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The Rise of Fiscal Capacity

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Discussion Paper No. 172

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The Rise of Fiscal Capacity

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Abstract

Having sufficient fiscal capacity to tax is a key hallmark and defining feature of states, and there is a growing literature trying to explain its origins. Existing empirical evidence on fiscal capacity is scarce and focuses on large, ex-post successful territories. In this paper we study the introduction of the first centralized, permanent fiscal institutions in the multifarious territories of the Holy Roman Empire from 1400 to 1800. We link information on fiscal centralization and the size and survival of territories to an extensive dataset on state-formation and growth-related outcomes. We empirically confirm that territories are more likely to centralize when neighboring territories are centralized and when they are exposed to a higher threat of war. In line with the literature on the consequences of fiscal capacity, we show that centralized territories are more likely to survive than non-centralized territories and as a result grow more in size. They invest more in administrative and military structures, but investments in the military only occur in the core areas of centralized territories. This contradicts the central assumption of models on fiscal capacity which states that investments into the military are a non-excludable public good.

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The fiscal history of a people is above all an essential part of its general history.
Schumpeter (1918)

1 Introduction

The idea that “nothing is certain but death and taxes” would have surprised a person living in the Middle Ages. While death was of course certain, taxes were either non-existent or irregular. Today, on the other hand, taxation by sovereign states is taken for granted in most parts of the world. However, there are large differences in the ability of governments to levy and collect taxes as it for example becomes apparent when looking at the size of the shadow economy relative to overall GDP in different countries: in Switzerland the shadow economy is estimated to make up 7 percent of GDP, whereas in Georgia around 65 percent (Medina and Schneider, 2018). These differences have far-reaching consequences for the ability of states to provide government spending, social services, or growth-enhancing investments. It is thus not surprising that most accounts of the rise of the modern state, from Schumpeter (1918) and Weber (1919) to Tilly (1975) and Olson (1993), identify the emergence of taxation as the key hallmark and defining feature of the state.

Even though the introduction of permanent and stable fiscal administrations is one of the most striking changes in the relationship between states and their citizens, and there is no scarcity of theories explaining this crucial transition to modernity, we lack consistent and reliable empirical evidence on the circumstances and consequences of the development of fiscal capacity. Historical data on tax revenues or tax-collecting institutions are scarce, and in most cases do not extend back to the date of their introduction. In fact, the very emergence of modern statistics is clearly a consequence, not a precondition for the emergence of fiscal capacity (Woolf, 1989).¹

In this paper, we use the rich history of the Holy Roman Empire to study a range of economic and institutional developments arguably linked to the introduction of modern fiscal administrations. Between the 16th and the 18th century, several component territories of the Holy Roman Empire introduced permanent offices, staffed by professionally trained individuals, in charge of raising and organizing revenues, and replacing personalized, local, or ad-hoc systems of taxation. These offices, mostly called “Chambers” (*Hofkammer* or *Rentkammer*), substantially increased the ability of sovereigns to raise taxes and thus to increase military power or provide public goods.² The outcomes we study cover both the periods *before* the introduction of fiscal institutions — thus allowing us to test theories relating to the emergence of fiscal capacity — and *after* their introduction — thus shedding light on the political and economic consequences of this momentous transition.

¹An alternative approach to investigate the origins of state formation and taxation is to study contemporary weakly institutionalized environments and their development in reaction to external shocks, as in Sánchez de la Sierra (2019).

²For most if not all territories of that time, raising sovereign debt was not a feasible path to increase state revenue, due to unsurmountable commitment problems (North and Weingast, 1989; Drelichman and Voth, 2014). Arguably, access to credit was easier for city states (Stasavage, 2011).

Our contribution is fourfold. First, we document and date of development of centralized fiscal institutions (“fiscal centralization”) for 27 territories of the Holy Roman Empire in the period between the 16th and the 18th century. The Holy Roman Empire, a loose confederation of hundreds of largely sovereign states of varying size, provides an ideal setting in which to study the genesis and consequences of this institutional innovation for eventually successful and eventually unsuccessful states. The detailed nature of our historical data allow us to observe all major territories – kingdoms, prince-bishoprics, dukedoms, margraviates, and principalities of all kinds — at a yearly level. We can thereby overcome selection (survivorship) bias. In contrast to existing literature that focuses on few, ex-post successful territories such as Prussia or England, we consider all territories that existed and not just those that survived and eventually became large.³ To understand the mechanisms that explain fiscal capacity and its effects, we need to understand which territories do not survive, and why.

Second, we map the cities in our dataset to a rich set of state formation and growth-related outcomes for the Holy Roman Empire. Our data are based on the city histories contained in the *Deutsches Städtebuch* (Keyser et al., eds, 1939-2003), a detailed encyclopedia of all 2,392 places within Germany according to its borders in 1937 that were granted, at some point, city rights.⁴ In particular, we can first measure a variety of outcomes relating to historical territories as our unit of observation: we observe dynastic mergers, break-ups, territorial expansions or losses as a consequence of wars and treaties. More generally, we can trace the existence, size, and shape of a territory through the number of cities a territory controls. Our second set of outcomes are all major construction events listed for any given city in the *Deutsches Städtebuch*: these can be classified into different types of buildings (military, administrative, public infrastructures...) and are dated precisely at the city-year level.⁵ Construction data give us an insight into administrative and military investments, and are ultimately a proxy for economic (urban) growth. We can also measure a territory’s exposure to war through the prism of the recorded history – occupations, sieges, destruction – of the cities that belong to it, again as reported in the *Deutsches Städtebuch*.

Third, we investigate the circumstances under which territories have adopted the institutions of fiscal centralization. We are able to confirm a number of hypotheses that have been put forward in the theoretical literature on the origins of fiscal capacity: territories are more likely to centralize when neighboring territories are centralized, and when they are exposed to a more bellicose environment.

³Tilly (1975) points out this fundamental selection problem: “Most of the European efforts to build states failed. The enormous majority of the political units which were around to bid for autonomy and strength in 1500 disappeared in the next few centuries, smashed or absorbed by other states-in-the-making [...] [O]f the handful which survived or emerged into the nineteenth century as autonomous states, only a few operated effectively—regardless of what criterion of effectiveness we employ. The disproportionate distribution of success and failure puts us in the unpleasant situation of dealing with an experience in which most of the cases are negative, while only the positive cases are well-documented” (p. 38-39).

⁴We use the anachronism “Germany” throughout the paper to refer to the German-speaking lands of the Holy Roman Empire. The cities included in the *Deutsches Städtebuch* encompass Germany in the borders of 1937.

⁵These data have been used previously in Cantoni et al. (2018).

Fourth, we look at the consequences of fiscal centralization. Observing territory-related outcomes, we find that centralized territories are more likely to survive, and grow more (expand the number of cities that they control⁶) than non-centralized territories. Observing city-related outcomes, we find that cities belonging to centralized territories invest more in administrative and military construction. This is predicted by models of fiscal centralization. But we also find evidence that is contrary to one of the core assumptions in the formal literature on fiscal capacity. In theoretical frameworks citizens accept fiscal institutions and taxes because they expect revenues to be used for military investments, which will protect them. These investments are always modeled in the form of non-excludable public goods. Despite this, we find that increases in military investments only occur in the *core* of territories, and not in the *periphery*. Factually, some citizens were thus excluded from these investments, and they can thus not be thought of as public goods.

The rest of this paper is organized as follows. In section 2, we survey the existing literature on fiscal capacity, and derive testable hypotheses that we will empirically test. Section 3 discusses the historical background of fiscal capacity in the Holy Roman Empire, and section 4 explains our dataset. We first look at potential determinants of fiscal capacity in section 5, before turning to the effects of fiscal capacity in section 6. Section 7 concludes.

2 Literature and Hypotheses

2.1 Definitions

State capacity and fiscal capacity are central concepts in the analysis of state formation. State capacity can broadly be defined as a “state’s ability to implement a range of policies” (Besley and Persson, 2010, p.1), or “the *ability* of a state to collect taxes, enforce law and order, and provide public goods” (Johnson and Koyama, 2017, p. 2). Often, states are described according to their ability to enforce policies as either “weak” or “strong”. In some cases the term state capacity does not refer to this broad definition, but to a concept mostly termed fiscal capacity in the economics literature.⁷ Fiscal capacity “captures how much tax a government could potentially raise given the structure of the tax system and its available power of enforcement” (Besley and Persson, 2013, p. 52). Sufficient levels of fiscal capacity allow states to collect enough taxes to finance their policies (Johnson and Koyama, 2017, p. 2). Empirical work has used several observable measures or proxies for fiscal capacity. Dincecco (2009, p. 52) uses a binary variable measuring whether a country is fiscally centralized, where fiscal centralization “was completed the year that the national government began to secure revenues using a tax system with uniform tax rates throughout the

⁶We can also look at the area a territory controls, and find the same relationship using this measure.

⁷The usage of the term state capacity to refer to what is mostly termed fiscal capacity in the economics literature is in line with how Tilly (1975) originally used the term. In this paper state capacity refers to the broad definition listed above, and we use the term fiscal capacity to talk about the capacity to tax in particular.

country”.⁸ Besley and Persson (2011) turn to per capita tax returns as a measure of the degree of fiscal capacity.

Fiscal and state capacity are also relevant for the literature on the importance of institutions for economic growth. Much influential work has defined institutions along the lines of “legal capacity”, the ability to support markets (Besley and Persson, 2010, p.1) and the ability to enforce rules across the entirety of the territory a government claims to rule (Johnson and Koyama, 2017, p. 2). North (1981), for example, measures the strength of states in early modern Europe by their ability to enforce property rights. Acemoglu et al. (2001) consider the risk of expropriation and repudiation of government contracts. Some work on fiscal capacity also studies interactions with legal capacity (e.g. in Besley and Persson, 2009). Looking at an earlier era, the granting of city rights by territorial lords can also be seen as an instance of building of state capacity (Cantoni and Yuchtman, 2014).

2.2 Determinants of Fiscal Capacity

Attempts to explain the emergence of state capacity as a driver of state formation go back at least as far as Weber (1919). Weber defined the state in terms of its monopoly on legitimate violence over a defined geographical area. A large literature (see for example Brewer, 1990; Levi, 1989) has tried to explain how states managed to establish this monopoly. One of the most influential arguments on state formation was made by Charles Tilly (1975), and has often been epitomized in the quote “[w]ar made the state and the state made war” (p. 42). Fighting war was costly, and thus rulers had to extract money from their population to finance these wars. As losing war was costly to everyone (e.g. if cities were looted), the population supported higher military investments and was willing to contribute to finance these. To organize the collection of taxes, fiscal bureaucracies were established. Once some states had built up such institutions, their neighboring states had to build up these fiscal capacity themselves to be able to compete with them or they would vanish (see for example Tilly, 1975; Bean, 1973).⁹ This leads to our first hypothesis:

Hypothesis 1 *Buildup of fiscal capacity in neighboring territories increases the probability that a territory will establish modern fiscal institutions.*

Tilly’s argument that war drives the buildup of fiscal capacity is at the core of many theoretical models on fiscal and state capacity in the economics literature.¹⁰ Military spending as a reaction

⁸Specifically, for the case of the region considered in this paper, Dincecco dates fiscal centralization only for the Kingdom of Prussia, selecting 1806 — the year in which the Stein-Hardenberg reforms, modernizing the entire Prussian government, were enacted — as the relevant date. Our empirical analysis focuses on the dates in which these fiscal institutions were first established, not the year of completion of the process.

⁹For a more detailed summary of the argument that war led to fiscal capacity and this led to state foundation in Europe refer to Herbst (1990, p. 117-122). In broader context, this is related to the study of spatial patterns of adoption of policy innovations, see e.g. Mukand and Rodrik (2005), Dobbin et al. (2007), and Cantoni (2012).

¹⁰Other potential determinants of fiscal capacity that are discussed in the literature are political stability, protection

to a *threat of war* enters models as a public good. While economists argue that there could also be other public goods that drive the build-up of fiscal capacity, they usually discuss military investments as the only example of a common-interest public good (see for example Besley and Persson, 2009). Besley et al. (2013) extend these considerations to a dynamic framework looking at the evolution of fiscal capacity over time, again focussing on the demand for public goods, i.e. military investments, as a potential driver of fiscal centralization.¹¹ A higher demand for the public good translates into more investments into fiscal capacity.

The link between war and fiscal centralization has been refined in several ways. Some authors distinguish between external and internal wars (Besley and Persson, 2008, 2010; Dincecco and Wang, 2018). While the threat of external war generates a common demand for military investments across the entire population, threat of internal war generates conflicting interests among the population. These models predict that as a result, the threat of external war leads to higher levels and threat of civil war leads to lower levels of fiscal capacity. Ko et al. (2018) examine how the number and geographic origins of external threats affect state-building. In their model military strength decreases with distance to the capital city. They argue that, as European territories faced external threats from different directions, it was optimal to have several (smaller) states instead of a centralized European empire. This allowed each state to tax its population and use tax incomes to provide military investments in a capital that was as close as possible to the external threat it was facing. Queralt (2018) distinguishes how war was financed in the modern period (from 1817 to 1913): while tax-financed wars have a positive impact on fiscal capacity, loan-financed wars do not always lead to an increase in fiscal capacity. Karaman and Pamuk (2013) look at twelve European territories from the 16th to the 18th century to test the role of warfare, economic structure, and political regime for the development of fiscal and state capacity. They find that war and modern urbanized economic structures increase tax revenues. Political regimes interact with these factors as representative regimes were more successful at building state capacity in urbanized economies, whereas authoritarian regimes fared better in less urbanized settings.

Gennaioli and Voth (2015) examine the changing role of money for military success over time. Available financial resources only begin to matter for war success after the so-called Military Revolution (after Roberts, 1956), which introduced new (costly) military technologies. While some key innovations such as gunpowder and the star-shaped fortification spread earlier (in the 14th and 15th centuries, respectively), Gennaioli and Voth (2015) determine the year 1650 as the turning point after which differences in military expenditures start becoming crucial in determining the outcomes of a battle. The authors derive a model in which threat of war only leads to increases in state capacity when financial resources matter for the probability of winning a war.¹²

of minorities, dependence on natural resources as well as the distribution of economic and political power (Besley and Persson, 2009). Other authors have argued that distance mattered for building up institutions, and that thus smaller polities had an advantage when travel was still slow and costly (Stasavage, 2010).

¹¹They also regard cohesiveness of institutions and stability of institutions as additional drivers.

¹²Another result of the model in the paper is that only cohesive countries will invest in state capacity, as building up

In our second hypothesis, we test the general argument on war and fiscal capacity, and the refined argument made by Gennaioli and Voth (2015):

Hypothesis 2a *Threat of war increases the probability that a territory will fiscally centralize.*

Hypothesis 2b *Threat of war only increases the probability that a territory will fiscally centralize after the Military Revolution (i.e. after 1650).*

2.3 Effects of Fiscal Capacity

In the models discussed here, more investments into fiscal capacity always generate higher revenues for the state, which are used to finance war, or – more generally – to finance investments into public goods (for example in Besley and Persson, 2009). In addition, states that are able to extract some part of their citizens' incomes have incentives to foster economic growth by investing into growth enhancing policies (in the spirit of Olson's (1993) *stationary bandit*). This mechanism is captured both in the theoretical (Besley and Persson, 2008) and in the empirical (Dincecco, 2015; Dincecco and Katz, 2016; Dincecco and Prado, 2012) literature on fiscal capacity.¹³ This motivates our third set of hypotheses:

Hypothesis 3a *Fiscally centralized territories invest more in military and administration.*

Hypothesis 3b *Fiscally centralized territories exhibit higher economic growth.*

In theoretical frameworks higher spending on war increases the probability of winning war, which means that rulers are able to remain in power (Besley and Persson, 2010); winning wars is thus predicted to be associated with the survival of territories in our setting. Gennaioli and Voth (2015) similarly predict that fiscal capacity leads to a higher probability to win wars after the Military Revolution. They show empirically that large European states with more tax revenues were more likely to win wars after the Military Revolution. To circumvent the problem that war is endogenous, they instrument the threat of war for countries by wars in neighboring countries. In Alesina and Spolaore (2005), there also is a positive relationship between wars and the size of states, because a more bellicose environment is associated with higher incentives to form larger states. We will study the following hypotheses:

Hypothesis 4a *Fiscally centralized states are less likely to vanish.*

Hypothesis 4b *Fiscally centralized states grow more in size.*

state capacity is costly for divided countries. Thus cohesive countries survive, while divided countries disappear.

¹³To study the effect of fiscal capacity on economic growth empirically, these papers use the incidence of war or war casualties in the past as an instrument for fiscal capacity. Conflict in the past is associated with higher economic growth/more wealth today.

Hypothesis 4c *Fiscally centralized states are less likely to vanish and grow more, because they are more successful at war.*

Other effects of war that are discussed in the literature include the build-up of national identity (Alesina et al., 2017; Mazumder, 2018), urbanization (Dincecco and Onorato, 2016), or the welfare state in general (Dincecco, 2015).¹⁴

3 Historical Background

In this paper, we study the rise of fiscal capacity in the Holy Roman Empire (HRE), an assembly of many different territories which existed from the 9th until the 19th century in Central Europe. It was headed by an elected Emperor, who was never able to fully unite the different territories and to create a centralized government. Instead, territories were ruled by local princes, who decided on the administrative and fiscal organization of their lands.

In the early Middle Ages, there was only very little fiscal capacity in the territories of the HRE. Local offices (so-called *Ämter*) were in charge of revenue collection and spending of princes. Revenues did not stem from taxes yet, instead they came from sources that were accessible even without sophisticated levels of fiscal capacity: from estates, demesnes and forests, income from court fees, as well as mine, salt and coin monopolies, and tariffs. The introduction of taxes began in the 13th century (Klein, 1974, p. 12-14). Initially, dues and taxes were mostly paid in-kind, because of the lack of monetarization of the medieval economy. Princes did not have a steady court location, and in-kind payments were extracted locally to provide for the prince and his court. This local collection of non-monetary revenues continued until approximately the middle of the 15th century. After that central cash offices (*Kassen*) were introduced.

An increasing number of feuds between territories, the increasing costs of holding court, and a rise in the costs of war technology were among the factors that required princes to increase their sources of revenues. As a consequence, the fiscal administration had to be modernized. As a first step in many territories, fiscal matters were assigned to one person, the so-called *Landrentmeister*.¹⁵

¹⁴Our research focuses on a European context. The literature on state and fiscal capacity has also studied development trajectories in other regions. Herbst (1990, 2014) aims to explain why African states are comparatively weak by contrasting the history of European state formation to (the absence) of African state formation before colonialism. Land abundance and the absence of external threats in Africa implied that there were no incentives for rulers to build up fiscal capacity to finance wars, thus providing an explanation for the weakness of state power in African states today. Depetris-Chauvin (2016) also suggests that there is a link between historical experiences and current state effectiveness in Africa, as he argues that regions in Africa with a longer history of statehood are better able to preserve order and experience less conflict today. Dincecco et al. (2018) study the link between conflict and fiscal capacity in the African context and find that historical conflict in Africa is associated with higher fiscal capacity, but at the same time more civil war. They suggest that a lack of social trust might explain why more historical warfare is not associated with more favorable current outcomes in Africa in contrast to the European case. Ko et al. (2018) explain the political centralization of China as a reaction to the presence of an external threat stemming from only one direction. In this case, having a government with a large tax base that can provide military investments at the affected border is the optimal strategy.

¹⁵In the lower Rhine areas the role of a *Landrentmeister* existed already in the 14th century, but in general this position only arose from the mid-15th century onward.

The *Landrentmeister* was in charge of collecting and organizing revenues, but there was no formal institution which he presided over. While initially most of these *Landrentmeister* were of noble origin, over time there was a shift towards commoners with a professional and university-trained background. In larger territories one or two writers supported him. One of the first tasks of this basic, un-institutionalized financial “administration” was the inspection and auditing of local offices.

The continuing centralization of territories’ administrations in the 15th and 16th century also affected the organization of fiscal administrations. During this time, Court Councils (*Hofräte*), that is informal groups of confidants, who aided rulers with making decisions, first emerged. Initially, these councils were concerned with all administrative areas, but quickly certain fields were handed to newly established, specialized councils. This marked the beginning of the first Finance Councils, mostly called Chambers (*Hofkammern* or *Rentkammern*) (Klein, 1974, p. 16): centralized fiscal institutions that continued to evolve over the following centuries. The Chamber was in charge of all domains and their revenues, as well as revenues from dues, tariffs, and taxes, using these revenues to make payments in the name of the prince. Eventually, the Chamber took on the role of an economic institution which tried to secure old and promote new revenue sources. This institutional and geographical centralization of fiscal administration was only possible because taxes were now paid in cash and princes had a constant residence. In general, smaller territories had smaller chambers (Wakefield, 2009, p. 16-17); larger territories had several Financial Councilors, smaller territories often just had one.

The exact form and time of introducing a Chamber varied across territories. The first territory to centralize in our dataset is Württemberg: in 1521, while under control of the Habsburg. The concept of centralizing fiscal matters in a Chamber had already been introduced in some areas of the Habsburg Empire at that time. After occupation ended, Württemberg continued to uphold an independent Chamber, which was the central cash office, and in charge of the prince’s domains and local offices. In Bavaria, a Chamber was introduced in 1550. Before this, an assigned official had administered all revenues, but there was no special office in charge of finances yet. After 1550 all spending and all financial matters had to go through the Chamber. Similarly, in Hesse the financial administration was also already executed by assigned officials before the introduction of a Chamber. The actual establishment of a Chamber followed in 1558, with the adoption of the first Chamber ordinance (*Kammerordnung*). It specified that the Chamber was in charge of managing the treasure, debts, the spending of the court on wages and food, as well as all princely properties including the forests. In 1567, Hesse split up into two lineages, Hesse-Kassel and Hesse-Darmstadt. The former territory continued the Chamber, whereas in the latter there is only evidence for a Chamber from the 1590s onwards.

Until the first half of the 18th century, a collegial organization of Chambers became the norm, even though the exact organizational set-up differed across territories. Different departments run by different Councilors within the Chamber were established with the aim of establishing depart-

ments in charge of individual aspects of governing. The first areas where this happened were trade and crafts. Over time, these newly established departments superseded the formerly all-encompassing role of the Chambers (Willoweit, 1982, p. 330-347).

The dissolution of the Holy Roman Empire in 1806 also marks a turning point in the fiscal history of German territories. In response to the Napoleonic Wars, the number of territories fell rapidly and in 1815 the remaining 39 German states formed the German Confederation. Each territory established its own finance ministry, which organized the relevant subordinated departments. There remained large differences in the fiscal capacity of states. For example, a universal income tax, the hallmark of modern fiscal capacity, was introduced in 1834 in Hanover, but only in 1913 in Mecklenburg-Neustrelitz and Mecklenburg-Schwerin. The Principality of Waldeck never introduced a universal income tax until it ceased to exist in 1918.

4 Data

Our analysis is based on a novel panel of 2,392 cities and their corresponding 707 territories from 1400 to 1800.¹⁶ Cities are taken from the *Deutsches Städtebuch* (Keyser et al., eds, 1939-2003), an encyclopedic compendium containing all cities that existed in Germany in 1937. Their location and border maps are taken from Bogucka et al. (2019). Figure 1 maps the location of these cities. We complement this with information on the history of administrative entities based on an encyclopedia on German territories (Köbler, 2007), a website listing lineage trees of the majority of German and European noble families, a large number of historical maps, and sources on individual families and territories (Cantoni et al., 2019).¹⁷

Each city is assigned to a territory in each year. The exact borders of territories in the Holy Roman Empire are mostly unclear.¹⁸ To obtain an idea of the geographical extent of territories, we thus estimate each territory's likely area of influence through the number and location of cities that were under its control, at any given point in time. We proxy borders by drawing polygons around each city, and assigning each point in the Holy Roman Empire to its closest city, taking into account territory ruggedness. The assignment is decided upon by modified Thiessen polygons (Voronoi partitions).

Figure 2 shows a snapshot of the size and location of territories created in this way for each cen-

¹⁶We exclude the territory Bohemia from our analysis for two reasons: first, due to the location of Bohemian lands, our dataset only captures a fraction of the kingdom, which extended far into the east. Thus, we cannot clearly infer about its size and the changes thereof. Second, its ruling family, the Habsburg Dynasty, aggravates the issue further, as their lands in Austria, Hungary, and Spain are also not covered in the data. No other territorial entity or ruling family is so clearly peripheral in our data. We note that no results change fundamentally with Bohemia included into the analysis (results available on request).

¹⁷For more information on the coding of the territories refer to Appendix A.1.

¹⁸The transition from the Middle Ages to the early modern era also marks the slow move from states based on feudal relationships of dependence between individuals (*Personenverbandsstaat*) to the concept of a state as a geographic area defined by spatial, not personal boundaries (*Flächenstaat*). Thus it is difficult to apply modern concepts of borders to previous eras, especially in earlier centuries (Mayer, 1956; Power, 1999; Schubert, 2006; Rutz, 2018).

tury from 1400 to 1800. The number of territories in our dataset declines from 361 to 197 between 1400 and 1800. At the same time the surviving territories grow in size; while the average territory we observe in 1400 had 85 cities, it had 245 in 1800 (the overall number of cities that we observe in each year is constant).¹⁹ Using the Herfindahl index, which measures the concentration of cities across territories, we find that the index increased by a factor of 3 between 1400 and 1800 (see Figure A.1 in the appendix). That is, while half of the territories were unsuccessful and disappeared, the successfully remaining territories tripled their number of cities. By 1800 small territories still existed, albeit in much lower numbers than 400 years earlier.

For each city, the *Städtebuch* contains information on significant construction events at the city level. We group construction events into different categories: administrative (courthouses, town halls, ...), military (castles, arsenals, fortifications, ...), and economic construction (storages, warehouses, manufactories, ...). There are around 16,000 construction events which we can date. We supplement this with data on modern, star-shaped fortifications based on Schütte (1984) and Klöffler (2004), and cross-check those with Wikipedia and google maps satellite images. During the Military Revolution several states built these fortifications, and we treat them as a prime example of a costly military technology introduced by the Military Revolution.

The *Städtebuch* moreover records attacks at the city level, which we consider a proxy for overall war activity. We observe two main groups of attack events: those leading to physical destruction, and attacks leading to a loss of money for the attacked party. It is not recorded from which territories these attacks originated, but in Table A.2 in the Appendix we provide evidence that attacks on cities of territories occur at the same time as new cities enter these territories. It appears thus that attacks on cities are part of a broader set of war activities, in which the territory under consideration is attacked and at the same time also attacks other territories; in the remainder of the paper, we interpret attacks as a proxy for overall military conflict.

To measure fiscal centralization, we collected a novel dataset on the timing of fiscal centralization in the territories of the Holy Roman Empire. The dataset builds on a comprehensive handbook on the history of administration in Germany (Jeserich et al., 1983). We supplement this with information from a large number of publications on fiscal and regional histories. We find evidence for fiscal centralization in 27 territories, which are presented in Figure 3.²⁰ There is considerable variation in the timing of fiscal centralization: Württemberg and Albertine Saxony were the first territories to centralize at the beginning of the 16th century, whereas the Duchy of Mecklenburg-Strelitz, the Prince-Bishopric of Augsburg, the Electorate of Trier, and the Prince-Bishopric of Paderborn only centralize at the beginning of the 18th century. The number of cities within centralized territories increases as the number of centralized territories increases. When Württemberg centralized in 1521, 81 cities belonged to a centralized territory, by 1600 this had increased to 261 cities, and

¹⁹Median territory size increased from 32 to 90 in the same time span.

²⁰Appendix Table A.1 summarizes the dates of fiscal centralization and type of institution that was introduced for each territory, and lists selected sources.

in 1723, when the last territory in our dataset, the Prince-Bishopric of Paderborn, introduced a *Chamber*, there were 1,526 cities in centralized territories. Figure 4 illustrates the increase in the area covered by centralized territories between 1500 and 1800. In 1500 no centralized territories existed yet, but by 1600 already large parts of the area under consideration belonged to centralized territories. By 1700 and 1800 this area had increased even further, incorporating even more space especially in the Northern parts.²¹

5 Determinants of Fiscal Centralization

We first study the circumstances that are associated – albeit not necessarily in a causal way – with the emergence of modern fiscal institutions. According to the literature on fiscal capacity, fiscal centralization is driven by centralization in neighboring territories (Hypothesis 1) and an environment of bellicosity (Hypotheses 2a and 2b). Centralized neighbors and threat of war increase the need of territories for revenues to finance potential conflict. To meet these demands, territories centralize. We estimate the following model to explore this relationship:

$$\begin{aligned}
100 \times \text{Centralization}_{jt} = & \gamma_1 \text{CentralizedNeighbors}_{jt} \\
& + \gamma_2 \text{CentralizedNeighbors}_{jt} \times \text{Post1650}_t \\
& + \beta_1 \text{ThreatWar}_{jt} + \beta_2 \text{ThreatWar}_{jt} \times \text{Post1650}_t \\
& + \zeta_1 \text{Controls}_{jt-1} + \zeta_1 \text{Controls}_{jt-1} \times \text{Post1650}_t \\
& + \alpha_j + \alpha_t + \epsilon_{it}
\end{aligned} \tag{1}$$

where $\text{Centralization}_{jt}$ is a dummy that takes on the value 1 if territory j centralizes in year t , and zero otherwise. To facilitate the readability of coefficients, we multiply this dummy with 100. Once a territory centralizes, it does not lose this status. Since we are interested in territories centralizing instead of staying centralized, we drop territories from the sample after they centralize. $\text{CentralizedNeighbors}_{jt}$ is the natural logarithm of one plus the number of cities from centralized territories within a 50 km radius of j in t . Positive values of γ_1 indicate that centralization of

²¹In our main analysis, we assume that territories have not been centralized if we have not found any evidence of the existence of a chamber. It is possible that by doing so we are treating some territories which in fact were centralized as non-centralized. If this wrong assignment is random, our estimates would be smaller in magnitude than the true difference between centralized and non-centralized territories. If, on the other hand, we are more likely to find evidence on centralization for larger territories, and our outcome of interest (e.g., territorial size, or construction activity) is generally higher in larger territories, our empirical analysis would be biased upwards. There are several reasons why we believe that this is not the case here. First, the historical literature clearly states that centralization in the HRE started in Württemberg in 1521. Thus, it is very unlikely that we missed any events before 1521. Second, not all of our treated territories are large and may encompass only a few cities in the dataset (for example Münster or Trier). Third, we have found explicit evidence on fiscal centralization for some territories that have not been treated – and these are in fact territories that ceased to exist. Last, there is a large regional history on German territories, which also focuses on small territories. In addition, we address this issue in our empirical analysis by controlling for territory fixed effects, thus only looking at the variation of outcomes within a territory after centralization was introduced.

neighbors is related to the centralization of a territory, as claimed in Hypothesis 1.

To capture the threat of war, *ThreatWar* is measured in two ways: first, we use a dummy measuring whether any cities in territory j were attacked in the current period or one or two decades before, which proxies actual war activities. Second, we also turn to the stock of military construction by other territories within a 50 km radius of territory j as a measure for the risk of a potential war, capturing how militarily exposed j is. The coefficient β_1 tests Hypothesis 2a, i.e. whether threat of war is associated with an increased probability to centralize.

CentralizedNeighbors and *ThreatWar* are both interacted with *Post1650*, a dummy for all decades after 1650. We follow Gennaioli and Voth (2015) who also use a dummy for the time after 1650 to capture the onset of the Military Revolution, after which financial resources arguably became more important to win wars. If Hypothesis 2b is true, and threat of war after the Military Revolution increases the probability that a territory centralizes, β_2 will be larger than zero. γ_2 indicates whether centralization of neighbors is associated with a different probability of centralization of a territory after the Military Revolution.

Controls_{jt-1} comprise the lagged natural logarithm of the number of cities in territory j . We also interact this with *Post1650* to allow the number of cities to have a different effect before and after the onset of the Military Revolution. α_j are territory fixed effects, and α_t are decade fixed effects. By including territory (time) fixed effects we are controlling for any territory (time) specific factors that are constant over time (the same for all territories). This is important in our setting if these factors are correlated with threat of war or centralization of neighbors and have an effect on centralization themselves. One example of such an omitted variable is resource abundance: territories that have access to more valuable resources, such as silver, might be attacked more often by other territories, and at the same time they are richer and thus able to invest more money in fiscal centralization. Standard errors are clustered at the territory level.

We use a linear probability model here to calculate the probability of centralization, following the approach in Belloc et al. (2016). Using a linear probability model in this setting, as opposed to a probit, logit or Cox duration model, allows us to include a wider range of fixed effects.

Results of estimating equation (1) are presented in Table 1. Before the onset of the Military Revolution, a 1 percent increase in the number of cities of a centralized territory within a 50 km radius is associated with a 1.4 percent increase in the probability of centralizing. After the Military Revolution, there is no longer a statistically significant difference in the probability of centralizing between territories with and without a centralized neighbor. This supports Hypothesis 1 with limitations; having a centralized neighbor increases the probability of centralization, but only before 1650; after the Military Revolution, having a centralized neighbor no longer predicts centralization.

There are two potential explanations for this pattern. First, territories with a centralized neighbor might be more likely to disappear, that is, they are more prone to being conquered by their centralized neighboring territory. In this case, they cease to exist before they have a chance to centralize. We examine the relationship between centralized neighbors and survival rates in the

next section. A second possible explanation is that centralized territories no longer focus on solely conquering their neighbors after the Military Revolution, but use novel military technologies to conquer territories in all parts of the HRE. In this case the overall number of centralized territories instead of distance to a centralized territory matters for centralization. The overall number of territories is the same for all territories and is thus captured by year fixed effects.

Attacks in the current and past two decades are positively related to centralization of a territory. This effect does not change with the onset of the Military Revolution (columns 2 and 4). Looking at the mere risk of war the same pattern emerges: an additional military building of another territory that lies within a 50 km radius increases the probability of centralization by 0.8 to 1.5 percent both before and after the Military Revolution (columns 3 and 5). This suggests that the so-called *threat of war*, which forms the basis of many models, can be understood both as the threat of an existing war or the threat of war occurring. With regard to our hypotheses the results suggest that conflict is related to centralization (in line with Hypothesis 2a), but this effect does not arise with the advent of the Military Revolution (contrasting Hypothesis 2b).

6 Effects of Fiscal Centralization

6.1 Local Investments

We now compare investment activity of centralized and non-centralized territories at the local level. Hypothesis 3 postulates that fiscally centralized territories invest more in administration and the military, and have higher rates of economic growth. We analyze investment activities at the city level and proxy investment activity by physical construction. In particular, we examine whether overall construction activity increases, and whether there is more administrative, military and economic construction. We interpret overall construction as conveying information on investment activity in general, administrative construction on investments into state capacity, military construction as investments into military, and economic construction as a proxy for economic activity. Figure 5 presents aggregate construction patterns. Construction is increasing from 1400 to around 1750 and is sensitive to large wars, e.g. during the Thirty Years' War (1618 to 1648) and the Seven Years' War (1756 to 1763) there are sharp drops in overall construction.

We estimate the following model:

$$100 \times Construction_{it} = \beta_1 Centralized_{j(i,t)t} + \zeta Controls_{ij(i,t)t} + \alpha_i + \alpha_{j(i,t)} + \alpha_t + \epsilon_{it}, \quad (2)$$

where *Construction* is the number of construction events (of a certain kind) in city *i* in year *t*. At any point in time, a city *i* is assigned to a territory *j(i,t)*. For readability, we again multiply outcome of interest by 100, thus values can be interpreted as construction per century. We differentiate between overall construction, administrative construction, military construction, construction of fortifications as a subgroup of military construction, and economic construction. *Centralized*_{*j(i,t)t*}

is a dummy that takes value 1 if city i in a given year t belongs to a territory $j(i, t)$ that is currently centralized.

Based on the literature on fiscal capacity, we expect there to be an increase in administrative and military construction (Hypothesis 3a), as well as in economic construction (Hypothesis 3b). In this case, β_1 will be positive. *Controls* account for the presence of a secondary ruler in a city in a given year and for whether the territorial affiliation of a city is contested.

Moreover, we include a number of fixed effects: α_i are city fixed effects, $\alpha_{j(i,t)}$ territory fixed effects, and α_t year fixed effects. We can identify city and territory fixed effects separately, as several cities switch territories over time. By including these fixed effects, β_1 measures how construction within a city changes after it becomes part of a centralized territory, net of the effect of unobserved factors that are constant over time for the city itself, for all cities in the same territory, and of time patterns in construction that affect all cities equally. This takes into account that centralization might occur during a time in which construction levels change in all cities equally, and controls for aggregate construction decreasing during times of large scale wars. Standard errors are clustered at the territory level.

Table 2 presents results. Overall construction at the city level increases by 0.411 events per century after a territory centralizes; this effect is statistically significantly different from zero at the 5 percent level (column 1). This is around a third of the average construction in a city in a century, which is 1.371 buildings. Centralization is also associated with an increase in administrative buildings (0.068, significant at 5 percent, column 2), which indicates that there are investments into state capacity, as suggested by hypothesis 3a. In addition, military construction increases by 0.039 (significant at 5 percent, column 3). This is an economically significant increase considering that on average 0.051 additional military buildings are constructed per century in a city. However, cities are not more likely to build fortifications, an extremely effective, but costly military technology that spread during the Military Revolution (column 4). Positive effects on overall military construction support the claims of the war-state capacity literature as in Hypothesis 3a. There is no evidence for a differential increase in investments into novel military technologies after centralization.

Hypothesis 3b states that centralized territories experience more economic growth. The relationship between centralization and economic construction, which we use as a proxy for commercial expansion and plausibly economic growth, is presented in column 5. While the estimated coefficient is similar in size to the coefficients for overall, administrative and military construction, standard errors are larger for economic construction.

Do these increases occur equally within centralized territories? In Panel B we differentiate between cities that were in a territory during the time of centralization, and cities that become part of already centralized territories. We refer to cities that were part of a territory at the time of centralization as the *core*, and to cities that became part of an already centralized territory as *periphery*. A peripheral city is coded as centralized after it enters an already centralized territory.

We find that only core cities experience a statistically significant increase in aggregate con-

struction of 0.464 buildings per century (significant at 1 percent level, column 1). Administrative construction increases equally in core and peripheral cities after centralization, which indicates that investments into administration in general, and fiscal capacity in particular, are made in all areas of a territory, also in newly acquired regions (column 2). However, military construction only increases in core cities of centralized territories (column 3). This finding contrasts with the conceptualization of military investments as public goods, and of investments that are used to fortify newly acquired territories. Since administrative investments are equal among core and peripheral cities, this difference cannot be due to a lack in the ability of the territory to enforce fiscal capacity or to operationalize investments in peripheral cities. Finally, economic construction increases by 0.043 (significant at 10 percent level) in core cities following fiscal centralization, but not in peripheral cities (column 5).

Event study analysis To understand the relationship between centralization and local investments over time, we estimate the effects in an event study framework as follows:

$$100 \times Construction_{it} = \sum_{\tau=-5, \tau \neq -1}^5 \beta_{\tau} Centralized_{j(i,t)t} \times DecadeDummy_{\tau(j(i,t),t)} + \alpha_{j(i,t)} + Controls_{ij(i,t)t} + \alpha_i + \alpha_{j(i,t)} + \alpha_t + \epsilon_{it} \quad (3)$$

where $Construction_{it}$, $Centralized_{j(i,t)t}$, α_i , $\alpha_{j(i,t)}$ and α_t are defined as above.

We interact centralization with a set of relative decade dummies for the decades before and after centralization, where the dummy for the decade prior to centralization is omitted. We define the dummy for $\tau = -5$ such as to encompass all the periods 5 decades or more prior to the year of centralization; analogously, for $\tau = 5$ we include all time periods 5 decades or later, relative to the year of centralization. Thus, we estimate construction in cities that will eventually centralize for each decade relative to construction in the ten years before centralization.

We control for whether there is a secondary ruler and whether sovereignty over the city is contested. We again include a full set of fixed effects: city fixed effects, α_i , territory fixed effects, $\alpha_{j(i,t)}$, and year fixed effects, α_t . Thus, β_t compares construction levels in cities that centralize to their construction levels during the decade before centralization after excluding all differences that are due to city specific factors, territory specific factors or time specific factors that exist for all territories.²² Standard errors are clustered at the territory level.

Results are presented in Figure 6, and add more nuance to the results of Table 2. There is no pre-trend in overall construction before centralization. Overall construction only starts to increase in the first decade after centralization, and continues to increase further over the next decades compared to construction levels in the decade before centralization. Before centralization, admin-

²²In Appendix A.2, we show results of Regression 2 when we limit the analysis to all cities that will centralize eventually. Results are nearly identical, as expected with the inclusion of city fixed effects in both regressions. Omitting cities that do not centralized will have an impact on the estimates of the time fixed effects.

istrative construction also shows no pre-trends. After centralization occurs, administrative construction jumps up, and remains on this higher level. Military construction is slightly lower in the third decade before and slightly higher in the second decade before centralization compared to the decade before centralization. After centralization, military construction in centralized cities increases slowly but continuously over the decades. Turning to the construction of fortifications specifically, one does not observe clear differences in trends after centralization.

The pattern for economic construction appears less smooth than that for overall or administrative construction. After centralization occurs, there is only evidence for a positive effect starting 50 years after centralization. The patterns thus add further support for Hypothesis 3a, i.e. that fiscally centralized territories invest more in their administration and their military, as the positive effects begin right after centralization was introduced. We conversely find no evidence strengthening Hypothesis 3b, which stated that centralized territories experience more economic growth, at least not in the short run.

6.2 Warfare in Centralized Territories

We found that investments in military construction are higher in centralized cities that lie in the core of centralized territories. Does this have an effect on war activities conducted by centralized territories, as is commonly assumed in the literature? We estimate the following regression looking at the number of attacks cities in centralized territories are subjected to:

$$100 \times Attacks_{it} = \beta_1 Centralized_{j(i,t)t} + \beta_2 Centralized_{j(i,t)t} \times Post1650_t + \alpha_i + \alpha_{j(i,t)} + \alpha_t + \epsilon_{it} \quad (4)$$

where $Attacks_{it}$ is the number of attacks in a year in city i in year t . Again, we multiply the outcome variable times 100 for easier readability. Coefficients can thus be interpreted as the change in the number of attacks occurring in a century. In further regressions, we differentiate between the number of attacks that lead to physical destruction and the number of attacks that are associated with monetary losses, for example because the city was looted, troops were billeted in it, or the city made payments to hostile troops. This captures the cost of war for the local population. According to the literature on fiscal capacity, people consent to paying taxes to protect themselves from the negative impacts of war. By looking at the relationship between fiscal centralization and attacks with costs for the local population, we assess the existence of this link in the Holy Roman Empire.

$Centralized_{j(i,t)t}$ is a dummy that takes the value 1 if territory $j(i,t)$ is centralized in year i . If $\hat{\beta}$ is larger than 0, cities in centralized territories are subject to more attacks, which we interpret as indicative of territories' involvement in more war overall. $Post1650_t$ is a dummy for all years after 1650, and captures the period after the advent of the Military Revolution. In a second set of regressions we differentiate between cities that were part of a centralized territory at the timing of centralization and cities that become part of centralized territories after centralization, i.e. core

and peripheral cities. α_i are city, $\alpha_j(i, t)$ territory, and α_t time fixed effects. Including city and territory fixed effects is important as attacks predict centralization. By including fixed effects we only consider changes in the number of attacks, not the overall level, so that we allow for the possibility that centralized territories might have experienced more attacks over the entire period under consideration. Standard errors are clustered at the city level.

Considering the entire time period from 1400 to 1800, the number of attacks on cities in centralized territories does not change (column 1, Panel A). Dividing the effect before and after the Military Revolution, we find that cities in centralized territories experience 0.003 fewer attacks per year (significant at 5 percent) compared to cities that are in non-centralized territories.

Next, in columns 4 to 6 of Panel A we focus on attacks that affected cities negatively. The number of attacks resulting in physical destruction is slightly higher in centralized cities before 1650, but does not differ from the number of attacks resulting in physical destruction in non-centralized cities after 1650 (column 4). Cities in centralized territories experience fewer attacks that lead to a loss of money after the Military Revolution (column 6). After the Military Revolution, when military investments arguably become central to success in war, increased military investments of cities in centralized territories are effective in reducing overall attacks, and as a result they also experience fewer attacks that lead to monetary losses for the local population. This adds evidence in line with the argument put forward in the literature about the incentives of citizens to accept the introduction of fiscal institutions.

In Panel B we explore the implication of regional inequalities in military investments between cities in the core and in the periphery of territories. Column 2 shows that decreases in the number of attacks only occur in core cities – and only after 1650. Peripheral cities, where military investments did not increase after they become part of centralized territories, do not experience a drop in the number of attacks in general (columns 1 and 2) or the number of costly attacks (columns 3 to 6) either before or after the Military Revolution.

6.3 Vanishing of Territories

Does the ability of centralized territories to finance more military investments translate into a lower probability of vanishing, as stated in Hypothesis 4a? We estimate the following OLS model to examine the relationship between fiscal centralization, and the disappearance of territories:

$$100 \times Vanish_{jt} = \beta_1 Centralized_{jt} + \beta_2 Centralized_{jt} \times Post1650_t + \zeta Controls_{jt} + \alpha_t + \epsilon_{it} \quad (5)$$

where $Vanish_{jt}$ is a variable that takes on the value 1 if territory j vanishes, multiplied by 100 for readability. In further refined regressions we look at various potential reasons for vanishing,

such as conflict and extinction of the ruling family.²³ After a territory vanishes, it is dropped from the sample. *Centralized_{it}* is a dummy for centralized territories.²⁴ *Post1650* is a dummy for all years after 1650, used to test whether centralization affects territorial survival differently after the Military Revolution. *Controls_{it}* are the lagged natural logarithm of the number of cities and a dummy for the existence of any centralized territories within a 50 km radius, and whether there was an attack on the territory in the current period or the period before. We interact all controls with a dummy for all years post 1650. α_t are year fixed effects that capture shocks that are common for all territories. Standard errors are clustered at the territory level.

Table 4 looks at the relationship between a territory's likelihood of vanishing and centralization. Centralized territories are 0.401 percentage points less likely to cease to exist in a given year (column 1), which is a very large effect considering that the baseline probability of vanishing is 0.444 percentage points each year. Controlling for the existence of centralized neighbors and attacks, the effect decreases slightly (0.378, column 2). This supports Hypothesis 4a, i.e. centralized territories are less likely to vanish. In addition, we are able to uncover a number of interesting patterns about the nature of vanishing of territories. The existence of centralized neighbors has no effect on the general probability of vanishing before or after the Military Revolution. Being attacked increases the probability of vanishing after 1650, indicating that the novel technologies in warfare introduced during the Military Revolution increase the ultimate cost of war for sovereigns: warfare can lead to extinction.

Turning to different reasons for vanishing, we find that centralized territories are around 0.05 percentage points less likely to vanish because of conflict, a sizable effect compared to a baseline probability of vanishing because of a conflict of 0.03 percent (see columns 3 and 4). This is in line with the common interpretation in the literature, where centralization makes territories more successful in (potential) conflicts (either by increasing the probability to win, or by discouraging other territories from engaging in conflict in the first place, as suggested in Table 3).

Moreover, having a centralized neighbor increases the probability that a territory vanishes because of conflict, and this probability increases even further after the Military Revolution. This provides a possible explanation as to why Table 1 shows that territories are no longer more likely to centralize if they have a centralized neighbor after the Military Revolution: while having a centralized neighbor increases the incentives to centralize to be able to compete militarily against centralized neighbors, it also increases the probability that they vanish because centralized neighboring territories attack them. Centralization is also associated with a decrease in the probability of vanishing because of extinction of the ruling family, holding the number of attacks on cities within the territory constant (0.45 to 0.54 percentage points lower probability, columns 5 and 6) compared

²³A territory is coded as vanishing due to conflict or extinction if the territory loses at least one city in the year they vanish due to the respective reason. Results are robust to limiting the analysis to cases in which at least 50 percent of all lost cities are lost due to the respective reason.

²⁴It should be acknowledged at this point that there are territories which centralize and still vanish. One example is Brunswick-Lüneburg, which centralizes in 1616 and vanishes due to lineage extinction in 1705.

to a baseline probability of 0.18 percent.

Overall the results in Table 4 provide evidence in favor of the hypothesis that centralization decreases the probability that a territory ceases to exist because they are more successful at warfare (Hypothesis 4c).

6.4 Territorial Expansion

Finally, we aim to examine whether centralized territories grow in size after they centralize, as claimed in hypothesis 4b. To test this, we estimate the following regression:

$$\begin{aligned} \text{NumberCities}_{jt} = & \beta_1 \text{Centralized}_{jt} + \beta_2 \text{Centralized}_{jt} \times \text{YearsCentralized}_{jt} \\ & + \gamma_1 \text{Attacks}_{jt} + \gamma_2 \text{Attacks}_{jt} \times \text{Post1650}_t \\ & + \alpha_j + \alpha_t + \epsilon_{jt}, \end{aligned} \tag{6}$$

where NumberCities_{jt} is the number (or natural logarithm) of cities that belong to territory j in year t . In separate regressions, we either use all cities and uncontested cities (results in Table 5 in main text), or contested cities and cities with only a single ruler (results in Table A.3 in the Appendix). Uncontested cities are cities over which a territory claims sovereignty without this claim being challenged by other territories, whereas for contested cities this claim is challenged. Cities with a single ruler are cities without a second, less powerful claimant of the city. An increase in the number of uncontested cities thus measures the increase in the size of territories that is not disputed by other territories, and offers a measure of an increase in factual control over a region.

Centralized_{jt} is a dummy indicating whether territory j was centralized in year t , $\text{YearsCentralized}_{jt}$ is the number of years territory j has been centralized. We include this term to allow the effect of centralization on size to grow (or fall) over the duration of centralization. To see whether the potential relationship between centralization and size of territories is driven by attacks, we control for Attacks_{jt} , the number of attacks in the current period. We interact this with Post1650_t to allow attacks to differently affect territory size before and after the Military Revolution. α_j and α_t are territory and time fixed effects. Standard errors are clustered at the territory level.

Results are presented in Table 5. Territories are larger after they centralize, holding territory and time fixed effects constant. Centralized territories on average hold 17 additional cities (significant at 10 percent) after centralization or around 23 percent (significant at 5 percent) more cities (column 1 in Panels A and B respectively). This increase in size occurs over time (column 2). A centralized territory grows by one city every five years (column 2, Panel A) or by 1 percent every ten years (column 2, Panel B). Controlling for the number of attacks on cities within the territory in the current decade does not have an effect on these coefficients. Attacks, which we interpret as proxying for war activities in general, are associated with an increase in territory size by around 1.4 cities (column 3, Panel A). Centralized territories grow by gaining uncontested sovereignty over cities: in columns 4 to 6 we only look at the number of cities uncontested by claims of sovereignty

through other territories. The coefficients are nearly identical to those in previous columns.

To understand the reasons for the increase in the size of centralized territories, we calculate the number of cities that enter and leave centralized territories compared to non-centralized territories using equation (6). Results are summarized in Table 6. Centralized territories do not gain or lose more cities overall compared to non-centralized cities (columns 1 and 4). There is also no relationship between centralization and gaining (losing) cities due to conflict (column 2 and 4). Territories that are engaged in war activities are more likely to gain or lose cities via conflict (columns 2 and 4 in Panel B).

How can we reconcile the finding that centralized territories are larger than non-centralized territories, but at the same time they do not gain more or lose less cities than non-centralized territories, *ceteris paribus*? All territories grow over time, and centralized territories exist longer, as they are less likely to vanish (see Table 4). Centralized territories thus have the opportunity to grow larger because they grow over a longer period of time, not because they grow at a faster rate than non-centralized territories.

7 Conclusion

The emergence of fiscal administrations that are able to levy and collect taxes are an important part of modern state formation (Weber, 1919; Tilly, 1975). In this paper, we document the history of fiscal capacity and how it links to the survival of territories in the Holy Roman Empire and analyze the causes and effects of the introduction of the first institutionalized and centralized fiscal organization, the Chamber.

We show that territories that are exposed to more incentives to centralize – either because neighboring territories are already centralized or because threat of war is higher – are more likely to introduce a Chamber. This confirms Tilly (1975) influential argument that wars led to the formation of states with fiscal administrations.

We then consider the consequences of fiscal centralization, and show that centralized territories are less likely to vanish, and are thus able to become larger than non-centralized territories. Centralized territories invest more in their administration and in their military. However, military investments do not occur equally across the territory: increases in investments only occur in those cities that were already part of the territory at the time it centralized (*core* territory), not in cities that enter the territory later (*peripheral* territory).

This has important implications for the way we should think about fiscal centralization. In theoretical models citizens agree to have fiscal centralization because they expect taxes to be spent on a public good, and thus to profit from them. We find evidence for this in the Holy Roman Empire. However, we add that there is a second important layer: after centralization was introduced, it increases the level of fiscal capacity in the entire territory. Cities that become part of an already centralized territory do not enter a bargain with the sovereign on whether fiscal central-

ization should be introduced, and are thus not offered any “rewards”, and consequently see no increase in military investments. Centralization can thus have large effects on inequality within territories. Higher military investments in the core of territories decreases their exposure to war when financial resources become important to win wars, whereas there is no such relationship for peripheral cities.

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8 Figures

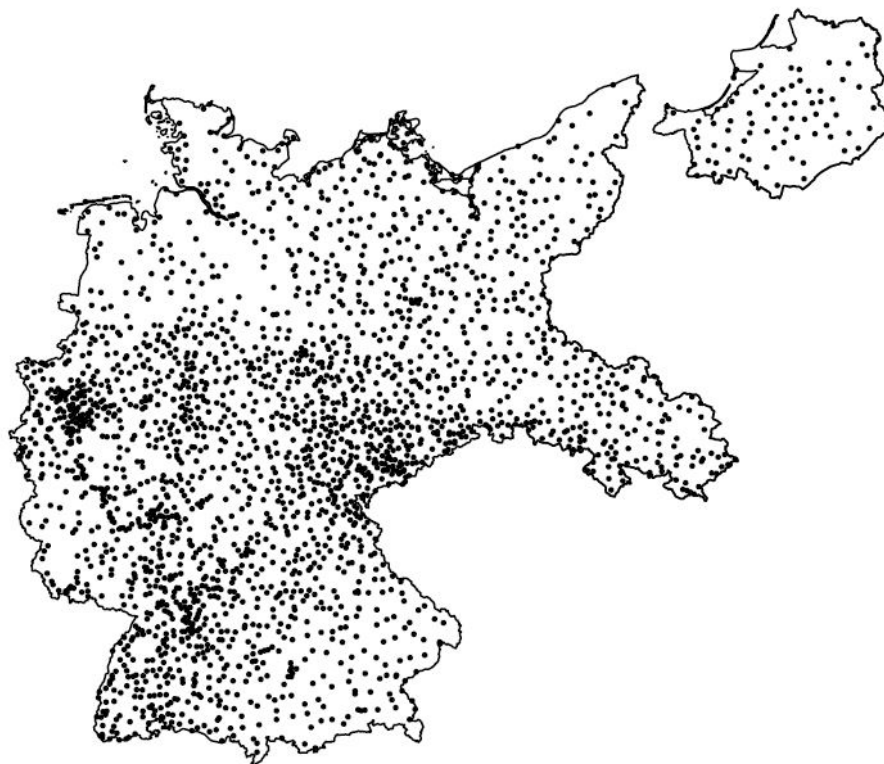
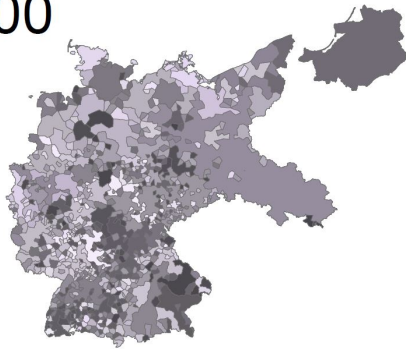


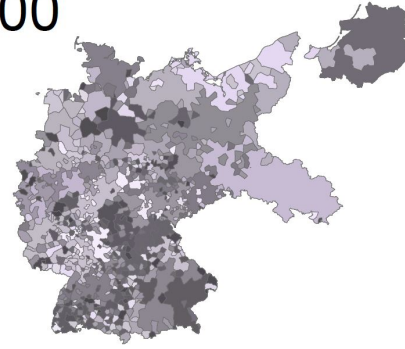
Figure 1: Cities in our Dataset within 1937 Borders

Note Each dot represents the location of one city in our dataset within the borders of Germany of 1937. Data sources: see text

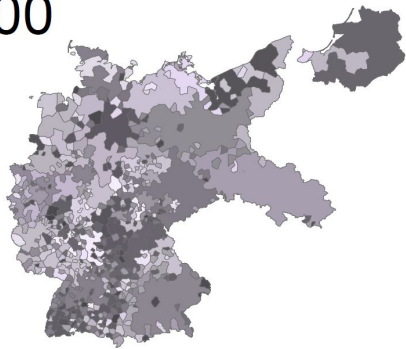
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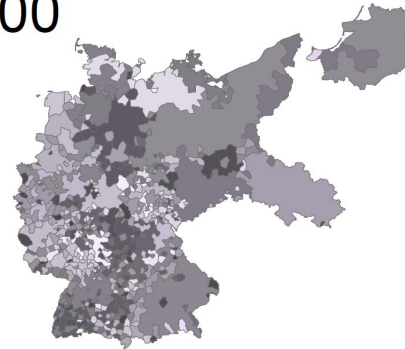
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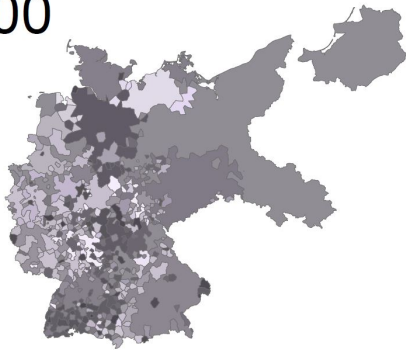
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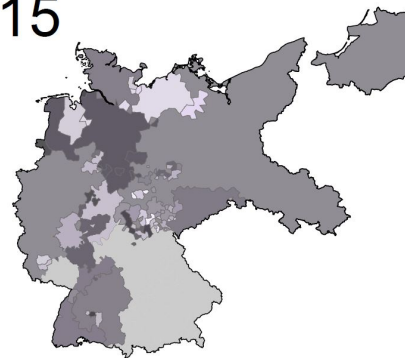


Figure 2: Territories in the Holy Roman Empire

Note The figure shows territorial borders for the years 1400, 1500, 1600, 1700, 1800, and 1815 within German borders of 1937. To map territories, we first calculate a Thiessen polygon around each city, taking into account terrain ruggedness. Next, we aggregate all cities and “their” surrounding Thiessen polygons that belong to the same territory in a given year. Data sources: see text

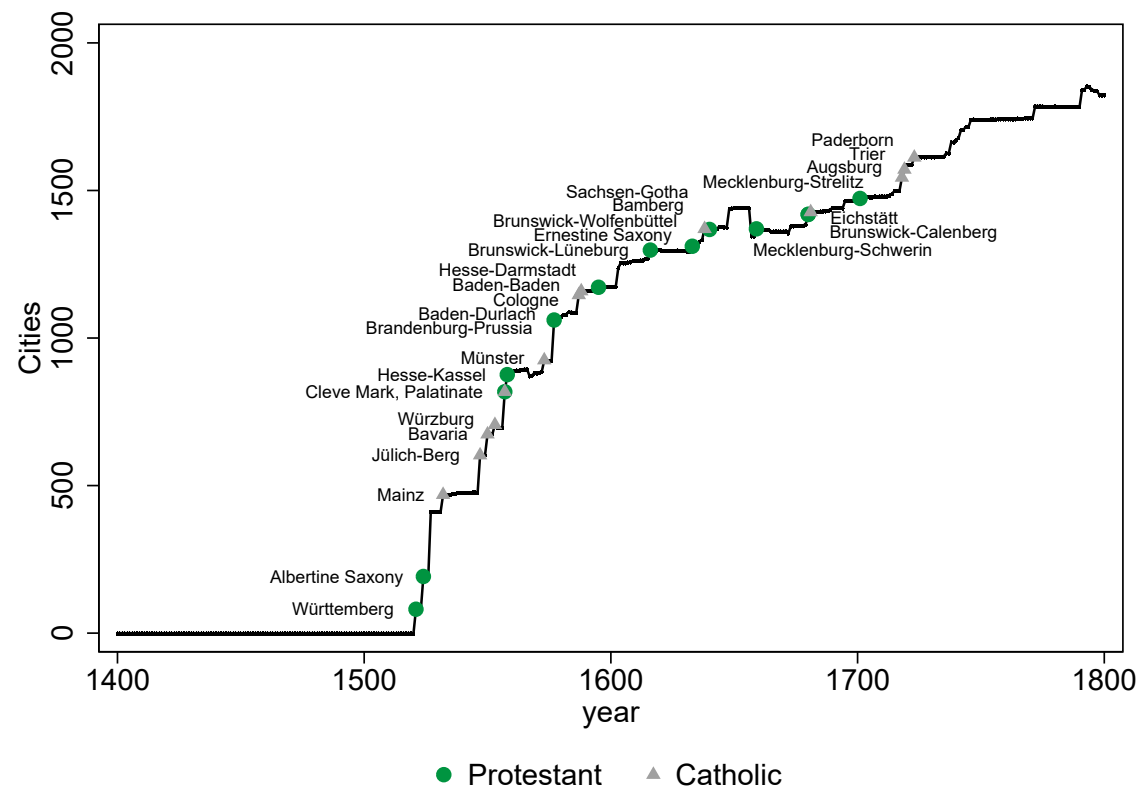


Figure 3: Number of Centralized Cities and Dates of Centralization

Note The figure shows the number of cities that belong to centralized territories in each year. Dots represent the year of the introduction of a Chamber in a Protestant territory, triangles the introduction of a Chamber in a Catholic territory. Data sources: see text and Appendix A.1

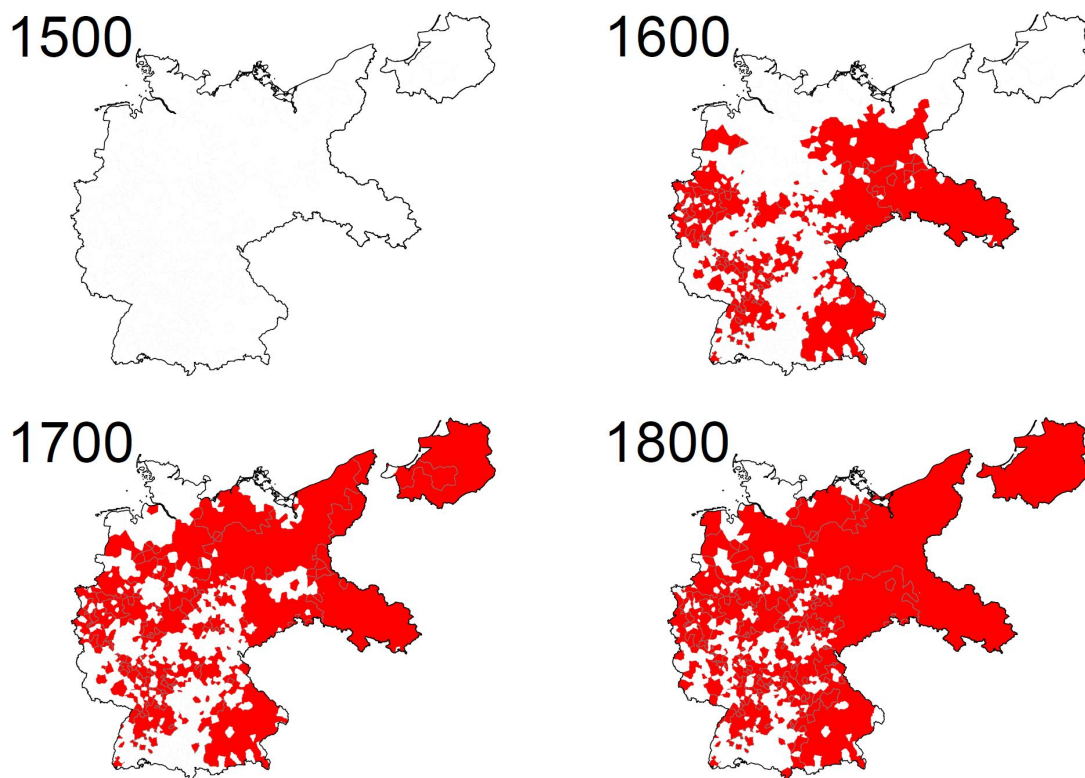


Figure 4: Centralized Territories in the Holy Roman Empire

Note The black area represents the area covered by centralized territories in the years 1500, 1600, 1700, and 1800. Data sources: see text

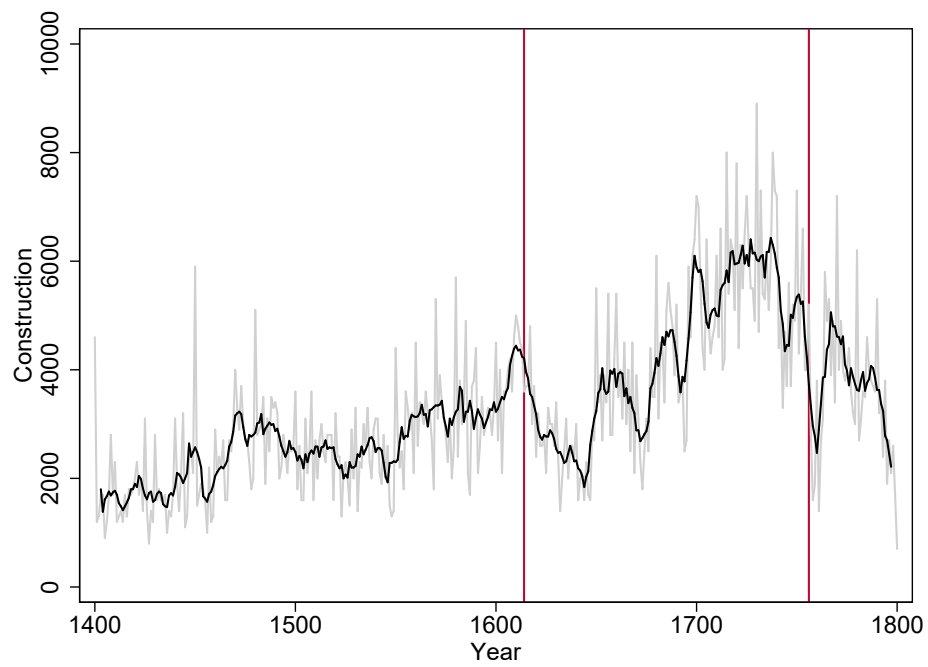
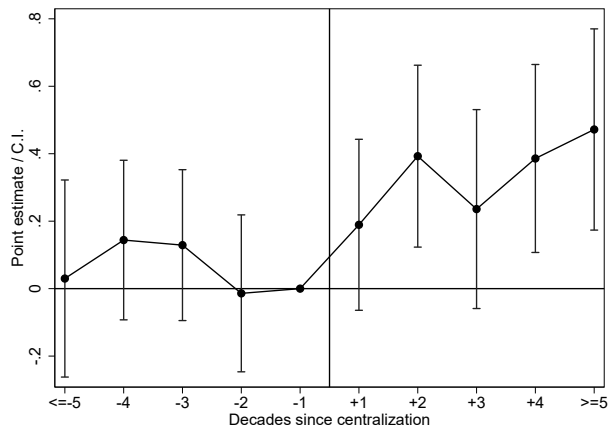
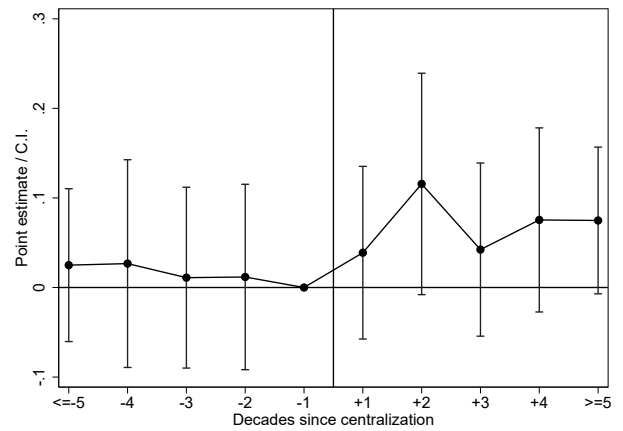


Figure 5: Aggregate Construction over Time

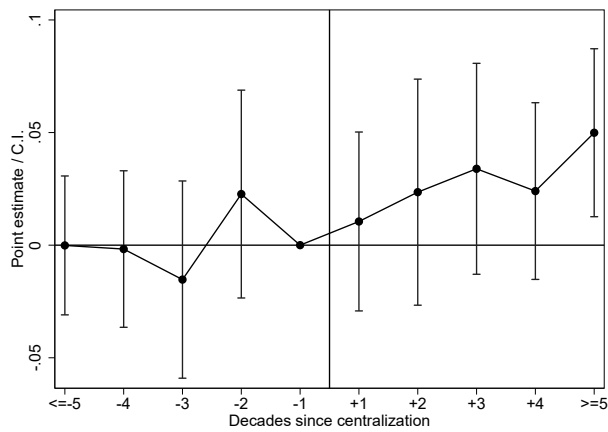
Note This figure shows aggregate construction over time. The gray line presents the raw numbers, the black line construction patterns based on a moving 3 year average. The two vertical lines mark the outset of the 30 Years' War (1618) and the 7 Years' War (1756). Data sources: see text.



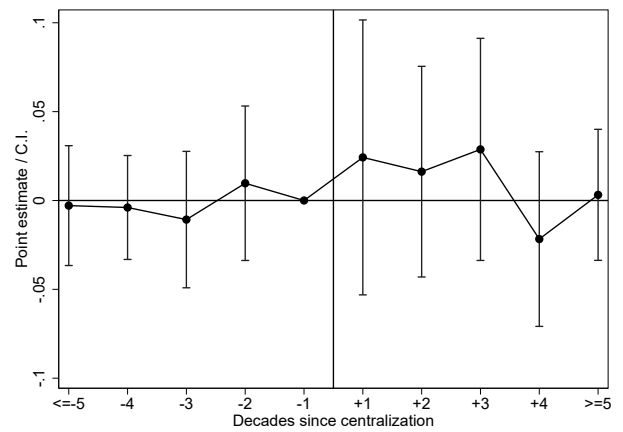
Overall construction



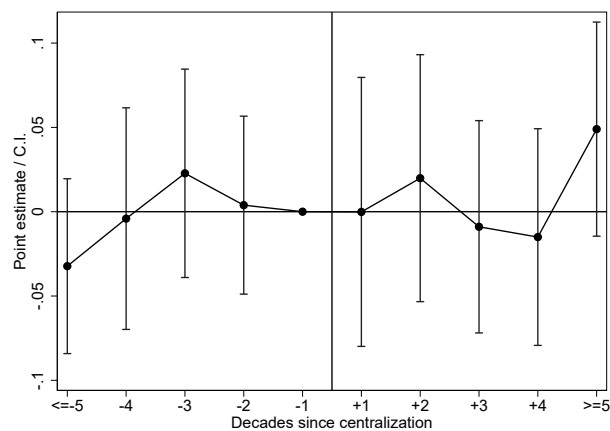
Administrative construction



Military construction



Fortifications



Economic construction

Figure 6: Differences in Construction over Time

Note Results of Regression 3 with 95 percent confidence intervals. Standard errors are clustered at territory level. Data sources: see text

9 Tables

Table 1: Predicting Centralization

	Centralized				
	(1)	(2)	(3)	(4)	(5)
In Centralized Neighbors	2.432*** (0.678)			2.365*** (0.671)	2.043*** (0.648)
In Centralized Neighbors × Post1650	-3.130*** (0.891)			-3.192*** (0.900)	-2.930*** (0.952)
Attack current decade		3.576*** (1.094)		3.443*** (1.065)	
Attack, one decade before		2.076** (0.864)		2.007** (0.845)	
Attack, two decades before		1.392* (0.777)		1.268* (0.758)	
Attack current decade × Post1650		-1.612 (2.150)		-1.433 (2.139)	
Attack, one decade before × Post1650		0.412 (1.965)		0.520 (1.957)	
Attack, two decades before × Post1650		2.045 (2.091)		2.208 (2.090)	
In Military Neighbors			2.835*** (0.936)		1.874** (0.873)
In Military Neighbors × Post1650			-2.625* (1.475)		-1.215 (1.561)
Controls	✓	✓	✓	✓	✓
R-squared	0.421	0.436	0.419	0.441	0.423
Observations	108,771	96,517	108,771	96,517	108,771

Note Table shows results of Regression 1. The individual unit of observation is a territory. The dependent variable, an indicator of centralization of a given territory, is multiplied by 100 for coefficient readability. Controls are the natural logarithm of the number of cities in a given territory and the natural logarithm of the number of cities that belong to a territory times a dummy for post 1650. Standard errors are clustered at territory level. *, **, and *** denote significance on the 10 percent, 5 percent, and 1 percent level, respectively.

Table 2: Construction in Cities

	Construction				
	All (1)	Admin (2)	Military (3)	Fortification (4)	Economic (5)
<i>Panel A: All Cities</i>					
Centralized	0.363*** (0.130)	0.056** (0.026)	0.041*** (0.014)	0.006 (0.010)	0.040* (0.022)
R-squared	0.026	0.006	0.008	0.005	0.007
<i>Panel B: Core vs Peripheral Cities</i>					
Centralized, core	0.390*** (0.131)	0.056** (0.027)	0.043*** (0.014)	0.006 (0.011)	0.040* (0.022)
Centralized, periphery	-0.017 (0.153)	0.065** (0.032)	0.003 (0.013)	0.011 (0.014)	0.038 (0.024)
R-squared	0.027	0.006	0.008	0.005	0.007
Controls	✓	✓	✓	✓	✓
City FEs	✓	✓	✓	✓	✓
Territory FEs	✓	✓	✓	✓	✓
Year FEs	✓	✓	✓	✓	✓
Mean dep. var	1.371	0.205	0.051	0.024	0.065
Observations	889,443	889,443	889,443	889,443	889,443

Note Results of Regression 2. The individual unit of observation is a city. The dependent variable, the number of construction events in a given city in a given year, is multiplied by 100 for coefficient readability. Controls are a dummy indicating whether a city has a secondary ruler and a dummy for whether the territorial affiliation of a city is contested. Standard errors are clustered at territory level. *, **, and *** denote significance on the 10 percent, 5 percent, and 1 percent level, respectively.

Table 3: Centralization and Attacks on Cities

	Number		Attacks			
	(1)	(2)	With physical destruction	(4)	With loss of money	(6)
<i>Panel A: All cities</i>						
Centralized	0.038 (0.087)	0.164 (0.119)	0.040 (0.028)	0.079* (0.042)	-0.003 (0.060)	0.075 (0.081)
Centralized \times Post 1650		-0.304** (0.148)		-0.095* (0.052)		-0.187** (0.084)
R-squared	0.034	0.034	0.015	0.015	0.023	0.023
<i>Panel B: Differentiating between core and new cities</i>						
Centralized core cities	0.045 (0.089)	0.240* (0.141)	0.043 (0.028)	0.086* (0.046)	0.004 (0.061)	0.123 (0.097)
Centralized core cities \times Post 1650		-0.421** (0.168)		-0.101* (0.059)		-0.257** (0.104)
Centralized peripheral cities	-0.068 (0.114)	-0.355 (0.403)	-0.001 (0.034)	0.017 (0.093)	-0.095 (0.076)	-0.268 (0.239)
Centralized peripheral cities \times Post 1650		0.249 (0.450)		-0.060 (0.105)		0.150 (0.260)
City FEs	✓	✓	✓	✓	✓	✓
Territory FEs	✓	✓	✓	✓	✓	✓
Year FEs	✓	✓	✓	✓	✓	✓
R-squared	0.034	0.034	0.015	0.015	0.023	0.023
Observations	889,443	889,443	889,443	889,443	889,443	889,443

Note Results of Regression 4. Standard errors clustered at city level. *, **, and *** denote significance on the 10 percent, 5 per cent, and 1 percent level, respectively. Data sources: see text

Table 4: Probability of Vanishing

	All		Vanishing Due to Conflict		Due to Extinction	
	(1)	(2)	(3)	(4)	(5)	(6)
Centralized	-0.412*** (0.112)	-0.397*** (0.103)	-0.049** (0.023)	-0.052** (0.024)	-0.446*** (0.104)	-0.545*** (0.084)
Centralized \times Post 1650	-0.184 (0.176)	-0.048 (0.177)	0.047 (0.035)	0.094** (0.048)	-0.009 (0.144)	0.145 (0.136)
Centralized Neighbors		0.106 (0.089)		0.010 (0.016)		0.091* (0.052)
Centralized Neighbors \times Post 1650		0.127 (0.116)		0.029 (0.033)		0.078 (0.064)
Attack		0.293*** (0.105)		-0.016 (0.018)		0.024 (0.062)
Attack \times Post 1650		0.025 (0.209)		0.170* (0.092)		-0.048 (0.124)
Attack one decade before		-0.152 (0.186)		0.008 (0.026)		0.151 (0.153)
Attack one decade before \times Post 1650		-0.283 (0.260)		-0.152* (0.087)		-0.270 (0.196)
Controls	✓	✓	✓	✓	✓	✓
Year FEs	✓	✓	✓	✓	✓	✓
R-squared	0.006	0.006	0.006	0.006	0.004	0.004
Mean dep. Var	0.441	0.441	0.030	0.030	0.193	0.193
Observations	109,290	109,290	109,290	109,290	109,290	109,290

Note Table presents results of 5. Controls are the natural logarithm of the number of cities, and the interaction natural logarithm of the number of cities with Post 1650. Standard errors are clustered at the territory level. *, **, and *** denote significance on the 10 percent, 5 percent, and 1 percent level, respectively. Data sources: see text

Table 5: Territory Size

	Cities					
	All			Uncontested		
	(1)	(2)	(3)	(4)	(5)	(6)
<i>Panel A: Number Cities</i>						
Centralized	16.570*	-3.819	-3.883	16.434*	-4.328	-4.385
	(8.974)	(3.624)	(3.571)	(8.907)	(3.601)	(3.549)
Centralized × Years Centralized		0.226*	0.220*		0.230*	0.224*
		(0.123)	(0.116)		(0.122)	(0.115)
Attack, this decade			1.516*			1.414*
			(0.794)			(0.786)
Attack, this decade × Post 1650			2.258			2.406
			(3.202)			(3.164)
R-squared	0.824	0.837	0.838	0.823	0.836	0.837
<i>Panel B: Natural logarithm of Cities</i>						
Centralized	0.284***	0.160	0.158	0.270**	0.122	0.121
	(0.105)	(0.102)	(0.104)	(0.106)	(0.107)	(0.109)
Centralized × Years Centralized		0.001***	0.001***		0.002***	0.002***
		(0.000)	(0.000)		(0.000)	(0.000)
Attack, this decade			0.031			0.031
			(0.027)			(0.028)
Attack, this decade × Post 1650			0.006			0.016
			(0.032)			(0.032)
R-squared	0.947	0.947	0.947	0.943	0.943	0.944
Territory FEs	✓	✓	✓	✓	✓	✓
Year FEs	✓	✓	✓	✓	✓	✓
Observations 108,771	108,771	108,771	108,771	108,771	108,771	

Note Table presents results of Regression 6. Standard errors are clustered at territory level. *, **, and *** denote significance on the 10 percent, 5 per cent, and 1 percent level, respectively. Data sources: see text

Table 6: Gains and Losses of Cities

	Cities gained			Cities lost		
	All (1)	Via Conflict (2)	Purchased (3)	All (4)	Via Conflict (5)	Sold (6)
<i>Panel A: Cities gained and lost: Baseline</i>						
Centralized	5.645 (5.967)	3.270 (5.496)	-1.583 (2.155)	-4.034 (6.630)	-0.706 (1.951)	-0.446 (0.284)
Centralized \times Years Centralized	-0.00743 (0.0645)	0.0167 (0.0734)	0.0142 (0.0292)	-0.0474 (0.0300)	0.00254 (0.00919)	-0.00538*** (0.00161)
R-squared	0.034	0.022	0.015	0.019	0.015	0.018
<i>Panel B: Cities gained and lost: Controlling for Warfare</i>						
Centralized	5.508 (5.939)	3.201 (5.463)	-1.564 (2.161)	-4.442 (6.630)	-0.798 (1.974)	-0.464 (0.292)
Centralized \times Years Centralized	-0.00520 (0.0625)	0.0142 (0.0669)	0.0161 (0.0317)	-0.0377 (0.0274)	0.00391 (0.00967)	-0.00503*** (0.00151)
Attack, this decade	2.890* (1.545)	1.825 (1.109)	-0.645 (0.394)	8.330** (3.341)	1.960* (1.030)	0.374 (0.334)
Attack, this decade \times Post 1650	-1.253 (1.709)	1.023 (3.127)	-0.838 (1.217)	-5.155 (3.185)	-0.782 (1.042)	-0.193 (0.436)
R-squared	0.034	0.022	0.015	0.019	0.015	0.018
Observations 108,771	108,771	108,771	108,771	108,771	108,771	

Note Table presents results of Regression 6, with the number of cities gained (columns 1 to 3) or the number of cities lost (columns 4 to 6) as a dependent variable. Standard errors are clustered at the territory level. *, **, and *** denote significance on the 10 percent, 5 per cent, and 1 percent level, respectively. Data sources: see text

Appendix A Appendix

A.1 Explanation of the Coding Process of Territories

Coding the history of the Holy Roman Empire (HRE) entails coding the history of its ruling families. Under loose regency of the Emperor, countless territorial entities existed, some large (Fürsten- und Herzogtümer), some small (Graf- und Herrschaften). We aim to assign every entity a unique ID and track its territorial holdings using said ID. A correct dataset thus depends on identifying ruling units, and identifying their respective territories.

One can roughly distinguish two types of territories and thus rulers: ecclesiastical and secular. We understand the largely stable ecclesiastical states under clerical rule as one entity throughout their existence. Secular territories, however, were continuously broken up, re-structured, and unified as their rulers changed. These dynamics were often determined by familial structure: Inheritances defined succession, warring siblings or heirs split territories, and marriages proved pivotal when no direct male heir was in a lineage. Understanding and consistently coding this history thus entails a full understanding of the relevant noble families. For this reason, we combine territorial information with lineage information.

Regularly, sons inherited their father's possessions. This could in principle take on many forms: sons sometimes ruled jointly, split the territory between them, or chose a unique successor. Most commonly adapted was the *Primogenitur*; here, the oldest son inherited all possessions from his father. The Golden Bull of 1356 instituted the *Primogenitur* in all electorate territories of the Holy Roman Empire, and other minor territories followed suit. Succession became more intricate when a ruler died without eligible (i.e. male) heirs. While surrounding rulers might have tried to bolster an inheritance claim through strategic marriage, or negotiating a contract to this effect, there were often multiple claims, causing dispute and sometimes war.

We trace lineages (that is, a string of male rulers in one family) throughout their existence by assigning a unique individual code. If a lineage dies out, its Territory ID vanishes with it. In the occasion of a split inheritance between siblings, we attest that there is always one favourable part of the territory. The sibling who inherits the favourable territory inherits the lineage dummy. For the newly founded lineage, a new code is established. Free cities and ecclesiastical territories are assigned one code throughout their history.

To record the territorial holdings, cities are then assigned to their respective rulers as expressed through the lineage codes. For every change, we record its specific reason. If a city is outside the Holy Roman Empire in a given period, we record the state it belongs to, and the family ruling the state, adhering to the rules stated above.

The rule structure of many cities was in reality multi-layered: one family could own estates but enfeoff others, for example. To account for this, we trace secondary in addition to primary rulers, conscious that we will not be able to depict actual power relations accurately. We include secondary rulers as robustness checks and for extended analyses.

Finally, we adjust the territorial dataset to fit the specific application regarding fiscal centralization of states. In order to accurately depict treatment, we “stitch together” states where a ruling family dies out but its institutions survive, and revert to the territorial definitions most suitable to the specific question.

A.2 Figures

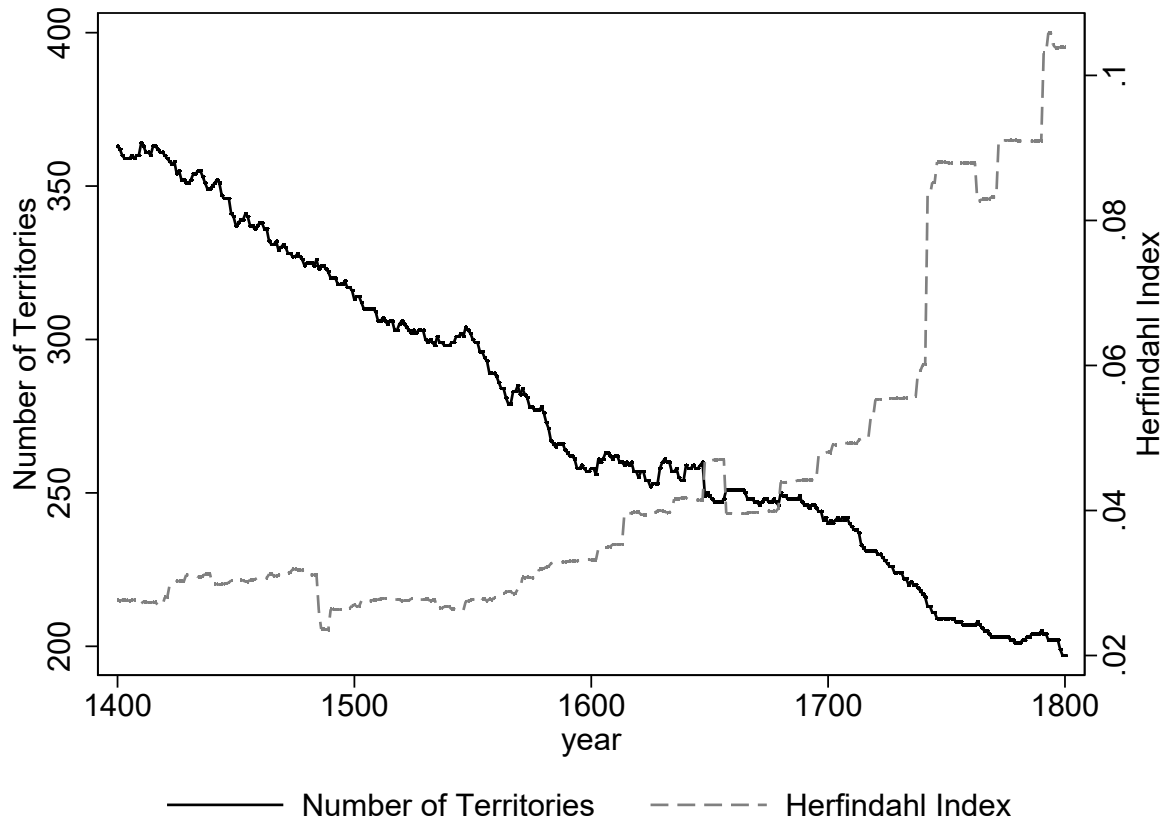
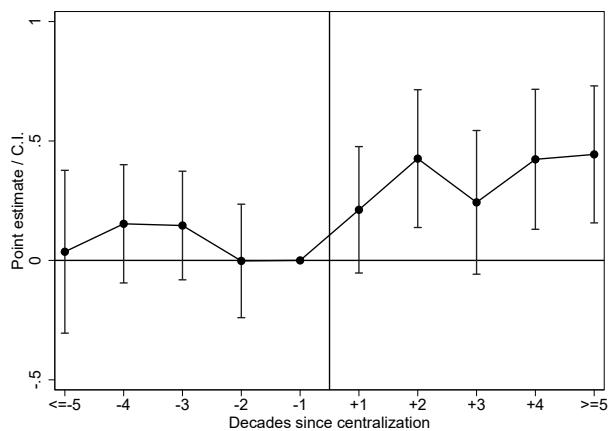
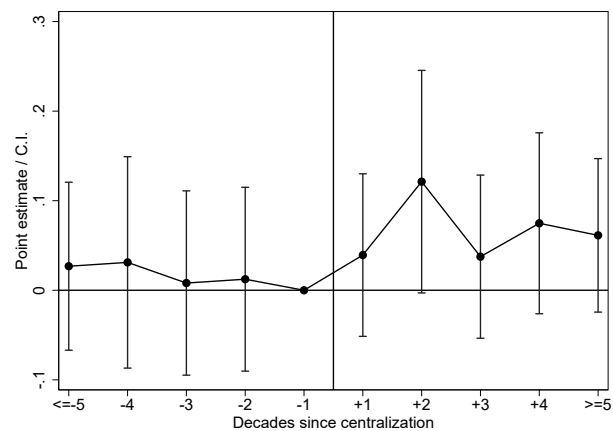


Figure A.1: Number of Territories and Concentration of Cities

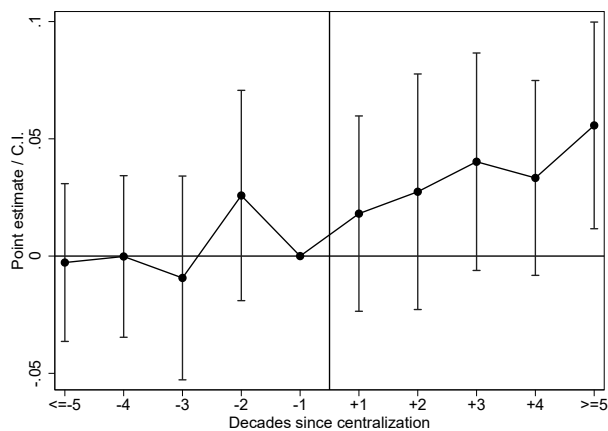
Note Left axis shows number of territories, right axis the Herfindahl Index that measures the concentration of cities across territories. Data sources: see text



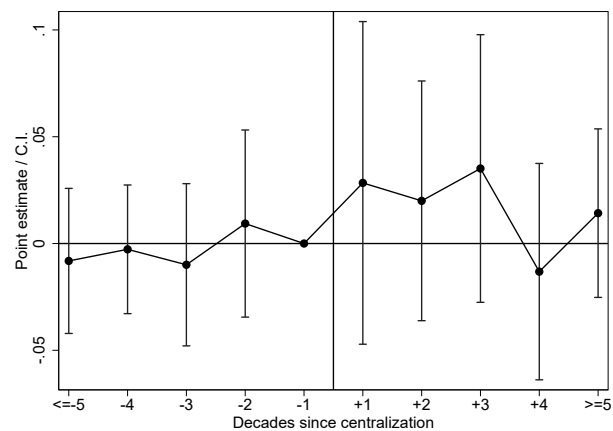
Overall construction



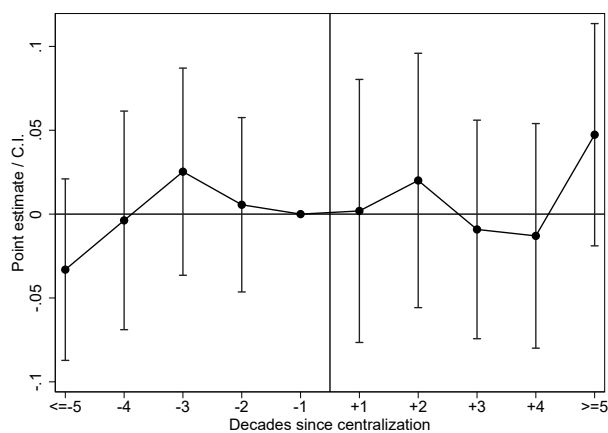
Administrative construction



Military construction



Fortifications



Economic construction

Figure A.2: Time Patterns of Construction, Intensive Margin

Note Results of regression 3 limiting the sample to cities that will at some point be part of a centralized territory with 95 percent confidence intervals. Standard errors are clustered at territory level. Data sources: see text

A.3 Tables

Table A.1: Centralized Territories and Dates of Centralization

Territory	Year	Name	Selected Sources
Albertine Saxony	1524	Rentkammer	Jeserich et al. (1983, p. 816)
Prince-Bishopric of Augsburg	1718	Hofkammer	Wüst (1987, p.39)
Margraviate of Baden-Baden	1588	Rentkammer	Taddey (2000, p. 168) Carlebach (1906, p. 43)
Margraviate of Baden-Durlach	1578	Rentkammer	Jeserich et al. (1983, p. 630), Taddey (2000, p. 168)
Prince-Bishopric of Bamberg	1638	Hofkammer	Weiß (2010)
Duchy of Bavaria	1550	Hofkammer	Jeserich et al. (1983, p. 581)
Margraviate Brandenburg	1577	Amtskammer	Schultze (2004, p. 142-3)
Brunswick-Calenberg	1680	Kammer	Jeserich et al. (1983, p. 754)
Brunswick-Lüneburg	1616	Kammer	Jeserich et al. (1983, p. 753)
Brunswick-Wolfenbüttel	1636	Kammer	Jeserich et al. (1983, p. 752)
Electorate Cologne	1587	Hofkammer	Wüst (1987, p. 37)
Bishopric of Eichstätt	1651	Hofkammer	(Braun, 1991, p. 94)
Landgraviate of Hesse-Darmstadt	1595	Rentkammer	Jeserich et al. (1983, p. 648)
Landgraviate of Hesse-Kassel	1558	Rentkammer	Jeserich et al. (1983, p. 648)
Duchy of Jülich-Berg	1547	Rechenkammer	Jeserich et al. (1983, p. 708)
Duchy of Cleve Mark	1557	Rechenkammer	Schottmüller (1896, p. 66)
Electoral Palatinate	1557	Rechenkammer	Press (1970, p. 99-100)
Electorate of Mainz	1532	Hofkammer	Wüst (1987, p.37)
Duchy of Mecklenburg-Schwerin	1659	Kammer	Hamann (1965, p. 83)
Duchy of Mecklenburg-Strelitz	1701	Kammer	Hamann (1965, p. 99)
Prince-Bishopric of Münster	1573	Rechenkammer	Jeserich et al. (1983, p. 732)
Prince-Bishopric of Paderborn	1723	Hofkammer	Jeserich et al. (1983, p. 735)
Ernestine Saxony	1633	Kammer	Jeserich et al. (1983, p. 853)
Electorate of Trier	1719	Hofkammer	http://www.rheinische-geschichte.lvr.de/orte/Gebiete_1789/herrschaften/Seiten/Kurtrier.aspx
Duchy of Württemberg	1521	Rentkammer	Bernhardt (1971, p. 32-3)
Bishopric of Würzburg	1553	Kammer	Reuschling (1984, p. 232-4)

Table A.2: Attacks on Territories and Gains and Losses of Cities

	Gains		Losses	
	Number (1)	ln (2)	Number (3)	ln (4)
<i>Panel A: Baseline</i>				
Attack	69.767** (31.913)	0.103*** (0.028)	4.036 (35.608)	0.053** (0.026)
Observations	17,979	17,979	17,979	17,979
R-squared	0.310	0.310	0.156	0.250
<i>Panel B: Controlling for past attacks</i>				
Attack	47.877 (37.821)	0.074*** (0.028)	3.321 (43.866)	0.044 (0.029)
Attack, one year before	30.748 (43.810)	0.031 (0.027)	126.810*** (32.947)	0.116*** (0.026)
Attack, two years before	-23.100 (23.728)	-0.011 (0.019)	-65.129 (49.777)	-0.057* (0.029)
Attack, three years before	10.675 (31.979)	-0.001 (0.024)	-24.768 (46.290)	-0.030 (0.026)
Attack, four years before	8.000 (19.618)	-0.000 (0.020)	52.226* (27.828)	0.043 (0.026)
Attack, five years before	17.785 (28.742)	0.024 (0.027)	111.390*** (40.733)	0.050 (0.031)
Observations	12,622	12,622	12,622	12,622
R-squared	0.243	0.317	0.143	0.268

Note Column 1 and 3 look at the absolute number of gains/losses, column 2 and 4 at the natural logarithm of 1 plus the number of gains/losses. Standard errors are clustered at the territory level. *, **, and *** denote significance on the 10 percent, 5 per cent, and 1 percent level, respectively.

Table A.3: Territory Size

	Contested			Cities		
	(1)	(2)	(3)	(4)	(5)	(6)
<i>Panel A: Number Cities</i>						
Centralized	0.136 (0.186)	0.509* (0.259)	0.502* (0.258)	17.531** (8.270)	-2.017 (3.186)	-2.048 (3.147)
Centralized \times Years Centralized		-0.004* (0.002)	-0.004 (0.002)		0.216** (0.109)	0.211** (0.103)
Attack, this decade			0.102** (0.047)			0.922* (0.530)
Attack, this decade \times Post 1650			-0.148 (0.094)			2.505 (2.794)
R-squared	0.470	0.472	0.473	0.805	0.821	0.822
<i>Panel B: Natural logarithm of Cities</i>						
Centralized	0.004 (0.077)	0.055 (0.071)	0.054 (0.071)	0.327*** (0.102)	0.173* (0.099)	0.172* (0.100)
Centralized \times Years Centralized		-0.001 (0.001)	-0.001 (0.001)		0.002*** (0.000)	0.002*** (0.000)
Attack, this decade			0.019 (0.013)			0.023 (0.025)
Attack, this decade \times Post 1650			-0.015 (0.026)			0.019 (0.032)
Territory FEs	✓	✓	✓	✓	✓	✓
Year FEs	✓	✓	✓	✓	✓	✓
R-squared	0.766	0.766	0.766	0.938	0.939	0.939
Observations	109,487	109,487	109,487	109,487	109,487	109,487

Note Results of Regression 6 using the number of contested cities (columns 1 to 3) and the number of cities with a single ruler (columns 4 to 6) as an outcome. Standard errors are clustered at territory level. *, **, and *** denote significance on the 10 percent, 5 per cent, and 1 percent level, respectively.