teutonic-Order borders is, if not arbitrary, strictly exogenous to the economic motivations that can potentially affect the causal relationship between military capacity and economic development. There was a division between pagan Prussian tribes living in East Prussia, and Polish principalities in Mazovia and in Greater Poland. However, since the 10th century, Polish principalities and Pagan tribes were contending the borders, with territories such as Chełmno Land colonized if not controlled by the Polish settlers and nobility. Furthermore, during the period of Teutonic-Order domination, the Order actively seeked to expand its territories outside Prussia. Only the Battles of Płowce (1331) and the Grunwald (1410) brought an end to its expansion (Christiansen, 1980; Czaja and Radziminski, 2016; Urban, 2003). As a further check, I test the regression discontinuity in the centuries before the Northern Crusades (12th and 13th centuries) to rule out the hypothesis that other factors prior to the advent of the Teutonic Order lead to a strategic selection of their territory and drive the results after treatment, Furthermore, to address the concern of the expansion of the order could bias the results or lead to a strategic selection of the borders, I also test my RDD by considering specific segments of the 13th century borders, which present different degrees of stability from historical and geographical reasons.

As in figure A1, I divide the 13th century borders into Northern (green) and Center-Southern borders (blue). The Northern borders coincide almost entirely with the Vistula. However, after the Order took over Gdansk and the western banks of the Vistula, the Northern border ceased to be a border. Therefore, these borders should display the weakest variation during the Teutonic Order dominion. Conversely, the Center-Southern borders remained unmodified for two centuries, which coincided historically with the East Prussia Borders. The Vistula river and *Große Wildnis* (the Great Wilderness), occupied by forests and swamps and not entirely colonized by the Order or by Mazovia, represent the natural boundaries.

However, in the regions, the imposition of the borders prior to the Teutonic-Order state is mostly exogenous. Prior to the Teutonic-Order state, several territories, including Chełmno Land, were already part of the Polish Kingdom and colonized by polish settlers. Furthermore, the defeat of the Teutonic Order in 1410 obliged it to give up these territories to the Kingdom of Poland. Natural borders (red) are a portion of the Center-Southern borders. Here, the Vistula marked the borders and enforced them for two centuries (the 13th and 14th centuries). Thus, the Center-Southern and Natural borders should show the highest variation between the 13th and 14th centuries.

[Table 3 about here]

Table 2 (column (3)) assesses, through a series of t-tests, the balance between the treatment and control group to evaluate if the better economic suitability of East Prussia, compared to its neighboring territories, drove the border choice of the Teutonic Order. Similarly, table 3 tests if some potential co-determinants of the economic development show any discontinuity across the cut-off. I use an RDD analogous to the main model to evaluate the effect of military capacity on economic development. However, I use the potential confounding variables as the outcome. I summarize the confounding variables according to the main economic dimensions they measure: social and demographic development, morphology, land suitability, accessibility to the main communication routes, and morphology. The results are not significant, except for the presence of Luvisol, which measures the heavy plough suitability, and the archaeological sites present in Pre-History and the Iron Age. Consequently, I follow the approach proposed by Grosfeld and Zhuravskaya (2015) to address a possible strategical selection of the border by the Teutonic Order according to the heavy plough suitability and higher socio-demographic development in the Iron Age. First, I assess if the archaeological sites in the Iron Age do not relate to the number of monuments (the results of these tests are available upon request). Second, in my main RDD I control for the presence of Iron Age archaeological sites. I also control for the presence of the presence of archeological sites in the High Middle-Ages, which immediately preceded the Northern Crusades, and for the presence of the Luvisol specification.

5 Results

5.1 Flow Number of Buildings

I start by considering the number of buildings as the outcome of the eq. 1, measuring the fixed-investment in the area. Figure 3a plots and orders chronologically the coefficients and their coefficient interval of the RDD by each century (11th - 17th century). The evolution of the coefficients shows a hump-shaped behavior, which reflects the rise and fall of the Teutonic Order. Prior to the arrival of the Order in Prussia, the coefficients are non significant and close to 0. These results support the absence of a discontinuity between Prussia and its neighbouring territories prior to the Crusades. The coefficients are significant and positive during the three centuries of Teutonic-Order domination, peaking in the 14th and 15th centuries. However, in the 16th and 17th centuries, the RDD coefficients drop and lose significance, following the collapse of the Order. A significant increase in the standard error is already visible starting from the 15th century. Overall, these results show a case of anti-persistence after the Order's collapse, but they are consistent with the role of military capacity as a driver of economic development.

[Figure 3 about here]

The action of the Teutonic-Order state in mobilizing military elites for the military campaign, and men and resources to support the military conquest may explain the rise and fall of economic development responding to the military fortune of the Teutonic-Order state. The peak in economic development for the Order coincides with the centuries (from the 13th to 15th centuries) of highest internal power and external prestige for the Teutonic-Order state. The state of permanent crusade attracted men-at-arms from all Europe, but also settlers and merchants attracted by the opportunities offered by the Prussian frontier. Conversely, the collapse of the Teutonic Order determines at the same time the decline in economic performance and development in the Order's territories. The loss of the military capacity of the Order after the Battle of Grunwald, and the military defeat by another Christian power delegitimized the role of the Order in the eyes of European military elites. Furthermore, military and economic instability, already evident in the 15th century, had undermined the economic opportunities for merchants and settlers.

5.2 Stock Number of Buildings

So far, I have focused on the flow number of buildings in a century. However, as the buildings persist into the next century, the presence of buildings erected in the previous centuries can still affect future economic development cumulatively over time. This hypothesis is in line with economic theory because buildings as a proxy of investment and infrastructure can facilitate or stimulate further construction and investment. As a consequence, in figure 3b, I use the stock number of buildings as the outcome and I compare the RDD coefficients across centuries to test the persistence of economic development in the following centuries. The specifications using the cumulative number of buildings per century show a trend similar to that with the flow number. Thus, a cumulative effect of past buildings on the next centuries' buildings is not visible. The most relevant difference is that the coefficients in the 16th and 17th centuries remain positive and significant, as development accumulated from the 13th to 15th centuries still affects the stock in the following centuries. However, the coefficient growth decreases, starting from the 16th and 17th centuries, while the standard error increases, reflecting the trend in the flow number of buildings. However, the trend in the stock number of buildings also highlights that, after the collapse of the Order any convergence phenomenon from neighboring territories is absent, as the coefficients' growth remains positive. Otherwise, the results would show a decreasing trend in the coefficients. This outcome means that the weakening of the Order's authority over the borders does not translate into an economic stimulus for the territories outside of the Order's state to catch up with its territories. Furthermore, these results provide evidence that the presence of the Teutonic Order did not play a negative role in the development of the neighbouring territories, either directly or indirectly.

5.3 Spread of Magdeburg Law and Town Charter

Next, I consider the spread of the town charters and the Magdeburg Law as a proxy of the development of urban institutions and the spread of German settlers in the area. The results in 3c and 3d show that the Teutonic Order played a role in the propagation of the town charters and Magdeburg Law, starting from the 13th century. Before the 13th century no data are available, confirming that the propagation of the town charters and Magdeburg Law started in Poland from the 13th century (Czaja and Radziminski, 2016; Harreld, 2015; Lück, 2018). Overall, the effects of the Order on these phenomena remain relatively weaker than for the buildings. For the town charters, the coefficients show a positive but weak growth over the period considered.

For the Magdeburg law, the coefficients show a hump-shape trend, similar to the buildings, with a drop starting from the 15th century. It is also relevant to notice that the standard error increase is apparent from the 14th century. As I consider only the cumulated number of Magdeburg-Law towns, the convergence from the neighboring territories in catching up with adoption of the Magdeburg Law explains the drop in the coefficient in the 15th century.

These results highlight how the general effect of the Teutonic Order on urbanization and general diffusion of urban institutions is weak. Moreover, they show that the buildings and town charters' trend seems to be partially driven by different factors. There are multiple explanations for this evidence. First, the town charter was a more general phenomenon, also broadly applied also by Polish principalities within the general process of modernisation of the state and warfare. Second, as the Order was a centralized state, it was only interested in granting some degree of autonomy to towns when necessary. Furthermore, the Order, as the ruler, and the towns were often in competition, if not economically, and were politically antagonistic (Górski, 1977). This evidence is also in line with Bosshart and Dittmar (2021) who highlight how the towns on the east side of the Elba had limited bargaining power with the feudal lord to demand economic and political freedom. Regarding the Magdeburg-Law towns, the results are higher because its spread was connected to the movement of German setttlers and merchants demanding to regulate the businesses in their communities according to the German-Saxon Law. Therefore, The Teutonic Order explicitly introduced the Magdeburg Law in all towns founded, to attract German settlers.

5.4 Heterogeneity

In section 4, I explain how different borders have differential treatment arising from their different histories and geographic position. The Center-Southern and Natural borders remained constant for two centuries. However, Polish settlers had already colonized parts of these territories prior to the arrival of the Teutonic Order. Thus, the cut-off should not only be more stable, but also be exogenous to the variables of interest. Conversely, the Northern borders disappeared in the 14th century when the Teutonic Order conquered the city of Gdansk and started to colonize the west banks of the Vistula. Consequently, I expect that the discontinuity is more significant across the Center-Southern and Natural borders than across the Northern borders. Figures 4 - 5 analyze the discontinuity of buildings, town charters and Madgeburg Law, focusing on different segments of the border. The Center-Southern and Natural borders show similar hump-shaped trends for the buildings (fig. 4 and A2). As expected, they seem not only significant but to be driving the results on the 13th century total borders. Furthermore, the Natural borders also present higher results between the 14th and 15th centuries than the Center-Southern border, as the treatment has the highest intensity. Conversely, the Northern borders (fig. 5) present a weakly positive coefficient in the 13th century. In the following centuries, they present non-significant results with coefficients close to 0. These results are in line with the initial hypothesis.

[Figures 4 and 5 about here]

The results for the Magdeburg Law and town charters are more difficult to interpret. The differences between the Northern borders, Center-Southern and Natural borders is still present, with the Center-Southern and Natural borders having significant and positive results. In contrast, the Northern borders show non-significant and close to 0 coefficients. However, the

Natural and Center-Southern borders present a difference in trend as well. While in the 13th and 14th centuries the coefficients are positive and significant across both borders after the 15th century, the Natural borders' coefficients drop and lose significativity. Conversely, the Center-Southern borders remain persistently positive and significant (for the town charters, the trend is increasing), and the process of colonization eastward and the eastward propagation of the town charters might provide an explanation for this difference. The data show an increase in the number of town charters and Magdeburg-Law charters in the eastern areas (Center-Southern borders), due to the movements of settlers and the propagation of the town charter model eastward. Conversely, the propagation process slows down in already colonized areas with a high-density of town charters (Natural borders).

5.5 Robustness Check

Tables A27 and A26 test the robustness of my results according to several specifications and control variables. I verify the robustness only for the 13th and 14th centuries as they represent the peak of the Teutonic Order's power. I adopt a linear parametrical model, as it is more flexible and allows a better comparison of models with different control variables. However, the results are robust even when a non-parametrical and second-order polynomial model is adopted, as in figures 3a and 3b. In tables A25 and A26, I control for macro regions fixed effects, as in figure A3. This division of space also has an economic and historical interpretation. Development proceeded from West-to-East in Medieval Poland, according to the distance to the Holy Roman Empire. The distance to the sea and the Order's direction of conquest justify the division of Prussian space into north-to-south regions. Column (1) adopts a specification controlling only for the variables that show any jumps as in table 3 (Luvisol presence, Altitude, Iron Age archaeological sites, High-Middle Ages archaeological site). Column (2) introduces the macro regions fixed effect. I adopted this specification in the previous analysis (figure 3a and 3b). Finally, in columns (3) to (7) of tables A25, and A26, I interacted the macro regions with measures of agricultural suitability (presence of Luvisol, suitability for Barley, Rye and Wheat, and the interaction between Luvisol and Barley as measure for heavy plough suitability). The results are robust and significant across all the specifications. Similarly, in tables A27 and A28, I test the results, controlling for the longitude and latitude of each centroid, my unit of observation (column (2)). In columns (3) to (7) I interact latitude and longitude for the suitability measures mentioned above. Again, the coefficients remain positive and significant.

I also repeat the above procedure, using the Magdeburg Law and town charter propagation as the outcome (tables A29 to A36). The coefficients are robust to all the specifications. In particular, the coefficients remain significant for the Magdeburg-Law diffusion and the 13th century. For the 14th century and the town charter, controlling for the square centroids' longitude and latitude and the presence of Luvisol increases the significance of the coefficients (table A32, columns (2), (6), (7)). A possible explanation is that urban centers needed a constant surplus of food from the countryside to survive and grow, which could only be possible in areas that are highly suitable for agriculture.

In the main specification, I employ the optimal bandwidth selection method (Calonico, Cattaneo, Farrell, and Titiunik, 2017; G. Imbens and Kalyanaraman, 2012), which changes according to the border selected and to the outcome distribution by century. Thus, I verify the robustness of the results by introducing a fixed bandwidth (50 km in tables A38 and A38; 30 km and 100 km are available upon request). In this spatial setting I verify the robustness of the results adopting the identification design proposed by Grosfeld and Zhuravskaya (2015) and Dell (2010), a two-dimensional RD specification. As in eq. 1, $Y_{s,t}$ are the flow number of buildings realized in a given century and within a square s, measuring economic development. However, I use a quadratic polynomial function of the square centroids' coordinates.[11] The results (A39 and A40) are also robust to this specification.

[Figure 6 about here]

In figure 6, I exploit the dynamic variation of the Teutonic-Order territory and borders across centuries to verify the robustness of the results in the event-study framework. The model adopted is the following:

$$Y_{st} = \sum_{j=-3}^{+5} \beta_j \, Teutonic\_Order_{st} \times Cen_t^j + \theta_s + \lambda_t + X'_{st} + \epsilon_{st} \tag{2}$$

Y_{st} is the outcome in region s at time t; θ_s is fixed effects for the region; λ_t is time fixed effects; X_{st} represents a set of control variables. $Teutonic\_Order_{st}$ is an indicator function, which is equal to 1 when s was part of the Teutonic-Order territory in a given century t and 0 otherwise. Cen_t^j is a set of indicator functions, which are 1 when $t - Century\_Treatment = j$ ($Century\_Treatment$ is the century of the treatment) and 0 otherwise. Thus, I calculate 2 leads and 5 lags that account for the evolution of the Teutonic-Order effect by century, before and after the treatment century.[12] I use the period -1 (one century before the treatment, i.e., in the 12th century) as the benchmark to calculate the other leads and lags. I introduce the Conley HAC standard errors (Conley, 1999, Conley, 2008) to account for the possible presence of spatial auto-correlation in the calculation of error ϵ_{st}. The leads' coefficient are close to 0 and are non significant. This evidence supports the parallel trends assumption required by the causal identification of an event-study design. Furthermore, I restrict the sample to the observations within a given distance from the border (30 km, 50 km) to guarantee homogeneity between treatment and control groups around the cut-off.[13] The event study's results confirm the hump-shape trend, with positive coefficients starting from the 13th century, with a peak in significativity and positivity in the 14th century. Then, starting from the 15th century, the coefficients begin to decrease and lose significativity.

[11] the polynomial takes the following function: $f(Lat_s, Lon_s) = Lat_s + Lon_s + Lat_s^2 + Lon_s^2 + Lat_s^3 + Lon_s^3 + Lat_s * Lon_s + Lat_s^2 * Lon_s + Lat_s * Lon_s^2$ controlls for the squares centroids' coordinates (Lat_s, Lon_s).

[12] for East Prussia, the treatment started in the 13th century, while for Gdansk and Pomerelia it started in the 14th century.

[13] In tables A41 - A43 I verify the robustness of the event study, applying the sample restrictions to observations within 30 km, 50 km, 100 km, 200 km from the border. Due to the variation of the Teutonic-Order territories and border across time, in figures A4a (a) - A4c (c), I apply the sample restriction using different borders as the cut-off (the 14th century borders, a combination of the 13th and 14th century borders, and the Natural borders).

6 Mechanisms

6.1 Teutonic Order: Positive or Negative Leviathan?

Is military capacity positive for economic development overall or is it just an expression of a dominant elite? While a strand of the literature (Besley and Persson, 2010; Cantoni, Mohr, and Weigand, 2019; Cox, Dincecco, and Onorato, 2022; Gennaioli and Voth, 2011; Mangini and Petroff, 2022) highlights the positive effects that war played in increasing the state capacity, another strand of the literature (Acemoglu, 2021; Bisin and Verdier, 2017; Malinowski, 2016; Raster, 2019) shows how despotic states or states ruled by a specific elite could harm long-term economic development. Thus, I test two alternative scenarios. In the first, the Teutonic Order, as a social planner, also stimulates development for actors that were not directly involved in the military conquest and conversion of Prussia. Thus, it was also of benefit to the German settlers and merchants to maximize resource extraction from Prussia and to lend economic support to the campaigns. In the second scenario, the economic rise and collapse of the Order may be an expression of a state captured by the military and religious elites, the Teutonic Order or the German nobles, who extract resources only to support warfare or religion.

To test this hypothesis, I classified the buildings in the historical building dataset (Narodowy Instytut Dziedzictwa [National Institute of Cultural Heritage], 2020b) in religious, military, civil, cultural, and palace/mansion buildings. This classification reflects the buildings' classification in Cantoni, Dittmar, and Yuchtman (2018). Thus, I repeated the RDD designs for each century, restricting the analysis to the number of monuments by category. Due to the scarcity of the last two categories, I restrict the study to the first three categories (religious, military, and civil). Furthermore, the former three categories are the most meaningful according to the two scenarios. The religious, military, and civil buildings could be a proxy for the respective interests respectively of the religious elite, the military/noble elite, and the merchants or economic elite. Under the benevolent social planner hypothesis, the Teutonic Order would not prefer the construction of military and religious buildings at the expense of civil ones. Under the hypothesis of elite capture (religious or military, in the case of analysis), the results should show more religious or military buildings than civil ones during the Teutonic Order's domination.

[Figure 7 about here]

The results are in contrast with the elite-capture hypothesis and they support the interpretation of the Teutonic Order as a social planner (at least in an economic sense). Figures 7a - 7c show how coefficients relative to military and religious buildings show higher coefficients than civil buildings. Conversely, the civil buildings are the only category that shows increasingly positive and significant results in the treatment group compared to the control group over the three centuries of the Teutonic Order's domination, driving the results of the main specification. On the other hand, religious buildings do not show a clear trend, while military buildings show positive and significant results during major military instability and political tension, i.e., in the 13th century and during and after the 15th century.[14] Looking at the partial borders, the Center-Southern borders drive the total 13th century borders' results (fig. A5a, fig. A5c, fig. A5b), while the Northern borders (fig. A6a, A6c, A6b), as in the main specification, show non-significant results during the Teutonic Order's domination, and negative and significant results for civil and military buildings in the 16th and 17th centuries.

6.2 State Capacity, Elites Movement and Market Integration

Historical research evidence that the strategy of conquest and colonization of Prussia consisted of the systematic invitation of knights ("Preußenreisen"), from the European élites, the lower nobility, and the ministeriales class (Friedrich Bruns, 1875; Paravicini, 1989; Querengässer, 2021. In this section, I test the hypothesis that the Teutonic Order's major capacity in organizing the movements of the European military can be a channel of development in Prussia. The mobilisation of men and resources and market integration would follow from the need of the Order to support economically the movement of the elite. This historical evidence is in line with Epstein (2000), who describes how market integration was a driver of development in a pre-modern state.

[Figure 8 about here]

To test this channel, I employ the main-routes' networks from Friedrich Bruns (1875), and digitized by Holterman et al. (2021)'s project. There is a consolidated historical evidence about the itineraries of the knights directed to Marienburg. There, they paid homage to the Grand Master before heading to the eastern territories of Prussia (Friedrich Bruns, 1875; Paravicini, 1989). As in figure 8, I select all the main routes from the West directed to Marienburg and Elblag. There are two main routes to reach the Teutonic-Order state. The first set of routes passes from Wroclaw (more rarely from Poznan) and then from Toruň and Chełmno Land in the southern part of the Order's state (Center, and Southern, and Northern routes from Frankfurt to Elblag, the South-Western route from the HRE[15] to Elblag, Gorlitz-Elblag, and Southern route from the HRE to Elblag). The second set of routes passes from Gdansk or generally from the north-west of the Teutonic-Order state (Northern route from the HRE to Elblag, and Northern route from Frankfurt to Elblag). Within the main RD framework, I introduce the distance from each route to Elblag and the interaction between each route's distance and the Teutonic-Order territories.[16] I test in particular two hypotheses based on historical and theoretical evidence:
1) In the 13th and the 14th centuries, the overall development along the main trade routes directed to Elblag should increase. In particular, as the direction of conquest proceeded from south (Chełmno Land) to north, and Gdansk was conquered in 1308, the Southern routes (from Wroclaw and Frankfurt and passing through Toruň) should show more evidence of development than the Northern routes passing through Gdansk. 2) The interaction between

[14] Historically, the logic of penetrating and securing the entire East Prussia territory during the Northern Crusades justifies the results in the 13th century. Similarly, the outbreak of war between the Order and the Kingdom of Poland and the Grand Duchy of Lithuania explains the positive coefficients in the 15th and 16th centuries.

[15] the HRE is acronym for the Holy Roman Empire

[16] I adopt a linear regression model as it allows a better management of the control variables, including the interaction term, and to include the more general effect represented by the routes.

the Teutonic-Order territories and the trade routes should contribute positively to economic development during the rise of the Order (in the 13th and 14th centuries). Conversely, the Order's military defeat undermined the *"Preußenreisen"* from the 15th century, which should negatively affect development along the routes, specifically in the Teutonic-Order state. This evidence should prove that the development in the Teutonic-Order territory is stronger than in the rest of Poland due to the centralizing effect played by the order in mobilizing economic resources.

[Table 4 about here]

Table 4 shows how the routes' closeness positively affects development, starting from the 13th century.[17] On average, the Southern routes seem to present higher and more significant results than the Northern routes from the 13th and 14th centuries. Thus, hypotheses (1) seems to be verified. The interaction between the Teutonic Order and routes seems positive for economic development, starting from the 13th century, but also significant in the 14th century. Furthermore, after the 15th century, the coefficients drop and are not significant and, from the 16th century, the effect on economic development is negative. In both cases the evidence is coherent with hypothesis (2). Tables A46 - A53 look separately at the civil, religious, and military buildings. Considering the interaction between the routes and the Teutonic Order, the Northern routes show a significant coefficient only for the religious buildings. Conversely, the Southern routes also show significant results for the civil and military buildings. These results provide further evidence for hypotheses (1) and (2).

6.3 The Teutonic Order and Urban Autonomy

The comparison between the RD on the number of buildings and the town charter and Magdeburg-Law spread across the total borders (Fig. 3) and partial borders (Fig. 4 and A2) show that buildings and urban institutions follow trends partially driven by varying factors. On the one hand, the Teutonic Order's military capacity tends to stimulate the spatial and administrative centralization of development. On the other hand, the spread of town charters tended to promote the administrative and spatial decentralization of development and economic activities. The significant and positive results relative to buildings across the Natural borders and the Center-Southern borders in section 5.3 are evidence of the town-charter spread along the main routes. In contrast, the town charter and Magdeburg Law show significant results only across the Center-Southern borders. From the persistence perspective, the two phenomena show different behaviors. The flow and stock number of buildings present a hump-shaped trend, while the Magdeburg-Law and town charters show a positive growth trend. However, using buildings as a comprehensive measure of economic development makes it difficult to separate the effect of Teutonic Order's military capacity from the institutional channel, measured by the Magdeburg Law and the town-charter propagation. Thus, I study the interaction between the Teutonic Order and urban autonomy in determining early economic development, as measured by the number of buildings. I introduce the following specification:

[17] the coefficient is negative as the higher the distance from the main routes, lower is the economic development.

$$Y_{st} = \sum_{j=-3}^{+6} \beta_j \left(TO_s \times Cen_t^j \right) + \sum_{j=-3}^{+6} \beta_j \left(TC_s \times Cen_t^j \right) + \\ + \sum_{j=-3}^{+6} \beta_j \left(TO_s \times TC_s \times Cen_t^j \right) + \theta_s + \lambda_t + X'_{st} + \epsilon_{st} \tag{3}$$

According to the following specification, Y_{st} is the number of buildings measuring economic development; $TC_s \times Cen_t^j$ measures the spread of the Magdeburg law as an autonomous phenomenon, proxying the effect of urban autonomy over EED. $TO_s \times Cen_t^j$, as before, measures the effect of the Teutonic Order on economic development. As I control for the urban autonomy-phenomenon, the Teutonic-Order effect can represent the state capacity for mobilizing and centralizing resources. Finally, $TO_s \times TC_s \times Cen_t^j$ represents the triple interaction between centuries, town charters, and the Teutonic-Order state. I employ an event-study design for the identification as it considers multiple drivers more flexibly than an RD framework. However, to make this design comparable with designs adopted in previous sections, I restrict the sample to observations within a 50 km distance of the 13th century borders.[18]

[Figure 9 about here]

The results confirm the difference in persistence between the Teutonic Order and urban autonomy. The town charter's effect (fig. 9b) seems persistent and increases over time. Conversely, the Teutonic Order continues to show non-persistence during the crisis and after its fall (fig. 9a). The difference seems intuitive and is in line with the literature. Urban autonomy, above all the Magdeburg Law, has permanent and positive effects on development after the consolidation of the town's identity and its economic and political organization. Furthermore, institutional effects are persistent after the treatment as they permanently change norms, customs, human interactions, and expectations in the target social community (North, 1990). On the other hand, the state capacity is less persistent, as its existence relies on the persistence of a central authority, the Teutonic Order, in the case of this analysis. Thus, after the treatment the effect of state capacity ceases to affect economic development. In conclusion, the results highlight that other forms of state capacity, complementary to and in addition to military capacity, are necessary for long-run growth, if the state that ensures the military capacity ceases to exist, its effect on economic development is not durable. Conversely, the effect of urban institutions is not only permanent through time but also increases.

7 Conclusion

Can a higher military capacity affect economic growth? In this paper, I analyze the role of the Teutonic-Order state as a driver of economic development in East Prussia within the framework

[18] Figures from A7 - A8 and table A54 show the robustness of the results according to different distances from the borders: 0 km, 50 km, 100 km, 200 km, respectively, in columns (1), (2), (3), (4). Alternatively, I do not restrict the sample, but I control for the distance from the border and the interaction between the distance and the Teutonic-Order effect (column (5)).

of the Northern Crusades. The analysis of the Teutonic-Order state in Prussia represents a case of higher military capacity compared to neighboring territories in Prussia. This setting shows that a form of state capacity can be a leading factor for economic development even before the Military Revolution and at the dawn of the modern state. Through an RDD, I compare development in East Prussia and the neighboring territories controlled by the Polish principalities, using the 13th century borders as the main cut-off. I use the number of buildings completed in a certain area and a given century (from the 11th to 17th centuries) as the leading measure of economic development.

I find a positive causal relationship between the Teutonic Order and early economic development. However, the coefficients show a hump-shaped trend. Before the 13th century, I do not find signs of discontinuity between the Teutonic-Order territories and the neighbors. From the 13th century, the coefficients are positive and significant, with a peak in the 14th and 15th centuries. After the 15th century, with the military defeat of the Order, the coefficients drop and they lose significance. Thus, these results represent evidence of the non-persistence of the military capacity once a military shock reduces it. I also evaluate the effect of the Teutonic Order on the awarding of town charters and the Magdeburg Law as a further measure of development, focusing on urbanization and the capacity to attract German settlers and merchants. The results for these outcomes are positive but weaker. Furthermore, they highlight a higher persistence in time (also after the 15th century), mainly in the eastern part of Prussian territory.

Analyzing the mechanisms, I assess if the Teutonic-Order state represents a case of state capture by religious or military elites negatively affecting Prussia's long-run economic development. I classify the buildings in the main dataset as religious, military, and civil buildings, where each category measures the interests of the religious, military, and economic elites. I then repeat the RDDs for each category. In the case of a state captured by the military and religious elite, the first two categories would drive the results in the main specification. Conversely, all three categories move in the same direction, and civil monuments are the only category that shows a significant discontinuity in the 13th, 14th, and 15th centuries, thus driving the main specification results.

I further add the interaction between the Teutonic Order and the distance from the main routes directed to Elblag/Marienburg to the main RDD specification. Thus, I demonstrate that part of the development is attributed to the Teutonic Order's capacity to mobilize military elites from Western Europe, leading the way for the movement of merchants and settlers and for market integration. The coefficients' hump-shaped trend, coinciding with the rise and fall of the Order as in the main specification, supports this evidence. Finally, I interact the centralizing role of state capacity with the decentralizing role of urban autonomy over the economic development in Prussia. I introduce a triple difference design, in which the Teutonic Order measures military capacity, and the Magdeburg Law measures the urban autonomy. The results highlight how the Teutonic-Order effect returns a hump-shaped trend following the rise and fall of the Order. Conversely, the Magdeburg Law has a more persistent and increasing effect over time, also including the military defeat of the Order. From these results, I can deduce that military capacity is insufficient and other forms of state capacity, such as institutional capacity, are required in order to have persistent long-run development during and after the treatment.

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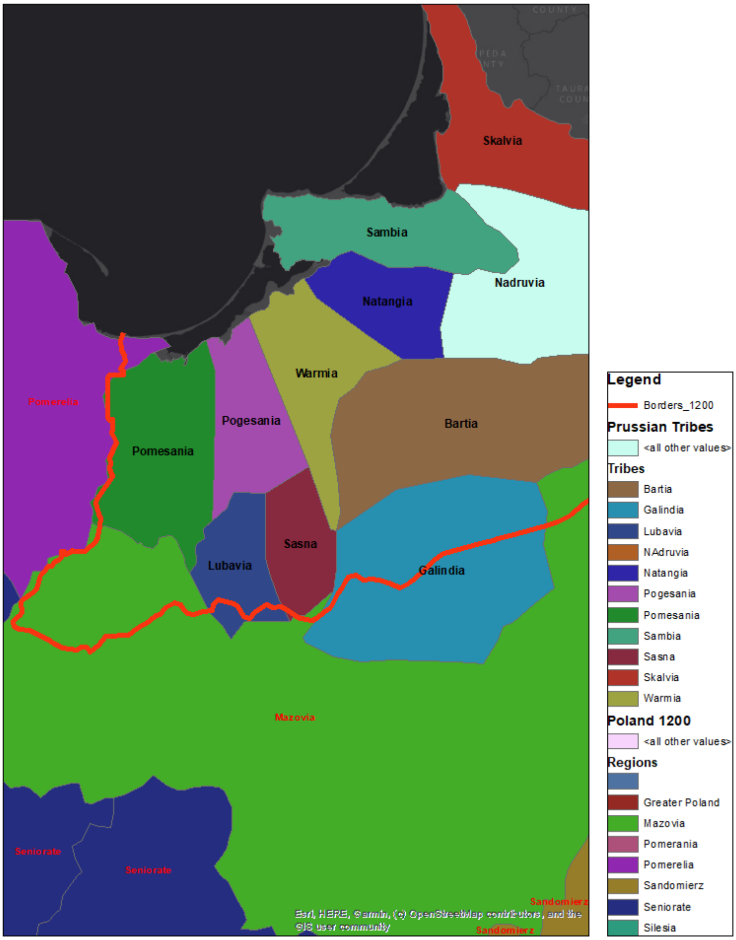
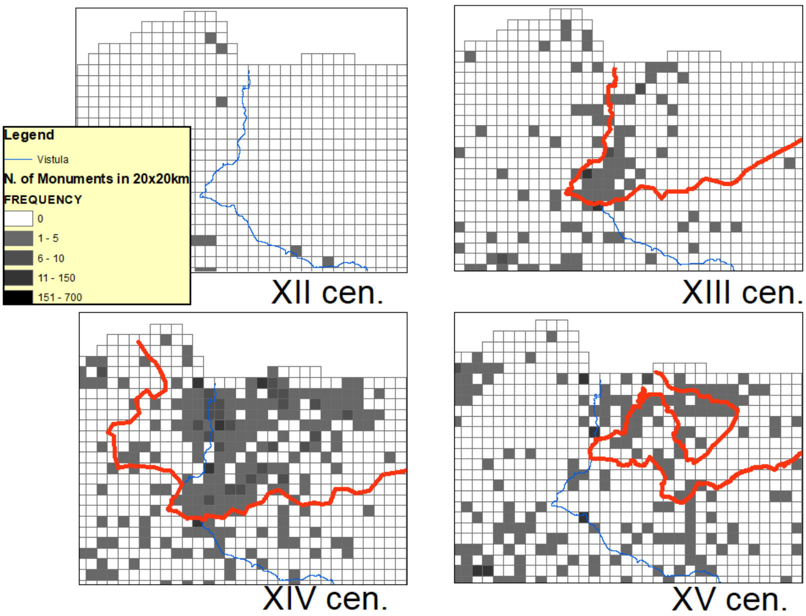
Tables

FIGURE 1. *Medieval Poland before the arrival of the Teutonic Order*



Notes: Prussian tribes (black shading) and division of the kingdom of Poland at the death of Bolesław III in 1138 (red shading). The red line represent the borders of the Teutonic-Order state at the end of the 13th century. This map describes the political situation of Medieval Poland on the eve of the invitation to the Teutonic Order to enter Prussia. **Source:** see text

FIGURE 2. *Geographic distribution of new buildings per century*



Notes: Number of buildings plotted on maps and aggregated in a 20x20km squares grid. The darker a point is, the more buildings were constructed in a given century. **Source:** see text

TABLE 1. *Descriptive Statistics of the Outcome Variables*

	Outcome Variables: 12th century, 50km from the 13th century border						
	Mean(Treatment)	Mean(Control)	Diff	St_Error_Treat	St_Error_Contr	St_Error_TT	Obs.
Number_Monuments	0.00	0.03	0.03	0.0	0.2	0.0	350
number_civil	0.00	0.01	0.01	0.0	0.1	0.0	350
number_relig	0.00	0.02	0.02	0.0	0.2	0.0	350
number_milit	0.00	0.00	0.00	0.0	0.0	0.0	350
number_palac	0.00	0.00	0.00	0.0	0.0	0.0	350
MagdCity	0.00	0.00	0.00	0.0	0.0	0.0	350
Number_Towns	0.00	0.00	0.00	0.0	0.0	0.0	350
N	350						

	Outcome Variables: 13th century, 50km from the 13th century border						
	Mean(Treatment)	Mean(Control)	Diff	St_Error_Treat	St_Error_Contr	St_Error_TT	Obs.
Number_Monuments	0.67	0.19	-0.47*	2.7	0.6	0.2	350
number_civil	0.23	0.07	-0.16	1.5	0.3	0.1	350
number_relig	0.23	0.10	-0.13	0.8	0.4	0.1	350
number_milit	0.18	0.02	-0.16*	0.8	0.1	0.1	350
number_palac	0.01	0.00	-0.01	0.1	0.0	0.0	350
MagdCity	0.09	0.04	-0.05	0.3	0.2	0.0	350
Number_Towns	0.11	0.08	-0.02	0.3	0.3	0.0	350
N	350						

	Outcome Variables: 14th century, 50km from the 13th century border						
	Mean(Treatment)	Mean(Control)	Diff	St_Error_Treat	St_Error_Contr	St_Error_TT	Obs.
Number_Monuments	2.04	0.75	-1.29**	4.2	3.0	0.4	350
number_civil	0.48	0.12	-0.37	2.6	0.8	0.2	350
number_relig	1.10	0.41	-0.69***	1.7	1.3	0.2	350
number_milit	0.36	0.18	-0.18	0.9	1.0	0.1	350
number_palac	0.00	0.00	0.00	0.0	0.0	0.0	350
MagdCity	0.18	0.08	-0.10**	0.4	0.3	0.0	350
Number_Towns	0.25	0.25	0.00	0.5	0.6	0.1	350
N	350						

Notes: Summary statistics for the outcomes (total numbers of buildings, number of civil buildings, number of religious buildings, number of military buildings) in the 14th century, restricting the sample to the observations within 50km from the 13th century borders. Columns (1) and (2) show the means for each control variable by the treatment and control group. In column (3) I test that the "differences between the ouctomes' means" of control and treatment groups are significantly different from 0 through a two-sided test. Columns (4) and (5) show the standard deviation for each control variable by the treatment and control groups. Column (6) shows the standard deviations difference. Column (7) shows the number of observations.

**Significant at 0.5%; **significant at 1%; *significant at 5%

TABLE 2. *Descriptive Statistics of Possible Confounding Variables: 50km from the 13th century borders*

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Mean(Treatment)	Mean(Control)	Diff	St_Error_Treat	St_Error_Contr	St_Error_TT	Obs.
FreqStAge	0.09	0.16	0.07	0.5	0.6	0.1	350
FreqPrHiAge	0.19	0.04	-0.15	1.1	0.2	0.1	350
FreqMdlAge	0.99	0.81	-0.18	1.5	1.3	0.1	350
FreqIronAge	0.32	0.73	0.41*	0.9	2.1	0.2	350
FreqBrAge	0.02	0.08	0.06	0.1	0.4	0.0	350
Archeo_MEHigh	0.92	0.75	-0.17	1.3	1.1	0.1	350
Archeo_MELow	0.26	0.13	-0.13*	0.6	0.4	0.1	350
Mean_Barley	0.88	0.78	-0.10**	0.3	0.3	0.0	350
Luvisol	0.16	0.15	-0.01	0.3	0.3	0.0	350
MeanLuvBar	0.15	0.13	-0.02	0.3	0.3	0.0	350
Mean_Rye	0.93	0.93	-0.00	0.2	0.2	0.0	350
Mean_Wheat	0.71	0.49	-0.22***	0.4	0.4	0.0	345
Access_Rou	0.63	0.58	-0.05	0.5	0.5	0.1	350
River_Acce	0.63	0.37	-0.26***	0.5	0.5	0.1	350
NearStreet	1102.29	1064.97	-37.32	199.9	299.7	26.9	350
NearRiv	3170.23	3278.86	108.63	1000.8	913.3	103.3	350
Mean_Alt	112.21	108.08	-4.14	53.6	35.8	5.0	350
Mean_Slope	0.14	0.13	-0.01	0.1	0.1	0.0	350
N	350						

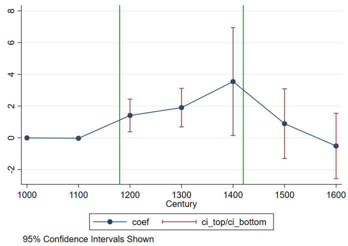
Notes: Summary statistics for the possible confounding variables, restricting the sample to observations within 50km of the 13th century borders. Columns (1) and (2) show the means for each control variable by the treatment and control group. In column (3) I test that the "differences between the ouctomes' means" of control and treatment groups are significantly different from 0 through a two-sided test. Columns (4) and (5) show the standard deviation for each control variable by the treatment and control group. Column (6) shows the standard deviations difference. Column (7) shows the number of observation.
***Significant at 0.5%; **significant at 1%; *significant at 5%

TABLE 3. *RDD balance across T.O. border (13th century)*

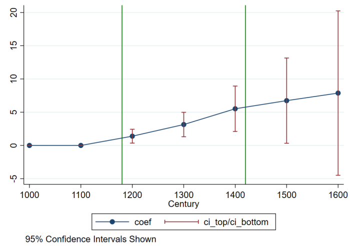
	(1)	(2)	(3)	(4)	(5)
			Archeological sites presence: Row (1)		
VARIABLES	Stone A. Sites	PreHist. A. Sites	Bronze Age	Iron Age	High Middle Ages
RD_Estimate	0.09	0.49*	-0.01	0.98*	0.51
	(0.18)	(0.22)	(0.01)	(0.45)	(0.45)
			Land and Agriculture Suitability: Row (2)		
VARIABLES	Barley	Rye	Wheat	Luvisol	LuvisolxBarley
RD_Estimate	-0.02	-0.07	0.10	0.19**	0.19***
	(0.08)	(0.09)	(0.11)	(0.07)	(0.04)
			Access and Trade feasibility: Row (3)		
VARIABLES	Routes Access	Streets Distance	Rivers Access	Rivers Access	
RD_Estimate	-0.23	27.95	-0.08	543.55	
	(0.12)	(26.17)	(0.29)	(439.42)	
			Land Morphology: Row (4)		
VARIABLES	Altitude	Slope			
RD_Estimate	-6.30	-0.03			
	(14.49)	(0.02)			

Notes: RDD coefficients with potential confounding variables as the outcome. I use a second order polynomial to account for the distance from the border as the cut-off. Row (1) measures the presence of socio-economic development coefficients across the 13th century borders prior to the Northern Crusades, as measured by the presence of archaeological sites in a 20x20km square. Row (2) shows the presence of jumps for land suitability. Row (3) shows the presence of jumps for the accessibility to the main land and water routes. Row (4) shows the presence of jumps for the morphology of the land.
***Significant at 1%; **significant at 5%; *significant at 10%.

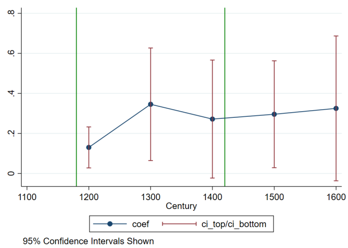
FIGURE 3. *RDD estimating the effect of the Teutonic Order on economic development: total 13th century borders*



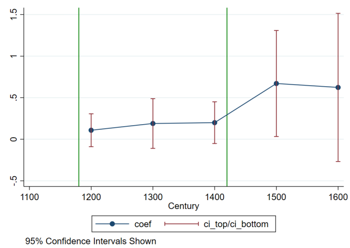
(a) *Flow number of buildings*



(b) *Stock number of buildings*



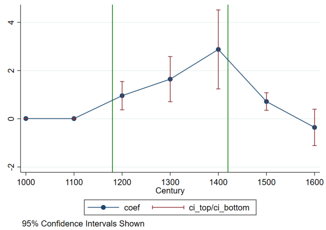
(c) *Number of Town receiving a Magdeburg-Law charter*



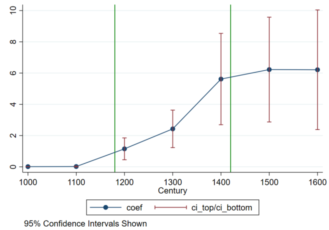
(d) *Number of Town receiving a town charter*

Notes: RDD coefficients and standard errors according to the specification in eq. 1. Each coefficient and standard errors are calculated for a given century and plotted chronologically to give the temporal evolution of the coefficient and of the standard error. I use the total 13th century borders as the cut-off. Fig. (a) evaluates the RDD using the flow buildings as the outcome. Figure (b) evaluates the RDD using the stock buildings as the outcome. Figure (c) evaluates the RDD using the Magdeburg-Law towns as the outcome. Figure (d) evaluates the RDD using the towns adopting a town charter as the outcome. The green vertical lines signal the beginning of the treatment (13th century) and the period after the treatment (mid-15th century).

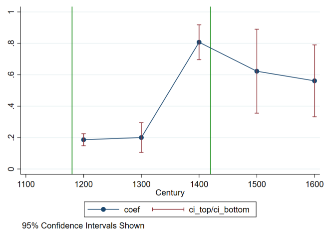
FIGURE 4. *RDD estimating the effect of the Teutonic Order on economic development: Center-Southern 13th century borders*



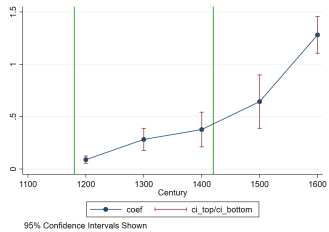
(a) *Flow number of buildings*



(b) *Stock number of buildings*



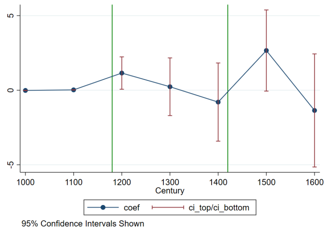
(c) *Number of Towns receiving a Magdeburg-Law charter*



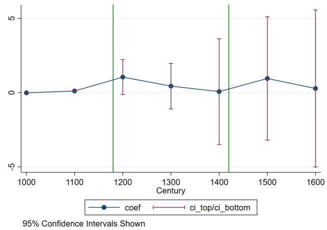
(d) *Number of Towns with a town charter*

Notes: RDD coefficients and standard errors according to the specification in eq. 1. Each coefficient and standard errors are calculated for a given century and plotted chronologically to give the temporal evolution of the coefficient and of the standard error. I use the Center-Southern 13th century borders as the cut-off. Figure (a) evaluates the RDD using the flow buildings as the outcome. Figure (b) evaluates the RDD using the stock buildings as the outcome. Figure (c) evaluates the RDD using the Magdeburg-Law towns as the outcome. Figure (d) evaluated the RDD using the towns adopting a town charter as the outcome. The green vertical lines signal the beginning of the treatment (13th century) and the period after the treatment (mid-15th century).

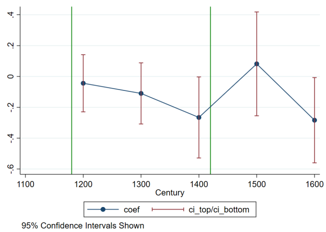
FIGURE 5. *RDD estimating the effect of the Teutonic Order on economic development: Northern 13th century borders*



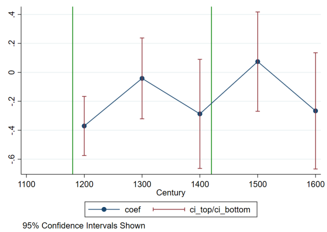
(a) *Flow number of buildings*



(b) *Stock number of buildings*



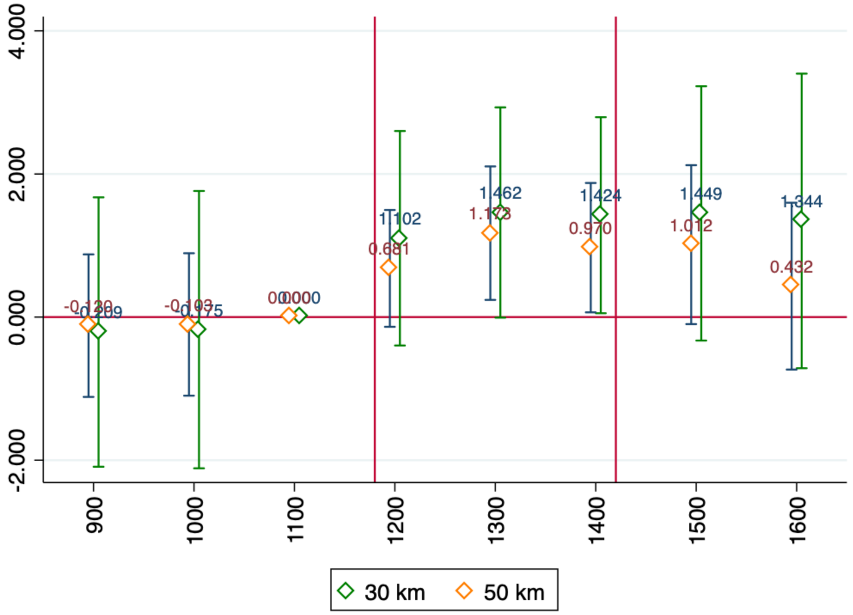
(c) *Number of Towns receiving a Magdeburg-Law charter*



(d) *Number of Towns with a town charter*

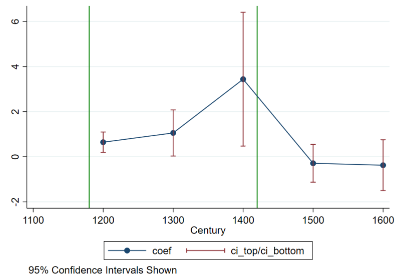
Notes: RDD coefficients and standard errors according to the specification in eq. 1. Each coefficient and standard errors are calculated for a given century and plotted chronologically to give the temporal evolution of the coefficient and of the standard error. I use the Northern 13th century borders as the cut-off. Figure (a) evaluates the RDD using the flow buildings as the outcome. Figure (b) evaluates the RDD using the stock buildings as the outcome. Figure (c) evaluates the RDD using the Magdeburg-Law towns as the outcome. Figure (d) evaluates the RDD using the towns adopting a town charter as the outcome. The green vertical lines signal the beginning of the treatment (13th century) and the period after the treatment (mid-15th century).

FIGURE 6. *Event-study analysis for monuments: 13th century borders*

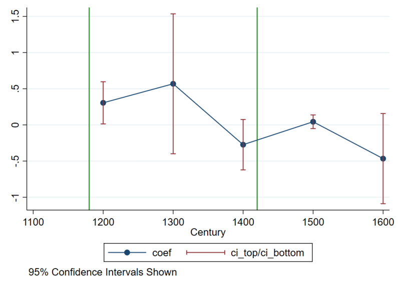


Notes: Event-study analysis showing the evolution of the coefficients interacting the treatment with each century and their standard deviation. In the green coefficient I restricted the sample to observations within 30 km of the 13th century borders.

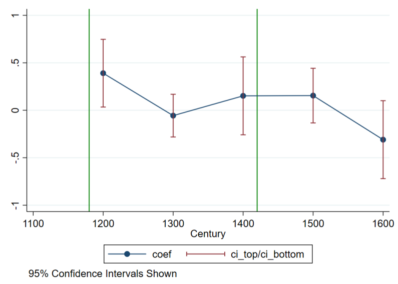
FIGURE 7. *RDDs over time on the total 13th century borders by function*



(a) *Civil Buildings*



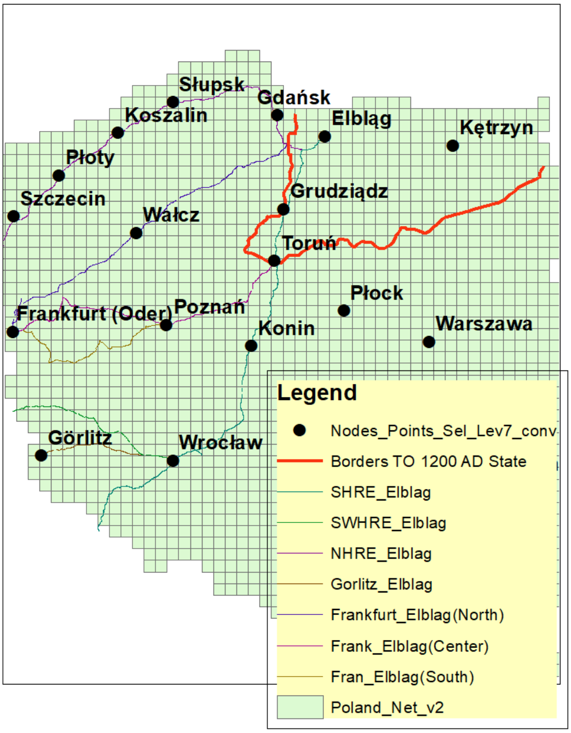
(b) *Religious Buildings*



(c) *Military Buildings*

Notes: RDD coefficients and standard errors according to the specification in eq. 1, where the main outcome is the new buildings by function (civil, religious, military). Each coefficient and standard errors are calculated for a given century and plotted chronologically to give the temporal evolution of the coefficient and of the standard error. I use the Northern 13th century borders. Figure (a) evaluates the RDD considering the civil buildings as the outcome. Figure (b) evaluates the RDD for the religious buildings. Figure (c) evaluates the RDD for the military buildings. In this specification I use the distance from the 13th century borders

FIGURE 8. *Main Routes to Elblang from the 13th century*



Notes: Main routes directed to Elblag controlling for the passage of the Preußenreisen and market integration. The red lines represent the borders of the Teutonic-Order state in the 13th century. **Source:** Holterman et al. (2021)

TABLE 4. *RDD and TO interacted with Northern and Southern Routes: all buildings*

Northern Routes

	Build.1000	Build.1100	Build.1200	Build.1300	Build.1400	Build.1500	Build.1600
Elblag-HRE (Northern) Route							
TO=1	-0.04	-0.09**	1.28*	3.60***	0.64	-0.56	-0.65
	(0.02)	(0.03)	(0.47)	(0.40)	(0.56)	(0.66)	(0.64)
NEAR_DIST(100km)	0.00	0.00	-0.01	-0.01	-0.00	-0.03	0.03
	(0.00)	(0.00)	(0.02)	(0.04)	(0.03)	(0.07)	(0.07)
TO=1 × NEAR_DIST(100km)	0.00	0.00	-0.02	-0.14***	0.02	0.05	0.05
	(0.00)	(0.00)	(0.02)	(0.02)	(0.03)	(0.04)	(0.04)
Elblag-Frankfurt (Northern) Route							
TO=1	-0.02	-0.26***	1.37	2.89***	1.06	-0.26	-0.10
	(0.01)	(0.06)	(0.68)	(0.47)	(0.88)	(0.33)	(0.61)
NEAR_DIST(100km)	0.00	-0.00	-0.03**	-0.04	-0.05	-0.11	-0.04
	(.)	(0.00)	(0.01)	(0.04)	(0.04)	(0.08)	(0.07)
TO=1 × NEAR_DIST(100km)	0.00	0.00**	-0.07	-0.28*	-0.11	0.03	-0.08
	(.)	(0.00)	(0.06)	(0.10)	(0.20)	(0.15)	(0.17)

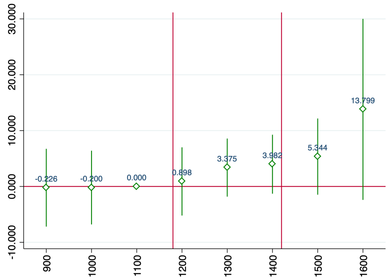
Southern Routes

	Build.1000	Build.1100	Build.1200	Build.1300	Build.1400	Build.1500	Build.1600
Elblag-Frankfurt (Central) Route							
TO=1	-0.03	-0.08**	1.56*	3.31***	1.26	-0.35	-0.32
	(0.02)	(0.02)	(0.67)	(0.38)	(0.83)	(0.41)	(0.54)
NEAR_DIST(100km)	-0.00	-0.00	-0.02	-0.02	-0.02	-0.03	-0.00
	(0.00)	(0.00)	(0.02)	(0.04)	(0.03)	(0.06)	(0.06)
TO=1 × NEAR_DIST(100km)	0.00	0.00*	-0.06	-0.15***	-0.05	0.05	0.02
	(0.00)	(0.00)	(0.05)	(0.04)	(0.05)	(0.03)	(0.03)
Elblag-Frankfurt (Southern) Route							
TO=1	-0.03	-0.08**	1.54*	3.29***	1.25	-0.38	-0.34
	(0.02)	(0.02)	(0.68)	(0.39)	(0.84)	(0.41)	(0.54)
NEAR_DIST(100km)	-0.00	-0.00	-0.03	-0.04	-0.02	-0.06	-0.03
	(0.00)	(0.00)	(0.02)	(0.05)	(0.03)	(0.07)	(0.06)
TO=1 × NEAR_DIST(100km)	0.00	0.00*	-0.06	-0.15**	-0.05	0.05	0.03
	(0.00)	(0.00)	(0.05)	(0.04)	(0.05)	(0.04)	(0.03)
Elblag-HRE(South-Western) Route							
TO=1	-0.04*	-0.08**	1.47	3.16***	1.23	-0.54	-0.47
	(0.02)	(0.02)	(0.75)	(0.46)	(0.86)	(0.44)	(0.63)
NEAR_DIST(100km)	-0.00	-0.00	-0.04*	-0.07***	-0.02	-0.08**	-0.06
	(0.00)	(0.00)	(0.02)	(0.01)	(0.01)	(0.02)	(0.04)
TO=1 × NEAR_DIST(100km)	0.00	0.00	-0.06	-0.15**	-0.05	0.06	0.03
	(0.00)	(0.00)	(0.05)	(0.04)	(0.05)	(0.03)	(0.03)
Elblag-HRE (Southern) Route							
TO=1	-0.04*	-0.08**	1.47	3.14***	1.21	-0.55	-0.51
	(0.02)	(0.02)	(0.75)	(0.47)	(0.88)	(0.43)	(0.63)
NEAR_DIST(100km)	-0.00*	-0.00	-0.04*	-0.08**	-0.03	-0.09**	-0.08*
	(0.00)	(0.00)	(0.02)	(0.02)	(0.02)	(0.02)	(0.03)
TO=1 × NEAR_DIST(100km)	0.00	0.00	-0.06	-0.15**	-0.05	0.05	0.03
	(0.00)	(0.00)	(0.05)	(0.04)	(0.06)	(0.03)	(0.03)
Elblag-Goritz Route							
TO=1	-0.04*	-0.08**	1.47	3.14***	1.22	-0.57	-0.49
	(0.02)	(0.02)	(0.76)	(0.47)	(0.87)	(0.43)	(0.63)
NEAR_DIST(100km)	-0.00	-0.00	-0.04*	-0.07***	-0.03*	-0.09**	-0.07
	(0.00)	(0.00)	(0.02)	(0.02)	(0.01)	(0.02)	(0.04)
TO=1 × NEAR_DIST(100km)	0.00	0.00	-0.06	-0.15**	-0.05	0.06	0.03
	(0.00)	(0.00)	(0.05)	(0.04)	(0.05)	(0.03)	(0.03)

Notes: RDD coefficients according to eq. 1. $Build.\#$ is the number of buildings constructed in a century. $Distance_{r}oute$ is the distance from the Elblag routes network and the $c.near_{r}oute_{s} \times 1.TO_{s,t=cen.}$ is the interaction between the Teutonic-Order state and the distance from the Elblag route; $X'_{s,t=cen.}$ is a set of control variables. Each column evaluates the RDD in a given century (from the 12th to 17th centuries). ***Significant at 1%; **significant at 5%; *significant at 10%.

FIGURE 9. *The Teutonic Order, town charters, and their interaction on economic development*

(a) *Teutonic Order coefficients*



(b) *Magdeburg-Law spread coefficients*

(c) *Teutonic Order × Magdeburg-Law coefficients*

Notes: Event study according to eq. 2 with new buildings per century as the outcome. Where $TO_s \times Cen_t^j$, as before, measures the effect of the Teutonic Order over time (pic (a)). $T.C._s \times Cen_t^j$ measures the spread of the Magdeburg law over time (pic (b)); $TO_s \times TC_s \times Cen_t^j$ represents the triple interaction between centuries, town charters, and the Teutonic-Order state (pic (c)). I restrict the sample to observations within 50km of the borders.

Appendix

A First Appendix

A.1 Data and Descriptive Tables

TABLE A1. *Outcome Variables: 12th century, 20km from the 13th century borders*

	(1)						
	Mean(Treatment)	Mean(Control)	Diff	St_Error_Treat	St_Error_Contr	St_Error_TT	Obs.
Number_Monuments	0.00	0.00	0.00	0.0	0.0	0.0	147
number_civil	0.00	0.00	0.00	0.0	0.0	0.0	147
number_relig	0.00	0.00	0.00	0.0	0.0	0.0	147
number_milit	0.00	0.00	0.00	0.0	0.0	0.0	147
number_palac	0.00	0.00	0.00	0.0	0.0	0.0	147
MagdCity	0.00	0.00	0.00	0.0	0.0	0.0	147
Number_Towns	0.00	0.00	0.00	0.0	0.0	0.0	147
N	147						

TABLE A2. *Outcome Variables: 13th century, 20km from the 13th century borders*

	(1)						
	Mean(Treatment)	Mean(Control)	Diff	St_Error_Treat	St_Error_Contr	St_Error_TT	Obs.
Number_Monuments	1.14	0.24	-0.89*	3.7	0.8	0.4	147
number_civil	0.41	0.09	-0.32	2.1	0.3	0.2	147
number_relig	0.37	0.11	-0.26*	1.0	0.5	0.1	147
number_milit	0.31	0.03	-0.28*	1.0	0.2	0.1	147
number_palac	0.01	0.00	-0.01	0.1	0.0	0.0	147
MagdCity	0.12	0.05	-0.08	0.3	0.2	0.0	147
Number_Towns	0.17	0.08	-0.10	0.4	0.3	0.1	147
N	147						

TABLE A3. *Outcome Variables: 14th century, 20km from the 13th century borders*

	(1)						
	Mean(Treatment)	Mean(Control)	Diff	St_Error_Treat	St_Error_Contr	St_Error_TT	Obs.
Number_Monuments	2.54	1.27	-1.27	5.4	4.8	0.8	147
number_civil	0.70	0.18	-0.52	3.5	1.2	0.4	147
number_relig	1.25	0.70	-0.55	1.8	2.0	0.3	147
number_milit	0.42	0.32	-0.10	1.0	1.5	0.2	147
number_palac	0.00	0.00	0.00	0.0	0.0	0.0	147
MagdCity	0.19	0.09	-0.09	0.4	0.3	0.1	147
Number_Towns	0.27	0.23	-0.04	0.5	0.7	0.1	147
N	147						

Notes: Summary statistics for the outcomes (total numbers of buildings, number of civil buildings, number of religious buildings, number of military buildings) from the 12th to 14th centuries, restricting the sample to the observations within 20km of the 13th century borders. Columns (1) and (2) show the means for each control variable by the treatment and control group. In column (3) I test that the "differences between the ouctomes' means" of control and treatment groups are significantly different from 0 through a two-sided test. Columns (4) and (5) show the standard deviation for each control variable by the treatment and control group. Column (6) shows the standard deviations difference. Column (7) shows the number of observation. ***Significant at 0.5%; **significant at 1%; *significant at 5%

TABLE A4. *Outcome Variables: 12th century, 100km from the 13th century borders*

	(1)						
	Mean(Treatment)	Mean(Control)	Diff	St_Error_Treat	St_Error_Contr	St_Error_TT	Obs.
Number_Monuments	0.00	0.05	0.05***	0.0	0.3	0.0	662
number_civil	0.00	0.01	0.01*	0.0	0.1	0.0	662
number_relig	0.00	0.04	0.04**	0.0	0.2	0.0	662
number_milit	0.00	0.00	0.00	0.0	0.0	0.0	662
number_palac	0.00	0.00	0.00	0.0	0.0	0.0	662
MagdCity	0.00	0.00	0.00	0.0	0.0	0.0	662
Number_Towns	0.00	0.00	0.00	0.0	0.0	0.0	662
N	662						

TABLE A5. *Outcome Variables: 13th century, 100km from the 13th century borders*

	(1)						
	Mean(Treatment)	Mean(Control)	Diff	St_Error_Treat	St_Error_Contr	St_Error_TT	Obs.
Number_Monuments	0.47	0.15	-0.33*	2.3	0.5	0.1	662
number_civil	0.18	0.06	-0.12	1.2	0.2	0.1	662
number_relig	0.15	0.07	-0.08	0.6	0.3	0.0	662
number_milit	0.12	0.01	-0.11**	0.6	0.1	0.0	662
number_palac	0.00	0.00	-0.00	0.1	0.0	0.0	662
MagdCity	0.08	0.03	-0.05*	0.3	0.2	0.0	662
Number_Towns	0.09	0.08	-0.01	0.3	0.3	0.0	662
N	662						

TABLE A6. *Outcome Variables: 14th century, 100km from the 13th century borders*

	(1)						
	Mean(Treatment)	Mean(Control)	Diff	St_Error_Treat	St_Error_Contr	St_Error_TT	Obs.
Number_Monuments	2.01	0.49	-1.52***	3.7	2.1	0.3	662
number_civil	0.44	0.09	-0.35*	2.1	0.6	0.1	662
number_relig	1.08	0.25	-0.83***	1.6	0.9	0.1	662
number_milit	0.42	0.12	-0.31***	1.0	0.7	0.1	662
number_palac	0.00	0.01	0.01	0.0	0.1	0.0	662
MagdCity	0.23	0.09	-0.14***	0.5	0.3	0.0	662
Number_Towns	0.26	0.26	-0.00	0.5	0.5	0.0	662
N	662						

Notes: Summary statistics for the outcomes (total numbers of buildings, number of civil buildings, number of religious buildings, number of military buildings) from the 12th to 14th centuries, restricting the sample to observations within 100km of the 13th century borders. Columns (1) and (2) show the means for each control variable by the treatment and control group. In column (3) I test that the "differences between the ouctomes' means" of control and treatment groups are significantly different from 0 through a two-sided test. Columns (4) and (5) show standard deviation for each control variable by the treatment and control group. Column (6) shows the standard deviations difference. Column (7) shows the number of observation. ***Significant at 0.5%; **significant at 1%; *significant at 5%

TABLE A7. *Outcome Variables: 12th century, 200km from the 13th century borders*

	(1)						
	Mean(Treatment)	Mean(Control)	Diff	St_Error_Treat	St_Error_Contr	St_Error_TT	Obs.
Number_Monuments	0.00	0.04	0.04***	0.0	0.2	0.0	1151
number_civil	0.00	0.01	0.01***	0.0	0.1	0.0	1151
number_relig	0.00	0.03	0.03***	0.0	0.2	0.0	1151
number_milit	0.00	0.00	0.00	0.0	0.0	0.0	1151
number_palac	0.00	0.00	0.00	0.0	0.0	0.0	1151
MagdCity	0.00	0.00	0.00	0.0	0.0	0.0	1151
Number_Towns	0.00	0.00	0.00	0.0	0.0	0.0	1151
N	1151						

TABLE A8. *Outcome Variables: 13th century, 200km from the 13th century borders*

	(1)						
	Mean(Treatment)	Mean(Control)	Diff	St_Error_Treat	St_Error_Contr	St_Error_TT	Obs.
Number_Monuments	0.46	0.18	-0.28	2.2	0.6	0.1	1151
number_civil	0.17	0.08	-0.10	1.2	0.3	0.1	1151
number_relig	0.15	0.09	-0.06	0.6	0.4	0.0	1151
number_milit	0.12	0.01	-0.11*	0.6	0.2	0.0	1151
number_palac	0.00	0.00	-0.00	0.1	0.0	0.0	1151
MagdCity	0.07	0.05	-0.03	0.3	0.2	0.0	1151
Number_Towns	0.09	0.12	0.03	0.3	0.3	0.0	1151
N	1151						

TABLE A9. *Outcome Variables: 14th century, 200km from the 13th century borders*

	(1)						
	Mean(Treatment)	Mean(Control)	Diff	St_Error_Treat	St_Error_Contr	St_Error_TT	Obs.
Number_Monuments	1.97	0.47	-1.50***	3.7	1.6	0.2	1151
number_civil	0.43	0.11	-0.33*	2.1	0.5	0.1	1151
number_relig	1.06	0.23	-0.83***	1.5	0.8	0.1	1151
number_milit	0.41	0.11	-0.30***	1.0	0.6	0.1	1151
number_palac	0.00	0.00	0.00	0.0	0.1	0.0	1151
MagdCity	0.22	0.11	-0.11***	0.5	0.3	0.0	1151
Number_Towns	0.26	0.30	0.04	0.5	0.5	0.0	1151
N	1151						

Notes: Summary statistics for the outcomes (total numbers of buildings, number of civil buildings, number of religious buildings, number of military buildings) from the 12th to 14th centuries, restricting the sample to observations within 200km of the 13th century borders. Columns (1) and (2) show the means for each control variable by the treatment and control group. In column (3) I test that the "differences between the ouctomes' means" of control and treatment groups are significantly different from 0 through a two-sided test. Columns (4) and (5) show standard deviation for each control variable by the treatment and control group. Column (6) shows the standard deviations difference. Column (7) shows the number of observation. ***Significant at 0.5%; **significant at 1%; *significant at 5%

TABLE A10. *Possible Confounding Variables: 20km from the 13th century borders*

	(1) Mean(Treatment)	(2) Mean(Control)	(3) Diff	(4) St_Error_Treat	(5) St_Error_Contr	(6) St_Error_TT	(7) Obs.
FreqStAge	0.12	0.17	0.04	0.7	0.7	0.1	147
FreqPrHiAge	0.22	0.03	-0.19	1.5	0.2	0.2	147
FreqMdlAge	1.16	0.95	-0.21	1.7	1.4	0.3	147
FreqIronAge	0.40	0.62	0.23	1.0	2.6	0.3	147
FreqBrAge	0.00	0.03	0.03	0.0	0.2	0.0	147
Archeo_MEHigh	1.10	0.88	-0.22	1.5	1.2	0.2	147
Archeo_MELow	0.41	0.18	-0.23*	0.7	0.5	0.1	147
Mean_Barle	0.85	0.73	-0.12*	0.3	0.4	0.1	147
Luvisol	0.19	0.13	-0.05	0.4	0.3	0.1	147
MeanLuvBar	0.17	0.07	-0.10*	0.3	0.2	0.0	147
Mean_Rye	0.91	0.95	0.03	0.2	0.2	0.0	147
Mean_Wheat	0.63	0.44	-0.19*	0.4	0.5	0.1	144
Access_Rou	0.64	0.52	-0.13	0.5	0.5	0.1	147
River_Acce	0.54	0.42	-0.12	0.5	0.5	0.1	147
NearStreet	1037.06	1056.91	19.85	228.0	260.5	40.9	147
NearRiv	3237.99	3214.71	-23.28	1048.9	913.2	161.9	147
Mean_Alt	98.11	100.39	2.28	53.8	42.2	7.9	147
Mean_Slope	0.12	0.12	0.00	0.1	0.1	0.0	147
N	147						

Notes: Summary statistics for the possible confounding variables, restricting the sample to the observations within 20km of the 13th century borders. Columns (1) and (2) show the means for each control variable by the treatment and control group. In Column (3) I test that the "differences between the ouctomes' means" of control and treatment groups are significantly different from 0 through a two-sided test. Columns (4) and (5) show the standard deviation for each control variable by the treatment and control groups. Column (6) shows the standard deviations difference. Column (7) shows the number of observations.
***Significant at 1%; **significant at 5%; *significant at 10%.

TABLE A11. *Possible Confounding Variables: 100km from the 13th century borders*

	(1) Mean(Treatment)	(2) Mean(Control)	(3) Diff	(4) St_Error_Treat	(5) St_Error_Contr	(6) St_Error_TT	(7) Obs.
FreqStAge	0.07	0.15	0.09*	0.5	0.6	0.0	662
FreqPrHiAge	0.21	0.04	-0.17**	1.0	0.2	0.1	662
FreqMdlAge	0.95	0.91	-0.04	1.4	1.4	0.1	662
FreqIronAge	0.30	0.75	0.45***	0.8	1.9	0.1	662
FreqBrAge	0.01	0.12	0.11***	0.1	0.5	0.0	662
Archeo_MEHigh	0.88	0.84	-0.03	1.3	1.4	0.1	662
Archeo_MELow	0.29	0.13	-0.16***	0.6	0.4	0.0	662
Mean_Barle	0.91	0.77	-0.14***	0.2	0.3	0.0	662
Luvisol	0.16	0.22	0.06*	0.3	0.4	0.0	662
MeanLuvBar	0.16	0.18	0.02	0.3	0.4	0.0	662
Mean_Rye	0.94	0.95	0.00	0.2	0.2	0.0	662
Mean_Wheat	0.79	0.48	-0.31***	0.4	0.4	0.0	656
Access_Rou	0.62	0.61	-0.00	0.5	0.5	0.0	662
River_Acce	0.54	0.40	-0.14***	0.5	0.5	0.0	662
NearStreet	1125.20	1095.91	-29.29	170.1	386.0	21.7	662
NearRiv	3172.08	2958.36	-213.72*	971.4	1119.6	83.3	662
Mean_Alt	112.10	110.56	-1.54	48.4	35.5	3.6	662
Mean_Slope	0.17	0.13	-0.04***	0.1	0.1	0.0	662
N	662						

Notes: Summary statistics for the possible confounding variables, restricting the sample to the observations within 100km of the 13th century borders. Columns (1) and (2) show the means for each control variable by the treatment and control group. In Column (3) I test that the "differences between the ouctomes' means" of control and treatment groups are significantly different from 0 through a two-sided test. Columns (4) and (5) show the standard deviation for each control variable by the treatment and control groups. Column (6) shows the standard deviations difference. Column (7) shows the number of observations.
***Significant at 1%; **significant at 5%; *significant at 10%.

TABLE A12. *Possible Confounding Variables: 200km from the 13th century borders*

	(1) Mean(Treatment)	(2) Mean(Control)	(3) Diff	(4) St_Error_Treat	(5) St_Error_Contr	(6) St_Error_TT	(7) Obs.
FreqStAge	0.07	0.25	0.18***	0.4	1.3	0.1	1151
FreqPrHiAge	0.21	0.03	-0.19**	1.0	0.2	0.1	1151
FreqMdlAge	0.95	1.13	0.19	1.4	1.7	0.1	1151
FreqIronAge	0.30	0.68	0.39***	0.8	2.0	0.1	1151
FreqBrAge	0.01	0.25	0.24***	0.1	1.0	0.0	1151
Archeo_MEHigh	0.87	1.05	0.18	1.3	1.6	0.1	1151
Archeo_MELow	0.28	0.20	-0.08	0.6	0.7	0.0	1151
Mean_Barle	0.91	0.76	-0.15***	0.2	0.3	0.0	1151
Luvisol	0.16	0.26	0.10***	0.3	0.4	0.0	1151
MeanLuvBar	0.15	0.21	0.05*	0.3	0.4	0.0	1151
Mean_Rye	0.95	0.95	0.01	0.2	0.2	0.0	1151
Mean_Wheat	0.79	0.47	-0.33***	0.4	0.4	0.0	1143
Access_Rou	0.63	0.64	0.01	0.5	0.5	0.0	1151
River_Acce	0.53	0.30	-0.22***	0.5	0.5	0.0	1151
NearStreet	1126.23	1181.33	55.10*	168.1	587.2	22.3	1151
NearRiv	3186.83	2409.82	-777.02***	965.4	1335.8	76.2	1151
Mean_Alt	110.86	113.80	2.94	48.5	41.9	3.4	1151
Mean_Slope	0.17	0.14	-0.03***	0.1	0.1	0.0	1151

Notes: Summary statistics for the possible confounding variables, restricting the sample to the observations within 200km of the 13th century borders. Columns (1) and (2) show the means for each control variable by the treatment and control group. In Column (3) I test that the "differences between the ouctomes' means" of control and treatment groups are significantly different from 0 through a two-sided test. Columns (4) and (5) show the standard deviation for each control variable by the treatment and control groups. Column (6) shows the standard deviations difference. Column (7) shows the number of observations.
***Significant at 1%; **significant at 5%; *significant at 10%.

TABLE A13. *RDD: Teutonic Order (13th century Center-Southern borders) on possible confounding variables*

	(1)	(2)	(3)	(4)	(5)
			Archeological sites presence: Row (1)		
VARIABLES	Stone A. Sites	PreHist. A. Sites	Bronze Age	Iron Age	High Middle Ages
RD_Estimate	0.0569**	0.686***	0.00739*	0.455***	0.148
	(0.0198)	(0.193)	(0.00293)	(0.129)	(0.244)
			Land and Agriculture Suitability: Row (2)		
VARIABLES	Barley	Rye	Wheat	Luvisol	LuvisolxBarley
RD_Estimate	0.06**	0.69***	0.01*	0.46***	0.15
	(0.02)	(0.19)	(0.00)	(0.13)	(0.24)
			Access and Trade feasibility: Row (3)		
VARIABLES	Routes Access	Streets Distance	Rivers Access	Rivers Access	
RD_Estimate	-0.27***	6.33	-0.12	177.99	
	(0.07)	(5.65)	(0.17)	(300.09)	
			Land Morphology: Row (4)		
VARIABLES	Altitude	Slope			
RD_Estimate	-5.02	-0.04**			
	(5.16)	(0.01)			

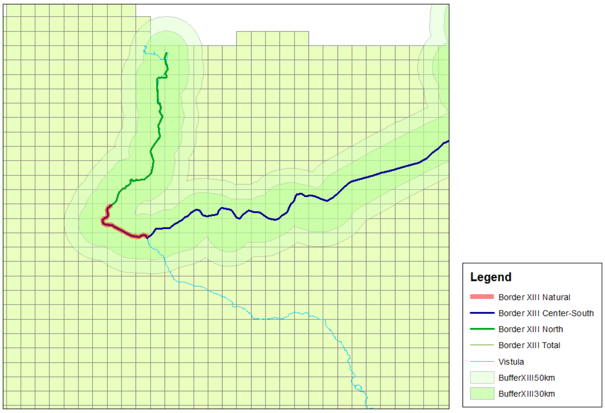
Notes: RDD coefficients with potential confounding variables as the outcome. I use a second order polynomial to account for the distance from the border as the cut-off. Row (1) measures the presence of socio-economic development coefficients across the Center-Southern 13th century borders prior to the Northern Crusades, as measured by the presence of archaeological sites in a 20x20km square. Row (2) shows the presence of jumps for land suitability. Row (3) shows the presence of jumps for the accessibility to the main land and water routes. Row (3) shows the presence of jumps for the morphology of the land.
***Significant at 1%; **significant at 5%; *significant at 10%.

TABLE A14. *RDD: Teutonic Order (13th century Northern borders) on possible confounding variables*

	(1)	(2)	(3)	(4)	(5)
			Archeological sites presence: Row (1)		
VARIABLES	Stone A. Sites	PreHist. A. Sites	Bronze Age	Iron Age	High Middle Ages
RD_Estimate	0.12	0.72***	-0.10***	-0.35	0.38
	(0.33)	(0.20)	(0.02)	(0.29)	(0.38)
			Land and Agriculture Suitability: Row (2)		
VARIABLES	Barley	Rye	Wheat	Luvisol	LuvisolxBarley
RD_Estimate	0.03	-0.13	0.47***	0.41***	0.20***
	(0.03)	(0.07)	(0.04)	(0.05)	(0.06)
			Access and Trade feasibility: Row (3)		
VARIABLES	Routes Access	Streets Distance	Rivers Access	Rivers Access	
RD_Estimate	-0.21***	85.62***	-0.01	1,481.78***	
	(0.05)	(20.18)	(0.10)	(378.80)	
			Land Morphology: Row (4)		
VARIABLES	Altitude	Slope			
RD_Estimate	-1.24	-0.02			
	(6.90)	(0.05)			

Notes: RDD coefficients with potential confounding variables as the outcome. I use a second order polynomial to account for the distance from the border as the cut-off. Row (1) measures the presence of socio-economic development coefficients across the Northern 13th century borders prior to the Northern Crusades, as measured by the presence of archaeological sites in a 20x20km square. Row (2) shows the presence of jumps for land suitability. Row (3) shows the presence of jumps for the accessibility to the main land and water routes. Row (3) shows the presence of jumps for the morphology of the land.
***Significant at 1%; **significant at 5%; *significant at 10%.

FIGURE A1. *Partial Borders considered in the RDD analysis*



Notes: Borders considered in the RDD analysis. The 13th century borders of the Teutonic-Order state are light green and they includes the other borders. The Center-Southern borders are in dark green. The blue borders represent the Northern borders, which ceased to exist after the conquest of Gdansk and Pomerelia in 1308. The Natural borders are in red. They remained constant in both the 13th and 14th centuries and they were delimited by the Vistula river. **Source:** see text

RDD: Results

TABLE A15. *RDD with 13th century number of buildings (13th century borders)*

VARIABLES	(1) 1200 Full	(2) 1200 Natural	(3) 1200 North	(4) 1200 Center-South
RD_Estimate	1.41**	4.25***	1.15*	0.96**
	(0.53)	(0.40)	(0.55)	(0.30)
Observations	1151	937	881	1151
Covariates	YES	YES	YES	YES
Mean left	0.180	0.211	0.209	0.129
Mean right	0.461	0.633	0.521	0.478
Bandwidth	52.14	199.6	70.85	18.59
Order polyn.	2	2	2	2

TABLE A16. *RDD with 13th century cumulative number of buildings (13th century borders)*

VARIABLES	(1) 1200 Full	(2) 1200 Natural	(3) 1200 North	(4) 1200 Center-South
RD_Estimate	1.39**	4.14***	1.04	1.15**
	(0.53)	(0.40)	(0.60)	(0.36)
Observations	1151	937	881	1151
Covariates	YES	YES	YES	YES
Mean left	0.231	0.272	0.272	0.185
Mean right	0.461	0.633	0.521	0.478
Bandwidth	51.12	199.6	67.96	18.15
Order polyn.	2	2	2	2

Notes: RDD coefficients according to the specification in eq. 1 with the flow and stock number of buildings in the 13th century as the outcome. Column (1) tests the RDD for the total 13th century borders. Column (2) tests the RDD for the Natural 13th century borders. Column (3) tests the RDD for the Northern 13th century borders. Column (4) tests the RDD for the Center-Southern 13th century AD borders.
***Significant at 0.5%; **significant at 1%; *significant at 5%

TABLE A17. *RDD with 14th century number of buildings (13th and 14th century borders)*

VARIABLES	(1) 1300 full (1300 borders)	(2) 1300 full (1200 borders)	(3) 1300 Natural	(4) 1300 North	(5) 1300 Center-South
RD_Estimate	0.49	1.90**	4.86***	0.23	1.64***
	(0.55)	(0.62)	(0.44)	(0.99)	(0.48)
Observations	1173	1151	937	881	1151
Covariates	YES	YES	YES	YES	YES
Mean left	0.392	0.468	0.554	0.541	0.468
Mean right	1.680	1.967	2.480	2.214	1.967
Bandwidth	30.31	39.55	199.6	59.37	37.18
Order polyn.	2	2	2	2	2

TABLE A18. *RDD with 14th century cumulative number of buildings (13th and 14th century borders)*

VARIABLES	(1) 1300 full (1300 borders)	(2) 1300 full (1200 borders)	(3) 1300 Natural	(4) 1300 North	(5) 1300 Center-South
RD_Estimate	1.31	3.14***	9.01***	0.44	2.43***
	(0.74)	(0.94)	(0.79)	(0.78)	(0.61)
Observations	1173	1151	937	881	1151
Covariates	YES	YES	YES	YES	YES
Mean left	0.622	0.699	0.826	0.812	0.699
Mean right	2.079	2.428	3.113	2.735	2.428
Bandwidth	27.94	49.68	199.6	72.59	31.07
Order polyn.	2	2	2	2	2

Notes: RDD coefficients according to the specification in eq. 1 with the flow and stock number of buildings in the 14th century as the outcome. Column (1) tests the RDD for the total 14th century borders. Column (2) tests the RDD for the total 13th century borders. Column (3) tests the RDD for the Natural 13th century borders. Column (4) tests the RDD for the Northern 13th century borders. Column (5) tests the RDD for the Center-Southern 13th century borders.
***Significant at 0.5%; **significant at 1%; *significant at 5%

TABLE A19. *RDD with 15th century number of buildings (13th century borders)*

VARIABLES	(1) 1400 full	(2) 1400 Natural	(3) 1400 North	(4) 1400 Center-South
RD_Estimate	3.54*	5.97***	-0.80	2.88***
	(1.73)	(0.66)	(1.34)	(0.84)
Observations	1151	937	881	1151
Covariates	YES	YES	YES	YES
Mean left	0.573	0.657	0.601	0.573
Mean right	0.864	1.096	0.967	0.864
Bandwidth	34.19	199.6	76.77	44.27
Order polyn.	2	2	2	2

TABLE A20. *RDD with 15th century cumulative number of buildings (13th century borders)*

VARIABLES	(1) 1400 full	(2) 1400 Natural	(3) 1400 North	(4) 1400 Center-South
RD_Estimate	5.52**	14.98***	0.07	5.62***
	(1.74)	(1.42)	(1.82)	(1.49)
Observations	1151	937	881	1151
Covariates	YES	YES	YES	YES
Mean left	1.272	1.483	1.413	1.272
Mean right	3.292	4.209	3.702	3.292
Bandwidth	47.64	199.6	67.19	42.99
Order polyn.	2	2	2	2

Notes: RDD coefficients according to the specification in eq. 1 with the flow and stock number of buildings in the 15th century as the outcome. Column (1) tests the RDD for the total 13th century borders. Column (2) tests the RDD for the Natural 13th century borders. Column (3) tests the RDD for the Northern 13th century borders. Column (4) tests the RDD for the Center-Southern 13th century borders.
***Significant at 0.5%; **significant at 1%; *significant at 5%

TABLE A21. *RDD with 16th century number of buildings (13th century borders)*

VARIABLES	(1) 1500 full	(2) 1500 Natural	(3) 1500 North	(4) 1500 Center-South
RD_Estimate	0.89	1.40***	2.66	0.72***
	(1.12)	(0.36)	(1.39)	(0.19)
Observations	1151	937	881	1151
Covariates	YES	YES	YES	YES
Mean left	0.597	0.650	0.574	0.597
Mean right	0.461	0.469	0.460	0.461
Bandwidth	38.09	199.6	39.14	29.50
Order polyn.	2	2	2	2

TABLE A22. *RDD with 16th century cumulative number of buildings (13th century borders)*

VARIABLES	(1) 1500 full	(2) 1500 Natural	(3) 1500 North	(4) 1500 Center-South
RD_Estimate	6.74*	16.38***	0.95	6.22***
	(3.27)	(1.66)	(2.12)	(1.71)
Observations	1151	937	881	1151
Covariates	YES	YES	YES	YES
Mean left	1.869	2.133	1.986	1.869
Mean right	3.753	4.678	4.163	3.753
Bandwidth	40.64	199.6	57	41.66
Order polyn.	2	2	2	2

Notes: RDD coefficients according to the specification in eq. 1 with the flow and stock number of buildings in the 16th century as the outcome. Column (1) tests the RDD for the total 13th century borders. Column (2) tests the RDD for the Natural 13th century borders. Column (3) tests the RDD for the Northern 13th century borders. Column (4) tests the RDD for the Center-Southern 13th century borders.
***Significant at 0.5%; **significant at 1%; *significant at 5%

TABLE A23. *RDD with 17th century number of buildings (13th century borders)*

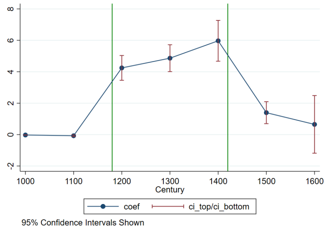
VARIABLES	(1) 1600 full	(2) 1600 Natural	(3) 1600 North	(4) 1600 Center-South
RD_Estimate	-0.51	0.65	-1.36	-0.36
	(1.05)	(0.94)	(1.93)	(0.38)
Observations	1151	937	881	1151
Covariates	YES	YES	YES	YES
Mean left	1.186	1.311	1.077	1.186
Mean right	0.691	0.774	0.749	0.691
Bandwidth	54.39	199.6	47.27	37.68
Order polyn.	2	2	2	2

TABLE A24. *RDD with 17th century cumulative number of buildings (13th century borders)*

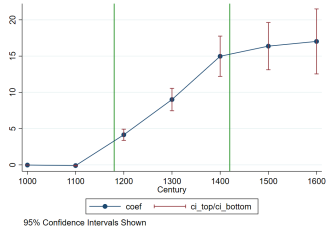
VARIABLES	(1) 1600 full	(2) 1600 Natural	(3) 1600 North	(4) 1600 Center-South
RD_Estimate	7.88	17.02***	0.28	6.21**
	(6.31)	(2.29)	(2.70)	(1.95)
Observations	1151	937	881	1151
Covariates	YES	YES	YES	YES
Mean left	3.055	3.443	3.063	3.055
Mean right	4.444	5.452	4.912	4.444
Bandwidth	37.34	199.6	51.24	39.36
Order polyn.	2	2	2	2

Notes: RDD coefficients according to the specification in eq. 1 with the flow and stock number of buildings in the 17th century as the outcome. Column (1) tests the RDD for the total 13th century borders. Column (2) tests the RDD for the Natural 13th century borders. Column (3) tests the RDD for the Northern 13th century borders. Column (4) tests the RDD for the Center-Southern 13th century borders.
***Significant at 0.5%; **significant at 1%; *significant at 5%

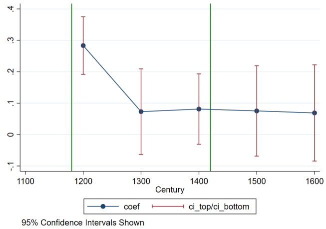
FIGURE A2. *RDD estimating the effect of the Teutonic Order on the economic development: Natural 13th century borders*



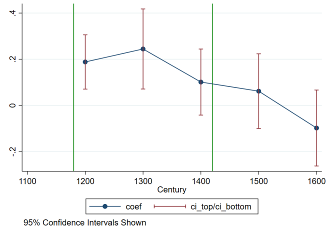
(a) *Flow number of buildings*



(b) *Stock number of buildings*



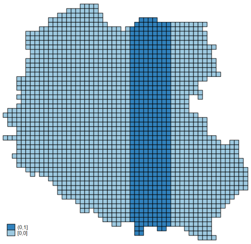
(c) *Number of Towns receiving a Magdeburg Law charter*



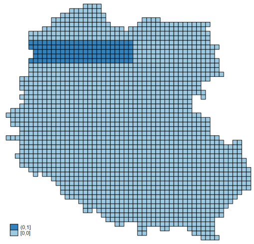
(d) *Number of Towns with a town charter*

Notes: RDD coefficients and standard errors according to the specification in eq. 1. Each coefficient and standard error is calculated for a given century and plotted chronologically to give the temporal evolution of the coefficient and of the standard error. I use the Natural 13th century borders. Figure (a) evaluates the RDD for the 13th century border, using the flow buildings as the outcome. Figure (b) evaluates the RDD, using the stock buildings as the outcome. Figure (c) evaluates the RDD, using the Magdeburg-Law towns as the outcome. Figure (d) evaluates the RDD, using the towns adopting a town charter as the outcome. The green vertical lines signed the beginning of the treatment (1200) and the period after the treatment (mid-1400).

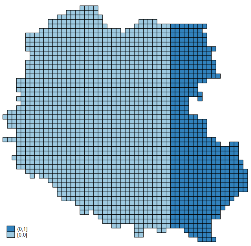
FIGURE A3. *Macro-geographic Zones in Poland*



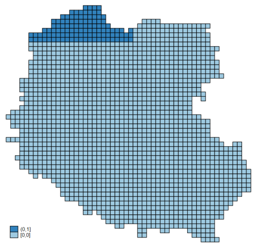
(a) *Central Zone* ***Source:*** *see text*



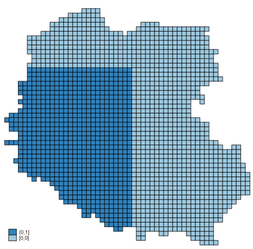
(b) *Center-Eastern Zone* ***Source:*** *see text*



(c) *Eastern Zone* ***Source:*** *see text*



(d) *Northern Zone* ***Source:*** *see text*



(e) *South-Western Zone* ***Source:*** *see text*

Notes: Macro regions of Poland controlling for unobserved heterogeneity. The direction from West to East controls for the different timing of the Teutonic Order's conquest of Prussia ((a) and (c)), but also the distance from the Holy Roman Empire, which should positively affect trade and development. The direction from North to South controls for the closeness to the coast on one side, and on the other side for closeness to Silesia, Greater Poland, and Lesser Poland, which were the main political and economic centers of Poland. **Source:** see text

TABLE A25. *Linear RDD, Selection of Control Variables Selection: 13th Century*

	(1) Build.	(2) Build.	(3) Build.	(4) Build.	(5) Build.	(6) Build.	(7) Build.
TO=1	1.12*	0.92*	0.92*	0.94*	0.91*	1.00*	0.93*
	(0.42)	(0.39)	(0.39)	(0.39)	(0.40)	(0.37)	(0.39)
dist_borderXIII(100km)	-0.21***	-0.03	-0.03	-0.05	-0.02	-0.08	-0.03
	(0.03)	(0.04)	(0.05)	(0.04)	(0.04)	(0.06)	(0.04)
TO=1 × dist_borderXIII(100km)	-1.17	-1.22	-1.20	-1.17	-1.22	-1.28*	-1.18
	(0.64)	(0.57)	(0.57)	(0.58)	(0.57)	(0.54)	(0.58)
Zones_FE	No	Yes	No	No	No	No	No
Zones_FE*Luv.	No	No	Yes	No	No	No	No
Zones_FE*Barley	No	No	No	Yes	No	No	No
Zones_FE*Rye	No	No	No	No	Yes	No	No
Zones_FE*Wheat	No	No	No	No	No	Yes	No
Zones_FE*LuvXBarley	No	No	No	No	No	No	Yes
Observations	1151.00	1151.00	1151.00	1151.00	1151.00	1143.00	1151.00
Adjusted R-squared	0.10	0.12	0.12	0.12	0.13	0.14	0.12

TABLE A26. *Linear RDD, Selection of Control Variables: 14th Century*

	(1) Build.	(2) Build.	(3) Build.	(4) Build.	(5) Build.	(6) Build.	(7) Build.
TO=1	2.49***	1.81**	1.81**	1.82**	1.73**	1.90***	1.82**
	(0.49)	(0.51)	(0.49)	(0.52)	(0.56)	(0.42)	(0.48)
dist_borderXIII(100km)	-0.37***	0.11	0.10	0.06	0.14	0.08	0.09
	(0.09)	(0.24)	(0.22)	(0.19)	(0.22)	(0.26)	(0.21)
TO=1 × dist_borderXIII(100km)	-0.64	-1.03	-0.93	-0.92	-0.85	-1.13	-0.89
	(0.77)	(0.59)	(0.59)	(0.58)	(0.56)	(0.67)	(0.58)
Zones_FE	No	Yes	No	No	No	No	No
Zones_FE*Luv.	No	No	Yes	No	No	No	No
Zones_FE*Barley	No	No	No	Yes	No	No	No
Zones_FE*Rye	No	No	No	No	Yes	No	No
Zones_FE*Wheat	No	No	No	No	No	Yes	No
Zones_FE*LuvXBarley	No	No	No	No	No	No	Yes
Observations	1151.00	1151.00	1151.00	1151.00	1151.00	1143.00	1151.00
Adjusted R-squared	0.18	0.23	0.23	0.26	0.24	0.24	0.23

Notes: RDD according to a linear specification with the flow number of buildings per century as the main outcome. I use a first degree polynomial to account for the distance from the border. Column (1) tests the specification without any further control variable. Column (2) controls for the macro regions (see fig. A3). Column (3) controls for the interaction between the macro regions and the presence of luvisol. Column (4) controls for barley suitability and the interaction between the macro regions and barley suitability. Column (5) controls for rye suitability and the interaction between the macro regions and rye suitability. Column (6) controls for wheat suitability and the interaction between the macro regions and wheat suitability. Column (7) controls for the interaction between the presence of luvisol and barley suitability, measuring heavy plough suitability, and the interaction between the macro regions, the presence of luvisol and barley suitability.

***Significant at 0.5%; **significant at 1%; *significant at 5%

TABLE A27. *Linear RDD, Selection of Control Variables: 13th Century*

	(1) Build.	(2) Build.	(3) Build.	(4) Build.	(5) Build.	(6) Build.	(7) Build.
TO=1	1.12*	1.25**	1.23**	1.34**	0.91***	1.24***	1.20**
	(0.42)	(0.31)	(0.33)	(0.33)	(0.20)	(0.23)	(0.36)
dist_borderXIII(100km)	-0.21***	-0.45***	-0.32	-0.58**	-0.07	-0.28	-0.29*
	(0.03)	(0.08)	(0.15)	(0.15)	(0.09)	(0.22)	(0.11)
TO=1 × dist_borderXIII(100km)	-1.17	-0.42	-0.40	-0.14	-0.43	-0.33	-0.45
	(0.64)	(0.54)	(0.63)	(0.54)	(0.38)	(0.71)	(0.64)
Zones_FE	No	No	No	No	No	No	No
Coord_FE	No	Yes	No	No	No	No	No
Coord_FE*Luv.	No	No	Yes	No	No	No	No
Coord_FE*Barley	No	No	No	Yes	No	No	No
Coord_FE*Rye	No	No	No	No	Yes	No	No
Coord_FE*Wheat	No	No	No	No	No	Yes	No
Coord_FE*LuvXBarley	No	No	No	No	No	No	Yes
Observations	1151.00	1151.00	1151.00	1151.00	1151.00	1143.00	1151.00
Adjusted R-squared	0.10	0.19	0.26	0.24	0.41	0.27	0.26

TABLE A28. *Linear RDD, Selection of Control Variables: 14th Century*

	(1) Build.	(2) Build.	(3) Build.	(4) Build.	(5) Build.	(6) Build.	(7) Build.
TO=1	2.49***	1.71*	1.84**	1.68*	1.37***	1.73**	1.80**
	(0.49)	(0.59)	(0.52)	(0.74)	(0.28)	(0.55)	(0.59)
dist_borderXIII(100km)	-0.37***	-0.45	-0.54	-0.94	-0.16	-0.22	-0.46
	(0.09)	(0.63)	(0.50)	(0.63)	(0.65)	(0.66)	(0.49)
TO=1 × dist_borderXIII(100km)	-0.64	-0.71	-0.67	-0.36	-0.63	-0.76	-0.72
	(0.77)	(1.25)	(1.29)	(1.33)	(1.47)	(1.28)	(1.26)
Zones_FE	No	No	No	No	No	No	No
Coord_FE	No	Yes	No	No	No	No	No
Coord_FE*Luv.	No	No	Yes	No	No	No	No
Coord_FE*Barley	No	No	No	Yes	No	No	No
Coord_FE*Rye	No	No	No	No	Yes	No	No
Coord_FE*Wheat	No	No	No	No	No	Yes	No
Coord_FE*LuvXBarley	No	No	No	No	No	No	Yes
Observations	1151.00	1151.00	1151.00	1151.00	1151.00	1143.00	1151.00
Adjusted R-squared	0.18	0.30	0.33	0.41	0.59	0.37	0.33

Notes: RDD according to a linear specification with the flow number of buildings per century as the main outcome. I use a first degree polynomial to account for the distance from the border. Column (1) tests the specification without any further control variable. Column (2) controls for the square centroids' longitude and latitude. Column (3) controls for the interaction between the square centroids' longitude and latitude and the presence of luvisol. Column (4) controls for barley suitability and the interaction between the square centroids' longitude and latitude and barley suitability. Column (5) controls for rye suitability and the interaction between the square centroids' longitude and latitude and rye suitability. Column (6) controls for wheat suitability and the interaction between the square centroids' longitude and latitude and wheat suitability. Column (7) controls for the interaction between the presence of luvisol and barley suitability, measuring heavy plough suitability, and the interaction between the square centroids' longitude and latitude, the presence of luvisol and barley suitability.
***Significant at 0.5%; **significant at 1%; *significant at 5%

TABLE A29. *Linear RDD, Selection of Control Variables: 13th Century*

	(1) MagdCity	(2) MagdCity	(3) MagdCity	(4) MagdCity	(5) MagdCity	(6) MagdCity	(7) MagdCity
TO=1	0.13**	0.11**	0.11**	0.11**	0.11**	0.10**	0.11**
	(0.04)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
dist_borderXIII(100km)	-0.05*	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03
	(0.02)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
TO=1 × dist_borderXIII(100km)	-0.05	-0.03	-0.03	-0.03	-0.04	-0.03	-0.03
	(0.08)	(0.07)	(0.07)	(0.07)	(0.08)	(0.06)	(0.07)
Zones_FE	No	Yes	No	No	No	No	No
Zones_FE*Luv.	No	No	Yes	No	No	No	No
Zones_FE*Barley	No	No	No	Yes	No	No	No
Zones_FE*Rye	No	No	No	No	Yes	No	No
Zones_FE*Wheat	No	No	No	No	No	Yes	No
Zones_FE*LuvXBarley	No	No	No	No	No	No	Yes
Observations	1151.00	1151.00	1151.00	1151.00	1151.00	1143.00	1151.00
Adjusted R-squared	0.08	0.09	0.09	0.09	0.09	0.10	0.09

TABLE A30. *Linear RDD, Selection of Control Variables: 14th Century*

	(1) MagdCity	(2) MagdCity	(3) MagdCity	(4) MagdCity	(5) MagdCity	(6) MagdCity	(7) MagdCity
TO=1	0.13*	0.08	0.08	0.08	1.73**	0.07	0.08
	(0.06)	(0.04)	(0.04)	(0.04)	(0.56)	(0.04)	(0.04)
dist_borderXIIIkm	-0.08*	-0.04	-0.05	-0.04	0.14	-0.04	-0.04
	(0.03)	(0.04)	(0.04)	(0.04)	(0.22)	(0.04)	(0.04)
TO=1 × dist_borderXIIIkm	0.28*	0.27*	0.28*	0.26*	-0.85	0.31**	0.27*
	(0.10)	(0.10)	(0.10)	(0.09)	(0.56)	(0.09)	(0.09)
Zones_FE	No	Yes	No	No	No	No	No
Zones_FE*Luv.	No	No	Yes	No	No	No	No
Zones_FE*Barley	No	No	No	Yes	No	No	No
Zones_FE*Rye	No	No	No	No	Yes	No	No
Zones_FE*Wheat	No	No	No	No	No	Yes	No
Zones_FE*LuvXBarley	No	No	No	No	No	No	Yes
Observations	1151.00	1151.00	1151.00	1151.00	1151.00	1143.00	1151.00
Adjusted R-squared	0.17	0.19	0.19	0.19	0.24	0.20	0.19

Notes: RDD according to a linear specification with the number of Magdeburg-Law towns per century as the main outcome. I use a first degree polynomial to account for the distance from the border. Column (1) tests the specification without any further control variable. Column (2) controls for the macro regions (see fig. A3). Column (3) controls for the interaction between the macro regions and the presence of luvisol. Column (4) controls for barley suitability and the interaction between the macro regions and barley suitability. Column (5) controls for rye suitability and the interaction between the macro regions and rye suitability. Column (6) controls for wheat suitability and the interaction between the macro regions and wheat suitability. Column (7) controls for the interaction between the presence of luvisol and barley suitability, measuring heavy plough suitability, and the interaction between the macro regions, the presence of luvisol and barley suitability.
***Significant at 0.5%; **significant at 1%; *significant at 5%

TABLE A31. *Linear RDD, Selection of Control Variables: 13th Century*

	(1) MagdCity	(2) MagdCity	(3) MagdCity	(4) MagdCity	(5) MagdCity	(6) MagdCity	(7) MagdCity
TO=1	0.13**	0.09***	0.10**	0.09**	0.09***	0.08***	0.10**
	(0.04)	(0.02)	(0.02)	(0.03)	(0.02)	(0.02)	(0.03)
dist_borderXIII(100km)	-0.05*	-0.02	0.02	0.02	0.01	0.03	0.01
	(0.02)	(0.05)	(0.05)	(0.03)	(0.05)	(0.05)	(0.05)
TO=1 × dist_borderXIII(100km)	-0.05	-0.02	-0.03	-0.06	-0.06	-0.01	-0.03
	(0.08)	(0.09)	(0.09)	(0.10)	(0.11)	(0.12)	(0.09)
Zones_FE	No	No	No	No	No	No	No
Coord_FE	No	Yes	No	No	No	No	No
Coord_FE*Luv.	No	No	Yes	No	No	No	No
Coord_FE*Barley	No	No	No	Yes	No	No	No
Coord_FE*Rye	No	No	No	No	Yes	No	No
Coord_FE*Wheat	No	No	No	No	No	Yes	No
Coord_FE*LuvXBarley	No	No	No	No	No	No	Yes
Observations	1151.00	1151.00	1151.00	1151.00	1151.00	1143.00	1151.00
Adjusted R-squared	0.08	0.15	0.20	0.21	0.18	0.21	0.21

TABLE A32. *Linear RDD, Selection of Control Variables: 14th Century*

	(1) MagdCity	(2) MagdCity	(3) MagdCity	(4) MagdCity	(5) MagdCity	(6) MagdCity	(7) MagdCity
TO=1	0.13*	0.07*	0.09*	0.05	0.06	0.06	0.09*
	(0.06)	(0.03)	(0.03)	(0.04)	(0.04)	(0.03)	(0.03)
dist_borderXIIIkm	-0.08*	-0.03	-0.02	0.04	0.02	-0.03	-0.01
	(0.03)	(0.05)	(0.06)	(0.06)	(0.05)	(0.06)	(0.06)
TO=1 × dist_borderXIIIkm	0.28*	0.33*	0.28	0.27	0.29	0.32	0.29
	(0.10)	(0.15)	(0.16)	(0.17)	(0.17)	(0.20)	(0.16)
Zones_FE	No	No	No	No	No	No	No
Coord_FE	No	Yes	No	No	No	No	No
Coord_FE*Luv.	No	No	Yes	No	No	No	No
Coord_FE*Barley	No	No	No	Yes	No	No	No
Coord_FE*Rye	No	No	No	No	Yes	No	No
Coord_FE*Wheat	No	No	No	No	No	Yes	No
Coord_FE*LuvXBarley	No	No	No	No	No	No	Yes
Observations	1151.00	1151.00	1151.00	1151.00	1151.00	1143.00	1151.00
Adjusted R-squared	0.17	0.23	0.28	0.27	0.26	0.29	0.29

Notes: RDD according to a linear specification with the number of Magdeburg-Law towns per century as the main outcome. I use a first degree polynomial to account for the distance from the border. Column (1) tests the specification without any further control variable. Column (2) controls for the square centroids' longitude and latitude. Column (3) controls for the interaction between the square centroids' longitude and latitude and the presence of luvisol. Column (4) controls for barley suitability and the interaction between the square centroids' longitude and latitude and barley suitability. Column (5) controls for rye suitability and the interaction between the square centroids' longitude and latitude and rye suitability. Column (6) controls for wheat suitability and the interaction between the square centroids' longitude and latitude and wheat suitability. Column (7) controls for the interaction between the presence of luvisol and barley suitability, measuring heavy plough suitability, and the interaction between the square centroids' longitude and latitude, the presence of luvisol and barley suitability.
***Significant at 0.5%; **significant at 1%; *significant at 5%

TABLE A33. *Linear RDD, Selection of Control Variables: 13th Century*

	(1) Number_Miasto	(2) Number_Miasto	(3) Number_Miasto	(4) Number_Miasto	(5) Number_Miasto	(6) Number_Miasto	(7) Number_Miasto
TO=1	0.12**	0.09	0.09	0.09	0.09	0.10	0.09
	(0.03)	(0.04)	(0.04)	(0.05)	(0.05)	(0.06)	(0.04)
dist_borderXIII(100km)	-0.08**	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05
	(0.02)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
TO=1 × dist_borderXIII(100km)	0.02	0.01	0.01	0.01	0.02	0.00	0.01
	(0.04)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.04)
Zones_FE	No	Yes	No	No	No	No	No
Zones_FE*Luv.	No	No	Yes	No	No	No	No
Zones_FE*Barley	No	No	No	Yes	No	No	No
Zones_FE*Rye	No	No	No	No	Yes	No	No
Zones_FE*Wheat	No	No	No	No	No	Yes	No
Zones_FE*LuvXBarley	No	No	No	No	No	No	Yes
Observations	1151.00	1151.00	1151.00	1151.00	1151.00	1143.00	1151.00
Adjusted R-squared	0.14	0.16	0.16	0.16	0.17	0.16	0.16

TABLE A34. *Linear RDD, Selection of Control Variables: 14th Century*

	(1) Number_Miasto	(2) Number_Miasto	(3) Number_Miasto	(4) Number_Miasto	(5) Number_Miasto	(6) Number_Miasto	(7) Number_Miasto
TO=1	0.14*	0.03	0.04	0.02	1.73**	0.03	0.04
	(0.05)	(0.05)	(0.05)	(0.05)	(0.56)	(0.07)	(0.05)
dist_borderXIIIkm	-0.12**	-0.03	-0.03	-0.02	0.14	-0.03	-0.03
	(0.04)	(0.02)	(0.02)	(0.02)	(0.22)	(0.03)	(0.02)
TO=1 × dist_borderXIIIkm	0.20*	0.13	0.14	0.13	-0.85	0.18*	0.13
	(0.09)	(0.08)	(0.08)	(0.08)	(0.56)	(0.08)	(0.08)
Zones_FE	No	Yes	No	No	No	No	No
Zones_FE*Luv.	No	No	Yes	No	No	No	No
Zones_FE*Barley	No	No	No	Yes	No	No	No
Zones_FE*Rye	No	No	No	No	Yes	No	No
Zones_FE*Wheat	No	No	No	No	No	Yes	No
Zones_FE*LuvXBarley	No	No	No	No	No	No	Yes
Observations	1151.00	1151.00	1151.00	1151.00	1151.00	1143.00	1151.00
Adjusted R-squared	0.21	0.25	0.25	0.26	0.24	0.26	0.25

Notes: RDD according to a linear specification with the number of towns having town charter per century as the main outcome. I use a first degree polynomial to account for the distance from the border. Column (1) tests the specification without any further control variable. Column (2) controls for the macro regions (see fig. A3). Column (3) controls for the interaction between the macro regions and the presence of luvisol. Column (4) controls for barley suitability and the interaction between the macro regions and barley suitability. Column (5) controls for rye suitability and the interaction between the macro regions and rye suitability. Column (6) controls for wheat suitability and the interaction between the macro regions and wheat suitability. Column (7) controls for the interaction between the presence of luvisol and barley suitability, measuring heavy plough suitability, and the interaction between the macro regions, the presence of luvisol and barley suitability.
***Significant at 0.5%; **significant at 1%; *significant at 5%

TABLE A35. *Linear RDD, Selection of Control Variables: 13th Century*

	(1) Number_Miasto	(2) Number_Miasto	(3) Number_Miasto	(4) Number_Miasto	(5) Number_Miasto	(6) Number_Miasto	(7) Number_Miasto
TO=1	0.12**	0.07	0.07*	0.07*	0.10*	0.07	0.07*
	(0.03)	(0.04)	(0.03)	(0.03)	(0.04)	(0.04)	(0.03)
dist_borderXIII(100km)	-0.08**	0.01	0.05	0.01	0.05	0.03	0.05
	(0.02)	(0.06)	(0.04)	(0.04)	(0.06)	(0.05)	(0.05)
TO=1 × dist_borderXIII(100km)	0.02	-0.03	-0.02	-0.03	-0.08	0.04	-0.02
	(0.04)	(0.08)	(0.09)	(0.10)	(0.09)	(0.13)	(0.08)
Zones_FE	No	No	No	No	No	No	No
Coord_FE	No	Yes	No	No	No	No	No
Coord_FE*Luv.	No	No	Yes	No	No	No	No
Coord_FE*Barley	No	No	No	Yes	No	No	No
Coord_FE*Rye	No	No	No	No	Yes	No	No
Coord_FE*Wheat	No	No	No	No	No	Yes	No
Coord_FE*LuvXBarley	No	No	No	No	No	No	Yes
Observations	1151.00	1151.00	1151.00	1151.00	1151.00	1143.00	1151.00
Adjusted R-squared	0.14	0.22	0.29	0.30	0.27	0.26	0.29

TABLE A36. *Linear RDD, Selection of Control Variables: 14th Century*

	(1) Number_Miasto	(2) Number_Miasto	(3) Number_Miasto	(4) Number_Miasto	(5) Number_Miasto	(6) Number_Miasto	(7) Number_Miasto
TO=1	0.14*	0.02	0.09*	0.04	0.06	0.05	0.07
	(0.05)	(0.05)	(0.04)	(0.03)	(0.06)	(0.05)	(0.04)
dist_borderXIIIkm	-0.12**	-0.01	-0.02	-0.06	-0.03	-0.09	0.00
	(0.04)	(0.04)	(0.07)	(0.06)	(0.07)	(0.07)	(0.06)
TO=1 × dist_borderXIIIkm	0.20*	0.30*	0.28*	0.41**	0.35**	0.43*	0.27*
	(0.09)	(0.12)	(0.10)	(0.11)	(0.11)	(0.15)	(0.09)
Zones_FE	No	No	No	No	No	No	No
Coord_FE	No	Yes	No	No	No	No	No
Coord_FE*Luv.	No	No	Yes	No	No	No	No
Coord_FE*Barley	No	No	No	Yes	No	No	No
Coord_FE*Rye	No	No	No	No	Yes	No	No
Coord_FE*Wheat	No	No	No	No	No	Yes	No
Coord_FE*LuvXBarley	No	No	No	No	No	No	Yes
Observations	1151.00	1151.00	1151.00	1151.00	1151.00	1143.00	1151.00
Adjusted R-squared	0.21	0.30	0.34	0.35	0.34	0.36	0.36

Notes: RDD according to a linear specification with the number of towns having a town charter per century as the main outcome. I use a first degree polynomial to account for the distance from the border. Column (1) tests the specification without any further control variable. Column (2) controls for the square centroids' longitude and latitude. Column (3) controls for the interaction between the square centroids' longitude and latitude and the presence of luvisol. Column (4) controls for barley suitability and the interaction between the square centroids' longitude and latitude and barley suitability. Column (5) controls for rye suitability and the interaction between the square centroids' longitude and latitude and rye suitability. Column (6) controls for wheat suitability and the interaction between the square centroids' longitude and latitude and wheat suitability. Column (7) controls for the interaction between the presence of luvisol and barley suitability, measuring heavy plough suitability, and the interaction between the square centroids' longitude and latitude, the presence of luvisol and barley suitability.
***Significant at 0.5%; **significant at 1%; *significant at 5%

TABLE A37. *RDD with the 13th century observations and 50 Km bandwidth (13th century borders)*

VARIABLES	(1) 1200 full	(2) 1200 North	(3) 1200 Center South
RD_Estimate	1.35*	1.77	1.11***
	(0.53)	(1.12)	(0.29)
Observations	1151	881	1151
Covariates	YES	YES	YES
Mean left	0.180	0.209	0.180
Mean right	0.461	0.521	0.461
Bandwidth	50	50	50
Order polyn.	2	2	2

Notes: RDD coefficients according to the specification in eq. 1, where the flow number of buildings per century (13th century) represents the main outcome. I adopt a 50 km bandwidth from the 13th century borders.
***Significant at 0.5%; **significant at 1%; *significant at 5%

TABLE A38. *RDD with the 14th century observations and 50 Km bandwidth (13th century borders)*

VARIABLES	(1) 1300 full (1300 borders)	(2) 1300 full (1200 borders)	(3) 1300 North	(4) 1300 Center-South
RD_Estimate	1.06	1.78***	1.39	1.90**
	(0.71)	(0.48)	(0.83)	(0.67)
Observations	1173	1151	881	1151
Covariates	YES	YES	YES	YES
Mean left	0.392	0.468	0.541	0.468
Mean right	1.680	1.967	2.214	1.967
Bandwidth	50	50	50	50
Order polyn.	2	2	2	2

Notes: RDD coefficients according to the specification in eq. 1, where the flow number of buildings per century (14th century) represents the main outcome. I adopt a 50 km bandwidth from the 13th century borders.
***Significant at 0.5%; **significant at 1%; *significant at 5%

TABLE A39. *Two-dimensional RDD with the 13th century observations*

	(1)	(2)	(3)
	Build.	Build.	Build.
TO_XIII	0.77*	0.77*	0.77*
	(0.35)	(0.35)	(0.35)
x	-0.00	-0.00	-0.00
	(0.00)	(0.00)	(0.00)
y	-0.00	-0.00	-0.00
	(0.00)	(0.00)	(0.00)
x_sq	0.00	0.00	0.00
	(0.00)	(0.00)	(0.00)
y_sq	0.00	0.00	0.00
	(0.00)	(0.00)	(0.00)
xy	0.00	0.00	0.00
	(0.00)	(0.00)	(0.00)
x_q	0.00	0.00	0.00
	(0.00)	(0.00)	(0.00)
y_q	-0.00	-0.00	-0.00
	(0.00)	(0.00)	(0.00)
xsqy	-0.00	-0.00	-0.00
	(0.00)	(0.00)	(0.00)
xysq	-0.00	-0.00	-0.00
	(0.00)	(0.00)	(0.00)
N	1972	1972	1966

Standard errors in parentheses
$^{*}\ p < 0.05$, $^{**}\ p < 0.01$, $^{***}\ p < 0.001$

Notes: Two-dimensional RDD with the 13th century observations as in eq. 1, where the flow number of buildings per century (13th century) represents the main outcome. In column (1) I restrict the sample to observations within 30 km of the cut-off. In column (2) I restrict the sample to observations within 50 km of the cut-off. In column (3) I restrict the sample to observations within 100 km of the cut-off. In column (4) I restrict the sample to observations within 150 km of the cut-off. In column (5) I restrict the sample to observations within 200 km of the cut-off.
***Significant at 0.5%; **significant at 1%; *significant at 5%

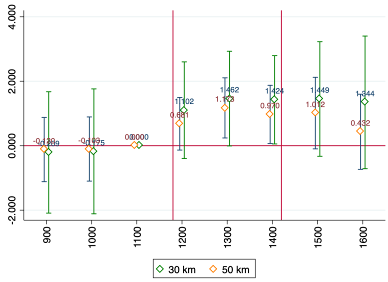
TABLE A40. *two-dimensional RDD with the 14th century observations*

	(1) Build.	(2) Build.	(3) Build.
TO_XIII	1.43**	1.43**	1.40**
	(0.43)	(0.43)	(0.43)
x	-0.00**	-0.00**	-0.00**
	(0.00)	(0.00)	(0.00)
y	-0.00	-0.00	-0.00
	(0.00)	(0.00)	(0.00)
x_sq	0.00**	0.00**	0.00**
	(0.00)	(0.00)	(0.00)
y_sq	0.00	0.00	0.00
	(0.00)	(0.00)	(0.00)
xy	0.00**	0.00**	0.00**
	(0.00)	(0.00)	(0.00)
x_q	-0.00	-0.00	-0.00*
	(0.00)	(0.00)	(0.00)
y_q	-0.00	-0.00	-0.00
	(0.00)	(0.00)	(0.00)
xsqy	-0.00**	-0.00**	-0.00**
	(0.00)	(0.00)	(0.00)
xysq	-0.00*	-0.00*	-0.00*
	(0.00)	(0.00)	(0.00)
N	1972	1972	1966

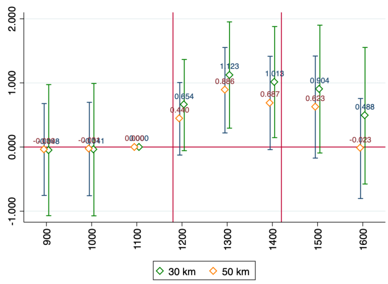
Standard errors in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Notes: Two-dimensional RDD with the 14th century observations as in eq. 1, where the flow number of buildings per century (14th century) represents the main outcome. In column (1) I restrict the sample to observations within 30 km of the cut-off. In column (2) I restrict the sample to observations within 50 km of the cut-off. In column (3) I restrict the sample to observations within 100 km of the cut-off. In column (4) I restrict the sample to observations within 150 km of the cut-off. In column (5) I restrict the sample to observations within 200 km of the cut-off.
***Significant at 0.5%; **significant at 1%; *significant at 5%

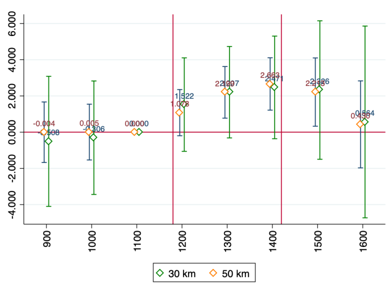
FIGURE A4. *Event study across different borders*



(a) *Event Study: 13th century borders*



(b) *Event Study: 13th or 14th centuries borders*



(c) *Event Study: Natural borders*

Notes: Event-study analysis showing the evolution of the coefficients interacting the treatment with each century and their standard deviation. In fig. A4a the green coefficients represent the specification with a sample restriction to observations within 30 km of the 13th century borders. The yellow coefficients represent the specification with a sample restriction to observations within 50 km of the 13th century borders. In fig. A4b The green coefficients represent the specification with a sample restriction to observations within 30 km of the 13th or 14th century borders. The yellow coefficients represent the specification with a sample restriction to observations within 50 km of the 13th or 14th centuries borders. In fig. A4c The green coefficients represent the specification with a sample restriction to observations within 30 km of the Natural borders. The yellow coefficients represent the specification with a sample restriction to the observation within 50 km of the Natural borders.

TABLE A41. *Event study: different distance from the 13th century borders*

	(1) Number_Monuments	(2) Number_Monuments	(3) Number_Monuments	(4) Number_Monuments	(5) Number_Monuments
lead3	-0.21	-0.12	-0.03	-0.01	0.00
	(0.96)	(0.51)	(0.38)	(0.44)	(0.39)
lead2	-0.18	-0.10	-0.03	-0.02	-0.01
	(0.99)	(0.51)	(0.40)	(0.40)	(0.37)
lag0	1.10	0.68	0.40	0.38	0.37
	(0.76)	(0.42)	(0.38)	(0.37)	(0.35)
lag1	1.46	1.17*	1.09**	0.99**	0.98**
	(0.75)	(0.48)	(0.34)	(0.37)	(0.33)
lag2	1.42*	0.97*	0.67	0.38	0.34
	(0.70)	(0.46)	(0.36)	(0.38)	(0.34)
lag3	1.45	1.01	0.53	0.18	0.17
	(0.91)	(0.57)	(0.43)	(0.44)	(0.40)
lag4	1.34	0.43	-0.27	-0.94*	-0.99**
	(1.05)	(0.59)	(0.38)	(0.43)	(0.38)
lag5	3.88	1.77	-0.49	-2.28	-2.33
	(3.05)	(1.71)	(1.13)	(1.42)	(1.27)
lag6	1.37	3.17*	2.78*	-0.19	0.30
	(1.97)	(1.47)	(1.29)	(1.31)	(1.22)
Spatial Clust.	Yes	Yes	Yes	Yes	Yes
ID FE	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes
Range	30Km	50Km	100Km	150Km	200Km
Observations	3300.00	5370.00	10095.00	13695.00	17430.00
Adjusted R-squared	0.01	0.01	0.01	0.00	0.00

Standard errors in parentheses
Robust clustered standard errors.
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Notes: Event study as in eq. 2 where the flow number of buildings represents the outcome. In column (1) I restrict the sample to observations within 30 km of the cut-off. In column (2) I restrict the sample to observations within 50 km of the cut-off. In column (3) I restrict the sample to observations within 100 km of the cut-off. In column (4) I restrict the sample to observations within 150 km of the cut-off. In column (5) I restrict the sample to observations within 200 km of the cut-off.
***Significant at 0.5%; **significant at 1%; *significant at 5%

TABLE A42. *Event study: different distance from the 14th century borders*

	(1) Number_Monuments	(2) Number_Monuments	(3) Number_Monuments	(4) Number_Monuments	(5) Number_Monuments
lead3	0.06	0.05	-0.02	0.00	0.00
	(0.30)	(0.34)	(0.38)	(0.40)	(0.38)
lead2	0.05	0.04	-0.03	-0.00	-0.00
	(0.31)	(0.35)	(0.39)	(0.38)	(0.37)
lag0	0.33	0.24	0.37	0.35	0.36
	(0.20)	(0.30)	(0.38)	(0.35)	(0.34)
lag1	0.75*	0.64	0.96**	0.96**	0.98**
	(0.30)	(0.33)	(0.35)	(0.34)	(0.33)
lag2	0.56	0.33	0.55	0.34	0.34
	(0.42)	(0.45)	(0.39)	(0.36)	(0.34)
lag3	0.20	0.15	0.45	0.21	0.17
	(0.25)	(0.34)	(0.45)	(0.42)	(0.40)
lag4	-0.47	-0.65*	-0.23	-0.83*	-1.03**
	(0.26)	(0.31)	(0.36)	(0.38)	(0.39)
lag5	-2.06**	-2.34**	-0.34	-1.99	-2.43
	(0.69)	(0.83)	(1.07)	(1.30)	(1.28)
lag6	0.60	1.76	3.77**	0.39	0.28
	(0.80)	(1.15)	(1.28)	(1.18)	(1.21)
Spatial Clust.	Yes	Yes	Yes	Yes	Yes
ID FE	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes
Range	30Km	50Km	100Km	150Km	200Km
Observations	4425.00	6990.00	11850.00	14955.00	17760.00
Adjusted R-squared	0.01	0.01	0.01	0.00	0.00

Standard errors in parentheses
Robust clustered standard errors.
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Notes: Event study as in eq. 2 where the flow number of buildings represents the outcome. In column (1) I restrict the sample to observations within 30 km of the cut-off. In column (2) I restrict the sample to observations within 50 km of the cut-off. In column (3) I restrict the sample to observations within 100 km of the cut-off. In column (4) I restrict the sample to observations within 150 km of the cut-off. In column (5) I restrict the sample to observations within 200 km of the cut-off.
***Significant at 0.5%; **significant at 1%; *significant at 5%

TABLE A43. *Event study: different distance from the total (13th or 14th centuries) borders*

	(1) Number_Monuments	(2) Number_Monuments	(3) Number_Monuments	(4) Number_Monuments	(5) Number_Monuments
lead3	-0.05	-0.04	-0.02	0.00	0.00
	(0.52)	(0.37)	(0.38)	(0.40)	(0.38)
lead2	-0.04	-0.03	-0.02	-0.00	-0.00
	(0.53)	(0.37)	(0.40)	(0.38)	(0.37)
lag0	0.65	0.44	0.37	0.35	0.36
	(0.36)	(0.29)	(0.38)	(0.35)	(0.34)
lag1	1.12**	0.89**	1.03**	0.96**	0.98**
	(0.42)	(0.34)	(0.35)	(0.34)	(0.33)
lag2	1.01*	0.69	0.56	0.34	0.34
	(0.44)	(0.37)	(0.38)	(0.36)	(0.34)
lag3	0.90	0.62	0.48	0.21	0.17
	(0.51)	(0.41)	(0.43)	(0.42)	(0.40)
lag4	0.49	-0.02	-0.20	-0.83*	-1.03**
	(0.54)	(0.40)	(0.36)	(0.38)	(0.39)
lag5	0.74	-0.16	-0.25	-1.99	-2.43
	(1.49)	(1.13)	(1.04)	(1.30)	(1.28)
lag6	1.72	2.90**	3.49**	0.39	0.28
	(1.18)	(1.03)	(1.31)	(1.18)	(1.21)
Spatial Clust.	Yes	Yes	Yes	Yes	Yes
ID FE	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes
Range	30Km	50Km	100Km	150Km	200Km
Observations	5190.00	7845.00	12195.00	14955.00	17760.00
Adjusted R-squared	0.00	0.01	0.01	0.00	0.00

Standard errors in parentheses
Robust clustered standard errors.
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Notes: Event study as in eq. 2 where the flow number of buildings represents the outcome. In column (1) I restrict the sample to observations within 30 km of the cut-off. In column (2) I restrict the sample to observations within 50 km of the cut-off. In column (3) I restrict the sample to observations within 100 km of the cut-off. In column (4) I restrict the sample to observations within 150 km of the cut-off. In column (5) I restrict the sample to observations within 200 km of the cut-off.
***Significant at 0.5%; **significant at 1%; *significant at 5%

TABLE A44. *Event study: different distance from the Natural borders*

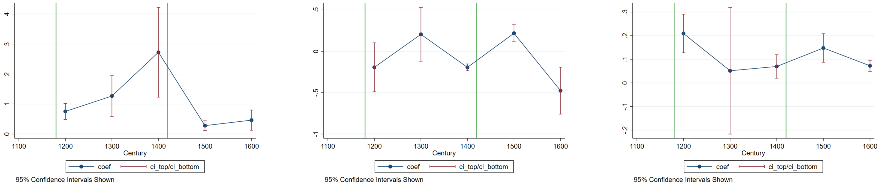
	(1) Number_Monuments	(2) Number_Monuments	(3) Number_Monuments	(4) Number_Monuments	(5) Number_Monuments
lead3	-0.51	-0.00	0.05	0.03	0.02
	(1.83)	(0.85)	(0.49)	(0.50)	(0.41)
lead2	-0.31	0.00	0.03	0.01	0.01
	(1.60)	(0.79)	(0.49)	(0.52)	(0.43)
lag0	1.52	1.08	0.50	0.42	0.38
	(1.32)	(0.65)	(0.37)	(0.47)	(0.40)
lag1	2.21	2.20**	1.47***	1.27**	1.09**
	(1.29)	(0.73)	(0.42)	(0.44)	(0.35)
lag2	2.47	2.66***	1.22**	0.71	0.47
	(1.45)	(0.74)	(0.39)	(0.44)	(0.37)
lag3	2.33	2.21*	0.75	0.46	0.30
	(1.95)	(0.96)	(0.47)	(0.51)	(0.44)
lag4	0.56	0.43	-0.67	-0.63	-0.83*
	(2.70)	(1.23)	(0.62)	(0.48)	(0.39)
lag5	0.39	0.69	-1.28	-1.47	-2.07
	(4.76)	(2.54)	(1.62)	(1.44)	(1.41)
lag6	-7.73	0.72	0.57	1.54	1.10
	(4.90)	(1.90)	(1.31)	(1.68)	(1.27)
Spatial Clust.	Yes	Yes	Yes	Yes	Yes
ID FE	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes
Range	30Km	50Km	100Km	150Km	200Km
Observations	1170.00	2115.00	5265.00	8970.00	13245.00
Adjusted R-squared	0.02	0.00	0.00	0.00	0.00

Standard errors in parentheses
Robust clustered standard errors.
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Notes: Event study as in eq. 2 where the flow number of buildings represents the outcome. In column (1) I restrict the sample to observations within 30 km of the cut-off. In column (2) I restrict the sample to observations within 50 km of the cut-off. In column (3) I restrict the sample to observations within 100 km of the cut-off. In column (4) I restrict the sample to observations within 150 km of the cut-off. In column (5) I restrict the sample to observations within 200 km of the cut-off.
***Significant at 0.5%; **significant at 1%; *significant at 5%

A.2 Mechanisms

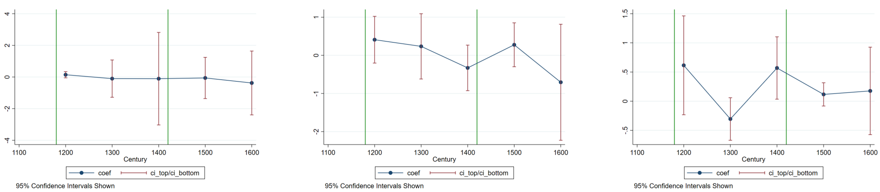
FIGURE A5. *RDDs over time on the Center-Southern 13th century borders*



(a) *Civil Buildings* **(b)** *Religious Buildings* **(c)** *Military Buildings*

Notes: RDD coefficients and standard errors according to the specification in 1. Each coefficient and standard errors are calculated for a given century and plotted chronologically to give the temporal evolution of the coefficient and of the standard error. I use the Northern 13th century borders. Figure (a) evaluates the RDD considering civil buildings as the outcome. Figure (b) evaluates the RDD for religious buildings. Figure (c) evaluates the RDD for military buildings. In this specification I use the distance from the Center-Southern 13th century borders.
***Significant at 0.5%; **significant at 1%; *significant at 5%

FIGURE A6. *RDDs over time on the Northern 13th century borders*



(a) *Civil Buildings* **(b)** *Religious Buildings* **(c)** *Military Buildings*

Notes: RDD coefficients and standard errors according to the specification in 1. Each coefficient and standard errors are calculated for a given century and plotted chronologically to give the temporal evolution of the coefficient and of the standard error. I use the Northern 13th century borders. Figure (a) evaluates the RDD considering civil buildings as the outcome. Figure (b) evaluates the RDD for religious buildings. Figure (c) evaluates the RDD for military buildings. In this specification I use the distance from the Northern 13th century AD borders.
***Significant at 0.5%; **significant at 1%; *significant at 5%

TABLE A45. *RDD and TO interacted with full routes network: all buildings*

	(1) Build.1100	(2) Build.1200	(3) Build.1300	(4) Build.1400	(5) Build.1500
TO=1	0.38	0.37***	0.06*	0.03	-0.02
	(0.22)	(0.08)	(0.02)	(0.03)	(0.07)
NEAR_DIST(100km)	-0.10	-0.33**	-0.06	-0.02	-0.21
	(0.09)	(0.10)	(0.05)	(0.10)	(0.12)
TO=1 × NEAR_DIST(100km)	-0.59	-0.04	-0.12	0.05	0.18
	(0.60)	(0.36)	(0.14)	(0.10)	(0.18)
dist_borderXIII(100km)	-20.44*	-52.35***	-23.26	-65.63**	-58.83***
	(7.05)	(9.55)	(12.25)	(17.34)	(9.35)
TO=1 × dist_border(100km)	-344.41	100.17	45.61	99.97	54.38
	(212.96)	(95.85)	(48.41)	(58.85)	(28.87)
Observations	1875	1875	1875	1875	1875

Notes: RDD coefficients according to eq. 1. $Build.\#$ is the number of buildings completed in a century. $Distance\_route$ is the distance from the Elblag routes network and the $c.near\_route\_s \times 1.TO_{s,t=cen.}$ is the interaction between the Teutonic-Order state and the distance from the Elblag route; $X'_{s,t=cen.}$ is a set of control variables. Each column evaluatess the RDD in a given century (from the 12th to 17th centuries) ***Significant at 1%; **significant at 5%; *significant at 10%.

TABLE A46. *RDD and TO interacted with Elblag-NHRE route: civil, religious, military buildings*

	(1) Build.1000	(2) Build.1100	(3) Build.1200	(4) Build.1300	(5) Build.1400	(6) Build.1500	(7) Build.1600
TO=1	-0.00	-0.02***	0.41**	0.58**	0.54	-0.38	-0.35
	(0.00)	(0.00)	(0.13)	(0.16)	(0.59)	(0.42)	(0.42)
NEAR_DIST(100km)	-0.00	0.00	0.00	0.01	0.02	-0.00	0.00
	(0.00)	(0.00)	(0.00)	(0.01)	(0.02)	(0.04)	(0.04)
TO=1 × NEAR_DIST(100km)	0.00	0.00***	-0.01	-0.01	0.02	0.03	0.02
	(0.00)	(0.00)	(0.01)	(0.01)	(0.04)	(0.02)	(0.02)
dist_borderXIII(100km)	-3.77	0.28	-16.60	42.79	239.98	-65.50	-178.66
	(2.71)	(4.59)	(25.86)	(75.32)	(159.56)	(307.40)	(350.34)
TO=1 × dist_borderXIII(100km)	5.62***	5.09	-419.74	-573.35*	-1797.96*	-248.25	28.29
	(1.32)	(6.02)	(202.17)	(228.28)	(679.63)	(198.65)	(179.00)
Observations	1875	1875	1875	1875	1875	1875	1875

	(1) Build.1000	(2) Build.1100	(3) Build.1200	(4) Build.1300	(5) Build.1400	(6) Build.1500	(7) Build.1600
TO=1	-0.04	-0.06**	0.41	2.35***	0.04	-0.27	-0.47
	(0.02)	(0.02)	(0.19)	(0.28)	(0.34)	(0.28)	(0.25)
NEAR_DIST(100km)	0.00	0.00*	-0.01	-0.02	-0.02	-0.02	0.03
	(0.00)	(0.00)	(0.01)	(0.03)	(0.02)	(0.02)	(0.02)
TO=1 × NEAR_DIST(100km)	0.00	0.00	-0.00	-0.11***	0.01	0.02	0.02
	(0.00)	(0.00)	(0.01)	(0.02)	(0.02)	(0.02)	(0.02)
dist_borderXIII(100km)	9.47	30.52***	-233.62	-301.19	-395.73*	-228.23	-67.15
	(7.93)	(6.77)	(124.03)	(254.27)	(158.68)	(118.09)	(78.31)
TO=1 × dist_borderXIII(100km)	-19.22	-21.00	-286.73	-242.79	695.71*	478.60*	129.22
	(15.76)	(28.04)	(204.48)	(358.71)	(254.06)	(163.08)	(323.45)
Observations	1875	1875	1875	1875	1875	1875	1875

	(1) Build.1000	(2) Build.1100	(3) Build.1200	(4) Build.1300	(5) Build.1400	(6) Build.1500	(7) Build.1600
TO=1	0.00	-0.01	0.39	0.55**	0.02	0.01	-0.05
	(.)	(0.01)	(0.18)	(0.15)	(0.05)	(0.02)	(0.07)
NEAR_DIST(100km)	0.00	0.00	-0.00	-0.00	0.00	-0.00	0.00
	(.)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)
TO=1 × NEAR_DIST(100km)	0.00	0.00	-0.01	-0.02	0.00	0.00	0.01
	(.)	(0.00)	(0.01)	(0.01)	(0.00)	(0.00)	(0.00)
dist_borderXIII(100km)	0.00	1.25	-25.56	-70.14	-22.01	-85.16	-30.77
	(.)	(4.11)	(20.91)	(37.34)	(25.96)	(49.91)	(36.57)
TO=1 × dist_borderXIII(100km)	0.00	-0.31	-358.56	65.37	50.18	101.67	67.27
	(.)	(4.60)	(200.00)	(73.32)	(42.08)	(56.16)	(35.34)
Observations	1875	1875	1875	1875	1875	1875	1875

Notes: RDD coefficients according to a linear specification. I use a first degree polynomial to account for the distance from the 13th century borders. The flow number of buildings per century represents the main outcome. $near\_NHRE\_Elblag$ is the distance from the Holy Roman Empire-Elblag Northern route. $1.TO \times c.near\_NHRE\_Elblag$ is the interaction between $near\_NHRE\_Elblag$ and the Teutonic-Order territories. Each column evaluates the RDD in a given century (from the 12th to 17th centuries).

***Significant at 0.5%; **significant at 1%; *significant at 5%

TABLE A47. *RDD and TO interacted with Elblag-Frankfurt (Northern) route: civil, religious, military buildings*

	(1) Build.1000	(2) Build.1100	(3) Build.1200	(4) Build.1300	(5) Build.1400	(6) Build.1500	(7) Build.1600
TO=1	-0.00	-0.05**	0.50*	0.78*	1.07	-0.21	-0.13
	(0.00)	(0.01)	(0.23)	(0.30)	(0.87)	(0.35)	(0.31)
NEAR_DIST(100km)	0.00	-0.00	-0.00**	0.02	0.02	-0.04	-0.02
	(.)	(0.00)	(0.00)	(0.01)	(0.03)	(0.05)	(0.06)
TO=1 × NEAR_DIST(100km)	0.00	0.00*	-0.03	-0.09	-0.14	0.03	0.00
	(.)	(0.00)	(0.02)	(0.05)	(0.16)	(0.11)	(0.09)
dist_borderXIII(100km)	-2.97	-2.05	-20.23	-8.51	103.56	-1.28	-186.90
	(1.51)	(2.57)	(11.27)	(31.12)	(91.09)	(80.19)	(107.86)
TO=1 × dist_borderXIII(100km)	5.05**	-8.56	-394.98*	-682.43*	-2056.01*	-362.27	-57.07
	(1.37)	(8.02)	(177.59)	(295.64)	(919.34)	(184.67)	(230.42)
Observations	1875	1875	1875	1875	1875	1875	1875

	(1) Build.1000	(2) Build.1100	(3) Build.1200	(4) Build.1300	(5) Build.1400	(6) Build.1500	(7) Build.1600
TO=1	-0.02	-0.17***	0.37	1.49***	-0.12	-0.14	-0.11
	(0.01)	(0.04)	(0.22)	(0.35)	(0.18)	(0.16)	(0.14)
NEAR_DIST(100km)	0.00	-0.00	-0.02**	-0.03	-0.06*	-0.04	0.02
	(.)	(0.00)	(0.01)	(0.03)	(0.02)	(0.03)	(0.02)
TO=1 × NEAR_DIST(100km)	0.00	0.00**	-0.01	-0.13*	0.05	-0.00	-0.04
	(.)	(0.00)	(0.02)	(0.05)	(0.04)	(0.03)	(0.05)
dist_borderXIII(100km)	5.89	17.77***	-115.75**	-137.45**	-200.11**	-73.06	-256.08**
	(4.22)	(3.15)	(36.06)	(38.67)	(52.04)	(39.99)	(72.67)
TO=1 × dist_borderXIII(100km)	-22.56	-58.43*	-325.87	-417.60	595.87*	310.15*	52.93
	(16.14)	(20.79)	(174.40)	(394.74)	(253.56)	(137.63)	(285.30)
Observations	1875	1875	1875	1875	1875	1875	1875

	(1) Build.1000	(2) Build.1100	(3) Build.1200	(4) Build.1300	(5) Build.1400	(6) Build.1500	(7) Build.1600
TO=1	0.00	-0.04*	0.42	0.45***	0.03	-0.02	-0.04
	(.)	(0.02)	(0.21)	(0.08)	(0.02)	(0.01)	(0.07)
NEAR_DIST(100km)	0.00	-0.00	-0.00	-0.02	-0.01	-0.02	-0.01
	(.)	(0.00)	(0.00)	(0.01)	(0.01)	(0.01)	(0.01)
TO=1 × NEAR_DIST(100km)	0.00	0.00*	-0.03	-0.05**	0.00	0.02	0.01
	(.)	(0.00)	(0.02)	(0.02)	(0.01)	(0.01)	(0.01)
dist_borderXIII(100km)	0.00	1.18	-15.38*	-32.75	-20.78*	-59.57***	-57.61***
	(.)	(3.37)	(5.66)	(21.61)	(7.84)	(10.62)	(10.51)
TO=1 × dist_borderXIII(100km)	0.00	-13.83	-324.38	-67.14	25.56	83.35*	33.58
	(.)	(6.48)	(168.72)	(101.00)	(33.79)	(37.99)	(27.43)
Observations	1875	1875	1875	1875	1875	1875	1875

Notes: RDD coefficients according to a linear specification. I use a first degree polynomial to account for the distance from the 13th century borders. The flow number of buildings per century represents the main outcome. $near\_NFrank\_Elblag$ is the distance from the Frankfurt-Elblag Northern route. $1.TO \times c.near\_NFrank\_Elblag$ is the interaction between $near\_NFrank\_Elblag$ and the Teutonic-Order territories. Each column evaluates the RDD in a given century (from the 12th to 17th centuries).
***Significant at 0.5%; **significant at 1%; *significant at 5%

TABLE A48. *RDD and TO interacted with Elblag-Frankfurt (Central) routes: civil, religious, military buildings*

	(1) Build.1000	(2) Build.1100	(3) Build.1200	(4) Build.1300	(5) Build.1400	(6) Build.1500	(7) Build.1600
TO=1	-0.00	-0.01***	0.54*	0.76*	1.20	-0.23	-0.21
	(0.00)	(0.00)	(0.23)	(0.27)	(0.87)	(0.33)	(0.32)
NEAR_DIST(100km)	-0.00	-0.00	-0.00	0.00	0.01	-0.01	-0.00
	(0.00)	(0.00)	(0.00)	(0.01)	(0.02)	(0.03)	(0.04)
TO=1 × NEAR_DIST(100km)	0.00**	0.00***	-0.03	-0.04*	-0.07	0.02	0.01
	(0.00)	(0.00)	(0.01)	(0.01)	(0.05)	(0.02)	(0.01)
dist_borderXIII(100km)	-3.78**	-7.44*	-43.15	14.88	163.72	-76.74	-207.65
	(1.01)	(2.87)	(24.32)	(61.57)	(116.69)	(227.71)	(235.82)
TO=1 × dist_borderXIII(100km)	4.64*	3.01	-346.99*	-499.89*	-1734.60*	-308.51	-40.30
	(1.60)	(5.06)	(151.78)	(172.63)	(586.07)	(249.31)	(203.98)
Observations	1875	1875	1875	1875	1875	1875	1875

	(1) Build.1000	(2) Build.1100	(3) Build.1200	(4) Build.1300	(5) Build.1400	(6) Build.1500	(7) Build.1600
TO=1	-0.03	-0.06*	0.48*	1.88***	-0.06	-0.25	-0.34
	(0.02)	(0.02)	(0.22)	(0.21)	(0.19)	(0.15)	(0.19)
NEAR_DIST(100km)	-0.00	-0.00	-0.01	-0.02	-0.03	-0.02	0.01
	(0.00)	(0.00)	(0.01)	(0.03)	(0.02)	(0.02)	(0.01)
TO=1 × NEAR_DIST(100km)	0.00	0.00	-0.01	-0.09***	0.02	0.03	0.02
	(0.00)	(0.00)	(0.02)	(0.02)	(0.01)	(0.01)	(0.02)
dist_borderXIII(100km)	0.11	-3.54	-204.47	-298.60	-395.96*	-199.33	-222.53*
	(4.85)	(11.54)	(130.11)	(240.60)	(158.48)	(111.74)	(85.54)
TO=1 × dist_borderXIII(100km)	-23.22	-19.14	-210.70	230.26	745.41**	451.52*	11.03
	(13.86)	(27.26)	(195.94)	(353.20)	(236.03)	(157.33)	(262.57)
Observations	1875	1875	1875	1875	1875	1875	1875

	(1) Build.1000	(2) Build.1100	(3) Build.1200	(4) Build.1300	(5) Build.1400	(6) Build.1500	(7) Build.1600
TO=1	0.00	-0.01	0.46*	0.49***	0.03	0.02	-0.00
	(.)	(0.01)	(0.21)	(0.10)	(0.03)	(0.02)	(0.06)
NEAR_DIST(100km)	0.00	0.00	-0.00	-0.00	0.00	-0.00	0.00
	(.)	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)
TO=1 × NEAR_DIST(100km)	0.00	0.00*	-0.02	-0.02*	0.00	0.00	0.00
	(.)	(0.00)	(0.01)	(0.01)	(0.00)	(0.00)	(0.00)
dist_borderXIII(100km)	0.00	2.28	-23.28	-59.65	-12.34	-74.52*	-49.89*
	(.)	(2.42)	(17.07)	(32.79)	(20.81)	(34.10)	(18.01)
TO=1 × dist_borderXIII(100km)	0.00	-3.45	-292.16	138.91	36.66	98.95	42.52
	(.)	(4.43)	(146.30)	(79.88)	(46.99)	(63.52)	(27.88)
Observations	1875	1875	1875	1875	1875	1875	1875

Notes: RDD coefficients according to a linear specification. I use a first degree polynomial to account for the distance from the 13th century border. The flow number of buildings per century represents the main outcome. $near\_CFrank\_Elblag$ is the distance from the Frankfurt-Elblag central route. $1.TO \times c.near\_CFrank\_Elblag$ is the interaction between $near\_CFrank\_Elblag$ and the Teutonic-Order territories. Each column evaluates the RDD in a given century (from the 12th to the 17th centuries). ***Significant at 0.5%; **significant at 1%; *significant at 5%

TABLE A49. *RDD and TO interacted with Elblag-Frankfurt (Southern) routes: civil, religious, military buildings*

	(1) Build.1000	(2) Build.1100	(3) Build.1200	(4) Build.1300	(5) Build.1400	(6) Build.1500	(7) Build.1600
TO=1	-0.00	-0.01***	0.53*	0.77*	1.20	-0.24	-0.22
	(0.00)	(0.00)	(0.23)	(0.27)	(0.87)	(0.33)	(0.32)
NEAR_DIST(100km)	-0.00	-0.00	-0.01	0.00	0.01	-0.02	-0.01
	(0.00)	(0.00)	(0.00)	(0.01)	(0.01)	(0.04)	(0.04)
TO=1 × NEAR_DIST(100km)	0.00*	0.00***	-0.03	-0.04*	-0.07	0.02	0.02
	(0.00)	(0.00)	(0.01)	(0.01)	(0.05)	(0.02)	(0.01)
dist_borderXIII(100km)	-5.45***	-6.63	-48.65	24.69	193.08	-131.79	-282.76
	(0.75)	(3.45)	(23.68)	(65.91)	(127.96)	(257.00)	(244.88)
TO=1 × dist_borderXIII(100km)	5.35***	2.52	-345.33*	-504.04*	-1746.49**	-285.70	-7.33
	(1.24)	(5.30)	(153.52)	(171.23)	(576.80)	(253.78)	(199.03)
Observations	1875	1875	1875	1875	1875	1875	1875

	(1) Build.1000	(2) Build.1100	(3) Build.1200	(4) Build.1300	(5) Build.1400	(6) Build.1500	(7) Build.1600
TO=1	-0.03	-0.06*	0.47	1.86***	-0.07	-0.26	-0.34
	(0.02)	(0.02)	(0.23)	(0.19)	(0.18)	(0.14)	(0.19)
NEAR_DIST(100km)	-0.00	-0.00	-0.02	-0.04	-0.03	-0.02	0.00
	(0.00)	(0.00)	(0.02)	(0.04)	(0.02)	(0.02)	(0.01)
TO=1 × NEAR_DIST(100km)	0.00	0.00	-0.01	-0.09***	0.02	0.03	0.02
	(0.00)	(0.00)	(0.02)	(0.02)	(0.01)	(0.01)	(0.02)
dist_borderXIII(100km)	1.60	1.61	-244.21	-402.29	-443.22*	-246.04	-232.88**
	(5.05)	(11.65)	(143.75)	(268.07)	(171.63)	(120.21)	(63.21)
TO=1 × dist_borderXIII(100km)	-24.03	-21.95	-195.79	271.29	761.45**	469.24**	16.76
	(14.05)	(27.23)	(203.62)	(342.56)	(233.28)	(151.95)	(265.33)
Observations	1875	1875	1875	1875	1875	1875	1875

	(1) Build.1000	(2) Build.1100	(3) Build.1200	(4) Build.1300	(5) Build.1400	(6) Build.1500	(7) Build.1600
TO=1	0.00	-0.01	0.46*	0.49***	0.03	0.02	-0.00
	(.)	(0.01)	(0.21)	(0.11)	(0.03)	(0.02)	(0.06)
NEAR_DIST(100km)	0.00	0.00	-0.00	-0.00	0.00	-0.01	0.00
	(.)	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)
TO=1 × NEAR_DIST(100km)	0.00	0.00*	-0.02	-0.02*	0.00	0.00	0.00
	(.)	(0.00)	(0.01)	(0.01)	(0.00)	(0.00)	(0.00)
dist_borderXIII(100km)	0.00	1.50	-28.54	-66.26*	-25.76	-100.52*	-58.52**
	(.)	(3.32)	(19.56)	(30.42)	(25.91)	(40.51)	(15.56)
TO=1 × dist_borderXIII(100km)	0.00	-3.05	-290.16	141.57	43.02	110.20	46.80
	(.)	(4.61)	(147.27)	(78.48)	(48.78)	(68.10)	(28.75)
Observations	1875	1875	1875	1875	1875	1875	1875

Notes: RDD coefficients according to a linear specification. I use a first degree polynomial to account for the distance from the 13th century border. The flow number of buildings per century represents the main outcome. $near\_SFrank\_Elblag$ is the distance from the Frankfurt-Elblag southern route. $1.TO \times c.near\_SFrank\_Elblag$ is the interaction between $near\_SFrank\_Elblag$ and the Teutonic-Order territories. Each column evaluates the RDD in a given century (from the 12th to the 17th centuries). ***Significant at 0.5%; **significant at 1%; *significant at 5%

TABLE A50. *RDD and TO interacted with Elblag-HRE (South-western) routes: civil, religious, military buildings*

	(1) Build.1000	(2) Build.1100	(3) Build.1200	(4) Build.1300	(5) Build.1400	(6) Build.1500	(7) Build.1600
TO=1	-0.01	-0.02***	0.53*	0.79*	1.27	-0.28	-0.23
	(0.00)	(0.00)	(0.24)	(0.26)	(0.84)	(0.35)	(0.37)
NEAR_DIST(100km)	-0.00*	-0.00	-0.01***	0.01	0.02	-0.02	-0.01
	(0.00)	(0.00)	(0.00)	(0.01)	(0.02)	(0.02)	(0.03)
TO=1 × NEAR_DIST(100km)	0.00*	0.00***	-0.03	-0.04*	-0.07	0.02	0.02
	(0.00)	(0.00)	(0.02)	(0.01)	(0.05)	(0.02)	(0.02)
dist_borderXIII(100km)	-7.47***	-8.44*	-48.28**	33.61	217.86	-125.86	-257.55
	(1.33)	(2.98)	(12.85)	(66.87)	(157.19)	(108.22)	(163.80)
TO=1 × dist_borderXIII(100km)	5.57***	2.49	-348.65*	-501.37**	-1737.14**	-302.38	-26.23
	(1.24)	(4.96)	(153.47)	(159.94)	(555.12)	(199.69)	(160.69)
Observations	1875	1875	1875	1875	1875	1875	1875

	(1) Build.1000	(2) Build.1100	(3) Build.1200	(4) Build.1300	(5) Build.1400	(6) Build.1500	(7) Build.1600
TO=1	-0.03	-0.06*	0.41	1.73***	-0.14	-0.34**	-0.37
	(0.02)	(0.02)	(0.27)	(0.13)	(0.14)	(0.09)	(0.19)
NEAR_DIST(100km)	-0.00	-0.00	-0.03	-0.06**	-0.04	-0.04**	-0.01
	(0.00)	(0.00)	(0.01)	(0.02)	(0.02)	(0.01)	(0.02)
TO=1 × NEAR_DIST(100km)	0.00	0.00	-0.01	-0.08***	0.02	0.03*	0.02
	(0.00)	(0.00)	(0.02)	(0.02)	(0.01)	(0.01)	(0.02)
dist_borderXIII(100km)	0.44	8.57	-249.05*	-422.87**	-406.76**	-265.71***	-318.13*
	(8.72)	(12.24)	(93.73)	(134.24)	(117.69)	(51.99)	(139.87)
TO=1 × dist_borderXIII(100km)	-24.24	-25.80	-213.75	237.05	719.50**	453.19**	45.42
	(14.08)	(26.41)	(181.24)	(266.25)	(208.88)	(115.07)	(270.30)
Observations	1875	1875	1875	1875	1875	1875	1875

	(1) Build.1000	(2) Build.1100	(3) Build.1200	(4) Build.1300	(5) Build.1400	(6) Build.1500	(7) Build.1600
TO=1	0.00	-0.01	0.45	0.47**	0.01	-0.01	-0.02
	(.)	(0.01)	(0.22)	(0.11)	(0.02)	(0.04)	(0.09)
NEAR_DIST(100km)	0.00	-0.00	-0.00	-0.01***	-0.01*	-0.01**	-0.01
	(.)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
TO=1 × NEAR_DIST(100km)	0.00	0.00**	-0.02	-0.02*	0.00	0.00	0.00
	(.)	(0.00)	(0.01)	(0.01)	(0.00)	(0.00)	(0.00)
dist_borderXIII(100km)	0.00	0.36	-25.49	-90.52***	-60.05*	-122.46***	-105.07***
	(.)	(2.74)	(12.40)	(11.58)	(25.16)	(28.95)	(19.03)
TO=1 × dist_borderXIII(100km)	0.00	-2.60	-293.27	146.58	53.01	111.28	61.10
	(.)	(4.28)	(146.24)	(70.55)	(46.29)	(64.65)	(29.11)
Observations	1875	1875	1875	1875	1875	1875	1875

Notes: RDD coefficients according to a linear specification. I use a first degree polynomial to account for the distance from the 13th century border. The flow number of buildings per century represents the main outcome. $near\_SWHRE\_Elblag$ is the distance from the Holy Roman Empire-Elblag South-Western route. $1.TO \times c.near\_SWHRE\_Elblag$ is the interaction between $near\_SWHRE\_Elblag$ and the Teutonic-Order territories. Each column evaluates the RDD in a given century (from the 12th to the 17th centuries).

***Significant at 0.5%; **significant at 1%; *significant at 5%

TABLE A51. *RDD and TO interacted with Elblag-HRE (southern) routes: civil, religious, military buildings*

	(1) Build.1000	(2) Build.1100	(3) Build.1200	(4) Build.1300	(5) Build.1400	(6) Build.1500	(7) Build.1600
TO=1	-0.01	-0.02***	0.53*	0.77*	1.25	-0.29	-0.28
	(0.00)	(0.00)	(0.24)	(0.27)	(0.86)	(0.35)	(0.36)
NEAR_DIST(100km)	-0.00*	-0.00	-0.01**	0.00	0.01	-0.03	-0.03
	(0.00)	(0.00)	(0.00)	(0.01)	(0.02)	(0.01)	(0.02)
TO=1 × NEAR_DIST(100km)	0.00*	0.00***	-0.03	-0.04*	-0.07	0.02	0.02
	(0.00)	(0.00)	(0.02)	(0.02)	(0.05)	(0.02)	(0.02)
dist_borderXIII(100km)	-5.77**	-7.87*	-39.88*	11.55	182.39	-134.67	-313.59*
	(1.62)	(2.95)	(15.25)	(46.92)	(120.39)	(78.78)	(127.80)
TO=1 × dist_borderXIII(100km)	4.73***	1.68	-354.03*	-494.86**	-1720.01**	-314.44	-25.79
	(0.98)	(4.80)	(153.22)	(163.66)	(563.27)	(192.69)	(156.70)
Observations	1875	1875	1875	1875	1875	1875	1875

	(1) Build.1000	(2) Build.1100	(3) Build.1200	(4) Build.1300	(5) Build.1400	(6) Build.1500	(7) Build.1600
TO=1	-0.03	-0.06*	0.41	1.72***	-0.14	-0.33**	-0.37
	(0.02)	(0.02)	(0.28)	(0.13)	(0.14)	(0.10)	(0.19)
NEAR_DIST(100km)	-0.00	-0.00	-0.03	-0.07*	-0.04	-0.03**	-0.01
	(0.00)	(0.00)	(0.01)	(0.02)	(0.02)	(0.01)	(0.02)
TO=1 × NEAR_DIST(100km)	0.00	0.00	-0.01	-0.09***	0.02	0.03*	0.02
	(0.00)	(0.00)	(0.02)	(0.02)	(0.01)	(0.01)	(0.02)
dist_borderXIII(100km)	-0.39	10.90	-235.79*	-396.75**	-382.75**	-228.51***	-299.79*
	(7.04)	(11.06)	(81.70)	(112.71)	(105.04)	(42.07)	(122.77)
TO=1 × dist_borderXIII(100km)	-24.75	-26.83	-233.38	195.33	693.35**	425.91**	34.69
	(13.10)	(25.60)	(177.85)	(254.57)	(202.43)	(111.81)	(269.03)
Observations	1875	1875	1875	1875	1875	1875	1875

	(1) Build.1000	(2) Build.1100	(3) Build.1200	(4) Build.1300	(5) Build.1400	(6) Build.1500	(7) Build.1600
TO=1	0.00	-0.01	0.45	0.47**	0.01	-0.01	-0.02
	(.)	(0.01)	(0.21)	(0.11)	(0.02)	(0.04)	(0.08)
NEAR_DIST(100km)	0.00	-0.00	-0.00	-0.01**	-0.01*	-0.01**	-0.01
	(.)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
TO=1 × NEAR_DIST(100km)	0.00	0.00**	-0.02	-0.02*	0.00	0.00	0.00
	(.)	(0.00)	(0.01)	(0.01)	(0.00)	(0.00)	(0.00)
dist_borderXIII(100km)	0.00	-0.12	-21.34	-87.44***	-51.61*	-115.16***	-94.76***
	(.)	(2.33)	(10.90)	(12.50)	(18.72)	(23.82)	(16.34)
TO=1 × dist_borderXIII(100km)	0.00	-2.59	-295.65	140.77	47.10	102.61	54.05
	(.)	(4.01)	(145.50)	(69.50)	(44.49)	(63.61)	(28.11)
Observations	1875	1875	1875	1875	1875	1875	1875

Notes: RDD coefficients according to a linear specification. I use a first degree polynomial to account for the distance from the 13th century border. The flow number of buildings per century represents the main outcome. $near\_SHRE\_Elblag$ is the distance from the Holy Roman Empire-Elblag Southern route. $1.TO \times c.near\_SHRE\_Elblag$ is the interaction between $near\_SHRE\_Elblag$ and the Teutonic-Order territories. Each column evaluates the RDD in a given century (from the 12th to the 17th centuries).

***Significant at 0.5%; **significant at 1%; *significant at 5%

TABLE A52. *RDD and TO interacted with Elblag-Göritz routes: civil, religious, military buildings*

	(1) Build.1000	(2) Build.1100	(3) Build.1200	(4) Build.1300	(5) Build.1400	(6) Build.1500	(7) Build.1600
TO=1	-0.01	-0.02***	0.53*	0.78*	1.26	-0.29	-0.26
	(0.00)	(0.00)	(0.24)	(0.27)	(0.85)	(0.35)	(0.36)
NEAR_DIST(100km)	-0.00*	-0.00	-0.01**	0.00	0.02	-0.03	-0.02
	(0.00)	(0.00)	(0.00)	(0.01)	(0.02)	(0.01)	(0.02)
TO=1 × NEAR_DIST(100km)	0.00*	0.00***	-0.03	-0.04*	-0.07	0.02	0.02
	(0.00)	(0.00)	(0.02)	(0.02)	(0.05)	(0.02)	(0.02)
dist_borderXIII(100km)	-6.11**	-7.83*	-44.14**	21.80	199.44	-144.18	-287.32
	(1.56)	(2.96)	(13.39)	(54.42)	(133.72)	(91.90)	(143.62)
TO=1 × dist_borderXIII(100km)	4.93***	1.92	-352.04*	-496.99**	-1726.08**	-307.01	-25.13
	(1.02)	(4.95)	(153.43)	(162.01)	(560.67)	(193.73)	(157.32)
Observations	1875	1875	1875	1875	1875	1875	1875

	(1) Build.1000	(2) Build.1100	(3) Build.1200	(4) Build.1300	(5) Build.1400	(6) Build.1500	(7) Build.1600
TO=1	-0.03	-0.06*	0.40	1.72***	-0.14	-0.34**	-0.37
	(0.02)	(0.02)	(0.28)	(0.13)	(0.14)	(0.09)	(0.20)
NEAR_DIST(100km)	-0.00	-0.00	-0.03	-0.07*	-0.04	-0.03**	-0.01
	(0.00)	(0.00)	(0.02)	(0.02)	(0.02)	(0.01)	(0.02)
TO=1 × NEAR_DIST(100km)	0.00	0.00	-0.01	-0.09***	0.02	0.03*	0.02
	(0.00)	(0.00)	(0.02)	(0.02)	(0.01)	(0.01)	(0.02)
dist_borderXIII(100km)	0.19	10.41	-245.65*	-410.75**	-394.20**	-247.52***	-301.65*
	(7.68)	(11.49)	(86.47)	(116.47)	(106.63)	(43.27)	(131.18)
TO=1 × dist_borderXIII(100km)	-24.58	-26.59	-225.39	211.16	702.98**	436.05**	37.16
	(13.54)	(25.93)	(177.88)	(257.01)	(203.56)	(111.37)	(270.88)
Observations	1875	1875	1875	1875	1875	1875	1875

	(1) Build.1000	(2) Build.1100	(3) Build.1200	(4) Build.1300	(5) Build.1400	(6) Build.1500	(7) Build.1600
TO=1	0.00	-0.01	0.45	0.47**	0.01	-0.01	-0.02
	(.)	(0.01)	(0.22)	(0.11)	(0.02)	(0.04)	(0.08)
NEAR_DIST(100km)	0.00	-0.00	-0.00	-0.01***	-0.01*	-0.01**	-0.01
	(.)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
TO=1 × NEAR_DIST(100km)	0.00	0.00**	-0.02	-0.02*	0.00	0.00	0.00
	(.)	(0.00)	(0.01)	(0.01)	(0.00)	(0.00)	(0.00)
dist_borderXIII(100km)	0.00	-0.20	-23.53	-89.46***	-53.63*	-118.58***	-97.51***
	(.)	(2.60)	(11.05)	(12.00)	(19.36)	(24.14)	(16.85)
TO=1 × dist_borderXIII(100km)	0.00	-2.52	-294.76	143.05	48.84	105.80	56.17
	(.)	(4.05)	(145.82)	(69.89)	(44.58)	(63.17)	(28.12)
Observations	1875	1875	1875	1875	1875	1875	1875

Notes: RDD coefficients according to a linear specification. I use a first degree polynomial to account for the distance from the 13th century border. The flow number of buildings per century represents the main outcome. $near\_Goritz\_Elblag$ is the distance from Goritz-Elblag Southern route. $1.TO \times c.near\_Goritz\_Elblag$ is the interaction between $near\_Goritz\_Elblag$ and the Teutonic-Order territories. Each column evaluates the RDD in a given century (from the 12th to the 17th centuries).
***Significant at 0.5%; **significant at 1%; *significant at 5%

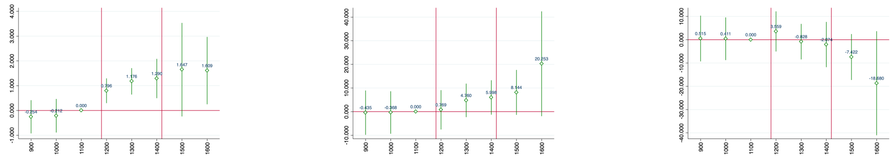
TABLE A53. *RDD and TO interacted with full routes network: civil, religious, military buildings*

	(1) Build.1100	(2) Build.1200	(3) Build.1300	(4) Build.1400	(5) Build.1500
TO=1	0.38	0.37***	0.06*	0.03	-0.02
	(0.22)	(0.08)	(0.02)	(0.03)	(0.07)
NEAR_DIST(100km)	-0.10	-0.33**	-0.06	-0.02	-0.21
	(0.09)	(0.10)	(0.05)	(0.10)	(0.12)
TO=1 × NEAR_DIST(100km)	-0.59	-0.04	-0.12	0.05	0.18
	(0.60)	(0.36)	(0.14)	(0.10)	(0.18)
dist_borderXIII(100km)	-20.44*	-52.35***	-23.26	-65.63**	-58.83***
	(7.05)	(9.55)	(12.25)	(17.34)	(9.35)
TO=1 × dist_borderXIII(100km)	-344.41	100.17	45.61	99.97	54.38
	(212.96)	(95.85)	(48.41)	(58.85)	(28.87)
Observations	1875	1875	1875	1875	1875

	(1) Build.1100	(2) Build.1200	(3) Build.1300	(4) Build.1400	(5) Build.1500
TO=1	0.38	0.37***	0.06*	0.03	-0.02
	(0.22)	(0.08)	(0.02)	(0.03)	(0.07)
NEAR_DIST(100km)	-0.10	-0.33**	-0.06	-0.02	-0.21
	(0.09)	(0.10)	(0.05)	(0.10)	(0.12)
TO=1 × NEAR_DIST(100km)	-0.59	-0.04	-0.12	0.05	0.18
	(0.60)	(0.36)	(0.14)	(0.10)	(0.18)
dist_borderXIII(100km)	-20.44*	-52.35***	-23.26	-65.63**	-58.83***
	(7.05)	(9.55)	(12.25)	(17.34)	(9.35)
TO=1 × dist_borderXIII(100km)	-344.41	100.17	45.61	99.97	54.38
	(212.96)	(95.85)	(48.41)	(58.85)	(28.87)
Observations	1875	1875	1875	1875	1875

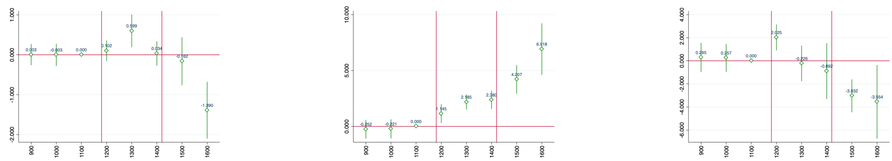
	(1) Build.1100	(2) Build.1200	(3) Build.1300	(4) Build.1400	(5) Build.1500
TO=1	0.38	0.37***	0.06*	0.03	-0.02
	(0.22)	(0.08)	(0.02)	(0.03)	(0.07)
NEAR_DIST(100km)	-0.10	-0.33**	-0.06	-0.02	-0.21
	(0.09)	(0.10)	(0.05)	(0.10)	(0.12)
TO=1 × NEAR_DIST(100km)	-0.59	-0.04	-0.12	0.05	0.18
	(0.60)	(0.36)	(0.14)	(0.10)	(0.18)
dist_borderXIII(100km)	-20.44*	-52.35***	-23.26	-65.63**	-58.83***
	(7.05)	(9.55)	(12.25)	(17.34)	(9.35)
TO=1 × dist_borderXIII(100km)	-344.41	100.17	45.61	99.97	54.38
	(212.96)	(95.85)	(48.41)	(58.85)	(28.87)
Observations	1875	1875	1875	1875	1875

Notes: RDD coefficients according to a linear specification. I use a first degree polynomial to account for the distance from the 13th century border. The flow number of buildings per century represents the main outcome. $near\_full\_netw\_lv7$ is the distance from the entire network of router (lv.7 is the importance index according to 8, where 7 are the most important streets). $1.TO \times near\_full\_netw\_lv7$ is the interaction between $near\_full\_netw\_lv7$ and the Teutonic-Order territories. Each column evaluates the RDD in a given century (from the 12th to the 17th centuries).
***Significant at 0.5%; **significant at 1%; *significant at 5%



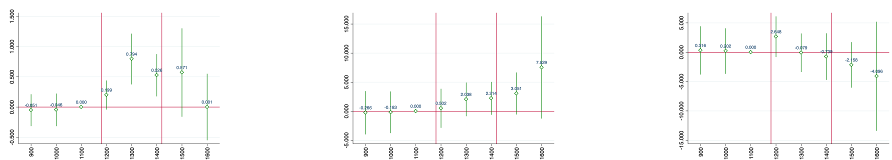
(a) (b) (c)

FIGURE A7. *Teutonic Order, town charters, and their interaction on economic development*



(a) (b) (c)

FIGURE A8. *Teutonic Order, town charters, and their interaction on economic development*



(a) (b) (c)

FIGURE A9. *Teutonic Order, town charters, and their interaction on economic development.*

TABLE A54. *Event study: different distance from the 13th century borders*

	(1) Build.	(2) Build.	(3) Build.	(4) Build.	(5) Build.	(6) Build.
lead2 TO	-0.21	-0.13	-0.05	-0.03	-0.03	-0.00
	(0.35)	(0.23)	(0.14)	(0.13)	(0.13)	(0.14)
lag0 TO	0.80**	0.47**	0.20	0.19	0.18	0.10
	(0.25)	(0.17)	(0.12)	(0.12)	(0.12)	(0.13)
lead1 TO	1.18***	0.92***	0.79***	0.74***	0.72***	0.60**
	(0.27)	(0.22)	(0.21)	(0.22)	(0.22)	(0.21)
lag2 TO	1.29**	0.84**	0.53**	0.33*	0.26	0.03
	(0.41)	(0.29)	(0.18)	(0.15)	(0.15)	(0.16)
lag3 TO	1.65	1.15	0.57	0.36	0.29	-0.16
	(0.96)	(0.64)	(0.37)	(0.32)	(0.32)	(0.31)
lag4 TO	1.61*	0.75	0.00	-0.43	-0.66*	-1.39***
	(0.69)	(0.50)	(0.28)	(0.25)	(0.30)	(0.36)
lead2 TOxTS	0.41	0.25	0.20	0.17	0.18	0.26
	(4.68)	(3.67)	(1.98)	(1.60)	(1.01)	(0.62)
lag0 TOxTS	3.56	2.99	2.65	2.36	2.37**	2.02***
	(4.40)	(3.25)	(1.77)	(1.41)	(0.91)	(0.57)
lead1 TOxTS	-0.83	-0.36	-0.08	-0.43	0.02	-0.23
	(3.89)	(3.02)	(1.68)	(1.35)	(0.97)	(0.78)
lag2 TOxTS	-2.07	-1.26	-0.74	-1.24	-0.46	-0.89
	(4.96)	(3.83)	(2.03)	(1.70)	(1.39)	(1.23)
lag3 TOxTS	-7.42	-4.77	-2.16	-3.35	-2.01	-3.03***
	(5.03)	(3.71)	(1.98)	(1.79)	(1.12)	(0.73)
lag4 TOxTS	-18.68	-11.63	-4.10	-7.16	-4.38	-3.55*
	(11.40)	(8.40)	(4.74)	(4.92)	(3.07)	(1.63)
lead2 TS	-0.37	-0.20	-0.18	-0.16	-0.16	-0.22
	(4.59)	(3.37)	(1.83)	(1.50)	(0.88)	(0.44)
lag0 TS	0.77	0.90	0.50	0.80	0.80	1.15**
	(4.25)	(3.12)	(1.71)	(1.32)	(0.79)	(0.43)
lead1 TS	4.76	3.37	2.04	2.35*	1.89**	2.19***
	(3.62)	(2.65)	(1.48)	(1.11)	(0.65)	(0.34)
lag2 TS	6.00	3.98	2.21	2.71*	1.94**	2.38***
	(3.72)	(2.69)	(1.45)	(1.10)	(0.65)	(0.42)
lag3 TS	8.14	5.34	3.05	4.36*	3.08**	4.21***
	(4.85)	(3.48)	(1.85)	(1.78)	(1.12)	(0.65)
lag4 TS	20.25	13.80	7.53	10.54*	7.75*	6.92***
	(11.32)	(8.27)	(4.49)	(5.03)	(3.11)	(1.18)
ID FE	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2640.00	4296.00	8076.00	10956.00	13944.00	23796.00
Adjusted R-squared	0.17	0.11	0.08	0.05	0.04	0.07

Notes: Event study according to the specification in eq. 3. In column (1) I restrict the sample to the observations within 30km from the borders. In column (2) I restrict the sample to the observations within 50km from the borders. In column (3) I restrict the sample to the observations within 100km from the borders. In column (4) I restrict the sample to the observations within 150km from the borders. In column (5) I restrict the sample to the observations within 50km from the borders. In column (6) I employ for the full sample, and I control for the distance from the 13th century borders.
***Significant at 0.5%; **significant at 1%; *significant at 5%

Abstrakt

Zkoumám, jak může stát podpořit ranní ekonomický rozvoj prostřednictvím své vojenské kapacity, ještě před zrodem moderních států. Po tři staletí vládl Řád německých rytířů, mnišsko-vojenská organizace, ve východním Prusku, na území současného severního Polska. Aby podpořil kampaň proti pohanským kmenům této oblasti, zorganizoval Řád německých rytířů centralizovaný stát k mobilizaci osadníků, obchodníků a zdrojů. Pomocí regresní diskontinuity přes hranice východního Pruska dokumentuji, jak tato území zaznamenala vyšší ekonomický rozvoj než jejich sousedé, když je ovládal Řád německých rytířů ve 13. - 15. století. Zjišťuji, že po vojenské porážce řádu nevykazují pohraniční oblasti žádnou diskontinuitu hospodářského rozvoje. Z mé analýzy mechanismů vyplývá, že vývoj v Řádovém státě nebyl pouze v zájmu armády a náboženských elit, ale také obchodníků a osadníků. Navrhuji, že vojenská kapacita Řádu řídila rozvoj prostřednictvím mobilizace lidí a zdrojů. Nicméně tento výzkum naznačuje, že rozhodující vojenská porážka může podkopat schopnost státu řídit rozvoj v případě, pokud stát nemá jiné formy kapacit.

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