The Rise of Fiscal Capacity

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Abstract

This paper studies the role of fiscal capacity in European state consolidation. Our analysis is organized around novel data on the territories and cities of the Holy Roman Empire in the early modern era. Territories implementing an early fiscal reform were more likely to survive, increased in size, and achieved a more compact extent. We provide evidence for the causal interpretation of these results and show key mechanisms: revenues, military investments, and marriage success. The imposition of Imperial taxes, which increased the benefits of an efficient tax administration, exogenously drove the implementation of fiscal centralization, tilting the consolidating states toward absolutism.

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1 Introduction

Europe in the Middle Ages was divided into hundreds of territories with limited and uncertain extent of their monopoly of power and overlapping jurisdictions. By the end of the early modern era, this territorial landscape had undergone a profound process of institutional innovation and state consolidation: the number of territories was substantially reduced, their competences and sovereignties clearly defined, and the princes' capacity to rule and tax was mostly uncontested (North and Thomas, 1973; Jones, 1981; Tilly, 1990). This development marked the transition from informal, personalized arrangements to a structured, institutionalized system of rule. As fragile states with low fiscal and state capacities remain, to this date, an unresolved challenge in many parts of the world, the trajectory of Europe in the past half millennium stands out as remarkable.

In this paper, we study the role of a crucial institutional innovation in the Holy Roman Empire — the development of fiscal capacity through modern, permanent administrations — in fostering this historical development (Hintze, 1975; Schumpeter, 1991). Between the 16th and the 18th century, several territories introduced permanent offices, staffed by professionally trained individuals, in charge of raising and organizing revenues, and replacing personalized, local, or ad-hoc systems. These offices, mostly called "Chambers" (*Hofkammer* or *Rentkammer*), substantially increased the efficiency of revenue extraction, and thus allowed to project military, political, and diplomatic power.

We find that, after centralizing their fiscal administration in Chambers, territories embarked on a process of state consolidation: they were more likely to survive, increased in size, and were able to achieve a more compact (cohesive) territorial extension. We show four key mechanisms through which the princes of the Empire were able to consolidate and strengthen their territories following the establishment of fiscal institutions: an increase in revenues; a reduction of short-term lending, as measured by the number of cities pawned to other rulers; more investments in military infrastructure, leading to improved defensive capability; and, a higher ability to marry off daughters to powerful princes. Crucially, this development took place outside the early parliaments, paving the way for German territories to become bureaucratic-absolutist states.

As a loose confederation of hundreds of largely sovereign states of varying size, the rich array of the Holy Roman Empire provides an ideal setting in which to study the genesis and consequences of this institutional innovation. In contrast to existing literature that focuses on few, ex-post successful territories such as Prussia or England, we observe

all territories and cities of the Empire at the yearly level, thereby overcoming selection (survivorship) bias.[1]

Laying the groundwork for our analysis is a major, novel data collection. First, we construct a dataset providing a complete picture of both cities and territories in the Holy Roman Empire. We link each city in the *Deutsches Städtebuch* (Keyser et al., 1939-2003), a detailed encyclopedia of all 2,371 cities in Germany, to its ruling dynasty for every year between 1400 and 1789. Aggregating this information, we can identify all territories ruling over at least one city extant in the Holy Roman Empire and trace their existence, size, and shape. We can describe their mergers, break-ups, expansions or losses as a consequence of wars, treaties, or dynastic changes. We further identify rulers of secular territories in an extensive kinship and marriage network of noble families. The resulting dataset encompasses 99,138 observations at the territory$\times$year level, 15,640 rule transitions, 625 distinct territorial entities, and 2,799 rulers of secular territories.[2]

Complementing these data, we document the presence and date of development of centralized fiscal institutions ("fiscal centralization") for 39 territories of the Holy Roman Empire in the period between the 16th and the 18th century. We also collect information about time periods in which (territory-level) Estates were active, and about the exposure of each territory to Imperial tax levies. Moreover, we collect an extensive set of additional data on the geography (ruggedness, agricultural suitability, distance to rivers and sea), economy (markets and construction activity) and conflict involvement of cities (attacks and military buildings). Information on neighboring territories allows us to measure a city's or territory's exposure to military threats.

We first offer a conceptual framework, motivated by historical evidence. Chamber adoption mainly yields benefits of efficiency in revenue handling, but comes at a fixed cost component for princes and a loss in their discretionary spending power. We argue that the need to levy an Imperial tax was a main exogenous driver of Chamber adoption:

[1] Tilly (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"* (pp. 38–39).

[2] Overall, we collect data on 2,390 cities and 695 territorial entities but omit some cities and territories from the sample for consistency reasons as described in Section 3. Some analyses are conducted at the city$\times$year level, yielding 810,350 observations.

at irregular intervals, princes were required to contribute to the military expenditures of the Empire, e.g. for the campaigns against the Ottoman troops. These sums could be raised directly from the subjects (without consulting Estates), and represented a shift in the benefits of efficiency in revenue collection. We find that Chambers are more likely to be installed by the territories in the years immediately following a taxation request by the Imperial Diet.[3]

Next, we analyze the consequences of fiscal centralization for the territories of the Empire. We establish that the adoption of fiscal centralization reduced a territory's likelihood of vanishing (because of military conflict or purchase, but not by extinction of the dynasty) in an immediate, permanent, and substantial way. Following fiscal centralization, territories also increase in size: the effect cumulates over time, and centralized territories control about 27.4 percent more cities one century after the institutional reform. We observe that such territories especially increase their number of uncontested cities (i.e., cities over which they rule exclusively), suggesting that fiscal centralization leads to a greater ability to project state capacity and resolve existing conflicts of shared control over regions.

This increase in territories' sizes also allowed rulers to achieve a more compact extension, with fewer enclaves and exclaves. We capture this by calculating, for each city in a territory, the share of its boundary that does not border a foreign polity. Cities in fiscally centralized territories experience a larger increase in their territorial contiguity over time: one century after centralization, our measure of compactness increases by 5 percentage points, relative to a baseline rate of 12%.

We argue that these results likely represent a positive, causal effect of the introduction of fiscal institutions, addressing concerns about selection, omitted variables, and endogeneity. First, our data do not just comprise a selection of the more powerful or most successful, surviving territories, but they include every territory and every city in the Holy Roman Empire over the period 1400–1789. We show that our results are robust to excluding single territories, and also hold within the intensive margin, i.e. the sample of territories that eventually adopt fiscal centralization (thus excluding a large number of potentially less comparable territories from the control group). Additionally, we demonstrate that heterogeneous treatment effects, as discussed by recent literature (De Chaisemartin and d'Haultfœuille, 2020b; Sun and Abraham, 2021), do not confound our results.

[3]None of the territories in this analysis was directly affected by Ottoman campaigns, which took place on the Eastern borders of the Holy Roman Empire. Hence, the incentive structure for the introduction of a Chamber was only affected through fiscal considerations, not direct war exposure.

By including city/territory and year fixed effects, our panel data regressions take into account a large class of potentially confounding factors; we can also control explicitly for potentially time-varying, territory-specific confounders. A major historical development at the territory level is the rise and eventual decline of representative assemblies (Estates). We show that the existence of Estates is not related to the institutionalization of fiscal capacity: the timing of Estates' activity is uncorrelated to the introduction of Chambers; Estates do not directly affect our outcomes of interest; and, the effect of fiscal centralization is not affected by the inclusion of this variable. We conclude that, far from fostering an increasing role of parliaments, expanding fiscal capacity led to a progressive fading of the role of Estates and of the taxation-representation nexus in the Holy Roman Empire.

In a series of event-study analyses, we do not observe pre-trends for our outcomes of interest; territories are thus not embarking on a path of consolidation before the introduction of a Chamber. To speak more directly to endogeneity concerns, we consider an alternative estimation approach, in which we exploit the levying of the Imperial war tax as an arguably exogenous shifter of the likelihood of Chamber adoption in an IV framework.

Finally, we turn to the mechanisms which allow fiscally centralized territories to become more likely to survive, larger, and more compact over time. Using two case studies — Hesse and Albertine Saxony — we show that revenues increase immediately following fiscal centralization. In the broader sample of our dataset, we demonstrate that territories with a Chamber are less likely to resort to inefficient, short-term sources of revenue: cities are less likely to be pawned to other rulers.[4]

After the adoption of a Chamber, territories also invest considerably more in military infrastructure: the rate of construction of new military buildings in cities increases by two thirds. These investments pay off: the likelihood that a city is lost to another ruler following a military attack is reduced by over 80% (relative to the baseline probability) if a city belongs to a fiscally centralized territory. Moreover, territories with a Chamber were able to improve the outcomes of their strategic diplomacy. Rulers of centralized territories married off their daughters more effectively; as a result of these marriages, more (and more powerful) rulers were in their immediate network.

Our paper contributes to a broad array of research. The historical development of fiscal capacity has been studied since the early work by Hintze (1975), Tilly (1975), Brewer

[4]For the vast majority of 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).

(1989), or Bonney (1999). More recent analyses have focused on fiscal innovations such as the introduction of personal income taxes in the 18th and 19th century (Dincecco, 2009; 2015; Dincecco and Katz, 2016). Our work provides a longer-term view of the development of fiscal capacity, encompassing the *early* buildup of fiscal institutions; it also provides a rich and complete array of cases, from small to large territories, covering a core region of Europe.

This literature has also frequently emphasized the tradeoff between levying taxes and the desire to participate in political affairs (North and Weingast, 1989). Our findings show that in the Holy Roman Empire the taxation-representation nexus was resolved in favor of rulers, who erected absolutist state structures at the expense of Estatal fiscal institutions. Complementing our research, the work by Becker et al. (2020) studies the taxation-representation nexus in German cities in an earlier epoch.[5] Our study further enriches our understanding of the institutional "bifurcation" (Cox et al., 2021) between parliamentarism and absolutism — adding to the well-known cases of institutional development in England, where full parliamentary control over taxes developed, and France or Spain, where the Estates General or Cortes were sidelined (North and Thomas, 1973).

Our work also speaks to the rich literature on the formation of the European state system in the early modern era (Schönholzer and Weese, 2019; Huning and Wahl, 2020; Fernández-Villaverde et al., 2020; Ottinger and Voigtländer, 2020). The role of wars in this context has been studied extensively, from the pathbreaking contribution by Tilly (1990), to the theoretical framework by Besley and Persson (2008; 2009) and more recent, empirical work (Gennaioli and Voth, 2015; Dincecco and Onorato, 2016; 2017).

Finally, our findings also relate to research on fiscal capacity in contemporary developing economies, which frequently feature constraints and problems similar to our historical context. These range from imperfect enforcement, studied in the contemporary context by Best et al. (2015), information gaps (Pomeranz and Vila-Belda, 2019), and more generally, the presence of a "compliance gap" resulting from a low enforcement elasticity of tax revenue (Keen and Slemrod, 2017). Relatedly, a series of recent papers has combined the investigation of the historical origins of fiscal capacity and the study of present-day fragile and developing states, yielding insights on the origins of taxation (Sánchez de la Sierra, 2020), on the taxation-representation nexus (Weigel, 2020), and on the challenges of tax enforcement under low capacity (Balan et al., 2021; Bergeron et al., 2021).

[5]Cities, while often endowed with a certain degree of political and fiscal autonomy, mostly belonged to one of the larger territories of the Empire in the period studied in this paper.

The remainder of the paper is organized as follows. In Section 2, we give an introduction to the Holy Roman Empire and explain the political and historical context to the development of fiscal capacity (Chambers) in this region. In Section 3, we introduce our novel datasets. In Section 4, we provide a conceptual framework on and analyze the origins of fiscal centralization; in Section 5, its main effects; in Section 6, mechanisms. Section 7 concludes.

2 Historical Background

2.1 The Holy Roman Empire: Territories and Territorial Competition

The Holy Roman Empire existed from the 9th until the beginning of the 19th century in Central Europe. We focus on the period between the Late Middle Ages and the Napoleonic era, 1400–1789, a time that saw large shifts in both fiscal institutionalization and state consolidation. The Empire consisted of a large number of territories, both secular (such as kingdoms, dukedoms, and free imperial cities) and ecclesiastical (such as prince-bishoprics), and was headed by an elected emperor (Whaley, 2012a; 2012b; Wilson, 2016). Rather than with the Emperor, territorial sovereignty increasingly lay with the rulers of these constituent territories, who decided on the administrative and fiscal organization of their lands (Klein, 1974, p. 3). At the heart of territorial politics were familial connections between and within noble dynasties: Sons of secular rulers inherited their fathers' territories,[6] and marriages strengthened or fractured alliances.

All territories foremost aimed to survive in this institutional setting: they faced threats of annexations or financial dependence. Secular rulers additionally needed to secure succession, while ecclesiastical territories faced the threat of secularization after the advent of Protestantism. To ensure survival, territories aimed to acquire new land holdings to extend demesne areas, and to achieve a more compact shape for ease of administration and defense. Acquisitions were driven by peaceful means of inheritance claims through strategic marriages, and outright purchases of land, as well as by means of warfare.

The transition from the Middle Ages to the early modern era marked the slow move from states based on feudal relationships between individuals (*Personenverbandsstaat*) to the concept of states as geographic areas defined by spatial, not personal boundaries

[6] Following Salic law, the territories of the Holy Roman Empire in our data established male succession. From the 15th century, most territories practiced primogeniture.

(*Flächenstaat*) in adaptation to changing economic and societal needs (Mayer, 1956; Power, 1999; Schubert, 2006; Rutz, 2018). This change was driven by an increasing institutionalization, in which rulers handed off power to bureaucratic office holders, hence decoupling state structures from ruling dynasties (Möckl, 1990, p. 97).

2.2 Early Territorial Finances: Dues, Estates, Pawns

In the early Middle Ages, fiscal capacity in the territories of the Empire was low. Local offices (so-called *Ämter*) were in charge of revenue collection and spending of princes. Revenues came from sources that were tied to geographic and geological features of territories, and which were accessible without sophisticated levels of fiscal capacity: demesnes, forests, metal, salt and coin monopolies, tolls, as well as tariffs (Klein, 1974, p. 12). Due to the multitude of income sources, and the low oversight over local offices, princely income was raised inefficiently.

These sources of revenues were extracted locally to provide for the prince and his court. The immediate, local consumption of surplus implied little need for bookkeeping. A so-called *Landrentmeister* was entrusted with fiscal matters. He was in charge of collecting local surpluses and auditing local offices in an ad-hoc manner, and without presiding over a formal institution — this arrangement was thus by no means a central financial administration (Isenmann, 1999, p. 247).

Over the course of the 15th century, princes strove to secure new funds as their traditional sources of revenue proved insufficient against an increasing number of feuds between territories, the growing costs of holding court, and a rise in the costs of war technology. Taxes were a way to address these financial shortcomings. However, the right to approve and deny taxes lay with the Estates (Finer, 1997, p. 1027), which represented towns, clergy, and nobility/knights and were convened at irregular assemblies (diets).[7] Taxation requests were designated for specific, pre-determined purposes, and decided upon on a once-off basis; Estates opposed regular taxation, which would have curtailed their rights.

As an alternative means to secure short-term revenues, rulers pawned parts of their land holdings to local nobles, who were granted limited privileges over the pawned lands in exchange for money. This proved a risky endeavor for sovereigns: pawning away a large part of the land also removed potential income sources to redeem these pawns; and

[7] Peasants did occasionally form Estates but these were considerably less powerful.

failure to redeem over long stretches of time effectively implied the permanent loss of this pawn.

A territory's potential income sources can thus be divided into two broad categories. One class of revenue sources were at princely disposal, including e.g. demesne income, seignorage from coins, and tolls. Alternative revenue sources were not controlled by the prince directly. Tapping into them meant shifting the balance of power to other stakeholders, either to the Estates (as in the case of taxes) or to local nobility (pawns).

2.3 The Introduction of Chambers

Rulers thus had an incentive to exploit existing revenue sources better, and to handle revenue more efficiently. This required a modernization and centralization of territories' fiscal administration, giving rise to specialized, central institutions, so-called Chambers (usually *Hofkammern* or *Rentkammern*) (Klein, 1974, p. 16). The timing of the first introduction of Chambers in the early 16th century reflects the increasing pressure experienced by rulers to raise revenue. By removing discretionary powers from single individuals, such as the *Landrentmeister*, and transferring it to abstract, rule-bound institutions, Chambers were a central step in the transition to a modern state administration and ultimately bureaucratic absolutism (Jeserich et al., 1983, p. 331).[8]

The Chamber was in charge of all princely income sources, such as demesnes, dues, and tariffs. It used these revenues to make payments in the name of the prince. Its financial endowment and proceedings were separate from the financial means that needed consent of the Estates (Weiß, 2010).[9] The Chamber took on the role of an economic institution mandated to secure and exploit sources of revenue, to handle revenues more efficiently, and to audit and supervise departments and officials.

An evident advantage of this central, collegial fiscal administration was its efficiency.[10] Through its professionalized approach to tax collection, it narrowed the compliance gap, and limited the leakage of revenues on their way from local extraction to the princely

[8] Württemberg is a representative example of Chamber organization with one Chamber master supervising six *Räte* (councillors), one secretary, one bookkeeper (extended to two in 1543), and four scribes (Bütterlin, 1977, p. 11).

[9] We treat as "Chamber" only institutions that are separate from a specific person, i.e. an institution that is collegially organized (Zimmermann, 1933, p. 69).

[10] Rulers and government officials recognized this advantage early on. In 1556 Melchior von Ossa, a lawyer closely associated with the Albertine Saxon court, recommended the institution of a Chamber in a Cameralist handbook (Klein, 1974, p. 21).

treasury.[11]

Against these gains of efficiency foremost stood fixed costs of establishing the new institution, and a loss of discretionary power on the side of the sovereign.Princes had to designate offices and employ Chamber officials; high salaries, intended to reduce opportunities for corruption, further added to the costs of establishing a Chamber.[12] In addition, the prince had to turn his private demesnes into Chamber assets, and to cede parts of his powers of fiscal administration to Chamber officials (Bütterlin, 1977, p. 14). Administration through Chamber officials required a reliable and predictable planning of expenses, and thus princely spending was now subject to oversight — before, it was neither known how much the prince spent, nor for which purposes.[13] While the Chamber introduced fiscal oversight over a prince's finances, there still remained some leeway for discretionary spending.[14]

Taxes, in contrast, had to be agreed upon by the Estates, which controlled the resulting revenues and only approved specific taxation purposes. To rulers, instituting a Chamber and hence narrowing the demesne compliance gap was a considerably more attractive option.

Incentives to adopt a Chamber varied, as the associated benefits and costs changed, across territories and across time. The concept of centralizing fiscal administration in a Chamber was first introduced to the Holy Roman Empire in areas of the Habsburg Empire at the turn of the 16th century. The first territory to fiscally centralize in our data is Württemberg in 1521. Over the course of the following centuries, a substantial number of territories of the Empire introduced similar institutional arrangements (cf. Table A.1).

[11]This is reflected in the texts of early Chamber ordinances, which emphasized the role of supervision of offices through audits and visits by officials. In Hesse, Chamber ordinances instituted regular reporting of local office administrators to the Chamber, and "political visitations" of over one hundred offices. These measures were designed to increase compliance and limit leakage, specifically in relation to forest administrators (Brakensiek, 2004, p. 141 ff.). See also Ertman (1997, p. 8) for an account of the infeasibility of administering finances through the ruler's family.

[12]Melchior von Ossa's cameralist handbook also recommended high salaries and collegiality to ensure a corruption-free Chamber (Krüger, 1980, p. 18).

[13]After the introduction of the Chamber in Württemberg, the ruler was only allowed to obtain funds in excess of his statutary pension against debt certificates (Bütterlin, 1977, p. 2). In Hesse, the main Chamber official, Hans Gleim, formally complained in 1567 about not being able to plan expenses since the ruler would drain Chamber funds with unexpected monetary requests (Zimmermann, 1933, p. 109); later, tighter expense control by Chamber officials limited discretionary spending (Krüger, 1980, p. 55). In Bavaria, duke Albrecht V committed to run all his expenses by the Chamber (Jeserich et al., 1983, p. 581).

[14]Veit Ludwig von Senckendorff's "The German Principality" (1655), a handbook for rulers, mentioned that princes cannot be be blamed if "they, to refresh themselves in the light of cumbersome governing work, use some of the Chamber funds on princely delights and practices".

2.4 Imperial Finances

Changes in Imperial finances, largely exogenous to territories' own internal developments, shifted incentives to adopt fiscal Chambers. The Empire itself possessed no own financial institutions.For the purposes of Imperial defense, the Emperor had to rely on troops provided by territorial rulers. A series of military defeats in the early 15th century demonstrated the inadequacy of these arrangements; additionally, after the conquest of Constantinople in 1453, an increased threat from the Ottoman Empire affected the Eastern Habsburg lands. In response, the Holy Roman Emperor attempted to levy taxes for Imperial defense purposes, but the territories of the Empire were reluctant to comply.[15]

A breakthrough for Imperial finances came with the creation of an Imperial Register, the *Reichsmatrikel*, at the Diet of Worms in 1521, which assigned each territory a fixed share of the imperial tax burden. These Imperial tax levies provided a considerable incentive to introduce a Chamber.

The primary reason for this shift was an innovation that held individual territories, not the Empire, responsible for levying the required sums. For rulers, there was little room for noncompliance: they could be held personally accountable in Imperial diets, and smaller territories faced the threat of having their right to participate in the Imperial diet revoked. Also, the increasing threat of the Ottoman Empire framed the taxes under increasingly ideological terms as a "brave [...] Christian deed" (Koch, 1747 [1530], §. 118).

A territory's share of the Imperial taxes, as set in the *Reichsmatrikel*, was determined in 1521 based on economic power and prestige, and remained fixed for the decades thereafter. Nevertheless, the overall sum of Imperial taxes raised differed over time (see Appendix Figure A.3). The Imperial Diet, meeting irregularly every few years, determined the amount of taxes to be raised (as a multiple of the "Roman Month", a fictitious unit of calculation equivalent to 128,000 guilders). For example, the Diets of 1566/67 approved an imposition of 48 Roman Months, the following Diet of 1570 approved 12 Months, then, after a hiatus of six years, the Diet of Regensburg in 1576 approved 60 Months (Schulze, 1978, p. 80). Thus, while the relative shares of each territory were pre-determined, the actual, required contributions changed at irregular intervals.

This system proved highly successful for Imperial finances: Between 1500 and 1650, the amount of Imperial taxes raised is estimated to have increased tenfold (Whaley, 2012a,

[15]The first Imperial tax, the Common Penny (*Gemeiner Pfennig*) of 1495, was suspended in 1505 and eventually abandoned in 1551 due to lack of compliance: the Empire itself had to collect these taxes, but because state capacity largely lay with the territorial rulers, this proved nearly impossible.

p. 512). Yet, this Imperial cohesion came at the expense of acknowledging and bolstering the sovereignty of territorial rulers.

Importantly, territorial rulers had no interest in passing on the Imperial tax to the Estates to keep their fiscal capacity as low as possible. Instead, the Imperial recess of 1530 determined that princes could, to raise the requested Imperial defense funds, "for all their subjects (...) create and levy a tax"; later recesses confirmed and extended these privileges (Schaupp, 2004, p. 136).[16] This created a substantial incentive to create efficiency-raising, centralized fiscal institutions in the form of Chambers. While princes could not raise arbitrarily large sums (the amount to be raised was public knowledge), there was scope for using revenues for princely purposes with less "leakage".[17]

3 Data

3.1 Territories, Cities, Lineages

Our setting requires a complete picture of both cities and territories in the Holy Roman Empire. To do so, we construct the first dataset linking each of the 2,371 cities in the *Deutsches Städtebuch* (Keyser et al., 1939-2003), an encyclopedic compendium on cities in the Empire,[18] to one or multiple rulers, for each year between 1400 and 1789. We note the kind of rule, the rule hierarchy (if there were multiple rulers), and the reasons for any rule changes. To construct these data, we additionally draw on an encyclopedia on German territories (Köbler, 2007), lineage trees of the majority of German and European noble families, numerous historical maps, as well as sources on individual cities, dynasties, and territories.[19]

The resulting dataset eventually features 810,350 observations at the city$\times$year level, including 15,640 changes of rulers, and belonging to 625 distinct territorial entities.

[16]This was also in the interest of the Emperor, who could more easily hold territorial rulers, who were convened regularly in Imperial diets, than their Estates accountable for noncompliance.

[17]In Hesse, for example, newly established princely coffers also held the Imperial taxes. These coffers served as the foundation of a fiscal administration that was independent of the Estates (Brakensiek, 2004, p. 140). Also, Schulze (1978) documents how rulers diverted parts of Imperial tax requests.

[18]This data source covers all cities within the borders of Germany in 1937.

[19]For more information on the coding of the territories, refer to the documentation files available with Cantoni et al. (2019). We exclude all territories that are directly under Danish, Polish or Bohemian rule and do not belong to the Holy Roman Empire. In Bohemia, for example, the data only captures Upper and Lower Silesia, but the full territory reached far into the East. We also omit the scattered Further Austrian territories of the House of Habsburg as we do not observe Austria, Hungary, and Spain.

Building on this dataset, we construct a series of variables that serve as primary outcomes in Section 5, or as measures of the mechanisms of interest in Section 6. Aggregating the information at the territory$\times$year level, we can measure the size of a territory (measured by the number of cities it rules over). We also code whether and when a territory ceases to exist, and the reasons for its disappearance (dynastic extinction, conquest, or purchase). Next, from the perspective of single cities, we can observe whether, when and why a city changes ruler, and whether the city is put in pawn to a secondary ruler.

Beyond its temporal evolution, territorial rule also had a spatial dimension. To approximate the spatial dimension of territorial holdings over the period considered (lacking detailed, year-to-year maps which reflect the complex layerings of sovereignty), we draw Thiessen polygons (Voronoi partitions) around city centerpoints.[20] Aggregating city polygons belonging to the same ruler, we obtain a graphical depiction of the extent of every territory in a given year.[21] Appendix Figure A.2 shows the resulting evolution of territorial borders for every century. Based on the shape of each territory's extent, we calculate several measures of compactness, or roundedness.

Finally, our dataset also considers the dynastic (network) dimension of the terriorial history of the Empire. We identify 2,799 rulers of secular territories in an extensive kinship and marriage network of over 132,000 members of noble families from Marek (2018). For each member of these dynasties, we know birth and death years, dates of marriage, and a full set of offspring and marriage links between individuals. We assign rulers to their land holdings from Cantoni et al. (2019), and we note the start and end years of their reign. Building on this information, we calculate network-based measures of dynastic connectedness for territorial rulers across time.[22]

[20] Appendix Figure A.1 shows the location of these city centerpoints. See the documentation files available with Bogucka et al. (2019) for details on the construction of polygons and point locations. Alternatively, we can draw modified polygons that take terrain ruggedness and river velocity into account (Bogucka et al., 2019); our results are robust to the use of either definition.

[21] This allows us to move beyond existing, coarse digital maps that have been used in the literature so far (e.g., Nüssli, 2006), and beyond maps that have been drawn by historians for single territories at selected points in time. We do acknowledge that exact borders of territories were ambiguous in the Middle Ages (Mayer, 1956; Power, 1999; Schubert, 2006; Rutz, 2018), but the assignment of cities to territories is clear during the entire time period of interest.

[22] Relatedly, Benzell and Cooke (forthcoming) and Marcassa et al. (2020) also consider kinship and marriage networks of the European nobility.

3.2 Territory-level Institutions

Complementing this detailed information on rulers, rule changes, and territorial holdings, we collect several measures relating to the fiscal-institutional development of these territories. Most importantly, we measure fiscal centralization, our key variable of interest. We construct a novel dataset on the timing of the introduction of a Chamber in the territories of the Holy Roman Empire by supplementing and rigorously verifying information from a comprehensive handbook on the administrative history of Germany (Jeserich et al., 1983) with a large number of publications on fiscal and regional histories. We find evidence for fiscal centralization in 39 territories, which are listed in Appendix Table A.1 along with the corresponding dates and the exact type of institution that was introduced. There is considerable variation in the timing of the introduction of a Chamber: Württemberg and Albertine Saxony are the first territories to fiscally centralize at the beginning of the 16th century, whereas Schaumburg-Lippe, Paderborn and Reuß-Greiz first have a Chamber in the 18th century.[23]

Another major institutional development in early modern Europe was the formation of Estates and territorial diets. For all territories which eventually adopted a Chamber, we collect information about time periods in which Estates were active (see Appendix Table B.1).

Finally, we map the territories in our data to the Imperial Register of 1521 (Zeumer, 1913, p. 313-317).[24] We also note the timing and size of the Imperial tax levy, to which territories had to contribute according to their share in the Imperial Register (Steglich, 1972, pp. 54–55; Schulze, 1978, pp. 79-80; Rauscher, 2012, p. 345). Appendix Figure A.3 shows the distribution of contribution shares as well as the level and timing of the required Imperial tax contributions, which were raised 27 times between 1522 and 1740.[25]

[23] We are confident that territories did not fiscally centralize if there is no evidence of the existence of a Chamber. The historical literature agrees that fiscal centralization in the Empire set out in Württemberg in 1521, so we do not miss events before 1521. Also, there is broad variation in the size of territories with a Chamber, ranging from very large (such as Prussia) to comprising only a few cities (for example Münster or Trier). Similarly, we observe that some territories with a Chamber cease to exist in our coverage period, so that survivorship bias is unlikely.

[24] Similar data has been used in Cantoni (2012). We also assign Imperial Register shares from the repartition of 1648 from Universitäts- und Landesbibliothek Sachsen-Anhalt (2008 [1663]) to our territorial entities.

[25] We omit the extraordinary, low-compliance contributions levied during the Thirty Years' War.

3.3 Other Variables

We collect an extensive set of additional information on the geography, economy and conflict involvement of cities. We calculate distance to the closest sea coast or navigable river (Map 2 in Kunz, 1991). Measures of agricultural suitability are taken from the FAO's Global Agro-Ecological Zones (GAEZ) 2002 database,[26] matched to the Thiessen polygons of city borders. Similarly, we also calculate terrain ruggedness for the area surrounding each city. To assess mining suitability of a city's surrounding area, we identify town charters which contained provisions on mining.[27]

From the *Deutsches Städtebuch*, we extract information on construction events associated with military spending such as castles, arsenals, or fortifications, and pooled construction events as an economic indicator (Cantoni, 2020). As another proxy for economic activity, we collect the number, type and timing of markets in the covered cities (Cantoni et al., 2020b). The *Städtebuch* moreover records attacks to cities, which we take as indicators of (defensive) conflict involvement and military threat to a territory.[28] Finally, we know, due to the spatial nature of our data, the neighbors for each city. Combining this with information on territories, we know military construction events taking place in foreign neighboring cities, or whether a city has neighboring cities that belong to a fiscally centralized territory.

4 Origins of Fiscal Centralization

Not all territories introduced a Chamber until 1789, and the timing of adoption differed widely among those that did (Appendix Figure A.4). It is thus natural to ask what drove the adoption of fiscal centralization by the territories of the Empire, and the timing of this reform. The historical account of Section 2 suggests a stylized framework of costs and benefits of fiscal centralization. The main benefit of introducing a Chamber was a more efficient collection and spending of revenues, narrowing the compliance gap. For a fixed size of the princely demesnes, a Chamber increased the fraction of potential revenues that the ruler could in fact access. On the cost side, there were fixed costs of introducing a

[26] This data was kindly shared by Nathan Nunn due to the FAO download center being defunct at the time of writing this paper.

[27] We extract data on the town charter status of cities from Cantoni et al. (2020a).

[28] Note that information on these attacks is not dyadic, so that we are agnostic about offensive consequences of these attacks to cities throughout our analysis.

Chamber, such as designating offices and employing Chamber officials, as well as power costs for rulers, whose spending was now subject to oversight. Changes in the costs and benefits of introducing a Chamber in a territory determined its adoption.

Importantly, rulers considered short-term benefits (marginally increased revenue) when deciding whether to adopt a Chamber and not the long term gains we study in this paper. The main reason for this is limited knowledge about benefits decades or even centuries after the introduction; also, rulers' discounting of future benefits or costs was substantial in the face of constant liquidity crises of the early modern era. One salient shock to the cost-benefit structure of Chamber adoption was the imposition of Imperial taxes: as the scope of revenues to be collected widened, narrowing the compliance gap through introducing a Chamber provided additional funds that the prince could keep. A simple, formal treatment of these dynamics is provided in Appendix C.

We take this framework to our data and consider the adoption of Chambers in a panel data set. We estimate the treatment hazard of territories in a linear model. Our panel contains one observation for each territory existing in a given decade and the dependent variable (fiscal centralization) is a binary indicator of the introduction of the Chamber in a territory in that decade. Reflecting the absorbing state of this treatment, we omit a territory from our sample once it is treated.

Our regression equation is as follows:

$$Treated_{jt} \quad = \quad \beta\, X_{jt} + \beta^{1500}\, X_{j,1500} + \alpha_t + \varepsilon_{jt} \tag{1}$$

It predicts the eventual adoption of the Chamber ($Treated_{jt}$) at the territory-decade level, using a vector of covariates X. We also control for the initial level of the variables contained in X ($X_{j,1500}$), measured in 1500 (or at the earliest available time period for territories that start to exist after 1500). β can thus be interpreted as the effect of relative changes in the variables contained in X. Finally, the regression includes a full set of decade fixed effects, α_t.[29] Standard errors are clustered at the territory level. We group the covariates into broad groups, related to the geography, internal power structure, economy, or external military pressure of territories; finally, we include a measure of the Imperial tax burden.[30]

[29] We follow other hazard models estimated as linear probability regressions (Currie and Neidell, 2005; Corno et al., 2020) in *not* including territory fixed effects in our main specification.

[30] We observe all covariates on a yearly basis. Note that even characteristics such as agricultural suitability are contained in the vector X_{jt}, as their value might change with a territory's extension.

Geographic conditions influenced a territory's demesnes. We thus include a vector encompassing (standardized) terrain ruggedness, distance to water, agricultural suitability, and the presence of any mining activity in territory j in decade t.We proxy for the internal state capacity of territorial lords by including the the share of cities with secondary rulers, which proxies for the relative power of territorial lords vis-à-vis the local nobility, as well as the share of cities that are members of the Hanse, which indicates the presence of more powerful urban centers. Among economic factors, we consider princely income sources related to the increasing commercialization during the late 14th and 15th century: the overall size of a territory (measured through the number of cities controlled), construction activity in the past decade, and the number of market grants in this territory.

We also turn to potential determinants of fiscal capacity that stem from inter-territorial conflicts (Gennaioli and Voth, 2015). We capture this with a vector capturing construction of military buildings in neighboring territories and exposure to warfare over the last decade. Finally, we look at a territory's contribution to the Imperial tax: the higher this contribution, the larger the incentive to introduce a Chamber.

Table 1: Predicting Fiscal Centralization

	Fiscal Centralization					
	(1)	(2)	(3)	(4)	(5)	(6)
Geographic factors (p-value)	[0.11]					[0.18]
Internal power (p-value)		[0.81]				[0.96]
Commercial factors (p-value)			[0.00]			[0.06]
External pressure (p-value)				[0.00]		[0.10]
Contribution (share) × ln Roman Months					0.714***	0.732***
					(0.209)	(0.211)
Observations	9,771	9,771	9,771	9,771	9,771	9,771
R^2	0.01	0.01	0.03	0.02	0.03	0.05
Baseline Controls	✓	✓	✓	✓	✓	✓
Decade FEs	✓	✓	✓	✓	✓	✓

Note Table presents results of estimating equation (1). Observations are at the territory-decade level. The sample comprises 38 decades and 625 territories. The dependent variable is a binary indicator reflecting the decade of introduction of the Chamber in a territory. We omit the territory from our sample thereafter, reflecting the absorbing state of this treatment. "Baseline Controls" indicates controls for the initial level of the independent variables, measured in 1500 or at the earliest available time period (for territories that start to exist after 1500). Standard errors are clustered at the territory level. *, **, and *** denote significance on the 10 percent, 5 percent, and 1 percent level, respectively. Appendix Table D.1 shows the full set of coefficient estimates of the specification in column 4 above, as well as different empirical approaches, including Cox hazard rates regressions and estimations of first-differenced models.

Table 1 presents results from the OLS estimation as described in equation (1). Factors relating to the geography or internal power structure of territories (viz., changes thereof) are weakly related to the actual timing of fiscal centralization (p-values for joint signifi-

cance of coefficient vectors shown in columns 1–2). Variables reflecting a territory's economy, or exposure to military threats and conflict, as well as the centralization status of neighbors, are generally (positively) related to a territory's own introduction of the Chamber (columns 3–4).

Fiscal centralization occurs in decades with higher requests of contributions to the Imperial budget, as measured by the natural logarithm of Roman Months levied, multiplied by the fixed contribution share (column 5). Conditional on a given share of contributions being assigned to a territory by the Imperial Register, being required to raise 10% more Roman Months (monetary equivalents) in a given decade increases the likelihood of fiscally centralizing in that decade by 0.74 percentage points, against a baseline probability of 0.29 percentage points. This suggests that territories adopted a Chamber when required to meet the Empire's fiscal needs, which widened the scope of revenues to be collected through the princely administration. This finding also holds when considering all potential determinants jointly in column 6: requests of Imperial tax contributions are the most consistent predictor of the timing of fiscal centralization, and hence the most significant shift in incentives to introduce a Chamber.

Appendix Table D.1 shows additional empirical approaches, including Cox hazard rates regressions and estimations of first-differenced models, in the context of the specification of Table 1, column 6. We obtain very similar results: the size of the tax contribution emerges as the only factor consistently predicting Chamber adoption throughout all specifications.

5 Effects of Fiscal Centralization

In the eyes of contemporaries, as the will of Frederick the Great attests, "the first concern of a ruler has to be to survive, only then comes the question of enlargement" (Friedrich II. von Preußen, 1769). We thus consider survival and two aspects of territorial "enlargement" — size and compactness — to depict the major aspects of consolidation. We first turn to these ultimate outcomes of state consolidation, before considering mechanisms in Section 6.

5.1 Survival of Centralized Territories

The most striking feature of state consolidation in the Holy Roman Empire was the survival of some territorial entities at a time when others vanished. To understand the role of fiscal centralization and test whether territories that became centralized were more likely to survive than those that did not, we estimate a linear probability model of the following form:

$$Vanish_{jt} = \beta_1 Treated_{jt} + \beta_2 Treated_{jt} \times DecadesTreated_{jt} + \alpha_t + \varepsilon_{jt} \quad (2)$$

where *Vanish* is a binary variable that reflects whether a territory j vanishes in year t. The specification is thus a hazard estimation in a linear probability setting, analogous to regression equation (1). We multiply the dependent variable by 100. The analysis is at the territory-year level. $Treated_{jt}$ is a dummy that takes value 1 if territory j is fiscally centralized at time t, and $DecadesTreated_{jt}$ measures for how many decades territory j is already treated in year t. This allows the effect of fiscal centralization to change in magnitude over time. α_t are year fixed effects. Standard errors are clustered at the territory level.

The detailed nature of our data allows us to consider three major reasons for territorial vanishing: extinction of the ruling lineage, conflicts, and purchase. Vanishing by dynastic extinction, when a ruling family does not produce a potential heir, is the most common impediment to territorial survival; nearly half of all vanishing territories fall in this group. We consider dynastic extinction to constitute a largely uncontrollable part of territorial survival, whereas the remaining reasons are endogenous to a territory's actions.[31]

Annexation was a constant threat for territories which were unsuccessful in building foreign relations and military strength. An early example is the Burgravate of Dohna, which vanished in a conflict with the Margravate of Meissen over territory in the middle Elbe region in 1402. Similarly, rulers who resorted to selling lands risked ending up in a self-reinforcing circle of ever-growing land pawns and vanishing by purchase. In 1548, Count Berthold of Henneberg-Aschach sold off his last substantial land holdings to the Mansfeld family, thus dissolving the territory, which ended up with Albertine Saxony shortly thereafter.

Table 2 shows results.[32] Columns 1 and 2 show there to be no differences between fis-

[31] As late as 1799, in a territory as significant as the Electorate of Bavaria, the ruling family died out, even though they hired major specialists and underwent fertility treatments multiple times (Stein, 2011).

[32] Similar to Section 4, Appendix Table D.2 includes only territories extant in 1500, and Appendix Table D.3

Table 2: Territorial Survival: Probability of Vanishing

	Vanishing					
	Extinction		Conflict and Conquest		Purchase	
	(1)	(2)	(3)	(4)	(5)	(6)
Treated	-0.0483	-0.0599	-0.129***	-0.149***	-0.0475***	-0.0463***
	(0.0650)	(0.110)	(0.0169)	(0.0194)	(0.0104)	(0.0106)
Treated × Decades Since		0.00132		0.00229*		-0.000130
		(0.00902)		(0.00127)		(0.00103)
Observations	99,138	99,138	99,138	99,138	99,138	99,138
R^2	0.00	0.00	0.01	0.01	0.00	0.00
Mean dep. var	0.21	0.21	0.13	0.13	0.06	0.06
Year FEs	✓	✓	✓	✓	✓	✓

Note Table presents results of estimating equation (2). Observations are at the territory-year level. The sample comprises 379 years and 625 territories. The dependent variable is an indicator that reflects whether a territory j vanishes in year t. We omit the territory from our sample thereafter, reflecting the absorbing state of this treatment. Standard errors are clustered at the territory level. *, **, and *** denote significance on the 10 percent, 5 percent, and 1 percent level, respectively. Appendix Table D.2 includes only territories extant in 1500, and Appendix Table D.3 shows results including both year and territory fixed effects.

cally centralized and non-centralized territories when it comes to extinction; coefficients are small and insignificant. This is consistent with the view that dynastic extinction due to the lack of (male) heirs was an outcome that could not be affected by the actual fiscal capacity of a territory. Columns 3 and 4 instead indicate a sizeable, significantly negative relationship between centralization and vanishing because of conflict. The last two columns consider whether territories cease to exist because they are sold. There is a large, significant reduction of this probability following fiscal centralization of around 80% of the baseline probability. As opposed to the birth of male offspring, thus, fiscal capacity increases the probability to survive thanks to military success and financial strength. We further examine these mechanisms in Section 6.

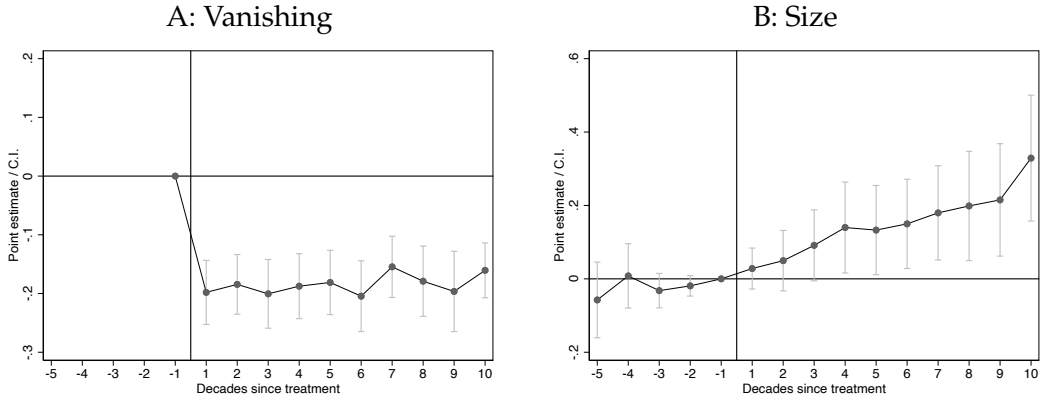
To examine vanishing dynamics over time, we estimate an event study framework:

$$Vanish_{jt} = \sum_{\tau=1}^{10} \beta_\tau Treated_{jt} \times RelativeDecade_{\tau(j,t)} + \alpha_t + \varepsilon_{jt} \ , \tag{3}$$

where $Treated_{jt}$ and α_t are defined as above. The analysis again is at the territory-year level. We interact the treatment indicator with a set of relative decade dummies for the

shows results including both year and territory fixed effects. Again, we obtain very similar results throughout.

Figure 1: Territorial Consolidation Event Studies (I)



Note The plot shows results of event study regressions of the effect of fiscal centralization on territorial survival and size, with 95 percent confidence intervals. Observations are at the territory-year level. The sample comprises 379 years and 625 territories. The dependent variables are (A) a binary variable whether a territory j vanishes due to conflict or purchase in year t, (B) the natural logarithm of cities that j rules alone in t. Standard errors are clustered at the territory level.

decades after treatment; the dummy for $\tau = 10$ is defined to include all time periods ten decades or later relative to the year of treatment. Thus, for each decade after the introduction of Chambers, we estimate the probability of vanishing for treated territories relative to all non-centralized territories, and territories before centralization. Note that we cannot estimate β_τ for $\tau < 0$, since our sample is conditional on a territory having survived up to time τ, i.e. the introduction of the Chamber.[33]

Figure 1, Panel A, shows the probability of vanishing due to purchase or conflict (i.e. excluding dynastic extinction) over time. Following fiscal centralization, there is an immediate, clear, and sustained decrease in this probability (by about 20%), compared to territories without a Chamber.

5.2 Size of Centralized Territories

A second important aspect of state consolidation is the size of territories. From 1400 to 1789 the size of the average territory increased substantially. In 1400 the average territory consisted of around 6 cities, in 1789 this had doubled to 12 cities. While the largest territory in 1400 held 185 cities, the largest territory in 1789 consisted of 598 cities.

The financial situation of territories and their ability to grow in size were closely

[33]This baseline event study also includes never-treated territories. Since $Treated_{jt}$ is zero throughout for these entities, they only enter the estimation via the year fixed effects.

linked, and rulers spent large parts of their revenues to enlarge their territories (Jeserich et al., 1983, p. 71). The case of Albertine Saxony shows how acquisitions were directly influenced by state revenue: after the introduction of a Chamber in 1524, the electoral prince spent 700,000 fl. until 1567 to buy up rural estates, villages, and entire lordships.

Financial means were not only necessary to purchase additional land holdings directly, but also to acquire land by other, seemingly non-financial means (such as inheritance and warfare). The case of Brandenburg — which installed a Chamber in 1577 — in the first decades of the 17th century illustrates the manifold linkages between financial means and size. In 1614 and 1618, the Electorate incorporated Ducal Prussia and the Duchy of Cleves-Mark (see Appendix Figure A.5). Brandenburg's expansion hinged on its financial capacity in three ways: The foundation for the territorial expansion was laid by building inheritance claims through strategic marriages. In 1591, the Elector of Brandenburg, Joachim Friedrich, had married his son Johann Sigismund to Anna of Prussia, which served as the basis for the claims to both the gain of Cleves-Mark and Ducal Prussia. In the case of Cleves-Mark, where the ruling dynasty died out in 1609, the inheritance claims were contested, as Philipp Ludwig of Palatinate-Neuburg also laid claim to the entire territory, giving rise to military disputes. The strength of Brandenburg's military forces ensured a division of the lands in which the larger part of Cleves-Mark went to the Electorate. Finally, disposable income played a direct role to complete the acquisitions, which necessitated large monetary sums — 300,000 fl. to the King of Poland for Ducal Prussia, and 600,000 fl. for Cleves-Mark (, p. 874). In Section 6, we demonstrate how the above factors — disposable income, and foreign relations through strategic marriages and warfare — were substantially influenced by fiscal centralization.

First, we test directly the relation between fiscal centralization and territory size. We estimate the following equation:

$$Size_{jt} = \beta_1 Treated_{jt} + \beta_2 Treated_{jt} \times DecadesTreated_{jt} + \alpha_t + \alpha_j + \varepsilon_{jt} \tag{4}$$

The outcome $Size_{jt}$ is the natural logarithm of cities in territory j in year t. The analysis is at the territory-year level. In addition to time fixed effects α_t, this equation also contains a full set of territory fixed effects α_j. Ownership of cities in the Holy Roman Empire was commonly disputed between several rulers; in addition, cities frequently had a hierarchy of rulers, for example as part of a pawn or a fief. To capture these aspects of state capacity, we consider for each territory the following dependent variables: *(i)* cities it rules alone,

Table 3: Territory Size

	Single Ruler		Uncontested		All	
	(1)	(2)	(3)	(4)	(5)	(6)
Treated	0.224***	0.0766	0.181***	0.0466	0.168***	0.0477
	(0.0608)	(0.0499)	(0.0509)	(0.0438)	(0.0501)	(0.0394)
Treated × Decades Since		0.0197***		0.0181***		0.0162***
		(0.00465)		(0.00497)		(0.00449)
Observations	99,138	99,138	99,138	99,138	99,138	99,138
R^2	0.95	0.95	0.95	0.95	0.95	0.95
Territory FEs	✓	✓	✓	✓	✓	✓
Year FEs	✓	✓	✓	✓	✓	✓

Note Table presents results of estimating equation (4). Observations are at the territory-year level. The sample comprises 379 years and 625 territories. The dependent variable is the natural logarithm of cities in territory j in year t. Standard errors are clustered at the territory level. *, **, and *** denote significance on the 10 percent, 5 percent, and 1 percent level, respectively.

(ii) uncontested cities, and *(iii)* total number of cities.[34]

Table 3 shows that there is an immediate effect of fiscal centralization on territories' size (β_1), measured through the number of directly ruled cities.[35] Fiscally centralized territories also grow larger over time, which points to territorial expansion taking hold gradually (columns 1 and 2). A territory that has been fiscally centralized for 100 years controls around 27.4 percent more cities than before the introduction of a Chamber. Similarly, the number of uncontested cities and the number of all cities — contested, given away, or ruled alone — do not increase immediately upon fiscal centralization of a territory, but grow over time (columns 3 and 4 and columns 5 and 6, respectively). Centralized territories hold 27.6 percent more uncontested cities and 21.0 percent more cities overall after having been fiscally centralized for 100 years. These results suggest that fiscally centralized territories are not only able to grow in size, but also that this growth is neither disputed by rivaling territories, nor shared with other stakeholders.

Our regression results in Table 3 show that territorial growth takes hold over time in the decades following fiscal centralization. We now estimate the analogue of the event-study setup in equation (3). Additionally, we include a full set of territory fixed effects, α_j, as well as a series of interaction terms for the decades prior to the treatment (thus

[34] For more information refer to Section 2 and the data description of Cantoni et al. (2019).

[35] These results on territory size also hold if we exclude city states, which arguably have different means of organizing their finances (Stasavage, 2007), from the analysis.

with $\tau = \{-5, ..., 10\}$), where $\tau = -5$ encompasses all periods five decades or more prior to the year of fiscal centralization. This setup allows us to examine the timing of the increase in size following fiscal centralization and any potential pre-trends in more detail. Figure 1, Panel B, shows the relationship between fiscal centralization and territory size over time. There is no trend in territory growth before the adoption of a Chamber. After fiscal centralization, the event study graph shows a clear increase in size over time, consistent with the positive estimates of β_2 in Table 3.

5.3 Compactness of Fiscally Centralized Territories

Compared to today, the territorial fragmentation of medieval and early modern polities is visually striking. Often territories consisted of disconnected areas with many gaps in their land holdings. State consolidation led to more compact territories. Consider again the example of Brandenburg: following the annexations between 1600–1625, which had fragmented the belongings, territorial growth in the following century rounded off the territory, even connecting previously separate parts of the Brandenburg lands (Appendix Figure A.5). Just as with overall size increases, achieving a more rounded territory hinged on the acquisition of lands, so that the factors discussed in the context of size growth — from financial solvency to functioning bookkeeping — all apply.

Measuring compactness is not straightforward in a context in which territories sought, at the same time, both to expand and to round off the shape of their holdings. Standard measures of compactness will, in general, not be invariant to overall size, and decline in value as territories grow: in the extreme, a territory that consists of only one city will have a large overall compactness.

We thus approach compactness as a measure that penalizes an acquisition of scattered land holdings. We first operationalize this at the level of territories. If a territory is completely spread out, it consists of a set of disconnected cities; the length of its border is then equal to the sum of all city borders.[36] In a more compact territory, cities will lie adjacent to each other. An increase in compactness thus implies longer "internal" (shared) borders between individual cities. Our territory-level measure of compactness is thus defined as the length of all "internal borders" (between ruled cities), relative to the sum of all city borders in that territory. This measure is 0 for disconnected territories. As more cities

[36] As explained in Section 3, we partition the territory of the Empire into a set of mutually exclusive polygons around the 2390 cities. A city's border is thus defined as the border of the polygon surrounding this city.

Table 4: Territorial Compactness

	Domestic Border			
	Territories		Cities	
	(1)	(2)	(3)	(4)
Treated	3.950***	1.588*	2.971***	0.959
	(1.095)	(0.934)	(1.060)	(1.001)
Treated × Decades Since		0.317***		0.410***
		(0.103)		(0.143)
Observations	99,138	99,138	810,350	810,350
R^2	0.93	0.93	0.87	0.87
City FEs			✓	✓
Territory FEs	✓	✓	✓	✓
Year FEs	✓	✓	✓	✓

Note Table presents results of estimating the analogue of equation (4), considering the compactness of territory j in year t as an outcome. Observations are at the territory-year level for the first two columns, and at the city-year level for the last two columns. The sample comprises 379 years and 625 territories (2,371 cities). Standard errors are clustered at the territory level. *, **, and *** denote significance on the 10 percent, 5 percent, and 1 percent level, respectively.

from the same territory share borders, the measure gets larger. For example, our measure of territorial compactness for Brandenburg increases from 0.78 to 0.81 between 1625 and 1725.

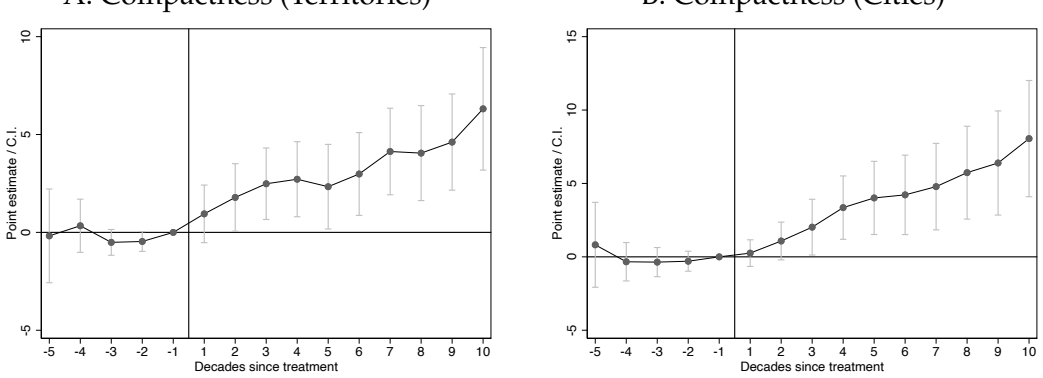
In an alternative approach, we account for the fact that cities might differ in their innate potential for compactness, for example because they are situated at the sea. We measure compactness from the perspective of individual cities, allowing the use of city fixed effects. Analogously to the previous definition, we define a city's compactness as the length of its border shared with cities from the same territory, relative to the length of the entire city border.[37]

We estimate the analogue of equation (4) with the above compactness measure as the outcome of interest (defined either at the level of territories j or of cities i, in each year t). We multiply the dependent variable by 100. The specification with city-level compactness as the outcome of interest includes both city fixed effects α_i and territory fixed effects α_j.

Table 4 shows results. Positive coefficients indicate that a larger share of borders are internal borders, i.e. within cities of the same territory, and thus a more compact shape. We find that fiscally centralized territories become substantially more compact after cen-

[37] $DecadesTreated_{ijt}$ measures the number of decades a city has belonged to a fiscally centralized territory.

Figure 2: Territorial Consolidation Event Studies (II)



Note The plot shows results of event study regressions of the effect of fiscal centralization on territorial compactness, with 95 percent confidence intervals. Observations are at the territory-year level for Panel A and at the city-year level for Panel B. The sample comprises 379 years and 625 territories (2,371 cities). The dependent variables are the compactness measure defined either (A) at the level of territories j or (B) of cities i, in each t. Standard errors are clustered at the territory level.

tralization (columns 1 and 3), and that this process occurs gradually over time (columns 2 and 4). Our measure of territory-level compactness increases by around 4.8 percentage points in the first century after fiscal centralization (5.1 percentage points in the case of city-level compactness), compared to a baseline level of 12 percent (42 percent, respectively) on average for the control group.

Panels A and B in Figure 2 present the effect of fiscal centralization on compactness over time, estimated following the event-study approach in equation 3. There are no changes to compactness in the decades prior to fiscal centralization. After the introduction of a Chamber, there is a continued and sustained increase in compactness in all following decades.

5.4 Robustness: Selection and Confounding Factors

The results of our previous analyses strongly suggest a positive association between the introduction of fiscal institutions and a range of outcomes relating to territorial consolidation and survival. However, this naturally raises the question about the causal nature of these correlations. Can these positive developments be interpreted as the causal effect of the introduction of fiscal chambers?

Clearly, there are several reasons to be cautious in claiming causality in this context. More powerful, richer, better organized territories can both stem the burden of reform-

ing their fiscal institutions and are more likely to achieve positive long-term outcomes. Talented or especially far-sighted rulers, such as Frederick II of Prussia, can almost single-handedly change the destiny of their territories (Ottinger and Voigtländer, 2020). Another concern, intrinsic to many major historical "experiments", is the fact that reforms often come in bundles, changing several aspects of the state administration and institutions at once.

While we acknowledge these concerns, in this section we offer a carefully optimistic take, suggesting that the results shown so far likely represent in fact a positive, causal effect of the introduction of fiscal institutions.

First, our data's unique breadth and coverage allows us to observe every territory and every city in the Holy Roman Empire over the entire period 1400–1789, not just a selection of the more powerful or (eventually) most successful territories. Our results are not driven by single outliers, such as the remarkable trajectory of Prussia. In Appendix Figures D.2 and D.3, we show that our results (both the differences-in-differences estimates and the event-study analyses) are robust to leaving out single territories from the treatment group.

A related concern is the comparability of territories, within the broad gamut of institutional settings in the Holy Roman Empire. The territories which (eventually) adopted Chambers may be a selected subset, differing from the control group in multiple ways. While our baseline regressions utilize all observations, relating to all territories in the dataset, we can conduct our analyses also within the sample of territories that eventually fiscally centralize. In Appendix Section D.4, we show that all our results are very comparable (both qualitatively and quantitatively) when using this selected sample of territories, i.e. regarding the "intensive margin" of fiscal centralization.

Second, the baseline research design, with panel data regressions and two-way fixed effects, takes into account two major groups of potential omitted variables relevant in this context. These could be time-invariant characteristics of states, which affect both their propensity to invest in fiscal capacity and to consolidate their territory, such as their ecclesiastical nature or their core geographic features; or, they could be historical shocks affecting all territories in equal measure, such as pandemics or technological paradigm shifts from the military revolution. Moreover, our regressions can also control explicitly for potentially time-varying, territory-specific confounders. We show these regressions in Appendix Section D.4. To avoid controlling for potentially endogenous developments, we limit the set of control variables to those that are arguably determined outside a territory,

such as past military attacks or military construction activity among neighbors.[38]

In the presence of heterogeneous treatment effects in staggered adoption designs, two-way fixed effects estimation procedures may not be robust, as suggested by a recent literature (Sun and Abraham, 2021; De Chaisemartin and d'Haultfœuille, 2020b). In Appendix Section D.5, we provide evidence that our results do not suffer from confounding heterogeneity.[39]

Finally, the introduction of Chambers could have coincided with a series of other reforms that modernized the state administration; in this case, our estimates would reflect the effect of the entire bundle of changes occurring at the same time. The historical accounts suggest that this was rarely the case.[40] When a Chamber was introduced together with additional institutional changes, it was generally the single most important reform. Other concurrent developments, such as the improvement of financial bookkeeping or the introduction of regular audits, were complementary or ancillary effects of the Chamber.

In particular, the developments in the Holy Roman Empire differ from other parts of Europe with regard to the development of a taxation-representation nexus. A large literature (Schumpeter, 1991; Tilly, 1975; North and Weingast, 1989) suggests a link between the increase in fiscal capacity and representative assemblies, approving the imposition of taxes and controlling revenue streams. However, in Appendix Section B we demonstrate that Chambers did not form part of the coordination between local nobility, clergy, and towns, but instead were closely tied to the sovereign's finances and a bureaucratic-absolutist form of government.

5.5 Robustness: Endogeneity

The potential endogeneity of the timing and the location of fiscal reforms are possibly still a cause of concern. Reassuringly, the event-study analyses of Figures 1 and 2 show that the effects of the introduction of a Chamber represent a distinct break from the periods preceding it. This absence of pre-trends speaks against territories embarking on paths of

[38] We acknowledge however the potential reflection problem, in a setting in which military investments and institutional innovations may be mutually interdependent. This is why these regressions are best seen as suggestive; reassuringly, our results are not particularly sensitive to the inclusion of these controls.

[39] We draw on the estimator suggested by De Chaisemartin and d'Haultfœuille (2020a), which is best suited for our setting. The jackknife graphs in Appendix Figures D.2 and D.3 also provide evidence against the presence of heterogeneous effects.

[40] Specifically, Privy Councils (*Geheime Räte*), a modernized branch of executive power, were typically introduced later.

successful expansion and consolidation *before* reforming their fiscal institutions.

To speak more directly to these endogeneity concerns, we consider an alternative estimation approach, in which we exploit an arguably exogenous shifter of the likelihood of Chamber adoption: the incidence of Imperial tax levies. Starting in the 16th century, the increasing financial needs of the Holy Roman Empire were rolled over to territories (see Section 2).[41] The need to raise considerable sums thus increased gains from efficiency improvements in the tax administration. To this purpose, territorial lords often invested in fiscal capacity, creating the first Chambers.

The actual burden borne by the single territories varied widely both across time and space. Sums to be paid to the Empire were determined by the product of a fixed share (the *Reichsmatrikel* contribution) and a multiplier (the number of "Roman months"). The interaction of these two factors is a strong and powerful predictor of the hazard of fiscal centralization, as shown in Table 1, columns 5 and 6. Note that the predictive power of the Imperial tax levies holds even after taking into account baseline territory characteristics and all other predictors. Conditioning on these factors, the interaction term thus represents an idiosyncratic, time-varying driver of the likelihood of adopting a fiscal Chamber.[42]

We hence employ the maximum Imperial tax contribution a territory has faced up to year t as an instrumental variable for the presence of a Chamber.[43] In Appendix Section D.6, we show that the 2SLS estimates of the effects of fiscal centralization on our main outcomes are similar to the OLS analogues.[44]

[41] Importantly, these increasing expenditures were caused by external political threats, especially the rise of the Ottoman Empire. These threats affected most directly the eastern Habsburg lands. Note that the Habsburg territories are largely outside the area of our analysis (we also exclude scattered minor Habsburg land holdings from the data).

[42] Analogously to econometric settings with "shift-share" instruments, in our context the share may be endogenous, but the temporal shocks are orthogonal to the internal development of territories (Borusyak et al., 2022).

[43] Defining, for each territory, $Instrument_t \equiv \max\{ImperialTax_\tau\}_{\tau=1400}^{t}$ closely mirrors the model of Chamber adoption in Appendix Section C : For a given territory, $Treated_t \equiv \max\left\{\mathbb{1}\left[D_\tau + (IT_\tau/\mu_\tau)\mu_{C_\tau} > P_{C_\tau}\right]\right\}_{\tau=1400}^{t}$. We additionally consider a setup that better accounts for the binary nature of the treatment and the fact that the eventual adoption of a Chamber is an absorbing state (Appendix Table D.15).

[44] The F-statistic associated with the instrument coefficient in the first-stage regression is 24.07.

6 Mechanisms

6.1 Revenues

Levying funds or tapping into new income sources proved difficult for most rulers at the dawn of the early modern era. Chambers were thus charged with a twofold objective: An improved exploitation of existing sources of revenue, and a more efficient handling of levied funds at court. Hesse's Chamber ordinance of 1568, for example, states the overarching goal of the institution as having to increase steady revenues (Zimmermann, 1933, p. 102).

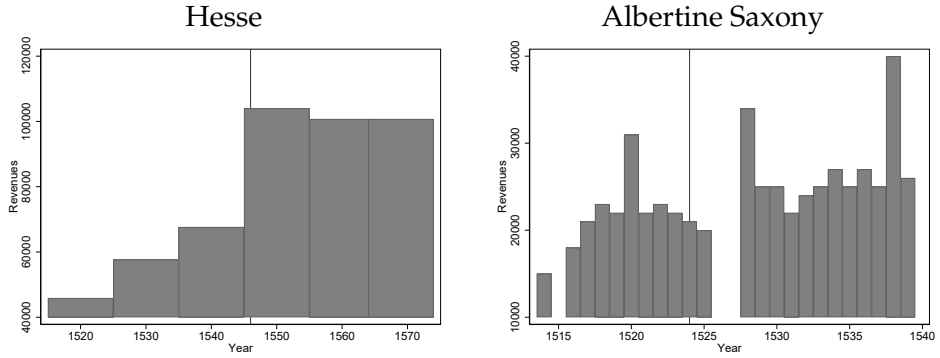
Comprehensively documenting increases in revenues resulting from the introduction of a Chamber is challenging, as systematic record-keeping was directly linked with the institution of the Chamber. Data about revenues in the periods prior to fiscal centralization are thus scarce. For two territories — Hesse and Albertine Saxony — revenue estimates spanning the periods before and after the reform exist. Figure 3 depicts the evolution of revenues for these territories over time, with the vertical line indicating the year of the introduction of a Chamber. In both cases, funds increase following fiscal centralization. In Hesse, the substantial and sustained revenue jump of over 35,000 fl. in the decade between 1540 and 1550 stands out, even against the moderate pre-trend in the period 1520–1540. In Albertine Saxony, drink excise tax revenues average 20,000 fl. yearly before the replacement of the *Landrentmeister* with a collegial Chamber in 1524; after the reform, revenues are stably at a higher level of approximately 24,000 fl. per year. Following the introduction of centralized fiscal Chambers, revenues in both territories thus increased.

6.2 Alternative Methods of Raising Revenue

While revenues are observed directly only for a minority of territories, we propose an indirect test of increases in disposable funds generated by fiscal centralization. We expect additional revenue to crowd out the conventional method of raising funds at a ruler's disposal: pawning of land holdings to local nobility and wealthy burghers.

For a large number of territories, pawns were the predominant means of raising funds for rulers, especially in the short term and in a context with low fiscal capacity. Moreover, pawns did not require consent from the Estates (see Klein (1974, p. 19) or Jeserich et al. (1983, p. 712)). Rulers under financial pressure exhausted these means until very little of their territory remained under direct control, setting off a vicious circle of further

Figure 3: Revenues



Note The plot shows revenues in Hesse and Albertine Saxony before and after the introduction of a Chamber. Sources: Chamber revenue estimates for Hesse are drawn from North (1999). Albertine Saxony recorded revenues from a drinks excise tax, one of the ruler's primary sources of disposable income during the time period considered Schirmer (2006, p. 235, 252-253, 605).

financial pressure due to lower revenue streams as a result of insufficient land holdings. These lands could even be lost permanently if sovereign rights were not exercised for a sufficiently long time period. Pawns were thus an inefficient and non-sustainable way of raising revenue, and there were large incentives to redeem pawned settlements, forests and acres.

For example, in 1561 the Chamber clerk in Hesse filed a complaint that he still found it impossible to cover expenditures from revenues of the local offices, since the majority of them had been put in pawn before.By 1569 the Chamber had redeemed 28 local offices, and it spent another 100,000 fl. in the following decade on redeeming pawns. A similar development can be traced for Albertine Saxony, where the largest ducal expenditures in the years following fiscal centralization (46,190 fl.) were spent on redeeming pawns.

Our data records pawnings of cities to secondary rulers at the yearly level. To estimate whether the introduction of a Chamber reduces the likelihood of a city being pawned, we estimate the analogue of equation (4) at the city level, where the dependent variable, $PawnedCity_{ijt}$, is an indicator whether city i in territory j is pawned to another ruler $j' \neq j$ in year t. We again include a full set of city, territory, and year fixed effects.

Table 5 shows results. Cities in fiscally centralized territories are slightly less likely to be put in pawn (column 1). The decrease in pawning probability is immediate, and attenuates over time (column 2). Results are similar when taking into account whether a city is located at the border to a foreign territory, which might make it more attractive for

Table 5: Pawning

	City Put in Pawn		
	(1)	(2)	(3)
Treated	-1.298	-1.279*	-1.279*
	(0.891)	(0.746)	(0.756)
Treated × Decades Since		-0.00378	0.00410
		(0.0976)	(0.0985)
At Foreign Border			1.062
			(1.493)
Observations	810,350	810,350	810,350
R^2	0.50	0.50	0.50
City FEs	✓	✓	✓
Territory FEs	✓	✓	✓
Year FEs	✓	✓	✓

Note Table presents results of estimating the analogue to equation (4), considering whether city i was pawned to a territory $j' \neq j$ in year t as an outcome. The sample comprises 379 years and 2,371 cities. Standard errors are clustered at the territory level. *, **, and *** denote significance on the 10 percent, 5 percent, and 1 percent level, respectively.

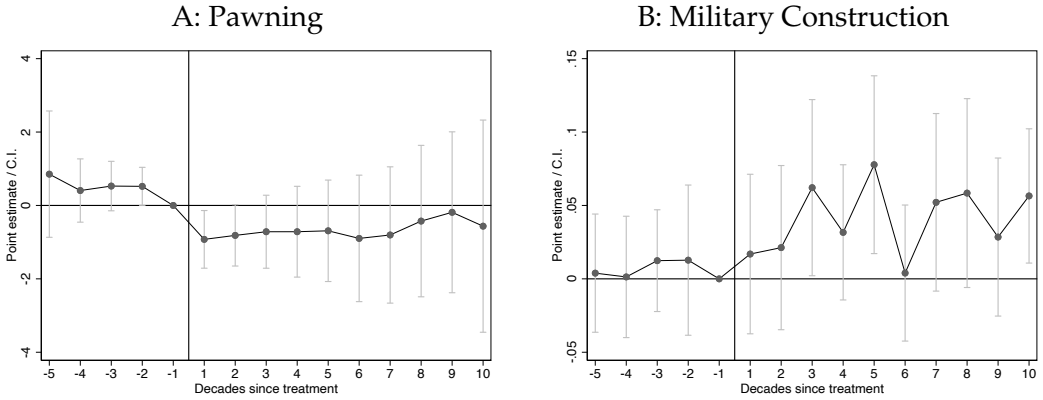
other rulers to pawn it (column 3).

A more informative picture emerges when considering changes in pawning probability over time, in the event-study graph of Figure 4, Panel A. In the decade immediately after fiscal centralization, cities in centralized territories experience a sharp drop in their probability of being pawned. This effect slowly attenuates over the following decades, leading to the weakly insignificant overall effect estimated in the differences-in-differences regressions of Table 5. The timing of effects suggests that the additional stream of revenues guaranteed by the new fiscal administration was immediately used by princes and Chamber officials to reduce the number of cities temporarily pawned away to other rulers — a step towards internal territorial consolidation, and an indicator of increased overall disposable revenue.

6.3 Military Investments and Success

How exactly did rulers profit from this internal consolidation to expand the size of their territories and increase probability of survival? Acquisitions through military interventions and marriage diplomacy strongly rely on financial means, as do direct purchases of

Figure 4: Mechanisms Event Studies (I)



Note The plot shows results of an event study regression of the effect of fiscal centralization on pawning of cities and military construction, with 95 percent confidence intervals. Observations are at the city-year level. The sample comprises 379 years and 2,371 cities. The dependent variables are (A) an indicator whether city i in territory j is pawned to a territory $j' \neq j$ in year t, (B) an indicator variable for new military construction in city$i$ in year t. Standard errors are clustered at the territory level.

lands. In the context of warfare, Chambers usually were put in charge of handling relevant expenditures, especially for military buildings (Jeserich et al., 1983, pp. 331, 640, 732, 816).[45]

We test for an increase in the number of military buildings in cities following fiscal centralization by estimating equation (4) at the city-year level, including relevant fixed effects. The dependent variable is an indicator variable for new military construction in a city$\times$year.[46] Results are shown in Table 6. For cities in treated territories, military construction increases by around 0.04 buildings per century (column 1). This is a significant and sizable effect, considering that average military construction in our sample amounts to 0.052 buildings per city and century. The effect on construction does not become larger over time (columns 2 to 5).

One potential confounder is a change in the threat environment: military construction could increase more in centralized territories because these are attacked more. In column 3 we account for attacks to cities in the current decade. This does not affect military construction at conventional significance levels, and the treatment coefficient remains unaffected. We also add measures for the threat of war, such as military construction by

[45] Albertine Saxony is exemplary in that following the 1530s, expenditures for armories, fortresses, and defense increased substantially (Schirmer, 2006, p. 569).

[46] We multiply the dependent variable by 100, thus coefficients can be interpreted as increases in construction per century.

Table 6: Military Construction

	Military Construction				
	(1)	(2)	(3)	(4)	(5)
Treated	0.0351***	0.0331**	0.0327**	0.0328**	0.0327**
	(0.0134)	(0.0151)	(0.0151)	(0.0151)	(0.0151)
Treated × Decades Since		0.000414	0.000423	0.000454	0.000445
		(0.00109)	(0.00109)	(0.00110)	(0.00110)
Attack, past decade			0.0280	0.0280	0.0280
			(0.0196)	(0.0196)	(0.0196)
Any Neighb. Mil. Constr., past decade				-0.00711	
				(0.0224)	
Near Foreign Cities				0.00121	
				(0.00222)	
At Foreign Border					0.00291
					(0.00948)
Observations	810,350	810,350	810,350	810,350	810,350
R^2	0.01	0.01	0.01	0.01	0.01
City FEs	✓	✓	✓	✓	✓
Territory FEs	✓	✓	✓	✓	✓
Year FEs	✓	✓	✓	✓	✓

Note Table presents results of the analogue to equation (4), considering military construction events in city i in territory j in year t as an outcome. Observations are at the city-year level. The sample comprises 379 years and 2,371 cities. Standard errors are clustered at the territory level. *, **, and *** denote significance on the 10 percent, 5 percent, and 1 percent level, respectively.

neighboring foreign territories and the number of foreign cities in the vicinity. Again, the coefficient of interest remains unchanged (column 4). The same holds when considering the length of the foreign border as another measure for the threat of war (column 5).

To examine the trajectory of building activity for military purposes over time, and to rule out the presence of pre-trends, we turn to an event-study framework. Figure 4, Panel B, shows the resulting coefficients. Military construction is constant before and increases steadily after the introduction of a Chamber. After three decades, military construction largely remains on an increased level compared to the decade prior to fiscal centralization.

Increased military investments can serve two purposes: they can allow to conquer new cities, thereby consolidating a territory's position and increasing the likelihood of survival, or they can allow to better defend existing cities. Our dataset — in which we observe attacks to cities, but not the identity of the aggressors — allows to examine the defensive channel. To do so, we consider the relationship between rule changes for cities

as a result of attacks in treated and untreated territories by estimating

$$\begin{aligned} ChangeRuler_{ij(t+1)} &= \beta_1 Treated_{ijt} + \beta_2 Treated_{ijt} \times DecadesTreated_{ijt} \\ &\quad + \gamma_1 Attack_{ijt} + \gamma_2 Attack_{ijt} \times Treated_{ijt} \\ &\quad + \delta M_{ijt} + \alpha_i + \alpha_j + \alpha_t + \varepsilon_{ijt} \end{aligned} \tag{5}$$

where *ChangeRuler* is an indicator whether city i changed from territory $j' \neq j$ to territory j in a given year. The analysis is at the city-year level. *Attack* is a dummy whether a city is attacked in year t, and M is a vector of military covariates. We include city, territory and year fixed effects.

The results in column 1 of Table 7 show that cities that are attacked have a 1.2 percentage points higher probability of changing ruler, relative to a baseline probability of rule change of 0.62 in each year. However, if a city belongs to a fiscally centralized territory, the conditional probability of changing hands if attacked is essentially reduced to zero ($0.183 = 1.211 - 1.028$).

As a plausibility check, we compare the effect of attacks on three different types of rule changes. The relevant interaction term (Attack $\times$ Treated) is sizable and significant only if the outcome considered is rule changes due to violence (column 2), but not for subsequent rule changes due to sales of cities or dynastic extinction (columns 3 and 4). This confirms that military investments following fiscal centralization substantially increase the defensive capabilities of territories.

6.4 Marriages

While warfare constituted an important feature of early modern polities, the predominant forms of rule expansion were peaceful. A central role played marriage alliances, both for sons — potential successors — and daughters of rulers.

Marriages were prestigious and hence costly endeavors. Chambers, through their close relation to the private finances of rulers, were important to finance these undertakings. The case of Albertine Saxony in the years of a Chamber's introduction illustrates this point. To successfully marry off the ruler's daughter Magdalene to Joachim II of Brandenburg, a prince who had been previously offered the hand of the French king's daughter, the Albertine Chamber paid 20,952 fl. of dowry. Lavish wedding ceremonies also burdened rulers' treasuries, e.g. for the marriage of Magdalene and Joachim, 3,000

Table 7: Retaining

	Change Ruler Due To			
	All	Violence	Purchase	Extinction
	(1)	(2)	(3)	(4)
Treated (t-1)	-1.904	-0.580	-0.126**	-0.541
	(1.208)	(0.460)	(0.0498)	(0.329)
Treated × Decades Since (t-1)	0.0232	0.00212	0.00139	-0.00124
	(0.0238)	(0.00548)	(0.00122)	(0.0137)
Attack	1.211***	0.713***	-0.00171	0.0791
	(0.364)	(0.240)	(0.0251)	(0.160)
Attack × Treated (t-1)	-1.028**	-0.640**	0.0111	-0.0881
	(0.405)	(0.272)	(0.0256)	(0.154)
Observations	810,350	810,350	810,350	810,350
R^2	0.04	0.04	0.02	0.03
Mean dep. var	0.65	0.07	0.04	0.23
Military Covariates	✓	✓	✓	✓
City FEs	✓	✓	✓	✓
Territory FEs	✓	✓	✓	✓
Year FEs	✓	✓	✓	✓

Note Table presents results of equation (5). Observations are at the city-year level. Standard errors are clustered at the territory level. The sample comprises 379 years and 2,371 cities. The dependent variable is an indicator whether city i changed from territory $j' \neq j$ to territory j in a given year. Military covariates are the natural logarithm of military buildings in a city and an indicator whether a city is located at a foreign border. *, **, and *** denote significance on the 10 percent, 5 percent, and 1 percent level, respectively.

guests had to be entertained, including 24 princes of the Empire (Schirmer, 2006, pp. 275–6). While marriage arrangements served to signal and secure prestige, they foremost had very tangible territorial consequences: In case of a lineage's extinction, inheritance claims were made based on marriage ties.

We quantify the strength of inheritance claims and ties to powerful dynasties in a graph of kinship and marriage connections. We observe the yearly network between members of noble families, and use it to calculate the marriage success for all daughters of territorial rulers.[47] Marriage success is defined as the change in dynasty connectedness resulting from the union. To measure dynasty connectedness, we count the number

[47]To capture the consequences of fiscal centralization, we focus on the marriage success of daughters and not of the rulers themselves which might have been determined before the institutional reforms. Also, marriages of noble daughters were more directly linked to princely revenues, e.g. through the payment of dowries.

Table 8: Marriage Gains

	Connectedness Gains			
	Rulers		Land Holdings	
	(1)	(2)	(3)	(4)
Treated	0.281**	0.266*	0.639	0.668
	(0.133)	(0.152)	(0.502)	(0.575)
Treated × Decades Since		-0.00758		0.0144
		(0.0266)		(0.117)
Observations	4,325	4,325	4,325	4,325
R^2	0.33	0.33	0.38	0.38
Territory FEs	✓	✓	✓	✓
Year FEs	✓	✓	✓	✓

Note Table presents results of estimating the analogue to equation (4), considering the logarithm of the marriage success for territory j in year t as an outcome. Observations are at the territory-year level. The sample only includes secular territories that eventually fiscally centralize. The sample comprises 379 years and 29 secular territories. Standard errors are clustered at the territory level. *, **, and *** denote significance on the 10 percent, 5 percent, and 1 percent level, respectively.

of territorial rulers within three degrees of family separation (kinship or marriage) in a daughter's network, as well as the number of cities that rulers within this immediate network preside over.[48] We calculate this measure once in the full network, and once in a network that does not have the daughter's marriage link. The difference between married and unmarried connectedness will be weakly positive, since a daughter cannot be less connected by adding a link to her network. This allows us to assess the quality of a marriage link.

We estimate the effect of fiscal centralization on marriage outcomes through an analogue of equation (4), where the outcome is the logarithm of the marriage success for territory j in year t.[49] Table 8 presents results. The outcomes of marriage politics improve after the adoption of a Chamber: a daughter's immediate network comprises 28% more rulers after her marriage (column 1), and the number of ruled cities in their network increases by more than 64% (column 3).

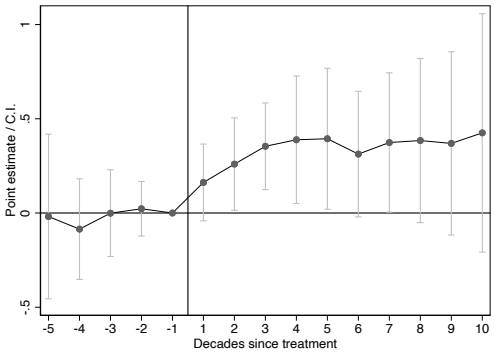
Panels A and B in Figure 5 show marriage gains in an event-study framework. There are no pre-trends for both the number of rulers and the number of ruled cities within the

[48] We do not consider members of the same dynasty to be relevant rulers.

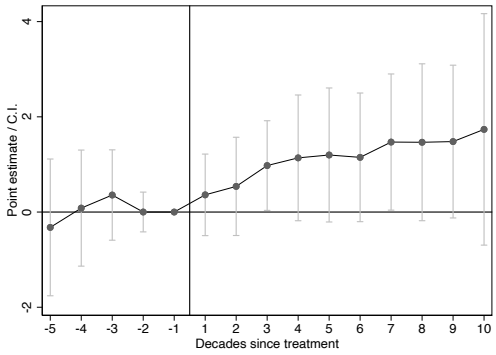
[49] To account for limited coverage of the dynasty data, we restrict the sample to secular territories that eventually fiscally centralize. We furthermore exclude all rulers who never had marriage-age daughters.

Figure 5: Mechanisms Event Studies (II)

A: Marriages (Connected Rulers)



B: Marriages (Connected Land Holdings)



Note The plot shows results of an event study regression of the effect of fiscal centralization on ruler daughters' marriage gains, with 95 percent confidence intervals. Observations are at the territory-year level. The sample comprises 379 years and 29 secular territories. The dependent variables are the logarithm of the marriage success for territory j in year t, defined either (A) as gains in close territorial rulers or (B) ruled cities. Standard errors are clustered at the territory level.

immediate network. Following fiscal centralization, there is a large and persistent jump in inheritance claims gained by marriage: rulers' daughters have more successful marriages after the introduction of a Chamber.[50]

7 Conclusion

In this paper we trace the early stages of the development of fiscal capacity. We study the Holy Roman Empire from 1400 to 1789, a time and setting that was marked by profound state consolidation that reorganized the political landscape of Europe. Using a novel and extensive dataset, we show that the introduction of Chambers, the first step towards a modern fiscal administration, increased the probability of survival, size and compactness of territories — three key elements of state consolidation. The absence of evident pre-trends, as well as the robustness of our results with regard to selection and endogeneity concerns, suggest that fiscal centralization played a causal role in this context. Territories were able to increase their revenues through fiscal centralization and had to revert less to

[50] An alternative definition of dynasty connectedness is mean "closeness" to the three closest rulers, defined as the inverse of the number of degrees of separation. No connected rulers implies a closeness of 0, and being married to a ruler implies a closeness of 1. To account for land holdings, we weight closeness values with the number of cities the closest (second-closest, third-closest) ruler reigns over. Results are comparable (Appendix Table D.4 and Figure D.1).

other means of raising short-term funds. This allowed rulers to increase military investments, making them more successful in conflicts with other territories, and to be more successful in tying linkages with other, powerful families through strategic marriages.

The results of this paper speak to the broader literature on fiscal capacity and state consolidation. One implication of our findings is that fiscal institutions staffed with a professional bureaucracy — alongside the solution of the well-studied commitment problem in sovereign borrowing (North and Weingast, 1989; Drelichman and Voth, 2014) — are fundamental in explaining the rise of modern state finances. In the context of the Holy Roman Empire, this institutional development did not originate from the development of early parliaments (Estates' diets) but from rulers, who, with backing of the Empire, could tilt the fiscal power balance in their favor at a critical juncture in the 16th century. Chambers with high bureaucratic capacity wrested an increasing number of fiscal tasks from Estates, and newly acquired territories were put under direct fiscal control of the Chamber (rather than the Estates), thus steadily increasing their financial base.[51]

Over the centuries, Chambers remained and proved to be a seed of territories' fiscal bureaucracy central to princely administration,[52] thus playing a crucial role in the development process (Besley and Persson, 2011; 2013). Our study thus sheds light on the historical "bifurcation" between absolutism and parliamentary control (Cox et al., 2021): the territories of the Holy Roman Empire embarked on a path towards absolutism, rather than a trajectory where repeated pledges to Estates for revenue led to more parliamentary control. Empirical studies of other historical trajectories will shed further light on the nexus between bureaucracy, taxation, and state consolidation.

[51] After the introduction of a Chamber in Ansbach, an committee of the Estates, tasked with fiscal auditing, was dissolved and its tasks transferred to the Chamber with reference to its superior fiscal-bureaucratic capacity (Schaupp, 2004, p. 116; similarly in Hesse: Krüger, 1980, p. 113). Territories growing in size further eroded the power of Estates: while the incorporation of territorial acquisitions into the Estates was contested (Bütterlin, 1977, pp. 11, 15), the Chamber's competences were automatically extended (as documented for example in Baden-Durlach, Hesse-Kassel, and Brunswick-Calenberg: Jeserich et al., 1983, pp. 631, 642, 754).

[52] In Bavaria, the Chamber soon after its introduction became the largest government office; similarly in the Electoral Palatinate (Jeserich et al., 1983, p. 582, 568).

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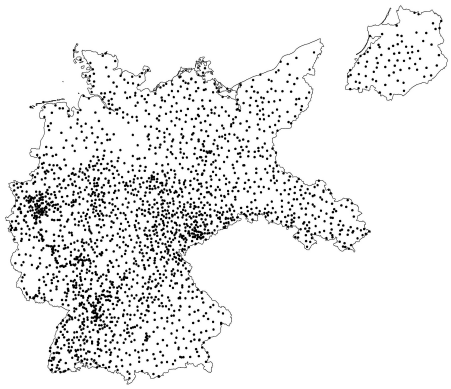
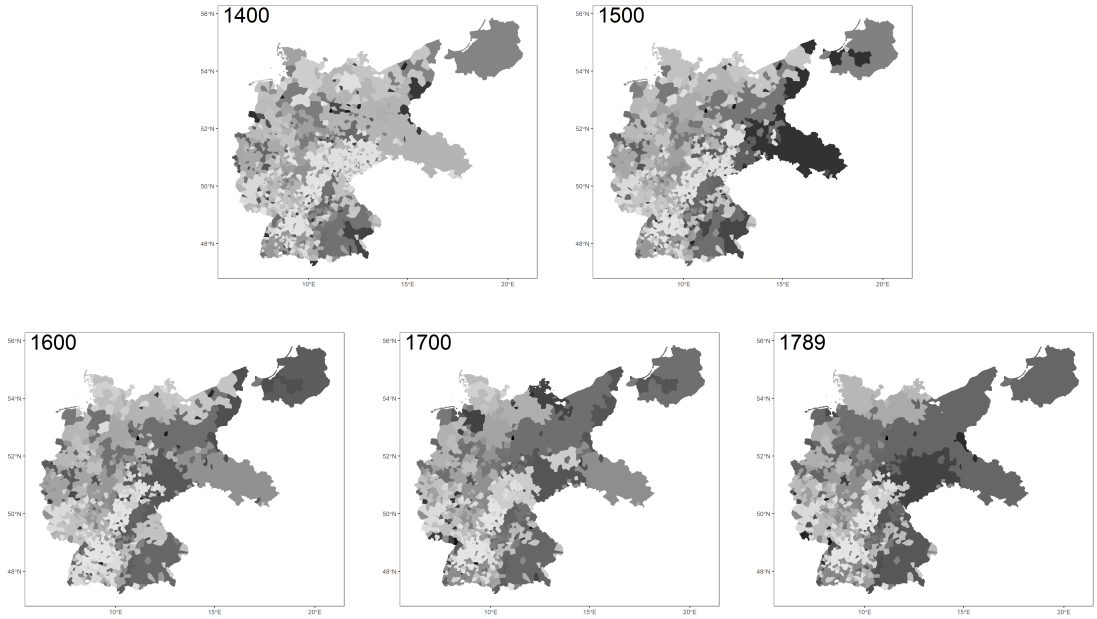
Supplementary Appendix: For Online Publication
A Data Description

Figure A.1: Locations of Cities



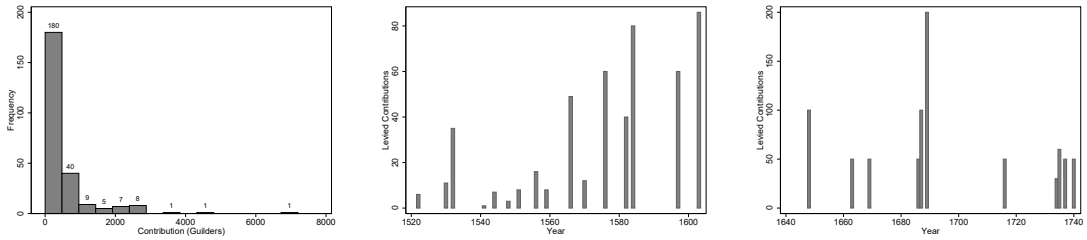
Note The map illustrates the location of each city in our data.

Figure A.2: Territories Over Time



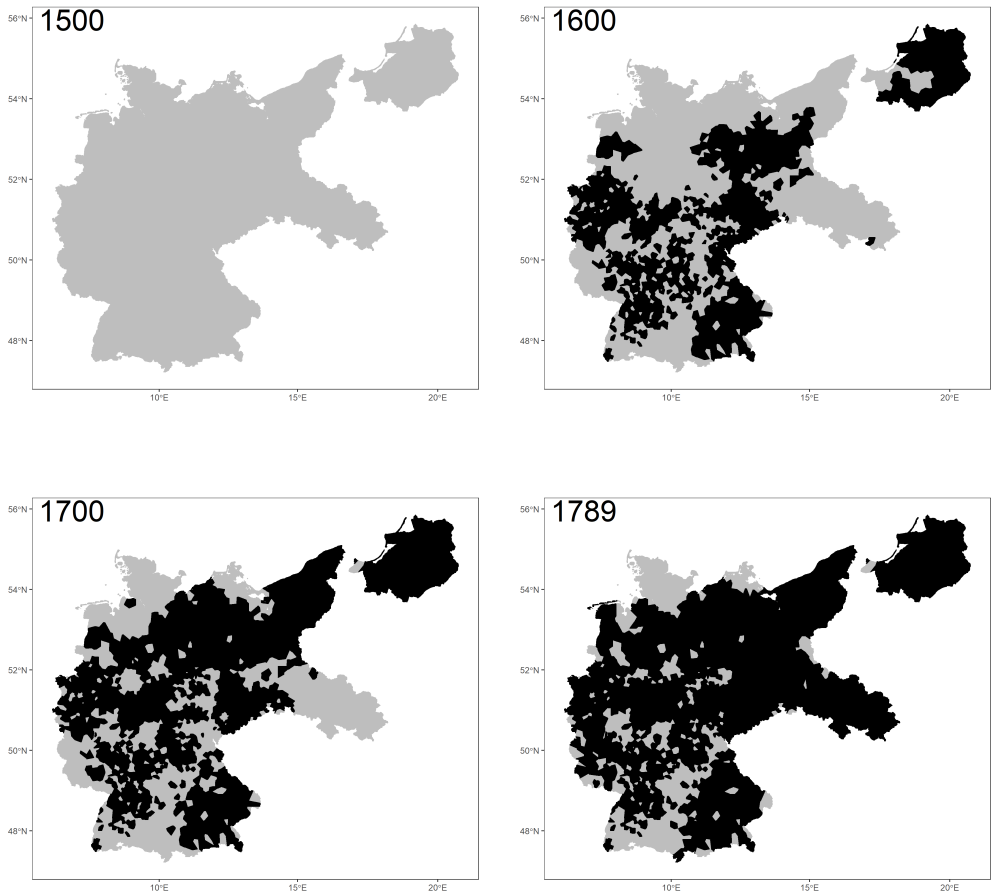
Note The maps show territorial borders for the years 1400, 1500, 1600, 1700, and 1789. To map territories, we aggregate all cities' Thiessen polygons that belong to the same territory in a given year.

Figure A.3: Imperial Tax Contributions



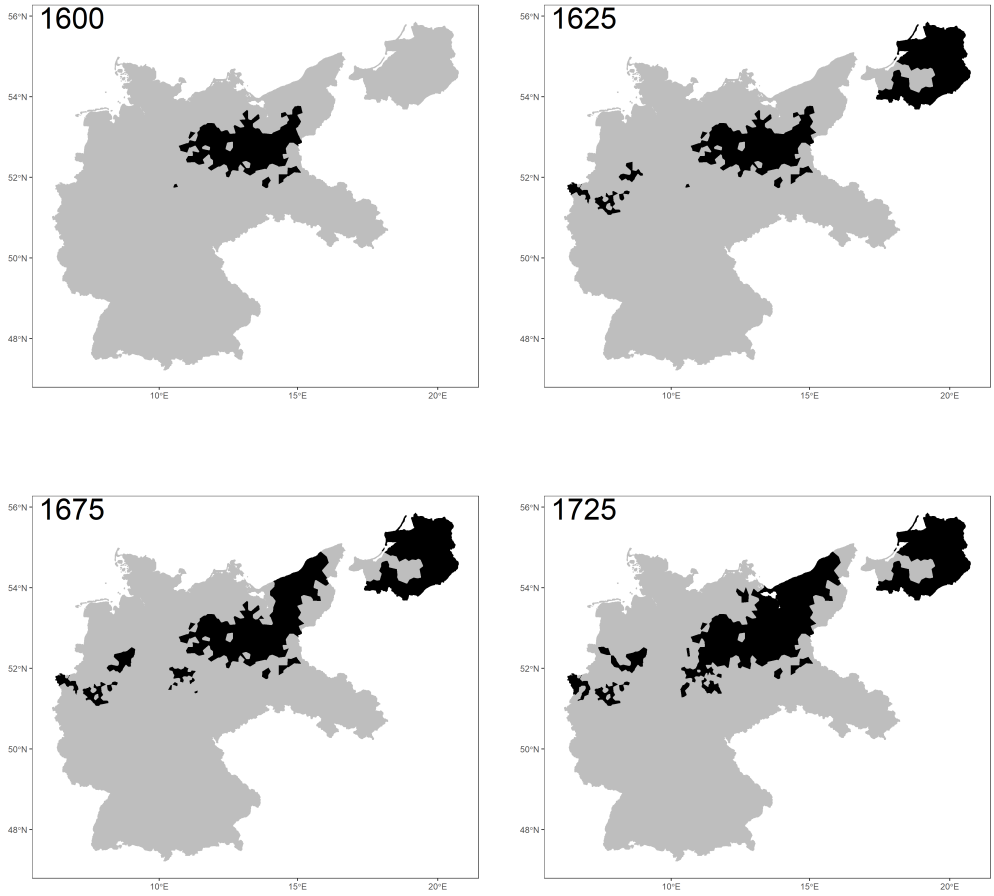
Note The first graph shows the distribution of territories' contributions to one "Roman Month" (128,000 guilders) of Imperial Taxes in the Imperial Register of 1521. The horizontal axis denotes binned contributions, the vertical axis the number of territories in each bin. The second and third graph show the size of contributions in terms of multiples of "Roman Months" levied 1521 to 1618 and 1648 to 1789.

Figure A.4: Fiscally Centralized Territories



Note The maps show the area covered by fiscally centralized territories in year 1500 (0 territories), 1600 (17), 1700 (26), and 1789 (29).

Figure A.5: Brandenburg, 1600-1725



Note The maps show the area governed by the dynasty ruling Brandenburg(-Prussia) between the years 1600 and 1725.

Table A.1: Dates of Fiscal Centralization

Territory	Year	Name	Selected Sources
Prince-Bishopric of Augsburg	1718	Hofkammer	Wüst (1987, p.39)
Margraviate of Baden-Baden	1588	Rentkammer	Carlebach (1906, p. 43)
Margraviate of Baden-Durlach	1578	Rentkammer	Taddey (2000, p. 168)
Prince-Bishopric of Bamberg	1638	Hofkammer	Caspary (1976, p. 47-53)
Duchy of Bavaria	1550	Hofkammer	Spindler (1988, p. 378)
Principality of Bayreuth	1576	Hofkammer	Schaupp (2004, p. 171)
Margraviate of Brandenburg	1577	Amtskammer	Schultze (2004, p. 142-3)
Duchy of Brunswick-Calenberg	1680	Kammer	Jeserich et al. (1983, p. 754)
Duchy of Brunswick-Lüneburg	1616	Kammer	Jeserich et al. (1983, p. 753)
Duchy of Brunswick-Wolfenbüttel	1636	Kammer	Jeserich et al. (1983, p. 752)
Duchy of Cleves-Mark	1557	Rechenkammer	Schottmüller (1896, p. 66)
Electorate of Cologne	1587	Hofkammer	Wüst (1987, p. 37)
Bishopric of Eichstätt	1681	Hofkammer	Braun (1991, p. 94)
Landgraviate of Hesse	1546	Rentkammer	Krüger (1980, p. 53)
Landgraviate of Hesse-Darmstadt	1590	Rentkammer	Jeserich et al. (1983, p. 648)
Landgraviate of Hesse-Marburg	1567	Rentkammer	Jeserich et al. (1983, p. 642)
Duchy of Jülich-Berg	1547	Rechenkammer	Sallmann (1902, p. 8)
Electorate of Mainz	1532	Hofkammer	Wüst (1987, p.37)
Duchy of Mecklenburg-Güstrow	1659	Kammer	Hamann (1965, p. 83)
Duchy of Mecklenburg-Schwerin	1660	Kammer	Hamann (1965, p. 83)
Duchy of Mecklenburg-Strelitz	1701	Kammer	Hamann (1965, p. 99)
Prince-Bishopric of Münster	1573	Rechenkammer	Jakob (1965)
County of Oldenburg	1623	Rentekammer	Ahrens (2003, p. 87)
Prince-Bishopric of Paderborn	1723	Hofkammer	Jeserich et al. (1983, p. 735)
Electoral Palatinate	1557	Rechenkammer	Press (1970, p. 99-100)
Principality of Palatinate-Sulzbach	1615	Hofkammer	Jeserich et al. (1983, p. 573)
County of Reuß-Greiz	1770	Kammer	Heß (1993, p. 51)
Duchy of Saxe-Eisenach	1672	Rentkammer	Heß (1993, p. 33)
Duchy of Saxe-Gotha	1640	Kammer	Heß (1993, p. 35)
Duchy of Saxe-Hildburghausen	1680	Kammer	Jeserich et al. (1983, p. 857)
Duchy of Saxe-Meiningen	1680	Kammer	Heß (1993, p. 42)
Albertine Saxony	1524	Rentkammer	Schirmer (2006, p. 597)
Duchy of Saxe-Weimar	1633	Kammer	Heß (1993, p. 30-31)
County of Schaumburg-Lippe	1728	Rentkammer	Schneider (1983, p. 24)
County of Schwarzburg-Rudolstadt	1707	Kammer	Müller (2012)
Electorate of Trier	1719	Hofkammer	Flach (2021)
County of Waldeck	1696	Rentkammer	Martin and Wetekam (1971, p. 229)
Duchy of Württemberg	1521	Rentkammer	Bernhardt (1971, p. 32-33)
Bishopric of Würzburg	1553	Kammer	Reuschling (1984, p. 232-234)

Note Table shows fiscally centralized territories and dates of fiscal centralization. Full references can be found in the reference section to the Online Appendix.

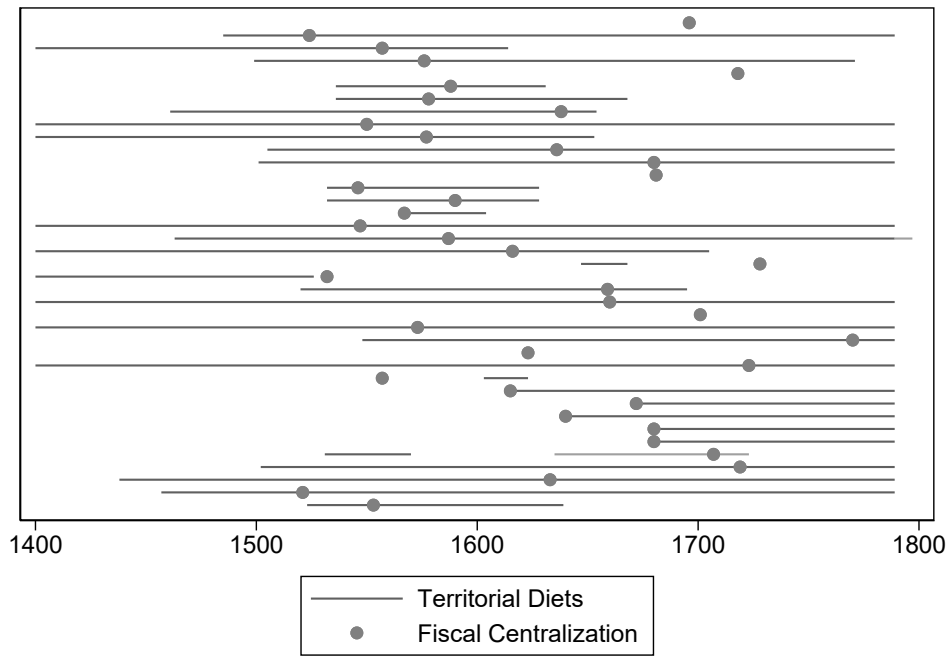
B Estates

Estates in the territories of the Empire gained in importance during the 15th century. They controlled extraordinary and large taxation requests, but were ultimately sidelined in favor of the princely Chambers, which controlled increasingly broad revenue streams. In Section 2, we present historical evidence that Chambers did not form part of the coordination between local nobility, clergy, and towns, but instead were closely tied to the sovereign's finances.[1]

Appendix Figure B.1 shows the timing of the introduction of a Chamber relative to the time periods during which Estates were in existence. There is no correlation between these events, confirming our reading of the historical literature. Moreover, in the regressions in Appendix Tables D.10 and D.11, we directly control for the presence of Estates. The main coefficient for fiscal centralization remains largely unaffected, and we find no direct effects of Estates on our outcomes of interest.

[1] Although increasingly sidelined from financial matters, for most territories Estates remained important pillars along other dimensions: They helped arbitrate inheritance disputes within noble lineages, and ensured ruler continuity in the case of underage rulers (Bütterlin, 1977, p. 29).

Figure B.1: Activity of Estates and Fiscal Centralization



Note The figure shows the time period during which Estates were active, for all territories that ever fiscally centralize. Dots indicate the timing of the introduction of a Chamber.

Table B.1: Presence of Estates

Territory	Years	Selected Sources
Prince-Bishopric of Augsburg	-	Lanzinner (2011)
Margraviate of Baden-Baden	1536-1631	Gut (1970, p. 355)
Margraviate of Baden-Durlach	1536-1668	Gut (1970, p. 379)
Prince-Bishopric of Bamberg	1461-1654	Staudenmaier (2014)
Duchy of Bavaria	1302-1803	Folz (1974, p. 197)
Principality of Bayreuth	1499-1771	Schaupp and Schnupp (2017)
Margraviate of Brandenburg	1345-1653	Sieg (2003, p. 128)
Duchy of Brunswick-Calenberg	1501-1803	Wieden (2004, p. 280)
Duchy of Brunswick-Lüneburg	1392-1807	Wieden (2004, p. 359)
Duchy of Brunswick-Wolfenbüttel	1505-1801	Wieden (2004, p. 414)
Duchy of Cleves-Mark	1347-1614	Schulze (1907, p. 18-20)
Electorate of Cologne	1463-1794; 1797-1803	Ruppert (1972, p. 57)
Bishopric of Eichstätt	-	Lanzinner (2011)
Landgraviate of Hesse	1532-1628	Siebeck (1914, p. 1)
Landgraviate of Hesse-Darmstadt	1532-1628	Siebeck (1914, p. 1)
Landgraviate of Hesse-Marburg	1567-1604	Siebeck (1914, p. 53-54)
Duchy of Jülich-Berg	1347-1802	Below (1885, p. 18)
Electorate of Mainz	1346-1526	Fischer (2010)
Duchy of Mecklenburg-Güstrow	1520-1695	Folz (1974, p. 197)
Duchy of Mecklenburg-Schwerin	1279-1918	Folz (1974, p. 197)
Duchy of Mecklenburg-Strelitz	1701-1918	Folz (1974, p. 197)
Prince-Bishopric of Münster	1278-1802	Schmitz-Kallenberg (1936, p. 34-35)
County of Oldenburg	-	Oldenburgische Landschaft (2014, p. 80)
Prince-Bishopric of Paderborn	1326-1802	Jacobs (1937, p. 46)
Electoral Palatinate	1603-1623	Gothein (1888, p. 39-41)
Principality of Palatinate-Sulzbach	1615-1808	Rösel (2010)
County of Reuß-Greiz	1548-1867	Espig (2008, p. 265)
Duchy of Saxe-Eisenach	1674-1809	Schirmer (2008, p. 61-64)
Duchy of Saxe-Gotha	1640-1810	Stievermann (2008)
Duchy of Saxe-Hildburghausen	1680-1807	Witter (2008, p. 253-258)
Duchy of Saxe-Meiningen	1680-1789	Witter (2008, p. 239-241)
Albertine Saxony	1485-1831	Sächsischer Landtag (2021)
Duchy of Saxe-Weimar	1438-1831	Sächsischer Landtag (2021)
County of Schaumburg-Lippe	1647-1668	Stieglitz (2004, p. 391-404)
County of Schwarzburg-Rudolstadt	1531-1570; 1635-1723	Herz (1997, p. 13-15)
Electorate of Trier	1502-1801	Dillinger (2009)
County of Waldeck	1400-1789	Martin and Wetekam (1971)
Duchy of Württemberg	1457-1805	Baden-Württemberg (2008)
Bishopric of Würzburg	1523-1639	Neumaier (2010)

Note Table shows fiscally centralized territories and years of Estate activity. If 1789 is given as the end date, Estates existed until at least the year 1789 (similarly for 1400 as start date).

C Chamber Framework

In the following, we present a simple formal model of the decision to introduce a Chamber, based on the historical narrative from Section 2. Rulers care about territorial spending T and private spending R. They face a budget constraint

$$D \cdot \mu = P_T \cdot T + P_R \cdot R \ ,$$

where D is the size of the demesnes, and μ is the efficiency of extraction (both through narrowing the compliance gap and limiting leakage), which is in $[0, 1]$. P_T and P_R proxy for the difficulty with which revenues can be spent on territorial or private purposes, respectively.

To finance extraordinary expenses, a ruler can petition the Estates for taxes. However, these are tightly earmarked, so that the budget constraint becomes

$$D \cdot \mu + E = P_T \cdot T + P_R \cdot R + E \ ,$$

with E the size of the Estate tax. Hence, consulting the Estates is necessary if the territory is facing existential financial crises, but it does not provide utility to the ruler above this purpose.

A ruler also can institute a Chamber C, which improves the efficiency with which revenues are collected by μ_C, so that overall revenue collection efficiency is $\mu_T = \mu + \mu_C$.[1] There are fixed costs P_C associated with the introduction of a Chamber.[2]

The Emperor levies Imperial taxes IT. The prince can collect the taxes himself (they become part of the demesnes), and he can credibly ask $\frac{IT}{\mu}$ from his tax base, which is the amount necessary to entirely cover the Imperial tax, with which he needs to comply, in the absence of a Chamber.

The full budget constraint hence becomes

$$\left(D + \frac{IT}{\mu}\right)(\mu + \mu_C \cdot C) + E = P_T \cdot T + P_R \cdot R + P_C \cdot C + E \ .$$

C is an indicator whether a ruler has instituted a Chamber.[3] The following threshold rule then determines that a Chamber is introduced if

[1] We assume that μ is far enough from 1 such that there is scope for the Chamber improvement; this is very plausible given contemporary accounts of the inefficiency of revenue collection.

[2] An additional way to model that the Chamber limits discretionary spending power of the ruler would be to increase P_R, the difficulty with which funds can be spent on private purposes. This doesn't substantially affect comparative statics.

[3] We treat the problem as static, which, given rulers' short time horizons is plausible.

$$\left(D + \frac{IT}{\mu}\right) \mu_C > P_C \ .$$

The likelihood of Chamber adoption increases with the size of the princely demesnes, the size of the Imperial tax levy, and the efficiency gain resulting from the Chamber; it decreases in baseline efficiency of revenue collection and with the cost of Chamber adoption. It is also straightforward to see that revenues (joint private and territorial spending) increase as the Imperial tax levies go up if there is a Chamber, and are not affected if there is no Chamber.

D Robustness

D.1 Alternative Estimation Specification

Table D.1: Predicting Fiscal Centralization, Alternative Specifications

	Fiscal Centralization						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Terrain Ruggedness (std.)	-0.559	-0.559	-0.204	-0.461	-0.936	-0.999	-3.851
	(0.341)	(0.341)	(0.491)	(0.514)	(0.794)	(0.858)	(2.628)
Distance to Water (std.)	0.113	0.113	0.236	0.525	1.046*	-0.0397	1.701
	(0.186)	(0.186)	(0.215)	(0.353)	(0.569)	(0.414)	(2.118)
Agricultural Suitability (std.)	0.280	0.280	-0.0320	0.221	0.644	0.412	1.385
	(0.250)	(0.250)	(0.396)	(0.363)	(0.610)	(0.474)	(1.755)
Any Mining Activity	1.882	1.882	3.441	2.295	3.083**	-0.601	0.564
	(1.426)	(1.426)	(2.239)	(2.061)	(1.227)	(0.482)	(1.208)
Share of Cities with Secondary Ruler	0.00699	0.00699	-0.198	-0.145	-1.924	-0.306	-0.523
	(0.126)	(0.126)	(0.157)	(0.213)	(1.644)	(0.245)	(0.629)
Share of Hanse Cities	-0.173	-0.173	-0.0493	-0.774	1.271	1.385	3.042
	(0.622)	(0.622)	(0.434)	(0.863)	(2.168)	(2.623)	(3.505)
ln Number of Cities/Towns	0.316	0.316	0.314	-0.0661	1.203**	1.120	1.271
	(0.232)	(0.232)	(0.235)	(0.294)	(0.533)	(0.872)	(1.074)
ln Number Markets	0.0384	0.0384	0.140	0.367	-0.345	0.299	0.782
	(0.159)	(0.159)	(0.204)	(0.238)	(0.691)	(0.367)	(0.712)
ln Construction, prior decade	0.382*	0.382*	0.619***	0.497**	0.334	0.240	0.528
	(0.222)	(0.222)	(0.238)	(0.240)	(0.324)	(0.192)	(0.502)
Any Attacks, past decade	0.491	0.491	0.475	0.619	0.0779	0.469*	1.032*
	(0.409)	(0.409)	(0.464)	(0.399)	(0.433)	(0.257)	(0.540)
Any Neighb. Mil. Constr., past decade	0.485	0.485	0.463	0.462	-0.340	-0.202	-0.515
	(0.468)	(0.468)	(0.531)	(0.466)	(0.397)	(0.344)	(0.717)
Any Centralized Neighbors	0.312**	0.312**	0.229	0.517**	0.742	0.211	0.192
	(0.144)	(0.144)	(0.172)	(0.263)	(0.513)	(0.555)	(0.743)
Contribution (share) × ln Roman Months	0.732***	0.732***	0.659***	0.815***	0.200***	0.397**	0.319***
	(0.211)	(0.211)	(0.210)	(0.228)	(0.0705)	(0.162)	(0.0702)
Observations	9,771	9,771	7,492	9,771	9,779	9,117	9,117
Model	OLS	OLS	OLS	OLS	Cox	OLS	Cox
Territories	all	all	1500	all	all	all	all
R^2	0.0462	0.0462	0.0606	0.133		0.0141	
Baseline Controls	✓	✓	✓		✓		
Territory FEs				✓			
Decade FEs	✓	✓	✓	✓		✓	
First Differences						✓	✓

Note Table presents results of estimating equation (1) in different specifications. Observations are at the territory-decade level. The sample comprises 38 decades and 625 territories. The dependent variable is a binary indicator reflecting the decade of introduction of the Chamber in a territory. Where applicable, we omit the territory from our sample thereafter, reflecting the absorbing state of this treatment. "Baseline Controls" indicates controls for the initial level of the independent variables, measured in 1500 or at the earliest available time period (for territories that start to exist after 1500). Standard errors are clustered at the territory level. *, **, and *** denote significance on the 10 percent, 5 percent, and 1 percent level, respectively.

Table D.2: Territorial Survival: Probability of Vanishing, 1500 Territories

	Extinction		Vanishing Conflict and Conquest		Purchase	
	(1)	(2)	(3)	(4)	(5)	(6)
Treated	0.0343	0.124	-0.104***	-0.148***	-0.0323***	-0.0325***
	(0.0841)	(0.144)	(0.0174)	(0.0272)	(0.0101)	(0.0121)
Treated × Decades Since		-0.00911		0.00445***		0.0000201
		(0.00708)		(0.00151)		(0.00120)
Observations	74,955	74,955	74,955	74,955	74,955	74,955
R^2	0.01	0.01	0.01	0.01	0.01	0.01
Mean dep. var	0.11	0.11	0.07	0.07	0.03	0.03
Year FEs	✓	✓	✓	✓	✓	✓

Note Table presents results of estimating equation (2) for the subset of territories that exist in 1500. Observations are at the territory-year level. The sample comprises 379 years and 625 territories. The dependent variable is an indicator that reflects whether a territory j vanishes in year t. We omit the territory from our sample thereafter, reflecting the absorbing state of this treatment. Standard errors are clustered at the territory level. *, **, and *** denote significance on the 10 percent, 5 percent, and 1 percent level, respectively.

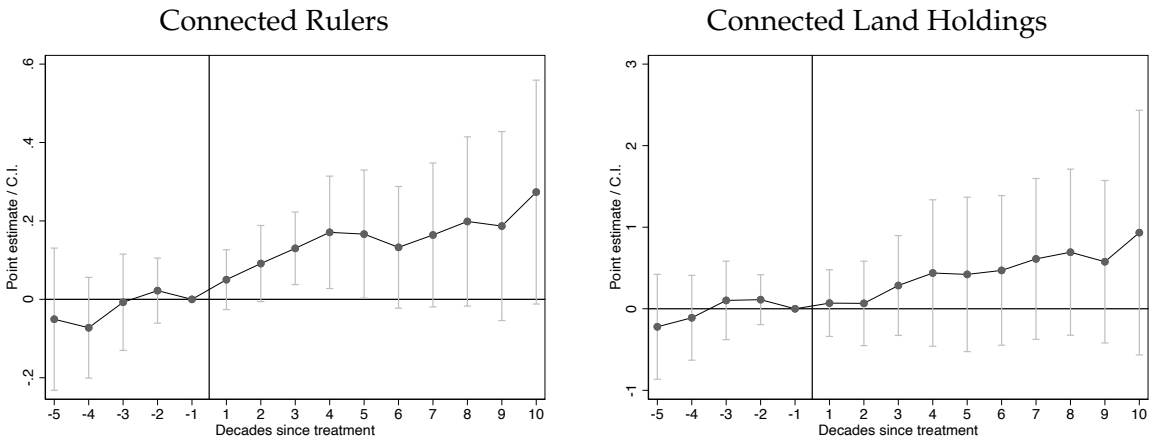
Table D.3: Territorial Survival: Probability of Vanishing, Territory FEs

	Extinction		Vanishing Conflict and Conquest		Purchase	
	(1)	(2)	(3)	(4)	(5)	(6)
Treated	0.0581	0.0619	-0.148***	-0.113***	-0.0460***	-0.0238**
	(0.122)	(0.137)	(0.0259)	(0.0219)	(0.0130)	(0.00991)
Treated × Decades Since		-0.000510		-0.00475***		-0.00298*
		(0.00926)		(0.00181)		(0.00156)
Observations	99,138	99,138	99,138	99,138	99,138	99,138
R^2	0.03	0.03	0.08	0.08	0.08	0.08
Mean dep. var	0.21	0.21	0.13	0.13	0.06	0.06
Territory_FEs	✓	✓	✓	✓	✓	✓
Year FEs	✓	✓	✓	✓	✓	✓

Note Table presents results of estimating equation (2) for the subset of territories that exist in 1500. Observations are at the territory-year level. The sample comprises 379 years and 625 territories. The dependent variable is an indicator that reflects whether a territory j vanishes in year t. We omit the territory from our sample thereafter, reflecting the absorbing state of this treatment. Standard errors are clustered at the territory level. *, **, and *** denote significance on the 10 percent, 5 percent, and 1 percent level, respectively.

D.2 Alternative Outcome Definition

Figure D.1: Marriage Gains (Alternative Connectedness Measure), Event Study



Note Figure presents the analogue to Panels A and B in Figure 5, considering gains in closeness to rulers instead of gains in immediate network connectedness.

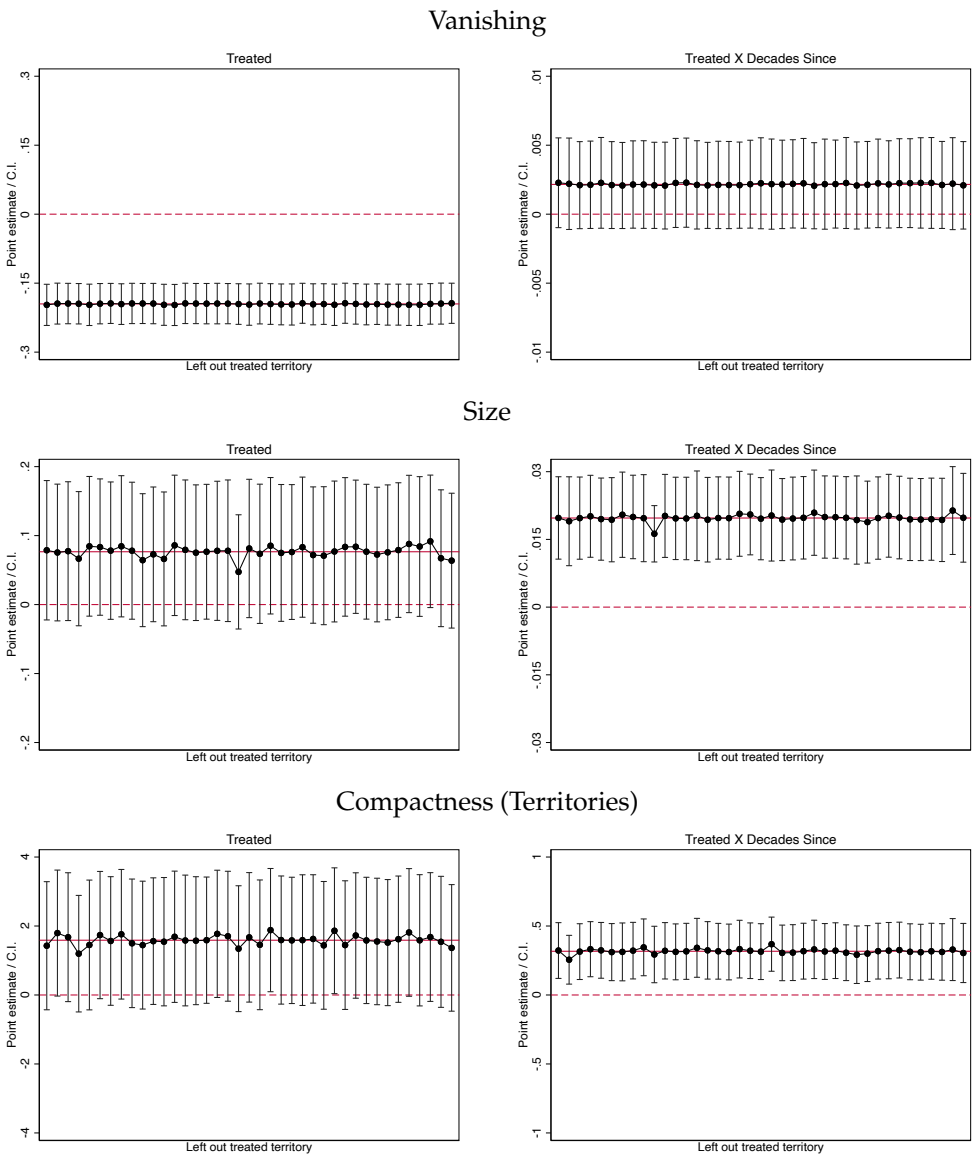
Table D.4: Marriage Gains (Alternative Connectedness Measure)

	Connectedness Gains			
	Rulers		Land Holdings	
	(1)	(2)	(3)	(4)
Treated	0.0973*	0.108*	0.131	0.317
	(0.0504)	(0.0593)	(0.281)	(0.304)
Treated × Decades Since		0.00552		0.0925
		(0.0122)		(0.0769)
Observations	4,325	4,325	4,325	4,325
R^2	0.38	0.39	0.60	0.61
Territory FEs	✓	✓	✓	✓
Year FEs	✓	✓	✓	✓

Note Table presents the analogue to Table 8, considering gains in closeness to rulers instead of gains in network connectedness.

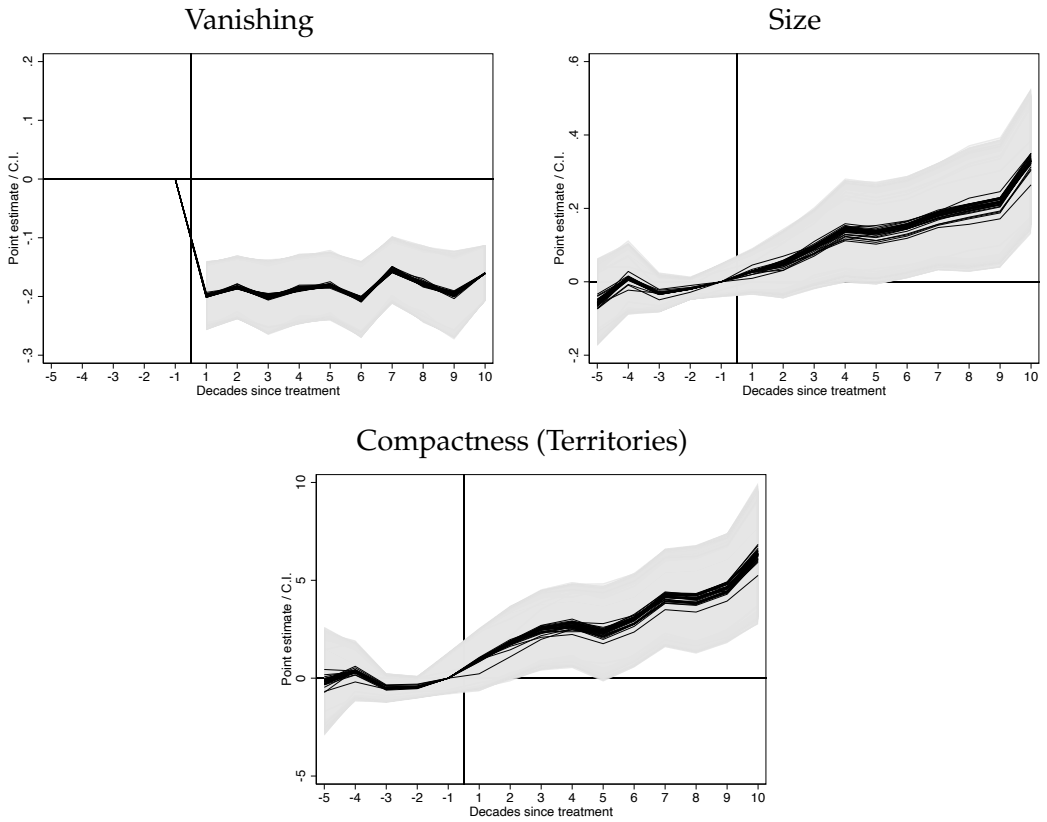
D.3 Sample Definition

Figure D.2: Leave-Out Coefficient Plots



Note The plots shows results for omitting one (eventually) fiscally centralized territory at a time from the sample, with 95 percent confidence intervals. Top panel shows the probability of vanishing as in Table 2. Middle panel shows territory size as in Table 3, column 2. Bottom panel shows territorial compactness as in Table 4. Left column shows β_1, and right column shows β_2. The dependent variables are a binary variable that reflects whether a territory j vanishes due to conflict or purchase in year t (top panel), the natural logarithm of cities in territory j in year t it rules alone (middle panel), the compactness measure defined at the level of territories in each year t (bottom panel).

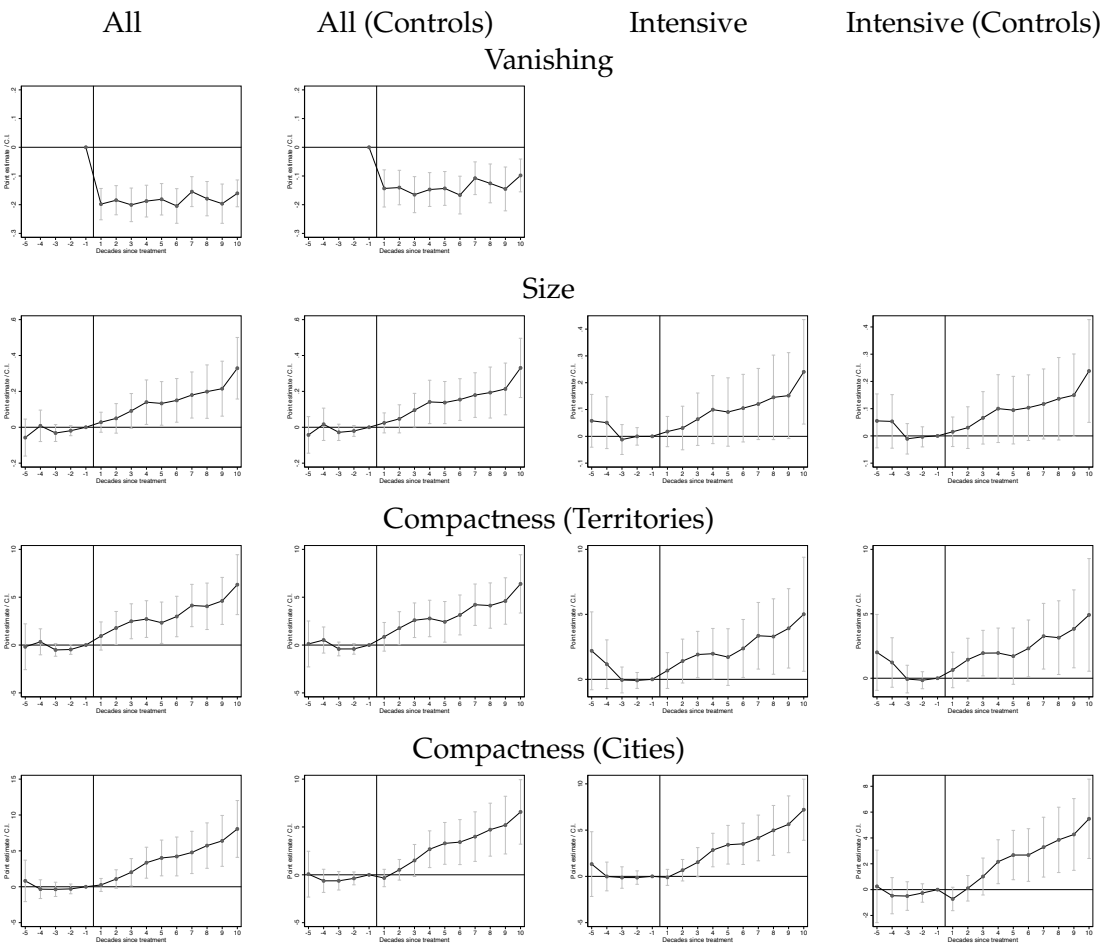
Figure D.3: Leave-Out Event Study Plots



Note The plots shows results for omitting one (eventually) fiscally centralized territory at a time from the sample, with 95 percent confidence intervals. Panels A, B, and C correspond to the respective panels in Figures 1 and 2. The dependent variables are (A) a binary variable that reflects whether a territory j vanishes due to conflict or purchase in year t, (B) the natural logarithm of cities in territory j in year t it rules alone, (C) the compactness measure defined at the level of territories in each year t.

D.4 Intensive Margin and Controls

Figure D.4: Territorial Consolidation, Intensive Margin and Controls



Note Figure shows the equivalent of Figures 1 and 2 in the first column. Second column shows results from including controls in the estimation. Third column shows results from only considering territories that ever fiscally centralize. Fourth column shows results for the intensive margin, including controls. The dependent variables are a binary variable that reflects whether a territory j vanishes due to conflict or purchase in year t (first row), the natural logarithm of cities in territory j in year t it rules alone (second row), the compactness measure defined either at the level of territories j (third row) or of cities i (fourth row), in each year t. Controls are an indicator for whether there were any attacks to the territory (city) in the past decade, an indicator of neighboring military construction activity in the past decade, an indicator of any fiscally centralized neighbors, and an indicator of the presence and activity of Estates (where applicable).

Table D.5: Territory Size, Intensive Margin

	Single Ruler		Uncontested		All	
	(1)	(2)	(3)	(4)	(5)	(6)
Treated	0.0200	0.0221	0.0107	0.0122	0.0103	0.0119
	(0.0472)	(0.0464)	(0.0473)	(0.0471)	(0.0423)	(0.0414)
Treated × Decades Since		0.0221***		0.0170**		0.0174***
		(0.00674)		(0.00650)		(0.00583)
Observations	9,257	9,257	9,257	9,257	9,257	9,257
R^2	0.95	0.96	0.96	0.96	0.96	0.96
Territory FEs	✓	✓	✓	✓	✓	✓
Year FEs	✓	✓	✓	✓	✓	✓

Note Table shows the equivalent of Table 3, including only intensive-margin territories into the analysis. The sample comprises 379 years and 39 territories. The dependent variable is the natural logarithm of cities in territory j in year t.

Table D.6: Territorial Compactness, Intensive Margin

	Domestic Border			
	Territories		Cities	
	(1)	(2)	(3)	(4)
Treated	0.489	0.524	1.046	0.189
	(1.021)	(0.986)	(0.957)	(0.976)
Treated × Decades Since		0.376*		0.429**
		(0.209)		(0.176)
Observations	9,257	9,257	652,597	652,597
R^2	0.94	0.94	0.85	0.85
City FEs			✓	✓
Territory FEs	✓	✓	✓	✓
Year FEs	✓	✓	✓	✓

Note Table shows the equivalent of Table 4, including only intensive-margin territories into the analysis. The sample comprises 379 years and 39 territories (1,942 cities). The dependent variable is the compactness measure defined either at the level of territories j (columns 1 and 2) or of cities i (columns 3 and 4), in each year t.

Table D.7: Territorial Survival: Probability of Vanishing (Controls)

	Extinction		Vanishing Conflict and Conquest		Purchase	
	(1)	(2)	(3)	(4)	(5)	(6)
Treated	-0.122	-0.119	-0.0982***	-0.125***	-0.0268**	-0.0333***
	(0.0755)	(0.112)	(0.0213)	(0.0217)	(0.0106)	(0.0120)
Treated × Decades Since		-0.000313		0.00306**		0.000752
		(0.00923)		(0.00134)		(0.00115)
Observations	99,138	99,138	99,138	99,138	99,138	99,138
R^2	0.00	0.00	0.01	0.01	0.00	0.00
Mean dep. var	0.21	0.21	0.13	0.13	0.06	0.06
Controls	✓	✓	✓	✓	✓	✓
Year FEs	✓	✓	✓	✓	✓	✓

Note Table shows the equivalent of Table 2, including controls into the analysis. The sample comprises 379 years and 625 territories. The dependent variable is a binary variable that reflects whether a territory j vanishes due to conflict or purchase in year t. Controls are an indicator for whether there were any attacks to the territory in the past decade, an indicator of neighboring military construction activity in the past decade, and an indicator of any fiscally centralized neighbors.

Table D.8: Territory Size (Controls)

	Single Ruler		Uncontested		All	
	(1)	(2)	(3)	(4)	(5)	(6)
Treated	0.214***	0.0658	0.172***	0.0368	0.160***	0.0387
	(0.0597)	(0.0487)	(0.0500)	(0.0431)	(0.0493)	(0.0387)
Treated × Decades Since		0.0199***		0.0181***		0.0162***
		(0.00443)		(0.00474)		(0.00426)
Observations	99,138	99,138	99,138	99,138	99,138	99,138
R^2	0.95	0.95	0.95	0.95	0.95	0.95
Controls	✓	✓	✓	✓	✓	✓
Territory FEs	✓	✓	✓	✓	✓	✓
Year FEs	✓	✓	✓	✓	✓	✓

Note Table shows the equivalent of Table 3, including controls into the analysis. The sample comprises 379 years and 625 territories. The dependent variable is the natural logarithm of cities in territory j in year t. Controls are an indicator for whether there were any attacks to the territory in the past decade, an indicator of neighboring military construction activity in the past decade, and an indicator of any fiscally centralized neighbors.

Table D.9: Territorial Compactness (Controls)

	Domestic Border			
	Territories		Cities	
	(1)	(2)	(3)	(4)
Treated	3.795***	1.392	2.387***	0.832
	(1.092)	(0.949)	(0.919)	(0.922)
Treated × Decades Since		0.322***		0.321***
		(0.101)		(0.122)
Observations	99,138	99,138	810,350	810,350
R^2	0.93	0.93	0.88	0.88
Controls	✓	✓	✓	✓
City FEs			✓	✓
Territory FEs	✓	✓	✓	✓
Year FEs	✓	✓	✓	✓

Note Table shows the equivalent of Table 4 with controls. The sample comprises 379 years and 625 territories (2,371 cities). The dependent variable is the compactness measure at the level of territories j (columns 1 and 2) or of cities i (columns 3 and 4), in each year t. Controls are indicators for whether there were any attacks to the territory (city) in the past decade, for neighboring military construction activity in the past decade, and for any fiscally centralized neighbors.

Table D.10: Territory Size, Intensive Margin (Controls)

	Single Ruler		Uncontested		All	
	(1)	(2)	(3)	(4)	(5)	(6)
Treated	0.0202	0.0213	0.0101	0.0110	0.0104	0.0113
	(0.0477)	(0.0465)	(0.0471)	(0.0466)	(0.0418)	(0.0407)
Estates	-0.155*	-0.117	-0.119	-0.0894	-0.114	-0.0839
	(0.0866)	(0.0832)	(0.0828)	(0.0793)	(0.0794)	(0.0762)
Treated × Decades Since		0.0191***		0.0148**		0.0152***
		(0.00560)		(0.00556)		(0.00475)
Observations	9,257	9,257	9,257	9,257	9,257	9,257
R^2	0.96	0.96	0.96	0.96	0.96	0.97
Controls	✓	✓	✓	✓	✓	✓
Territory FEs	✓	✓	✓	✓	✓	✓
Year FEs	✓	✓	✓	✓	✓	✓

Note Table shows the equivalent of Table 3, including only intensive-margin territories into the analysis, and including controls. The sample comprises 379 years and 39 territories. The dependent variable is the natural logarithm of cities in territory j in year t. Controls are an indicator for whether there were any attacks to the territory in the past decade, an indicator of neighboring military construction activity in the past decade, and an indicator of any fiscally centralized neighbors.

Table D.11: Territorial Compactness, Intensive Margin (Controls)

	Domestic Border			
	Territories		Cities	
	(1)	(2)	(3)	(4)
Treated	0.565	0.586	0.557	0.0758
	(1.028)	(0.999)	(0.877)	(0.924)
Estates	-1.043	-0.347	-2.287	-1.990
	(1.034)	(1.054)	(1.547)	(1.562)
Treated × Decades Since		0.352		0.250
		(0.214)		(0.152)
Observations	9,257	9,257	652,597	652,597
R^2	0.94	0.94	0.86	0.86
Controls	✓	✓	✓	✓
City FEs			✓	✓
Territory FEs	✓	✓	✓	✓
Year FEs	✓	✓	✓	✓

Note Table shows the equivalent of Table 4, including only intensive-margin territories and with controls. The sample comprises 379 years and 39 territories (1,942 cities). The dependent variable is the compactness measure defined either at the level of territories j (columns 1 and 2) or of cities i (columns 3 and 4), in each year t. Controls are an indicator for whether there were any attacks to the territory (city) in the past decade, an indicator of neighboring military construction activity in the past decade, and an indicator for fiscally centralized neighbors.

D.5 Heterogeneous Treatment Effects

Table D.12: De Chaisemartin and d'Haultfœuille (2020)

	Vanishing	Size	Compactness	Comp. (Cities)
	(1)	(2)	(3)	(4)
Panel A: Two-Way Fixed Effects				
Treated	-0.0186***	0.235***	0.0400***	0.0309***
	(0.00286)	(0.0630)	(0.0116)	(0.0109)
Panel B: Chaisemartin and D'Haultfoeuille				
Treated(Avg.)	-0.0141***	0.222***	0.0429***	0.0602**
	(0.00196)	(0.0829)	(0.0141)	(0.0244)
Observations	10,273	10,273	10,273	85,755

Note Table presents results of applying the estimator in De Chaisemartin and d'Haultfœuille (2020) to our main outcome regressions. In Panel A, we report the coefficients from two-way fixed effects regression. We deviate from the results in the main text body in two ways: i) we aggregate our data from yearly to decadal frequency, and ii) we also proxy three-way fixed effects through a territory-city and a decade fixed effect. Despite the deviations, results are very similar to their counterparts in the main text body. The deviations ensure comparability with Panel B, in which we report the average effect from the $DID_{+,l}$ estimator from De Chaisemartin and d'Haultfœuille (2020) for $l \in \{0, 1, \ldots, 20\}$. By averaging the effect of 200 years following the treatment, this is (asymptotically) similar to the differences-in-differences interpretation of the fixed effects regression. We run 200 bootstrap replications. Observations are at the territory-decade level. The sample comprises 38 decades and 625 territories (2,371 cities). The dependent variables are a binary variable that reflects whether a territory j vanishes due to conflict or purchase in year t (column 1), the natural logarithm of cities in territory j in year t it rules alone (column 2), the compactness measure defined at the level of territories in each year t (column 3), the compactness measure defined at the level of cities in each year t (column 4). Standard errors are clustered at the territory level. *, **, and *** denote significance on the 10 percent, 5 percent, and 1 percent level, respectively.

Table D.13: Weights

	Territories	Cities
Pos. Weight ATT	495	23628
Neg. Weight ATT	48	8698
Sum Neg. Weight	-0.0036	-0.087

Note Table shows the weights associated with territory-level and city-level two-way fixed effects regressions in our sample. The first row shows the number of observations that receive a positive weight. The second row shows the number of observations that receive a negative weight. The final row shows the sum of negative weights.

D.6 Instrumental Variables

Table D.14 shows the effect of fiscal centralization on the main outcomes of section 5, employing the maximum Imperial tax contribution a territory has faced up to year t as an instrumental variable for the presence of a Chamber.

Table D.14: Main Outcomes, Instrumental Variables Approach

	Vanishing	Size	Compactness
	(1)	(2)	(3)
Panel A: Fiscal Centralization (OLS)			
Treated	-0.176***	0.224***	3.950***
	(0.0200)	(0.0608)	(1.095)
Panel B: Fiscal Centralization (IV)			
Treated	-0.489***	0.889***	15.08***
	(0.105)	(0.267)	(4.940)
Observations	99,138	99,138	99,138
Territory FEs		✓	✓
Year FEs	✓	✓	✓

Note Table presents results of estimating the effect of fiscal centralization on vanishing probability, size, and territorial compactness. Panel A presents results for actual fiscal centralization treatment. Panel B shows results when using Imperial tax contributions as an instrumental variable for the treatment. Observations are at the territory-year level. The sample comprises 379 years and 625 territories. The dependent variables are a binary variable that reflects whether a territory j vanishes due to conflict or purchase in year t (column 1), the natural logarithm of cities in territory j in year t it rules alone (column 2), the compactness measure defined at the level of territories in each year t (column 3). In Panel A, column 1 pools the results of Table 2, column 3 and 5 (vanishing due to conflict or purchase). Column 2 is the same as Table 3, column 1. Column 3 is the same as Table 4, column 1. We use the maximum Imperial tax contribution a territory has faced up to year t as an instrumental variable for the presence of a Chamber as described in Section 5.5. The F-statistic associated with the instrument coefficient in the first stage is 24.07. Standard errors are clustered at the territory level. *, **, and *** denote significance on the 10 percent, 5 percent, and 1 percent level, respectively.

To better account for the binary nature of the treatment and the fact that the eventual adoption of a Chamber is an absorbing state, we present an approach equivalent to a 2SLS regression below: We first use the regression in Table 1, column 6, to predict, decade-by-

decade, the linear probability of adopting a Chamber for each territory. The corresponding F-statistic associated with the coefficient (analogous to the excluded instrument in a standard 2SLS setup) is equal to 12.00. We then set a threshold of 4.75%, and impute a "predicted" adoption of the Chamber for all decades after a territory passes this threshold for the first time. The threshold is chosen such as to match, in the prediction, the actual number of territories eventually fiscally centralizing in our dataset (39). In the analogue of a second-stage regression, we then use these predicted treatments to estimate the effects of fiscal centralization on the outcomes of the previous sections (likelihood of vanishing, size, and territory-level compactness). Results are presented in Table D.15 below, comparing the OLS baseline estimates (Panel A) to our 2SLS-analogue regressions (Panel B). The estimates using the imputed fiscal centralization events are close to the baseline results, throughout all specifications.

Table D.15: Main Outcomes, Using Predicted Fiscal Centralization

	Vanishing		Size		Compactness	
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Fiscal Centralization						
Treated	-0.176***	-0.195***	0.224***	0.0766	3.950***	1.588*
	(0.0200)	(0.0225)	(0.0608)	(0.0499)	(1.095)	(0.934)
Treated × Decades Since		0.00216		0.0197***		0.317***
		(0.00163)		(0.00465)		(0.103)
Panel B: Predicted Fiscal Centralization						
Treated (Pred.)	-0.168***	-0.168***	0.255***	0.135**	4.497***	2.364*
	(0.0244)	(0.0504)	(0.0499)	(0.0575)	(1.372)	(1.242)
Treated (Pred.) × Decades Since		0.0000361		0.0135***		0.242***
		(0.00332)		(0.00502)		(0.0803)
Observations	99,138	99,138	99,138	99,138	99,138	99,138
Territory FEs			✓	✓	✓	✓
Year FEs	✓	✓	✓	✓	✓	✓

Note Table presents results of estimating the effect of (predicted) fiscal centralization on vanishing probability, size, and territorial compactness. Panel A presents results for actual fiscal centralization treatment. Panel B shows results for predicted values of fiscal centralization. Observations are at the territory-year level. The sample comprises 379 years and 625 territories. The dependent variables are a binary variable that reflects whether a territory j vanishes due to conflict or purchase in year t (columns 1 and 2), the natural logarithm of cities in territory j in year t it rules alone (columns 3 and 4), the compactness measure defined at the level of territories in each year t (columns 5 and 6). In Panel A, column 1 pools the results of Table 2, columns 3 and 5 (vanishing due to conflict or purchase). Similarly, column 2 pools Table 2, columns 4 and 6. Columns 3 and 4 are the same as Table 3, columns 1 and 2. Columns 5 and 6 are the same as Table 4, columns 1 and 2. We predict the decade-by-decade linear probability of adopting a Chamber for each territory based on Table 1, column 6. We compute the "predicted" adoption of a Chamber as described in Section 5.5. Standard errors are clustered at the territory level. *, **, and *** denote significance on the 10 percent, 5 percent, and 1 percent level, respectively.

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