DISCUSSION PAPER SERIES

DP15601

WARS, TAXATION AND REPRESENTATION: EVIDENCE FROM FIVE CENTURIES OF GERMAN HISTORY

Sascha O. Becker, Andreas Ferrara, Eric Melander and Luigi Pascali

DEVELOPMENT ECONOMICS

ECONOMIC HISTORY

MACROECONOMICS AND GROWTH

PUBLIC ECONOMICS

ISSN 0265-8003

WARS, TAXATION AND REPRESENTATION: EVIDENCE FROM FIVE CENTURIES OF GERMAN HISTORY

Sascha O. Becker, Andreas Ferrara, Eric Melander and Luigi Pascali

Discussion Paper DP15601
Published 23 December 2020
Submitted 20 December 2020

Centre for Economic Policy Research
33 Great Sutton Street, London EC1V 0DX, UK
Tel: +44 (0)20 7183 8801
www.cepr.org

This Discussion Paper is issued under the auspices of the Centre's research programmes:

- Development Economics
- Economic History
- Macroeconomics and Growth
- Public Economics

Any opinions expressed here are those of the author(s) and not those of the Centre for Economic Policy Research. Research disseminated by CEPR may include views on policy, but the Centre itself takes no institutional policy positions.

The Centre for Economic Policy Research was established in 1983 as an educational charity, to promote independent analysis and public discussion of open economies and the relations among them. It is pluralist and non-partisan, bringing economic research to bear on the analysis of medium- and long-run policy questions.

These Discussion Papers often represent preliminary or incomplete work, circulated to encourage discussion and comment. Citation and use of such a paper should take account of its provisional character.

Copyright: Sascha O. Becker, Andreas Ferrara, Eric Melander and Luigi Pascali

WARS, TAXATION AND REPRESENTATION: EVIDENCE FROM FIVE CENTURIES OF GERMAN HISTORY

Abstract

We provide causal evidence for the role of conflicts in the development of representative institutions in Europe. Using novel data on the universe of German cities between 1250 and 1710, we show that involvement in wars resulted in city councils that were larger, had a higher probability of being elected by citizens, and a higher probability of guild representation. Additionally, conflicts led to a substantial long-term increase in local fiscal and spending capacity. This effect persisted well after the end of the conflicts: temporary war taxes were transformed into permanent sophisticated systems of taxation, while public spending was re-directed from military to civilian spending. We use the gender of the firstborn child of the best-connected local noble to instrument for conflict: a firstborn daughter increases the likelihood of conflict relative to a firstborn son.

JEL Classification: N13, P48, R11

Keywords: wars, institutions, medieval constitutionalism, fiscal capacity

Sascha O. Becker - s.o.becker@warwick.ac.uk
Monash University, University of Warwick and CEPR

Andreas Ferrara - a.ferrara@pitt.edu
University of Pittsburgh

Eric Melander - eric.melander@unamur.be
University of Namur, Centre for Competitive Advantage in the Global Economy, University of Warwick

Luigi Pascali - luigi.pascali@upf.edu
Pompeu Fabra University and CEPR

Wars, Taxation and Representation: Evidence from Five Centuries of German History*

Sascha O. Becker
Monash U & U Warwick

Andreas Ferrara
University of Pittsburgh

Eric Melander
University of Namur

Luigi Pascali
Universitat Pompeu Fabra & BGSE

This version: 28 September 2020 (First version: 19 December 2018)

Abstract

We provide causal evidence for the role of conflicts in the development of representative institutions in Europe. Using novel data on the universe of German cities between 1250 and 1710, we show that involvement in wars resulted in city councils that were larger, had a higher probability of being elected by citizens, and a higher probability of guild representation. Additionally, conflicts led to a substantial long-term increase in local fiscal and spending capacity. This effect persisted well after the end of the conflicts: temporary war taxes were transformed into permanent sophisticated systems of taxation, while public spending was re-directed from military to civilian spending. We use the gender of the firstborn child of the best-connected local noble to instrument for conflict: a firstborn daughter increases the likelihood of conflict relative to a firstborn son.

Keywords: WARS; MEDIEVAL CONSTITUTIONALISM; FISCAL CAPACITY; PUBLIC EXPENDITURE
JEL Classification: N13; P48; R11

Acknowledgments: We thank Carlo Altomonte, Jeanet Bentzen, Alberto Bisin, Dan Bogart, Raquel Fernandez, Oded Galor, Phil Hoffman, Mark Koyama, Stelios Michalopoulos, Jared Rubin, Shanker Satyanath, Mara Squicciarini, David Stasavage, Joachim Voth, and David Weil for helpful discussions and comments. Conference and seminar participants at Bocconi University, Brown University, HKU, U Javeriana Bogota, NYU Abu Dhabi, NYU New York City, Oxford, Southampton, UCLA, Warwick, York, Zurich, at the World Economic History Congress in Boston, the Workshop on 'Growth, History and Development' at the University of Southern Denmark, at ASREC Europe in Bologna, at the 27th CEPR European Summer Symposium in International Macroeconomics (ESSIM), at the GSU Spring Conference on Global and Economic History, and at the Australian Political Economy Workshop gave useful feedback. Dominik Bursy, Lander Elizondo, Pavel Filippov, Evgeniia Filippova, Sebastian Hager, Dominique Lade, Melissa Özer, Jan Ringling, Federica Schneider, Stephanie Spahn, Miriam Venturini, Mirko Vintar, Ivan Yotzov and Simon Zeiser provided excellent research assistance. Support by the ESRC Centre for Competitive Advantage in the Global Economy (ESRC grant ES/L011719/1) is gratefully acknowledged. Melander gratefully acknowledges financial support from Excellence of Science (EOS) research project FNRS O020918F. Pascali gratefully acknowledges financial support from the Spanish Ministry of Economy and Competitiveness, through the Severo Ochoa Programme for Centres of Excellence in R&D (SEV-2015-0563). All authors are affiliated with CAGE. Becker is also affiliated with CEPR, CESifo, CReAM, ifo, IZA, ROA and SoDa Labs. Pascali is also affiliated with CEPR. A previous version of this paper was circulated in December 2018 as CAGE WP No. 395 under the title: "Wars, Local Political Institutions, and Fiscal Capacity: Evidence from Six Centuries of German History".

1 Introduction

Why did the Western world emerge during the second millennium as the most powerful and wealthy world civilization? A large literature in economics has emphasized the superiority of Western institutions, characterized by representative assemblies and the rule of law.[1] But what led to the development of these institutions in the first place?

To answer this fundamental question, we need to go back in time. Starting in the thirteenth century, Europe experienced an extraordinary political divergence with respect to the other contemporaneous major world civilizations.[2] Two new concepts emerged among Europeans that would inexorably change their fates: the spread of representative assemblies and the diffusion of the idea that rulers should govern with the consent of their subjects.[3] A strip of land in Central Europe ranging from the Flemish and Dutch coast to Northern Italy witnessed the development of local centres of power – towns and cities – characterized by representative assemblies, rule of law, and substantial fiscal and spending capacity. This institutional framework, which is often referred to as medieval constitutionalism, provided the Europeans with the first training camp on democratic institutions and posited the ideological basis of Western liberal democracies.[4]

What gave rise to medieval constitutionalism? How did it spread? A classical theoretical and

[1] A large empirical literature, beginning with the seminal contributions of Engerman and Sokoloff (1994), La Porta, Lopez-de Silanes, Shleifer and Vishny (1997) and Acemoglu, Johnson and Robinson (2001), has convincingly shown that effective, accountable, and inclusive institutions (with respect to contract enforcement and property rights protection) are critical for economic growth. These empirical studies have built upon an earlier theoretical and qualitative body of literature dating back to North and Thomas (1973) and North (1981, 1990). For a complete review, see Nunn (2009).

[2] See Stasavage (2016) for a comparison of patterns of representation and consent between medieval Europe and three other major world civilizations: China, the Byzantine Empire and the Abbasid Caliphate. See Downing (1989) on the medieval origins of constitutional government in the West in comparison with the medieval institutions in Japan, China and Russia. See also Møller (2014) for a historical institutional comparison between Western Europe and Russia.

[3] Rubin (2017) discusses the role of legitimization of rulers in Europe via parliaments in comparison to the continued religious legitimization of Islamic rulers.

[4] Already Alexis de Toqueville and John Stuart Mill emphasized local self-governance as a training camp for the development of modern democracies (Elkin, 1987). More recently, the medieval roots of democracy have been highlighted by Downing (1989), Sabetti (2004) and Møller (2014). Downing (1993, p. 1) writes: "[...] late medieval Europe had numerous political characteristics that distinguished it from other major world civilizations. These characteristics, the most important of which were representative assemblies, constituted a basis for liberal democracy, which provided Europe with a predisposition toward democratic political institutions [...]"

qualitative literature in political science (which we discuss in detail below) has hypothesized that a series of historical developments combined with crucial geographical factors divided Central Europe into a myriad of small states with weak rulers constantly at war with each other. Figure 1 illustrates the history of territorial borders in Europe during our sample period: no other region shows the same density of borders as Central Europe.[5] In this context of weak rulers and constant wars, representative assemblies were a fundamental tool to raise the taxes and credit necessary to finance these wars. In this sense, external threats and wars were the ultimate drivers of the spread of medieval representative institutions.

The aim of this paper is to test this hypothesis in the context of German history. Specifically, we look at the universe of German towns and cities from the thirteenth century until the early eighteenth century and test whether exogenous external threats and conflicts had a causal impact on the spread of local representative assemblies. To understand whether representative institutions were a means to raise fiscal capacity to finance wars, we also study the impact of conflicts on local fiscal and spending capacity.

The history of the city of Dortmund, today the largest city in the Ruhr area of western Germany, illustrates our main hypothesis.[6] During a twenty-month siege in 1388-89, the city incurred heavy war debts. Funds to pay off the debts were raised by levying war taxes, including exceptional wealth taxes in 1393, 1395 and 1396. Citizens responded by revolting and thereby secured increased participation on the city council in 1400 (in the form of six direct citizens' representatives). In the following decades, the city's increased fiscal capacity translated into additional spending capacity, with church renovations and the construction of a new church tower. In the half-century before the siege (and hence before the introduction of wealth taxes and citizens' representation), there is no evidence of similar public expenditures. Dortmund's early steps towards

[5] Appendix Figure A1 compares the number of sovereign states in China and Europe in the last two millennia. Throughout this period, the number of states in Europe has been substantially higher than China. Moreover, the number of states in Europe experienced a rising trend with a marked acceleration from the twelfth century. No such increase took place in China.

[6] This example is taken from the history of the city of Dortmund as described in Keyser (1939-1974, Volume 11, p. 108-117). This source, and our extensive data collection, is described in Section 3. The relevant excerpts for the example of Dortmund are shown in Figure A2.

medieval constitutionalism are therefore closely entwined with its historical experience of war.

This paper is based on a large data collection effort and introduces two novel datasets, both with a panel structure covering every decade during the period 1250-1710. The start year of our sample is motivated by Figure A1, showing a large increase in the political fragmentation of Europe during the thirteenth century. The final year marks the end of this period of fragmentation which saw the rise of larger and more powerful states, such as the formation of the Kingdom of Prussia (1701), which permanently changed the political landscape in the German lands.

Our first dataset contains information on 2,340 German towns and is based on the *Deutsches Städtebuch* (Keyser, 1939-1974), a large encyclopedia of the history of German cities. From this source, we collected four different types of information. First, we collected information on conflicts in which the cities were involved, such as sieges, battles, and sackings. To our knowledge, our conflict data for German cities significantly improves upon conflict data used in previous studies in terms of the number of conflicts and length of time period covered.[7]

Second, we collected information on a series of institutional features of the cities in our sample. In particular, we attempt to capture elections and political representation, two key components of medieval constitutionalism. We focus on city councils as representative political institutions; in the words of Stasavage (2016), city councils were the "chief means of seeking consent [to tax]" where "representatives from different parts of a society would be able to express themselves" (p. 147). We collect three types of institutional information. We investigate whether the city council is elected by the citizens without the interference of the local nobility. To capture the representativeness of the city council, we both measure the size of city council and collect information on whether the guilds had a permanent representation in the council.[8]

[7]To date, the most comprehensive and well-known sources of historical conflicts are Clodfelter (2008) and Brecke (1999). Clodfelter covers global conflicts from 1494 to 2007, while Brecke's data starts from 1400. We improve on these sources in two dimensions. In contrast to these two databases, our data also cover conflicts from 1250 to 1390, a crucial period when studying the origin of medieval constitutionalism. Moreover, our focus is not only on battles, but on a broader set of conflict events. We are therefore able to capture much greater local detail, and hence a much larger number of conflict events, than the two databases combined from 1400 to 1750 for the German lands. By way of comparison, for the period 1400 to 1900, our dataset records more conflicts for German cities than these two sources combined for the entirety of Europe, Northern Africa and the Near East. For more details see footnote 21.

[8]See Kjaer and Elklit (2014) on the relationship between assembly size and representativeness.

Third, we collected detailed data on the tax system for the cities in our sample. We identify 28 different types of taxes and categorize them into two levels of sophistication: from simple taxes that do not require any registry (such as mill or road taxes which could be charged on the spot) to sophisticated taxes that require a registry and a specialized class of bureaucrats (such as income or inheritance taxes). These tax data introduce an important novelty compared to previous studies on fiscal capacity, which are usually based on measures of public spending, as they are better able to capture the amount of resources that the local government could theoretically extract if it chose to.

Fourth, to separately capture public spending, we collected detailed data on each public construction event with a civil, military or religious purpose.[9]

The second dataset provides information about the European aristocratic network in the period of analysis. We start from a dataset that is available online, the *Peerage* project (Lundy, 2020), which comprises data on over 680,000 European nobles. This dataset provides information about the entire network of nobles, with links formed by parenthood or marriage. We complement this dataset with hand-coded data on locations of births, deaths, and marriages, which allows us to link individual nobles to cities and territories. The main source of location data are the *Europäische Stammtafeln* (European Family Trees, Schwennicke (1998)), supplemented with additional information from the *Peerage* itself.

We combine these two novel datasets to study the impact of conflicts on the emergence of local representative institutions, fiscal capacity and public spending. We start by showing that conflicts are positively correlated with more representative local institutions, and higher levels of fiscal capacity and public spending. First, we use the Thirty Year's War, one of the most destructive wars in the history of the German lands, as illustrative example. We show that cities that were involved in this conflict experienced a relative increase in the probability that citizens elected their councils, in the number of members of the council, in the number of local complex taxes and in the number of new construction events, compared to cities that were not touched by the war.

[9] Cantoni, Dittmar and Yuchtman (2018) recently coded construction events in German cities before and after the Protestant Reformation (1475-1600) to document a shift from religious to secular purposes, especially in Protestant cities.

Interestingly, these comparative changes are permanent, in the sense that they survive the end of the war. Second, we extend the analysis to our full sample: the resulting OLS panel regressions confirm this positive relationship between wars and the rise of medieval constitutionalism. The question that naturally follows is then whether this correlation has a causal interpretation.

To isolate an exogenous source of variation in conflicts and external threats we use the gender of the firstborn of the most prominent local noble. The idea is that a female firstborn child is more likely to give rise to conflicts. There are two reasons behind this. First, wars of succession are often fought about women's right to inherit as rulers. The classical example, outside our own sample, is the War of the Austrian Succession (1740-1748), which involved all the great powers of Central Europe and was fought over Maria Theresa's succession to the Habsburg Monarchy, precluded to women by Salic Law. A more mundane example from our own setting is the War of the Succession of Landshut (1503-1505). George, the Duke of Bavaria-Landshut, had failed to produce a male heir. He named his daughter Elisabeth as his heir, thereby breaching both imperial law and a previous agreement within the House of Wittelsbach on succession upon extinction of the male line. Duke Albert of the Bavaria-Munich line did not accept George's breach of the House agreement, leading to a destructive two-year war in the Landshut lands. Second, once in power, female rulers tend to fight more wars than their male counterparts. Dube and Harish (2020) show that states led by women in Europe between 1400 and 1900 were more prone to conflict than states led by men. Our first stage estimates confirm that the gender of the firstborn has a large impact on the probability that the city is involved in a conflict in the subsequent decade.

Using the gender of nobles' firstborn children as an exogenous source of variation, we then find that wars led to more representative local institutions. Our estimates show that exposure to one additional conflict is associated with a 2.6 percentage points increase in the probability that citizens elect the council without interference of the local ruler, an expansion of the council by approximately three members and an increase in the probability of a guild representation in the council by 17 percentage points.

Further, we find that conflicts initially led to a temporary increase in war taxes which, over

time, were replaced by (permanent) sophisticated taxes, such as taxes on income, wealth, and inheritances. Sophisticated taxes broadened the tax base but often required the development of additional administrative capacity and more complex registries in addition to the consent of the population to be taxed. Overall, the tax results are suggestive that political representation was used as a bargaining chip to raise local taxes in times of war.

Lastly, in addition to an increasingly sophisticated tax system, we also find that conflicts caused an increase in longer-term public spending. Clearly, in the short run, wars resulted in higher military expenses. What is interesting, however, is that wars had an impact on spending also in the long run. It appears that, once fiscal capacity was developed for wars, it continued to be used for other public spending and led to an increase in the stock of public buildings up to three decades after the war was over.

Our paper contributes to several strands of the literature in economics and political science. The theory of the bellicose origins of democratic institutions has a long pedigree in the social sciences. In one of his lectures, recorded and published by his students, (Weber, 1923/1981, pp. 324-325) famously said that, "The basis of democratization is everywhere purely military in character; it lies in the rise of disciplined infantry, the hoplites of antiquity, the guild army of the middle ages. [..] Military discipline meant the triumph of democracy because the community wished and was compelled to secure the cooperation of the non-aristocratic masses and hence put arms, and along with arms, political power into their hands".

A large qualitative literature has looked at the impact of wars on the development of medieval constitutionalism. The broad idea, championed by Downing (1993) and Hoffman and Norberg (1994), is that representation and some fundamental rights were given by medieval European rulers in exchange for an increased tax burden in times of war. Taxation was not the only part of the financial toolkit of European rulers. Other authors have emphasized the role of credit (Stasavage, 2011, 2016). Rulers had to borrow to meet the expenses of war. Representative assemblies were a solution to the commitment problem of rulers with their future creditors. A recent literature also looks at the impact of wars on modern democratic liberal states. Ticchi and Vindigni (2008) ar-

gue that, in modern wars, democratic institutions were essential to keep high the morale of armies formed by conscripted citizens: they were a commitment device to promise future redistribution of income.[10] Cox, Dincecco and Onorato (2020) link the emergence of local communes and parliaments to bargaining between merchants and local rulers. They argue that fragmentation of polities and wars decreased the bargaining power of local rulers while the bargaining power of merchants rose in wake of the Commercial Revolution. As trade increased the profitability for merchants of being involved in the political process, this led to a shift in political power.

The literature on wars and representative local democratic institutions is largely theoretical and qualitative, while, to the best of our knowledge, there is no systematic empirical evidence.[11,12] In a recent literature review, Stasavage (2016) writes: "So far, the evidence suggests some causal link between warfare and representative institutions, although we do not know in which direction causality runs. War might lead to institutional development, but institutional development would also make it easier to wage war." One key objective of our work is to provide evidence for one direction of causality, from wars to representation.

Our paper also contributes to a large empirical literature on the impact of wars on urban growth and development in Europe. Dincecco and Onorato (2016) show that cities that were more exposed to conflict in Europe starting from the ninth century were also those that grew the most.[13] Our work

[10] Acemoglu (2005) discusses the circumstances under which a "consensually strong state equilibrium can emerge". This is an equilibrium in which the state is politically weak but is allowed to impose high taxes as long as a sufficient fraction of proceeds are invested in public goods. On a cross-country basis, Besley and Persson (2009) find that conflicts from 1800 up to 1975 are correlated with investors' protection and government anti-diversion (i.e. property protection) policies.

[11] An important exception is a recent working paper by de Magalhaes and Giovannoni (2019) which uses data on European polities between 1350 and 1700 to argue that parliaments were more likely to be called by the rulers in periods of wars or external threat.

[12] Note, however, that there is a related growing empirical literature on the impact of democratic institutions on fiscal capacity, which usually makes the case that democratic institutions are able to gather more fiscal revenues. Angelucci, Meraglia and Voigtländer (2020) show that cities in England in which taxes were raised by local officials rather than external sheriffs in the twelfth century were the same cities that entered the English Parliament when it was created in 1295. The king had to negotiate directly with these cities to raise new taxes and the efficient place to do so was the Parliament. Dincecco, Federico and Vindigni (2011) look at Italian states before the unification and show that parliamentary regimes gathered more taxes and spent more on public goods compared to absolutist regimes. A similar result is obtained by Dincecco (2009) who looks at Europe from 1650 to 1913 and shows that centralized and limited regimes were associated with significantly higher revenues than fragmented and absolutist ones.

[13] Dincecco and Prado (2012) show that national states in Europe that were involved in more wars in the nineteenth century are characterized today by larger spending capacity and better economic performance.

is suggestive of one particular channel through which wars might have fostered economic development in these cities: the development of democratic institutions together with improvements in fiscal and spending capacity.

Further, our work is related to a large theoretical and empirical literature on wars and state capacity in modern Europe.[14] This literature has convincingly shown that the Military Revolution, a radical change in warfare due to the introduction of portable firearms and the rise of the infantry that made wars more costly, led to a process of centralization of power and rise of state capacity that concluded in the formation of the European states from the seventeenth century.

Finally, we contribute to a long-standing literature in the social sciences which emphasises the role of cities and their institutions in shaping European development. Written in the early twentieth century, the classic works of Weber (1921) and Pirenne (1927/2014) trace the fledging origins of democracy to Europe's medieval cities. More recent empirical work confirms that city autonomy and participatory political institutions were important contributors to city growth and economic development (Acemoglu, Johnson and Robinson, 2005; Bosker, Buringh and van Zanden, 2013; Stasavage, 2014; Cox, 2017).[15] Most closely related to our work, due to a shared historical setting, is Wahl (2019), who finds a robust association between participative institutions and population growth in a sample of 282 medieval German cities. In the context of Italy, Coleman (1999) and DeLong and Shleifer (1993) document that regions adopting communal institutions experienced

[14] Within the literature, the most cited work is Tilly (1975) with the famous line: "war made the state and the state made war". Gennaioli and Voth (2015), using post-1500 data, investigate empirically both the importance of fiscal revenues to win wars and patterns of state building in early modern Europe. The literature remains highly active. Cantoni, Mohr and Weigand (2019) focus on the process of fiscal centralization in the Holy Roman Empire, as a result of the threat of war, and Schönholzer and Weese (2019) study the consolidation of the European state system from 1000-1850 as a result of wars.

[15] Acemoglu, Johnson and Robinson (2005) argue that Atlantic trade strengthened merchant groups and shaped property rights institutions in a manner conducive to subsequent economic growth. Importantly, these developments depended on initial political institutions that placed constraints on the monarchy. Bosker, Buringh and van Zanden (2013), in turn, argue that local participative institutions in cities explain the urban development that allowed Europe to eventually outpace the Islamic world. This view is consistent with recent theories on citizens' involvement in governing and the efficiency of taxation (Acemoglu, Ticchi and Vindigni, 2011). Stasavage (2014), revisiting the early hypotheses of Weber (1921), confirms that city autonomy was important for growth, but cautions that autonomous cities eventually risked stagnation if powerful elites were able to erect barriers to entry into positions of political power. Cox (2017) considers the interaction between Europe's political innovations and political fragmentation, and shows that urban growth was faster in Western Europe's most fragmented and parliamentary areas.

larger urban growth relative to regions with strong princely rulers. Revisiting a well-known hypothesis by Putnam, Leonardi and Nanetti (1993), Guiso, Sapienza and Zingales (2016) show that the communal experience had a long-term impact on trust and social capital. Turning to the origins of participative political institutions in Italian cities, Belloc, Drago and Galbiati (2016) show that the emergence of self-governance was slowed by earthquakes (interpreted as the wrath of God) in episcopal cities, where religious-political leaders could restore the feudal social order. Universities, on the other hand, provided the requisite human capital to build legal capacity and the foundations for participative institutions (Belloc, Drago and Galbiati, 2017). We contribute to our understanding of the origins of inclusive medieval city institutions by highlighting the causal role played by wars.

The rest of this paper is structured as follows. Section 2 discusses the historical background. Section 3 introduces the city-level data providing us with information on German cities, the conflicts they experienced, their political institutions, the taxes they collect, and their expenditures as measured by the construction of public buildings. It then describes the genealogical data on the German nobility, as well as the construction of our instrument. The empirical strategy and results are described in Section 4. We start with an illustrative case study, the Thirty Years' War. We then switch to the full sample and discuss the OLS and 2SLS panel results on the effect of conflicts on representativeness, and fiscal and spending capacity. Section 5 concludes.

2 Historical Background

A large literature in political science posits the origins of the main features of medieval constitutionalism in Central Europe in the first two centuries of the second millennium. This region was characterized by weak rulers constantly at war with each other. The origins of their weakness is often traced to the Treaty of Verdun (843), when the Carolingian Empire was divided into three parts: West Francia, Lotharingia (the Middle Kingdom), and East Francia. Lotharingia and East Francia were never fully consolidated due to a combination of large geographical obstacles and succession wars (Downing, 1993; Stasavage, 2011). The presence of mountains and rivers resulted in poor

internal communications and gave the possibility to small insurgent polities to defend themselves from central armies,[16] while the fact that succession did not follow primogeniture created continuous dynastic disputes. A few decades after the Treaty of Verdun, central Europe disintegrated into a myriad of small polities continuously at war with each other and under weak central rule by the Holy Roman Emperor. The Holy Roman Empire never achieved the extent of political unification of its western neighbour, France, evolving instead into a decentralized monarchy composed of hundreds of sub-units: kingdoms, principalities, duchies, prince-bishoprics, and other domains. The result was a precarious balance of power between the Emperors, the local aristocracy, and the Church. The rise in local representative institutions and the rule of law have been related to the interaction between this balance of power and, depending on the author, either the European military system or the European financial markets.

Downing (1993) and Hoffman and Norberg (1994) emphasize the role of the European military system.[17] European armies were usually composed of a combination of knights and city militias. The war machine was expensive, especially for weak rulers that could not count on a centralized

[16]Several scholars have emphasized the role of Europe's fractured physical geography in explaining its historical political fragmentation. A prominent example can be found in *The Rise and Fall of the Great Powers* by Kennedy (1987): "For this political diversity Europe had largely to thank its geography. There were no enormous plains over which an empire of horsemen cold impose its swift dominion; nor were there any broad and fertile river zones like those around the Ganges, Nile, Tigris and Euphrates, Yellow, and Yangtze, providing food for masses of toiling and easily conquerable peasants. Europe's landscape was much more fractured, with mountain ranges and large forest separating the scattered population centres in the valleys; and its climate altered considerably from north to south and west to east. This had a number of important consequences. For a start, it both made difficult the establishment of unified control, even by a powerful and determined warlord, and minimized the possibility that the continent could be overrun by an external force like the Mongol hordes." (p. 17). A similar argument is also made by (Diamond, 1997, pp. 414-415) comparing China's tendency towards political unification and Europe's protracted political fragmentation. A version of the fractured-land hypothesis is tested in a recent working paper by Fernandez-Villaverde, Koyama, Lin and Sng (2020). Using historical maps over sovereign states in Europe, Northern Africa and Western Africa, Kitamura and Lagerlöf (2019) show that state borders tend to be located in rugged and mountainous terrain.

[17]Hoffman and Norberg (1994) write: "Between the end of the Middle Ages and the outbreak of the French Revolution Western states sucked into a vortex of near permanent war, war that grew costly with every battle call. For rulers traditionally obliged to live on their own, the cost of fighting soon exceed their income from Crown lands and customary dues. Their pockets nearly empty, they were often forced to strike deals that meant sharing political power in return for higher taxes. In some instances, the eventual result was a representative government." (p. 1) They conclude that: "In the end, representative institutions, not absolute monarchy proved superior in revenue extraction. Where representative bodies held the ultimate authority as in the Netherlands or eighteenth-century England, they facilitated taxing. Representation in the English parliament created a willingness to pay; so did the older attitudes about contributing to the government. Where forceful representative institutions were absent, though, fiscal paralysis was almost inevitably the result." (p.306).

state and a centralized fiscal machine. Rulers were then compelled to distribute a series of privileges and immunities to convince knights and militias to join their armies. Originally, knights were military specialists that used to fight in exchange for land. These soldiers began to secure a system of hereditary rule over their allocated land together with a series of jurisdictional and administrative immunities. These immunities were then safeguarded by assemblies of knights: it is exactly from these assemblies that the first European Parliaments emerged. City militias were instead provided by towns. Usually town-dwellers exchanged military services for a set of privileges, the most important of which were voice in town assemblies, immunities and guarantees of legal access.

Stasavage (2011, 2016) emphasizes instead the role of credit to fight wars. The absence of a centralized fiscal system implied that rulers had to borrow to meet war expenses: only then these expenses could be spread into the future and paid with taxes or the spoils of war. Usually, the only group of individuals with enough liquidity to finance a war were rich merchants, typically located in large cities. When absolute rulers sought to borrow money, however, they faced a classical commitment problem. Limits to the power of the executive and the spread of local representative institutions were a solution to this problem: by conceding representation to citizens in towns and cities, the rulers were giving their creditors a degree of control over future policies and a series of jurisdictional and administrative immunities.

Whether the crown-aristocracy-Church balance led to the rise of medieval constitutionalism through the need to continuously raise armies of knights and city-militias or through the need of credit for the continuous financing of wars, the motors of this change were those towns located in a strip of land extending from present-day Belgium and the Netherlands to Northern Italy, passing through the German lands of Central Europe. These towns built their own government, separate from the administrative web of kings, nobles, and bishops. The German city of Worms, for example, was one of the first cities to receive a town charter (in 1074). For the first time, residents of the city were explicitly identified as citizens (*cives*), a term that recalled the privileged political and

legal status of free individuals in ancient Rome with respect to laws, property and governance.[18] Similar charters soon followed for more and more cities. It is important to stress that the development of city self-governance in the Holy Roman Empire (see Weber (1921)) is by no means limited to the so-called Free and Imperial Cities, which held the status of 'Imperial immediacy' and were subordinate only to the Emperor. Also territorial cities and towns (*Landstädte*) which were subordinate to a territorial prince — be it an ecclesiastical lord (such as a prince-bishop) or a secular prince – were able to gain such rights. In fact, a key aspect of our paper is to show that many cities were able to elect their own city councils.

The political life of the city was centred on the city councils. These bodies met frequently and played an active role in monitoring not only taxation but also public spending and borrowing. At the beginning councils were composed of a small number of individuals, but with time they became larger and were complemented by specialized committees. For instance, by 1450, Frankfurt am Main had eighteen specialized committees supervising the military, finance, and justice, which supported the council in the administration of the city. The local administration of these towns was unquestionably oligarchic, especially in their earlier days, with a governing elite composed mainly of merchants, military specialists, and legal experts. However, even the most oligarchic towns guaranteed some fundamental freedoms: citizens were free from feudal ties and services ("*Stadtluft macht frei*": urban air makes you free) and had access to an efficient legal system. Citizenship was usually granted after residing within the town walls for a period of time, usually a year.

The medieval constitutionalism framework started declining in German lands from the second half of the seventeenth century (Downing, 1993). The formation of the Kingdom of Prussia (1701) highlights the development away from the fractionalization of the Holy Roman Empire (into hundreds of territorial units) towards fewer and more centralized political entities.[19] Our sample period

[18]The 1074 charter was conceded by the Holy Roman Emperor, Henry IV, in exchange for the economic and political support, provided by merchants and Jews from Worms, in the struggle against the Pope and his allies: "when every single city seemed to have been virtually closed against our approach [...] only Worms, in the common goodwill of its citizens, preserved itself for our coming" (Abulafia, 2014).

[19]Frederick William (1640-1688) established an absolute monarchy in Brandenburg-Prussia and created a profes-

therefore ends in this decade. This process of centralization in the seventeenth century is not unique to Central Europe. The Military Revolution, a series of radical changes in military strategy and tactics due to the introduction of portable firearms and the rise of infantry had introduced large economies of scale in warfare. The result was a generalized process of centralization of power and rise of state capacity that concluded in the formation of the European states.

3 Data

3.1 German City-Level Data

The main data source is the *Deutsches Städtebuch* (Encyclopedia of German Cities), a series of volumes edited by Erich Keyser (1939-1974) that provide information on each city in the German Empire incorporated prior to the compilation of the *Städtebuch*. The book offers a systematic treatise of the history of German cities from their foundation until the twentieth century. A separate article is devoted to each city, following a consistent structure that divides the city history into twenty categories. These include sections on a city's past names, its geographic location, its local economy, educational and church systems, and so on. Particularly relevant for our purposes are section 5 on buildings, section 9 on the administration of the city, section 10 on warfare and conflicts experienced by the city, and section 13 on its financial system (including its means of taxation). Excerpts from the *Städtebuch* are shown in Figure A2.

Conflicts

Our main explanatory variable is a measure of a city's exposure to conflict. From the relevant section of the *Städtebuch*, we record for each city the dates and duration of violent conflicts in which the city was involved. The conflict information in the *Städtebuch* is detailed, and we are able to classify each conflict according to its type. We capture involvements elsewhere (if the city engaged in raids or wars in other territories), battles fought in the vicinity of the city, sieges, sackings, partial destruction of the city, complete destruction of the city, and occupation. We

sional centralized army. In 1701 his son, Frederick III upgraded Prussia from a duchy to a kingdom and crowned himself King Frederick I. His successor, Frederick William I created a centralized bureaucracy and fiscal system in the kingdom. This brought an end to the phase of medieval constitutionalism in German history.

therefore have a rich set of information both on the occurrence of conflicts as well as their nature.

The level of detail with which we capture city-level instances of conflict is significantly more comprehensive than other frequently used sources, such as Brecke (1999) and Clodfelter (2008).[20] These sources begin in 1400 and 1494, respectively, while our data allows us to extend further back in history. More importantly, these sources focus primarily on battles. While battles are no doubt important considerations for local rulers, we are also able to capture other forms of conflict. Indeed, extensive sieges or occupations (which can last months, years, or even decades) plausibly exert greater pressure on rulers to tax than more short-lived battle events.[21]

Political Institutions

To investigate the inclusiveness and representativeness of local institutions, we focus on the characteristics of the city councils. City councils had legislative and administrative power in the local context. Using information from the *Städtebuch*, we record the year in which the council is first mentioned as well as (where applicable) its end date, its size and the identity of its members. We also collect data on who elects or appoints council members. We construct three main political institution variables. To capture the opportunities for political participation by citizens, we define an indicator taking a value of one if the council is directly elected by citizens without the interference of the local lord. Second, to capture the strength and breadth of the council, we define a count variable of the number of council members. Third, for a subset of our cities we rely on data by Wahl (2019) which provides an indicator for whether the guilds are represented on the council. While Wahl's data are on the city-century level, we collected additional information on the exact timing of guild representation to build a city-decade panel.

[20]Examples of the use of these battle datasets include Dincecco and Prado (2012), Kokkonen and Sundell (2020) and Iyigun, Nunn and Qian (2017a,b)

[21]To illustrate the advantage of our data, consider two of the most widely used sources for historical battles in the literature, Brecke (1999) and Clodfelter (2008). Their focus is on Europe, Northern Africa and the Near East during the period 1400-1900, for which they record almost 3,000 battles. Our conflict data, which focuses on a much smaller geographical region (the German lands) records a total of 3,982 city-level conflict events for the same period. This is illustrative of the greater local detail we capture. Of course, our temporal focus is slightly different: our sample period consists of the years 1250-1710, during which we record a total of 3,295 city-level conflict events.

Taxation

Cities enjoyed significant fiscal freedoms over our sample period. Even though they were an important source of revenue for kings and emperors, they mainly conducted fiscal policy for their own development and upkeep by taking on debt and raising taxes of their own accord (Kuske, 1904). This was by no means a privilege of free imperial cities alone, such as Nördlingen.[22] Also cities like Erfurt – which never enjoyed imperial status – were known to conduct independent fiscal policy and taxation.[23]

We assemble information on the cities' fiscal capacity by collecting information on the taxes levied in the cities from the *Städtebuch*. We categorize individual taxes into 28 distinct types. We further aggregate these into two levels of sophistication according to whether or not a registry was required to collect the tax. We determine the level of complexity of each tax by the required knowledge or administrative structure that needed to exist in order to levy the tax, as well as the ease with which the taxable quantity could be observed. For example, an income tax requires knowledge of an easily concealed quantity and a correspondingly large administrative effort to observe and collect. On the other end of the spectrum are simple taxes that did not require a registry or specific knowledge of the quantity to be taxed. This includes trade taxes that are levied on each traveling merchant who seeks entry into the city or at toll stations. Table A1 provides a detailed overview of our classification scheme including the assigned level of complexity, type of tax, and a brief description of the taxes and the ways in which they were raised with examples if appropriate. Additionally, we track which taxes are levied explicitly to cover war expenses.

Public Expenditure

Finally, we collect information on the construction of public buildings. Specifically, we record all major construction events that take place over the course of the city's history. These include

[22] Dorner (1905) describes Nördlingen as a closed and unified tax community, which levied and redistributed taxes according to its own will. He also provides several examples of the city's fiscal autonomy such the exemption from taxes by Emperor Konrad IV (Dorner, 1905, p. 10).

[23] Erfurt had several departments that collected and redistributed taxes for specific purposes while remaining surpluses would be surrendered to the city's treasury, demonstrating that taxes were primarily raised and spent locally (Horn, 1904).

religious buildings (such as churches, chapels and cathedrals), civil buildings (such as schools, town halls and other seats of administration) and military buildings (such as walls, towers and city gates). Our main outcome of interest is the number of *net* construction events in any given period. That is, we net out construction that takes place to replace destroyed buildings to circumvent a mechanical relationship between war and public expenditure.

3.2 Data on the German Nobility

In our instrumental variables strategy, explained at greater length in Section 4 below, we use the gender of the firstborn children of important nobles as shocks to the likelihood that cities experience conflict. We combine two data sources to create a dataset of nobles which we then link to the German cities in the *Städtebuch*. The first is the *Peerage* project (Lundy, 2020) which compiles data on more than 680,000 European nobles.[24] The *Peerage* database contains information on nobles' dates of birth, death, and marriages. In addition, we collect basic information on gender and age.[25] Further, the *Peerage* contains information which allows us to link each noble to their parents, siblings, spouses and children. As an example, Figure A3 shows the *Peerage* entry for Wolfgang, Duke of Braunschweig-Grubenhagen. Based on this information, we are able to reconstruct the European nobility network at any given point in time.

To supplement this data, we digitize information from the *Europäische Stammtafeln* (European Family Trees, Schwennicke (1998)), in particular Volumes 1-1, 1-2 and 1-3. These volumes cover 379 family trees of ruling families in the German lands. Figure A4 shows an example of a family tree for the dukes of Braunschweig-Grubenhagen, and a detailed individual entry is shown in Figure A5. Note that this entry is the same individual, Wolfgang, as identified in the *Peerage* example above. The *Stammtafeln* provide additional valuable information on *locations* of births, deaths, marriages and other events, which allows us to link individual nobles to cities within the German lands. Additionally, where available, we supplement this information using data on locations from the *Peerage* itself.

[24] Accessed 20 January 2020.

[25] In some instances, only the date of birth *or* death is available. In such cases, we impute the missing date using the median age of all nobles known for certain to be alive at the same time as the given noble.

We use the information on the locations and life events of nobles to link them spatially and temporally to the *Städtebuch* cities. The data on parental, sibling and marital ties between nobles allows us to reconstruct the network of the European nobility each decade, yielding a potentially disconnected, undirected, unweighted graph.[26] Finally, for each noble, we identify the year of birth and gender of their firstborn child.

Equipped with this information, we construct our instrument for conflict. For each city-decade, we assign a noble to cities using a grid cell approach.[27] Cities are grouped according to 1×1 degree grid cells. In each decade, we associate a noble with a grid cell if the noble is associated with any city in that grid cell. We then identify the best-connected noble in each grid cell by counting the number of direct links the noble has to other nobles in the European nobility network (their degree centrality). This measure of importance correlates closely with other possible measures, such as the length of the nobles' entry in the *Peerage* database. Having identified for each grid-cell-decade observation a best-connected noble, we check whether that noble had their firstborn child in the given decade. If so, we create an indicator taking a value of one if the first child was female, zero if male. If the best-connected noble did not have their first child in the given decade, the instrument takes a missing value for the given grid-cell-decade.

3.3 Other Data Sources

In our analysis, we make use of a range of city-level characteristics to construct control variables. We collected information on key trade routes passing through the German lands around the year 1500. These are hand-digitised from Berthold (1976) and shown in Figure A6 in the Appendix. We additionally create indicators for imperial cities, based on contributions to the imperial army in 1422.[28] We identify cities that were part of the Hanseatic League,[29] as well as cities with river or coastal access. Finally, we create indicators for cities with market rights before 1500 and university

[26] We consider each of the following relationships to constitute a direct link between nobles: parent, child, sibling, spouse.

[27] We discuss the relative merits of this approach when we describe our empirical strategy in Section 4 below.

[28] Data accessed on 18 April 2015 from https://de.wikipedia.org/wiki/Freie_und_Reichsstädte.

[29] Data accessed on 20 July 2020 from https://en.wikipedia.org/wiki/Hanseatic_League#Lists_of_former_Hansa_cities.

cities using Cantoni and Yuchtman (2014).[30]

3.4 Descriptive Statistics

We start from the universe of 2,340 cities detailed in Keyser (1939-1974). We are interested in outcomes related to the inclusiveness of local political institutions, proxied by various characteristics of city councils. We therefore restrict attention to those cities for which there is evidence of councils being in place before 1900. This guarantees a minimum of informational content in our outcomes of interest. We observe these cities at decadal intervals between 1250 and 1710, for a total of 1,461 cities and 65,660 city-decade observations.

Descriptive statistics for the cities in our main sample are reported in Panel A of Table 1. Our main treatment variable, an indicator for exposure to conflict, is defined at the 1×1 degree grid cell level. On average, a proportion of 0.310 city-decade observations are "treated" by conflict.

Turning to our measures of the inclusiveness of political institutions, around 25 percent of all city-decade observations have a council present. Notice that this is an average number over the entire sample period and it increases substantially over the final centuries. Of the cities that have a council, 8 percent were elected directly by citizens without the interference of the local lord (2 percent of all city-decade observations), and the average council consisted of 10 members (approximately 3 council members in all city-decade observations, including zeros). Members of the guilds are represented on councils in about 1 percent of city-decade observations (indicating the representation of commercial interests).[31]

We are also interested in the development of fiscal and spending capacity, and create measures of the sophistication of the tax system as well as construction events. In the average city-decade 0.022 taxes are levied explicitly as war taxes, and 0.259 complex taxes are raised (requiring a registry, and therefore considerable administrative and institutional architecture, to collect). Turning to constructions, the average city-decade observation sees approximately 0.1 new construction

[30] We added information on market cities for East Prussia from the *Städtebuch* ourselves as these were not included in Cantoni and Yuchtman (2014).

[31] This data was originally collected by Wahl (2019), at the century level, for the set of cities in Bairoch, Batou and Chèvre (1988). As previously noted, we coded it at the decade level for this set of cities.

events. Note that *net* construction is defined as the construction taking place in a given decade less the number of destroyed buildings. This definition is useful in our subsequent empirical analysis, since it allows us to abstract away from a mechanical "rebuilding" effect of conflict on construction. There is substantial variability: the extreme city-decade observations range from a net loss of 15 buildings to a net gain of 10 buildings.[32]

Finally, we have a range of city-level controls at our disposal. These include the distance to the nearest trade route in 1500 and indicators for Imperial, market, and Hanse cities. We additionally observe whether a city had a university by 1500 and if it had river or coastal access. Finally, we create a measure of cities' article length in our main source of city-level information (Keyser, 1939-1974). Summary statistics for these city-level characteristics are reported in the second half of Panel A.

In our instrumental variables strategy, we use the gender of prominent nobles' firstborn children as a shock to conflict. As explained above, the instrument is only defined in grid-cell-decade combinations in which the best-connected noble has their first child. We report summary statistics for this subsample in Panel B of Table 1, and we show the distribution of first births across time and space in Figure 2. Across the board, variable averages are very similar between the full sample and the first child subsample.

4 Empirical Evidence

4.1 Motivating Case Study: German Cities in the Thirty Years' War

Before describing our empirical strategy and presenting our main results below, we conduct a suggestive "event study", using the Thirty Years' War as a motivating example. Between 1618 and 1648, central Europe — particularly the German lands — was ravaged by extensive conflict between the great European powers. What began as a war between states of the Holy Roman Empire, sparked by a revolt in the Kingdom of Bohemia, soon mutated into an extension of the power

[32]Note that the total number of observations is reduced from 65,660 to 65,219 since the *net constructions* variable is measured as a change. In our sample, 441 cities were founded after 1240, the decade before the start of our sample period. As such, for these cities, no information is available to construct the first observation, which explains the drop in the total number of observations for this variable.

struggle between the House of Habsburg and the Kingdom of France. Throughout its duration, the war's belligerents additionally included the English and Swedish Kingdoms, the Spanish Empire and the Dutch Republic, among others.

The arena for this episode of pan-European conflict was predominantly the German lands, and the war's consequences were far-reaching. Battles, sieges, pillaging and widespread famine resulted in an overall death toll of around 20 to 25 percent of the German population (Wilson, 2009), with some regions experiencing losses of up to 50 percent (Theibault, 1997). Besides its demographic impact, the agreements reached at its conclusion — at the Peace of Westphalia in 1648 — fundamentally shaped subsequent European history. By fixing territorial boundaries and re-defining the legal relationship between subjects and states, the principles underlying the peace treaty planted the seeds for the development of modern nation-states in the eighteenth century.[33]

What were the short- and long-term impacts of this intense period of warfare on the political institutions, tax systems and public expenditure in the cities in our sample? In Figure 3, we plot the evolution of citizens' involvement in electing the council as well as the council size, separately for those cities that were and were not directly involved in conflict between 1618 to 1648 (panels (a) and (b)). Additionally, we plot the number of complex taxes levied and the number of new construction events undertaken (panels (c) and (d)).

Strikingly, cities that were spared conflict stagnated in terms of their development of inclusive political institutions, in contrast to those cities which did see conflict in this period. Cities exposed to the Thirty Years' War saw an immediate increase in the probability that citizens elected their councils from 1.8 to 2.1 percentage points, an increase of approximately 10 percent. Additionally, the average council grew in size by around 10 percent from under 2.4 to over 2.7 members. Unexposed cities saw no such developments. Furthermore, in the aftermath of this episode of warfare, affected cities developed more complex tax systems and engaged in more public expenditure.

[33] In the field of international law, the principle that each state has exclusive sovereignty over its territory is often referred to as *Westphalian sovereignty*. While the direct links between the Peace of Westphalia and modern concepts of state sovereignty have been called into question (Croxton, 1999; Osiander, 2001), the Thirty Years' War and the agreements reached at its conclusion unquestionably had a far-reaching impact on the subsequent formation of European nation-states.

Both groups of cities levied, on average, between 0.24 and 0.26 complex taxes prior to the Thirty Years' War. In the decades after the war, a substantial gap developed between affected and unaffected cities, and the number of complex taxes was approximately 31 percent larger in cities which saw conflict.[34] While unaffected cities engaged in more public expenditure around the turn of the seventeenth century, after the Thirty Years' War affected cities pulled ahead, constructing up to 80 percent more new public buildings.[35] Notice that none of these changes can be explained by differential pre-war trends.

These effects underscore the silver lining of conflict in this violent episode of European history. The ravages of war undoubtedly inflicted substantial human costs on the citizens of affected cities. But they simultaneously prompted rulers to introduce inclusive political institutions and to develop more sophisticated tax systems, which in the long run translated into an increased capacity for public expenditure.

4.2 Empirical Strategy and Main Results

The motivating exercise above is informative but, of course, only suggestive. We now turn to a formal empirical analysis with the aim of uncovering the causal effect of conflicts on local political institutions, sophisticated means of taxation, and spending on public goods. We estimate equations of the following form:

$$y_{ict} = \alpha_i + \lambda_t + \beta \text{ Conflict}_{ct} + X'_{ict}\pi + \epsilon_{ict} \tag{1}$$

where cities are indexed by subscripts i, 1×1 degree grid cells by c, and decades by t.

To capture the inclusiveness of political institutions, we consider three outcomes y_{ict}. The first is an indicator for whether citizens elect the council without interference from the local ruler. The second measures the size of the council in terms of the number of council members. Third, for a subset of cities, we also track whether members of the guilds are represented on the council.

[34] Affected cities levied 0.29 complex taxes on average from 1660 to 1680, compared to 0.22 in unaffected cities.

[35] Cities exposed to conflict constructed an average of 0.09 new buildings in 1660, compared to 0.05 in unaffected cities.

Together, these three measures capture the electoral power of citizens, as well as the size and representativeness of legislative institutions.

To capture the impact of wars on the sophistication of the local tax system, we consider as outcomes the number of war-related taxes and the number of complex taxes. War-related taxes are taxes raised with the explicit purpose of financing war expenses, while complex taxes are taxes that required complex registries and a specialized bureaucracy to be raised. An example of a complex tax is a wealth tax, which would normally require a census and a sophisticated system of fiscal laws calibrated to tackle tax avoidance and tax evasion. A non-complex tax in this context would be instead a trade tax, that is levied whenever a trader enters the city through one of the city gates, or a mill tax, that is normally levied in the form of a fee to use the local mill.

Lastly, to capture the impact of wars on local public spending capacity, we consider as outcomes the construction of new public buildings. Since wars can be destructive, some construction events will occur in order to replace destroyed buildings. To capture the impact of conflict on subsequent construction undiluted by rebuilding, we use the number of new construction events net of destroyed buildings in a given decade as our outcome of interest.

The treatment variable Conflict_{ct} is an indicator taking a value of one if any conflict took place in grid cell c in decade t. We adopt a grid cell approach for two reasons. First, the outcomes of a given city i may be affected by conflict not only in the city itself, but also in its vicinity. This may be due to considerations of collateral damage, where a city faces the possibility of becoming embroiled in nearby wars, or due to local rulers controlling multiple cities and mobilising their entire territory to deal with an external threat. Second, since borders change as a result of wars, borders are themselves endogenously determined. Our approach, which exogenously imposes a 1×1 degree grid cell structure, does not suffer from such endogeneity concerns.

Finally, we include city fixed effects α_i to capture time-invariant factors that lead to differences in outcomes across cities. Aggregate shocks over time that affect all cities are absorbed by the decade fixed effects λ_t. Additional time-varying city and institutional characteristics are included in the vector X_{ict}. We describe these controls in detail as we introduce them in the analysis be-

low. All other variation in the outcome is left in the stochastic error term ϵ_{ict}. To account for heteroskedasticity and autocorrelation, we cluster standard errors at the grid cell level.

A concern with the baseline specifications in (1) is that conflicts are potentially endogenous. Not only is war potentially a choice of the local rulers, but the causality between conflicts and political institutions, taxation and public expenditure may run both ways (Stasavage, 2016). For instance, autocratic regimes are more prone to be involved in conflict (Lake, 1992; Bueno de Mesquita and Siverson, 1995; Bueno de Mesquita, Morrow, Siverson and Smith, 1999; Jackson and Morelli, 2007). As such, a simple OLS regression of equation (1) would underestimate the true effect of wars on the development of inclusive political institutions and on the provision of public goods. We therefore attempt to resolve these potential issues via an instrumental variables strategy.

4.2.1 First-Stage Relationship between Gender of Nobles' Firstborn Children and Conflict

We use the gender of the firstborn children of important nobles as shocks to the likelihood that a particular region is involved in conflict. The key advantage of using the gender of the firstborn child as an instrument for conflict is the nature of the shock it gives rise to. Nobles have no control over the gender of their firstborn child; upon having their firstborn child, they enter into a lottery in which either realisation (a male or a female child) is equally likely. The impact of the birth on nobles' propensity to become involved in conflict, however, is not equivalent between the two realisations: a female firstborn is more likely to give rise to conflict.

Gender of Nobles' Firstborn Children and Conflict: Historical Background

There are two main reasons why birth of a firstborn female may lead to more conflict.

First, female firstborn children are more problematic when it comes to inheritance. Wars of succession are often fought about women's right to inherit because rulers without sons might attempt to change succession laws to allow their daughter to succeed them.[36] In our context - the

[36]One might be tempted to say that the gender of the firstborn is bound to be a weak instrument as families would react by trying to have a son following a firstborn daughter. It turns out, however, that even with this limitation, our instrument is powerful.

Holy Roman Empire - succession among the upper nobility was governed by private family rules, the 'House Laws'.[37,38] By virtue of being mainly family rules, there was no uniform succession rule applying to all dynasties across all centuries. However, the norm was male succession, which could result in challenges to the ruling family upon the birth of a firstborn girl. Recall, for example, the case of George, Duke of Bavaria-Landshut, who named his daughter Elisabeth as his heir. In 1503, this breach of the agreements of the House of Wittelsbach provoked a two-year succession war between Bavaria-Landshut and Bavaria-Munich. Elsewhere in the German lands, the city of Cologne - an important Holy Roman trading centre - can trace the origins of its communal institutions to the War of the Limburg Succession (1282-1288). Disputes arose as Waleran IV, Duke of Limburg, died without a male heir. Reginald I (the husband of Waleran's only daughter, Ermengarde) and Adolf VII (Waleran's nephew), both staked claims to the Duchy and conflict ensued involving a host of local powers. In exchange for their services during the war, the citizens of Cologne gained independence from the Archbishopric and the city later achieved imperial status.

Second, once in power, female rulers tend to fight more wars than their male counterparts. In the context of Europe over the fifteenth to twentieth centuries, Dube and Harish (2020) show that polities led by queens engaged in war more than polities led by kings. Specifically, single queens were more likely to be attacked than single kings and married queens were more likely to attack than married kings. The authors interpret this result as evidence that married queens were more inclined to enlist their spouses in helping them rule, enabling them ultimately to pursue more aggressive war policies.

Both of these reasons why female firstborns have a higher likelihood to trigger conflict than male firstborns provide us with an exogenous, relevant shock to our treatment.

[37]Later, in the nineteenth century, the term 'private law of princes' was used.

[38]The main source of law, for each family, was a collection of documents including testaments, family compacts, treaties with other families, treaties with the Emperor, and rules laid down by the patriarch. Only in the absence of specific family provisions, succession was decided by general principles that had been developing through the centuries and were based on a mixture of ancient German law, canon law, and medieval Roman law (Moser, 1737-53).

Gender of Nobles' Firstborn Children and Conflict: Results

The corresponding first-stage equation in our instrumental variables strategy is:

$$\text{Conflict}_{ct} = \eta_i + \delta_t + \gamma \text{Daughter}_{c,t-1} + X'_{ict}\phi + \nu_{ct} \tag{2}$$

where $\text{Daughter}_{c,t-1}$ is an indicator taking a value of one if the best-connected noble in grid cell c has a firstborn daughter in decade $t-1$, zero if the firstborn is a son.[39] Note, therefore, that the sample we use for the instrumental variables strategy includes only those cell-decade combinations in which the best-connected noble has their firstborn child. This comes at the cost of reducing the size of the sample we have at our disposal for the two-stage least squares estimation.[40] Reassuringly, as shown in Figure 4, the cities which enter our first child subsample are not systematically drawn from any particular region of Germany. Further, Figure 2 demonstrates that birth events are evenly distributed across grid cells and across decades. As expected, births are also equally likely to result in male and female firstborn children. For completeness, when describing our results below, we additionally show that OLS results are very similar between the full sample and the restricted first-child subsample. Figure 5 shows that our instrument is perfectly balanced on observable city characteristics. For this exercise we regressed the instrument on city-level characteristics for which we plot coefficients in panel (a). All of these are insignificant and very small which becomes clear when relating them to summary statistics of the instrument as shown in panel (b). This implies that places that had female births are not systematically different, in terms of their observables, to places with male births, which strengthens our argument that the gender of the firstborn child is a

[39] We pick the "best-connected" noble on the basis of degree centrality in the wider European network of aristocracy. That is, the best-connected noble is chosen based on the number of direct familial links they have to other nobles. This measure of centrality correlates closely with other measures of the importance of nobles, such as the length of their entry in the *Peerage* database. This gives us confidence that we are using the firstborn children of important nobles, who are likely to be key in determining war and peace in a region, to define our shocks. For further details on the data used to construct these shocks, see Section 3 above.

[40] This approach follows the spirit of local average treatment effects, where a specific instrument picks a specific source of exogenous variation ('compliers') and where 'always-takers or 'never-takers' do not provide identifying variation. Similarly, here we exploit only variation stemming from birth events. Of course, conflicts also happen independent of birth events, but those are not picked up by our instrument.

true lottery.

In Table 2, we report estimations of the first-stage relationship between the gender of nobles' firstborn children and subsequent incidence of conflict. Throughout, our main estimation sample spans the years 1250 to 1710. Given the one-decade lag structure of our first-stage equation, this temporal restriction implies that we use shocks to conflict arising from a firstborn daughter up until the year 1700.

The first column of Table 2 reports the first-stage relationship from a specification in which we include city and decade fixed effects.[41] The first stage effect is strong and in the expected direction: when the best-connected noble in a given grid cell has a firstborn daughter (as opposed to a firstborn son), the cell is approximately 20 percentage points more likely to experience conflict in the following decade. In column two, we include region-by-century fixed effects. These regions correspond to the five main regions in our main source of city-level information (Keyser, 1939-1974); we show these in Figure 4. This set of controls (city-level characteristics plus the set of region-by-century fixed effects) constitute our *full controls* in the remainder of the analysis.

In columns 3 and 4, we experiment with other fixed effect constellations. Grid-cell-by-century fixed effects and border-cell-by-century fixed effects barely change the estimated coefficients and they remain statistically and qualitatively identical to the baseline coefficient.[42] Finally, in columns 6 through 7, we include alternative linear time trends at the region, cell and border-cell levels. Coefficients fluctuate a bit more in these demanding specifications, but remain qualitatively similar to the baseline estimate. This range of specification checks gives us confidence that our first-stage relationship is highly robust, in addition to being a relevant and exogenous shock to the local incidence of conflict.

4.2.2 Conflict and Local Political Institutions

[41] Appendix Table A2 reports results including a full set of controls of time-invariant city characteristics interacted with century fixed effects. These are: the distance to the nearest trade route in 1500, free imperial city status in 1422, market city status before 1500, cities in the Hanseatic League, cities with a university, cities with river or coastal access, and the city's article length in our main source of city-level information (Keyser, 1939-1974). See Section 3 for a more detailed description of these data and their sources.

[42] Border cells are those grid cells which have at least one neighbouring cell without cities in it.

Conflict and Council Elections

We now use the first-stage relationship between nobles' firstborn children and conflict in the instrumental variables framework described above to explore the impact of wars on local political institutions. The first outcome we consider is whether a city's citizens were involved in electing local councils. Concretely, in equation (1) above, y_{ist} will be an indicator taking a value of one if citizens elected the council without the interference of the local lord.

Results from this exercise are reported in Table 3. Column 1 presents OLS estimates of equation (1), in which we regress an indicator for whether citizens elected the council on an indicator for whether any conflict took place in the grid cell associated with the city.[43] In this parsimonious specification, we additionally include only city and decade fixed effects. We find a positive relationship between conflict and elected city councils: exposure to conflict is associated with a 0.3 percentage points increase in the probability that a city's council is elected by its citizens. This estimate should be interpreted with caution, however, due to the likely downward bias arising from the reverse and negative relationship between conflicts and political institutions (that is, autocratic rulers are also likely to be more belligerent).

We therefore turn to the instrumental variables strategy explained above, where we use the gender of nobles' firstborn children as a shock to generate exogenous variation in conflict in a first stage. The nature of this instrument reduces our sample to those grid cell-decade observations for which the best-connected noble has their firstborn child. In column 2 of Table 3 we therefore re-estimate the parsimonious OLS specification on this subsample. Reassuringly, we find a correlational relationship very similar to that in the full sample.

In column 3, we report results from a two-stage least squares estimation. In the first stage, the birth of a firstborn daughter (as opposed to a firstborn son) constitutes a shock which increases the probability that a grid cell is involved in conflict in the following decade. We then use this exogenous variation in conflict to estimate its impact on council elections in the second stage.

[43] Specifications controling for the presence of a council (extensive margin) yield very similar results, as discussed further below.

Concretely, a conflict induced by the birth of a firstborn daughter causes an increase of 3 percentage points in the probability that citizens elect the city council. Exposure to wars therefore plays an important role in the establishment of inclusive political institutions. This result is in line with the theory on the roots of medieval constitutionalism. Furthermore, the difference in magnitude between our instrumental variables result and the coefficients reported in columns 1 and 2 highlights the dangers of causally interpreting downward-biased OLS estimates in this context.

Columns 4 to 6 repeat the same exercise (OLS using the full sample, OLS using only the firstborn child sample, two-stage least squares using the gender of the firstborn as a shock to conflict) with the inclusion of the full set of controls. Results change only marginally compared to the parsimonious specifications without controls.

Conflict and Representativeness

Our second measure of political representativeness is the size of the city council, where larger councils are taken to better represent the interest of the local citizenry. In our historical setting, council expansions are often associated with greater direct representation of citizens. The city of Braunschweig, for example, expanded its *gemeine Rat* ('common council') in 1386 to enable direct representation of citizens from Braunschweig's distinct municipal areas.[44] We report results using council size as the outcome of equation (1) in Table 4. As before, OLS results (columns 1 and 2) are likely biased downwards, but we nevertheless find a positive impact of conflict exposure on council size. Turning to our instrumental variables specification in column 3, as expected we find a larger and statistically significant effect. Exogenous exposure to conflict increases the size of the council by approximately three members. Results remain stable with the inclusion of our full set of controls in columns 4 to 6, with coefficients statistically indistinguishable from their counterparts in columns 1 to 3.

In the theory of medieval constitutionalism advanced by Stasavage (2011, 2016), wars bring more inclusive political institutions because rulers grant their creditors power over future policy as

[44]For the modern era, see Kjaer and Elklit (2014) for an empirical test of the relationship between assembly size and representativeness.

a commitment device. These creditors would often be wealthy merchants or guild members. To test this hypothesis, we use data on guild representation on city councils. As detailed in Section 3 above, this information is available only for a subset of cities in Bairoch, Batou and Chèvre (1988). Results are reported with and without controls in columns 7 and 8 of Table 4. We indeed find that, as predicted by the theory, conflict exposure increases the likelihood that guilds are represented on city councils, by approximately 17 percentage points.

Robustness Checks

To assess the robustness of our results, we conduct a number of sensitivity checks which we report in Figures A7 and A8 in the Appendix. Starting with the effect of conflict on the election of councils by citizens, we report OLS results for the full sample and first child subsample in panels (a) and (b) of Figure A7 and 2SLS results in panel (c). In each subfigure, we show the coefficient estimate from the baseline regression using a vertical dashed line. We then proceed to re-estimate the regressions by varying the subsample and weighting scheme used.

First, we perform a jackknife exercise where we leave out one century in turn to explore whether any one century appears to be driving our results. The top six coefficients in Figure A7 correspond to this exercise. Reassuringly, no single century appears to drive our results; all coefficients are statistically indistinguishable from the baseline.

Second, in the same spirit, we leave out in turn one of the five broad German regions in our sample. These correspond to the grouping of cities in our main source of city-level data (Keyser, 1939-1974), and we illustrate these in Figure 4. Results are not driven by any particular region, with all coefficients very close to the estimated baseline.

We now turn to city-level characteristics to redefine our sample. We exclude, in turn, imperial cities and cities that were part of the Hanseatic League. Such cities could plausibly have had peculiar unobserved institutional characteristics, but reassuringly these do not appear to systematically drive the findings we document.

Cities near the boundary of what became the German Empire may have had a particular historical trajectory. While substantial conflicts took place in the interior of the German lands over

the course of history, border regions may have been particularly vulnerable to foreign conflicts, for example. We therefore re-estimate our regressions by excluding border regions.[45] This leaves results unchanged when compared with baseline estimates.

Finally, we conduct sensitivity checks to two different weighting schemes. Cities' entries in our main source of city-level data (Keyser, 1939-1974) are of different lengths, depending on the amount of archival material on the cities' histories. We can therefore weight by entry length to give more weight to those cities with relatively higher information quality. This slightly increases the magnitude of the estimated coefficients, but leaves them qualitatively and statistically unchanged. Lastly, we weight by the number of cities in a cell since some cells are more sparsely covered than others. Again, coefficients increase marginally in size, but are practically unchanged.

We perform a similar range of robustness checks for the impact of conflict on council size (Figure A8). Throughout, results remain highly robust. Since not all cities have a council, we rule out an extensive-margin explanation by controlling for the existence of a council in a given city and decade in Table A3 for the election outcome and in Table A4 for the council size and representation outcomes.[46] Again, our results remain robust and are not driven by the decision to adopt a council.

4.2.3 Conflict and the Development of Complex Systems of Taxation

Taxation is central to theories of the link between conflict and the development of medieval constitutionalism. By raising the immediate fiscal burden, wars forced rulers to extend fundamental political rights to citizens in exchange for consent to increased taxation. The emphasis of Stasavage (2011, 2016) on the role of credit introduces interesting dynamics to this relationship. More precisely, since rulers financed wars by relying significantly on credit, conflict shaped future taxation levied to repay creditors.

We documented above that conflict led to the development of inclusive political institutions.

[45] Concretely, we define a city as being in a border region if it is in a grid cell which is not surrounded by other grid cells with other German cities in them. See Figure 4 for a plot of the grid cells and the spatial distribution of cities.

[46] We did not include this variable in our main set of controls due to concerns of it being a potential bad control: an explanatory variable that is itself an outcome of the treatment.

Did the emergence of more sophisticated systems of taxation follow, as predicted by the theory? We now turn to this question. To capture the dynamic impact of conflict on taxes, we consider the impact of conflicts on forms of taxation not only in t but also in the following three decades when estimating equation (1). We again use the gender of nobles' firstborn children as an instrument for conflict in a first stage given by equation (2).

When looking at taxes, dynamic effects are of particular interest for a variety of reasons: first, in the short run, rulers may raise war taxes to satisfy the immediate need for liquidity. Even if all wars were tax-financed, increased taxation combined with increased participation may lead to a new equilibrium of higher taxation whereby, even when a conflict is over and war taxes stop, other forms of taxation replace them on a more permanent basis as fiscal capacity is built. Second, to the extent that rulers also borrow from creditors as war taxes alone do not raise sufficient funds in the short run, those credits need to be paid back via taxes raised from citizens. While we have no direct evidence, in our data, about credit-financed wars, both reasons just stated suggest that complex taxes replacing war taxes are likely to kick in with some delay.

We first study whether wars cause an increase in explicit war taxes, as is natural to expect. In Table 5, we report results from regressions of the number of war taxes in a given city-decade on an indicator for whether the city was exposed to conflict in that decade. As before, we use the gender of nobles' firstborn children as an instrument to isolate exogenous variation in conflict. To explore the dynamics of the impact of wars on war taxes, we consider not only a contemporaneous effect in decade t, but up to three decades into the future: $t + 10$, $t + 20$, $t + 30$. We show that, indeed, conflicts triggered by the birth of a firstborn daughter lead to an increase in war taxes in the decade of the conflict, both without (Panel A) and with controls (Panel B).[47,48] The number of war taxes doubles relative to its overall mean of 0.026 per city-by-decade in the 2SLS sample. After this, the effect of conflicts on the number of war taxes fades out quickly. In the following decade we still observe an elevated point estimate which, however, is not statistically significant at conventional

[47]The fact that war taxes immediately increase in response to conflict triggered by the birth of a female firstborn supports our argument that our instrument works through wars.

[48]Appendix Table A5 shows the corresponding OLS results.

levels. In later decades there is no association between conflict and war taxes and the estimated coefficient continues to approach zero.

To test more formally whether the effect of wars on the development of local political institutions is mediated by the collection of war taxes as short-term means of raising credit, we employ the causal mediation framework of Dippel, Gold, Heblich and Pinto (2018).[49] In our setting, we are interested in the mediating effect of raising war taxes on the causal impact of wars on political institutions. If the collection of war taxes to finance wars was associated with the trade-off of political power, as we discussed in the previous subsection, then war taxes should explain a non-trivial proportion of the effect of wars on political institutions in our instrumental variables setting. In our causal mediation analysis, we estimate that levying war taxes can explain 72.3 percent of the increased probability of citizens electing their council and 58.3 percent of the increase in council size in response to conflicts.

As stated before, the need to repay creditors and the potential increase in fiscal capacity gained from levying war taxes may translate into other forms of taxation that persist in the longer term. To test this, we now consider the effect of conflicts on the number of complex taxes levied in city i in decade t and the following three decades. As described in Section 3, complex taxes are those which require a registry to collect. The ability to raise complex taxes is indicative of considerable sophistication of the tax system, since these require both the enumeration of the subjects to be taxed as well as additional information to calculate the amount owed or the value of the quantity that is to be taxed, such as land or inheritances. We report results on the impact of conflict on complex taxes using our instrumental variables strategy in Table 6, first without controls in Panel A and then with the full set of controls in Panel B.[50] Both panels tell very similar stories. Conflicts that are triggered by the birth of a firstborn daughter cause a larger number of complex taxes to be raised in a city, but the effect is not immediate. Instead it takes around two decades after the conflict for these taxes to be established. This is unsurprising, since the disruption caused by war makes

[49] Their framework allows for estimating how much of a treatment effect can be explained by a mediating variable in an instrumental variables setting without requiring the mediator to be exogenous or having an additional instrument for the mediator. For details on implementation, see Dippel, Ferrara and Heblich (2020).

[50] Results from the corresponding OLS regressions are reported in Table A6 in the Appendix.

large-scale, sophisticated tax reforms difficult during its duration and immediate aftermath.[51] In terms of magnitudes, the number of complex taxes increases by 0.194 and 0.163 (relative to a city-by-decade average of 0.260 in the 2SLS sample) two and three decades after a conflict, thus substantially increasing relative to baseline.

In the Appendix, we show that basic taxes are not affected by conflicts. Both the number of trade taxes (Table A7) and of mill taxes (Table A8) does not change in response to conflict, in line with the theory that conflicts fostered more sophisticated forms of taxation over the medium to long run, after an initial boost to war taxes.

4.2.4 Conflict and Construction

We argued above that we expect increased tax power to ultimately benefit the citizens (as opposed to filling the coffers of a local ruler) since inclusive political institutions allow citizens to direct the future actions of rulers. This hypothesis is based on the historical literature on taxation in cities, which shows that cities predominantly raised and spent their taxes locally.[52] Of course they were also important contributors of revenue for kings and emperors, but the majority of taxation in cities was carried out for their own upkeep and development (Kuske, 1904). So if citizens gained more political power, did they use this power to divert tax revenue to local spending that benefited their community in the long run, for example via the construction of new public buildings? To test this hypothesis, we collected detailed information on construction events in our sample of cities. This is the best and most well-documented measure of expenditure on public goods in our historic data. Since wars are disruptive, our expectation is that it takes a few decades before cities that experienced more conflicts – with their now increased tax capacity – pull ahead of cities with lower conflict intensity in terms of construction events. Recall that in the case study of Dortmund, public building projects took place in the half century following conflict and increased political participation.

[51] Note that we exclude explicit "war taxes" from our count of complex taxes, which were often levied on a per head basis to raise emergency funds in a state of war.

[52] For examples of cities' fiscal autonomy see Dorner (1905) on Nördlingen, a free imperial city, and Horn (1904) on Erfurt, which was not an imperial city. Tax autonomy was not a privilege of imperial cities alone, but was commonly practiced in cities throughout the German lands.

In Table 7, we test this formally. Again, we estimate regressions of the form given by equation (1) for the effect of conflicts on constructions in decade t and the following three decades, where we instrument for conflict using the gender of nobles' firstborn children using equation (2).[53] The outcome is the number of *new* construction events: we count the number of construction events in a given city-decade and subtract the number of destroyed buildings. This is to net out a mechanical effect of war, where construction takes place merely to replace lost buildings. We report these two-stage least squares regressions without controls in Panel A, and with our full set of controls in Panel B.

We find a striking dynamic pattern of the impact of conflict on public expenditure, which confirms our proposed causal chain. There is no obvious impact of conflict on new construction events during wars or in their immediate aftermath. After three decades, however, cities exposed to conflict appear to invest more in public goods. In terms of magnitudes, a conflict is associated with 0.25 (net) construction events. Viewed against the outcome mean of about 0.1, this is a sizeable effect. While in any decade every tenth city sees a major (net) construction event, one in four cities affected by a conflict three decades before has a major construction event. Given the results we present above on political institutions and taxation, this pattern is expected. Conflict causes rulers to cede political rights to their subjects. More complex systems of taxation follow in the ensuing decades to enable rulers to pay off their war debts. Citizens, in turn, use their new-found voice to direct future spending into public goods.

5 Conclusion

What were the fundamental drivers of the development of medieval constitutionalism in Europe, ultimately providing the basis for modern democratic institutions and Western liberal democracies? A prominent theoretical hypothesis sees the fragmentation of the European states and constant warfare as a focal point in this development. With small states (and therefore generally weak rulers) and the requirement to finance wars and defence, representation and consent were fundamental

[53] Table A9 in the Appendix reports the corresponding OLS regressions.

tools for rulers to raise tax revenues, especially in the medieval and early modern period.

In this paper, we provide causal evidence for this hypothesis by turning to Germany between 1250 and 1710. We introduce a novel panel data set for the universe of German cities, with information on cities' local political institutions, systems of taxation, and expenditure on new public buildings. Combining this data with information on cities' involvement in conflict and on the firstborn children of prominent nobles in the European network of nobility, we implement an instrumental variables strategy to isolate exogenous variation in conflict exposure. In a first stage, we show that cities in areas in which the most prominent noble has a firstborn daughter (as opposed to a firstborn son) are more likely to see conflict.

Exploiting this quasi-random variation in conflict exposure, we document a direct causal link between violent conflicts and the rise of representative political institutions, the development of increasingly complex systems of taxation, and greater subsequent expenditure on public construction. In line with theoretical predictions from the literature, cities exogenously exposed to conflict developed councils which were more likely to be elected by the local citizenry, of larger size, and with greater guild participation.

The conflict-induced rise in political representation is accompanied by an increased sophistication of the local tax system. In the decades following conflict, affected cities introduce more complex taxes requiring substantial administrative architecture, both to calculate the amounts owed and to ultimately collect the levied taxes. We lastly present evidence that this increased sophistication of the tax system was matched by a long-term increase in the construction of public buildings. Taken together, these findings underscore the role of conflict in explaining the roots of European liberal democracy.

References

Abulafia, Anna Sapir, *Christian Jewish Relations 1000-1300: Jews in the Service of Medieval Christendom*, Routledge Press, 2014.

Acemoglu, Daron, "Politics and Economics in Weak and Strong States," *Journal of Monetary Economics*, 2005, *52* (7), 1199–1226.

_ , Davide Ticchi, and Andrea Vindigni, "Emergence and Persistence of Inefficient States," *Journal of the European Economic Association*, 2011, *9* (2), 177–208.

_ , Simon Johnson, and James A. Robinson, "The Colonial Origins of Comparative Development: An Empirical Investigation," *American Economic Review*, 2001, *91* (5), 1369–1401.

_ , _ , and James Robinson, "The Rise of Europe: Atlantic Trade, Institutional Change, and Economic Growth," *American Economic Review*, 2005, *95* (3), 546–579.

Angelucci, Charles, Simone Meraglia, and Nico Voigtländer, "How Merchant Towns Shaped Parliaments: From the Norman Conquest of England to the Great Reform Act," *NBER Working Paper No. 23606*, 2020.

Bairoch, Paul, Jean Batou, and Pierre Chèvre, *La population des villes européennes, 800-1850: Banque de données et analyse sommaire des résultats*, Droz, 1988.

Belloc, Marianna, Francesco Drago, and Roberto Galbiati, "Earthquakes, Religion, and Transition to Self-Government in Italian Cities," *Quarterly Journal of Economics*, 2016, *131* (4), 1875–1926.

_ , _ , and _ , "Law, Human Capital and the Emergence of Free City-States in Medieval Italy," *CESifo Working Paper No. 6719*, 2017.

Berthold, Lothar, *Atlas zur Geschichte in zwei Bänden*, Vol. 1, VEB Hermann Haack, 1976.

Besley, Tim and Torsten Persson, "The Origins of State Capacity: Property Rights, Taxation, and Politics," *American Economic Review*, 2009, *99* (4), 1218–1244.

Bosker, Maarten, Eltjo Buringh, and Jan L. van Zanden, "From Baghdad to London: Unraveling Urban Development in Europe, the Middle East, and North Africa, 800-1800," *Review of Economics and Statistics*, 2013, *95* (4), 1418–1437.

Brecke, Peter, "Violent Conflicts 1400 A.D. to the Present in Different Regions of the World," *Paper presented at the 1999 meeting of the Peace Science Society*, 1999.

Cantoni, Davide and Noam Yuchtman, "Medieval Universities, Legal Institutions, and the Commercial Revolution," *Quarterly Journal of Economics*, 2014, *129* (2), 823–887.

_ , Cathrin Mohr, and Matthias Weigand, "The Rise of Fiscal Capacity," *Rationality & Competition Discussion Paper No. 172*, 2019.

_ , Jeremiah Dittmar, and Noam Yuchtman, "Religious Competition and Reallocation: The Political Economy of Secularization in the Protestant Reformation," *Quarterly Journal of Economics*, 2018, *133* (4), 2037–2096.

Clockwork Mapping, *Centennia Historical Atlas: Research Edition*, http://www.historicalatlas.com/, 2018.

Clodfelter, Michael, *Warfare and Armed Conflicts: A Statistical Encyclopedia of Casualty and other Figures, 1494-2007*, McFarland & Co., 2008.

Coleman, Edward, "The Italian Communes. Recent Work and Current Trends," *Journal of Medieval History*, 1999, *25* (4), 373–397.

Cox, Gary W., "Political Institutions, Economic Liberty, and the Great Divergence," *Journal of Economic History*, 2017, *77* (3), 724–755.

__ **, Mark Dincecco, and Massimiliano G. Onorato**, "War, Trade, and the Roots of Representative Governance," *SSRN Working Paper No. 3616438*, 2020.

Croxton, Derek, "The Peace of Westphalia of 1648 and the Origins of Sovereignty," *International History Review*, 1999, *21* (3), 569–591.

de Magalhaes, Leandro and Francesco Giovannoni, "War and the Rise of Parliaments," *Working Paper*, 2019.

de Mesquita, Bruce Bueno and Randolph M. Siverson, "War and the Survival of Political Leaders: A Comparative Study of Regime Types and Political Accountability," *American Political Science Review*, 1995, *89* (4), 841–855.

__ **, James D. Morrow, Randolph M. Siverson, and Alastair Smith**, "An Institutional Explanation of the Democratic Peace," *American Political Science Review*, 1999, *93* (4), 791–807.

DeLong, J. Bradford and Andrei Shleifer, "Princes or Merchants? City Growth before the Industrial Revolution," *Journal of Law and Economics*, 1993, *36* (2), 671–702.

Diamond, Jared, *Guns, Germs, and Steel: The Fates of Human Societies*, W.W. Norton and Company, 1997.

Dincecco, Mark, "Fiscal Centralization, Limited Government, and Public Revenues in Europe, 1650-1913," *Journal of Economic History*, 2009, *69* (1), 48–103.

__ **and Massimiliano Gaetano Onorato**, "Military Conflict and the Rise of Urban Europe," *Journal of Economic Growth*, 2016, *21* (3), 259–282.

__ **and Mauricio Prado**, "Warfare, Fiscal Capacity and Performance," *Journal of Economic Growth*, 2012, *17* (3), 171–203.

__ **, Giovanni Federico, and Andrea Vindigni**, "Warfare, Taxation and Political Change: Evidence from the Italian Risorgimento," *Journal of Economic History*, 2011, *71* (4), 887–914.

Dippel, Christian, Andreas Ferrara, and Stephan Heblich, "ivmediate: Causal mediation analysis in instrumental variables regressions," *Stata Journal*, 2020, *20* (3), 613–626.

__ **, Robert Gold, Stephan Heblich, and Rodrigo Pinto**, "Instrumental Variables and Causal Mechanisms: Unpacking the Effect of Trade on Workers and Voters," *NBER Working Paper No. 23209*, 2018.

Dorner, Friedrich, *Die Steuern Nördlingens zu Ausgang des Mittelalters*, H.E. Sebald, 1905.

Downing, Brian M., "Medieval Origins of Constitutional Government in the West," *Theory and Society*, 1989, *18* (2), 213–247.

__ , *The Military Revolution and Political Change: Origins of Democracy and Autocracy in Early Modern Europe*, Princeton University Press, 1993.

Dube, Oeindrila and S.H. Harish, "Queens," *Journal of Political Economy*, 2020, *128* (7), 2579–2652.

Elkin, Stephen L., *City and Regime in the American Republic*, University of Chicago Press, 1987.

Engerman, Stanley L. and Kenneth L. Sokoloff, "Factor Endowments, Institutions, and Differential Paths

of Growth Among New World Economies: A View from Economic Historians of the United States," *NBER Historical Working Paper No. 66*, 1994.

Fernandez-Villaverde, Jesus, Mark Koyama, Youhong Lin, and Tuan-Hwee Sng, "Fractured-Land and the Puzzle of Political Unification and Fragmentation," *mimeo.*, 2020.

Gennaioli, Nicola and Hans-Joachim Voth, "State Capacity and Military Conflict," *Review of Economic Studies*, 2015, *82* (4), 1409–1448.

Guiso, Luigi, Paola Sapienza, and Luigi Zingales, "Long-Term Persistence," *Journal of the European Economic Association*, 2016, *14* (6), 1401–1436.

Hoffman, Philip T. and Kathryn Norberg, *Fiscal Crises and the Growth of Representative Institutions*, Stanford University Press, 1994.

Horn, Wilhelm, *Erfurts Stadtverfassung und Stadtwirtschaft in Ihrer Entwicklung bis zur Gegenwart*, Verlag von Gustav Fischer, 1904.

Iyigun, Murat, Nathan Nunn, and Nancy Qian, "The Long-Run Effects of Agricultural Productivity on Conflict, 1400-1900," *NBER Working Paper No. 24066*, 2017.

_ , _ , and _ , "Winter is Coming: The Long-Run Effects of Climate Change on Conflict, 1400-1900," *NBER Working Paper No. 23033*, 2017.

Jackson, Matthew O. and Massimo Morelli, "Political Bias and War," *American Economic Review*, 2007, *97* (4), 1353–1373.

Kennedy, Paul, *The Rise and Fall of the Great Powers*, Vintatge Books, 1987.

Keyser, Erich, *Deutsches Städtebuch, 5 vols.*, Kohlhammer, 1939-1974.

Kitamura, Shuhei and Nils-Petter Lagerlöf, "Geography and State Fragmentation," *Journal of the European Economic Association*, 2019.

Kjaer, Ulrik and Jørgen Elklit, "The Impact of Assembly Size on Representativeness," *Journal of Legislative Studies*, 2014, *20* (2), 156–173.

Ko, Chiu Yu, Mark Koyama, and Tuan-Hwee Sng, "Unified China and Divided Europe," *International Economic Review*, 2018, *59* (1), 285–327.

Kokkonen, Andrej and Anders Sundell, "Comparative Political Studies," *QOG working paper 2017/9*, 2020, *53* (3-4), 434–468.

Kuske, Bruno, *Das Schuldenwesen der deutschen Städte im Mittelalter*, Druck von H. Laupp jr., 1904.

La Porta, Rafael, Florencio Lopez de Silanes, Andrei Shleifer, and Robert W. Vishny, "Legal Determinants of External Finance," *Journal of Finance*, 1997, *52* (3), 1131–1150.

Lake, David A., "Powerful Pacifists: Democratic States and War," *American Political Science Review*, 1992, *86* (1), 24–37.

Lundy, Darryl, *The Peerage*, http://www.thepeerage.com, 2020.

Møller, Jørgen, "Why Europe Avoided Hegemony: A Historical Perspective on the Balance of Power," *International Studies Quarterly*, 2014, *58* (4), 660–670.

Moser, Johann Jakob, *Teutsches Staats-Recht*, Volume 19, Nurnberg : Stein, 1737-53.

North, Douglass C., *Structure and Change in Economic History*, Norton, 1981.

_ , "A Transaction Cost Theory of Politics," *Journal of Theoretical Politics*, 1990, *2* (4), 355–367.

_ **and Robert Paul Thomas**, *The Rise of the Western World: A New Economic History*, Cambridge University Press, 1973.

Nunn, Nathan, "The Importance of History for Economic Development," *Annual Review of Economics*, 2009, *1* (1), 65–92.

Osiander, Andreas, "Sovereignty, International Relations, and the Westphalian Myth," *International Organization*, 2001, pp. 251–287.

Pirenne, Henri, *Medieval Cities: Their Origins and the Revival of Trade*, Princeton University Press, 1927/2014. Reprinted in 2014.

Putnam, Robert D., Robert Leonardi, and Raffaella Y. Nanetti, *Making Democracy Work: Civic Traditions in Modern Italy*, Princeton University Press, 1993.

Rubin, Jared, *Rulers, Religion, and Riches: Why the West Got Rich and the Middle East Did Not*, Cambridge University Press, 2017.

Sabetti, Filippo, "Local Roots of Constitutionalism," *Perspectives on Political Science*, 2004, *33* (2), 70–78.

Schönholzer, David and Eric Weese, "Creative Destruction in the European State System: 1000-1850," *mimeo.*, 2019.

Schwennicke, Detlev, *Europäische Stammtafeln, Neue Folge, Vol. I.1-I.3*, Vittorio Klostermann, 1998.

Stasavage, David, *States of Credit: Size, Power, and the Development of European Polities*, Princeton University Press, 2011.

_ , "Was Weber Right? The Role of Urban Autonomy in Europe's Rise," *American Political Science Review*, 2014, *108* (2), 337–354.

_ , "Representation and Consent: Why They Arose in Europe and Not Elsewhere," *Annual Review of Political Science*, 2016, *19*, 145–162.

Theibault, John, "The Demography of the Thirty Years War Re-Revisited: Günther Franz and His Critics," *German History*, 1997, *15* (1), 1–21.

Ticchi, Davide and Andrea Vindigni, "Wars and Endogenous Democracy," *IZA Discussion Paper*, 2008, *3397*.

Tilly, Charles, *The Formation of National States in Western Europe*, Princeton University Press, 1975.

Wahl, Fabian, "Political Participation and Economic Development: Evidence from the Rise of Participative Political Institutions in the Late Medieval German Lands," *European Review of Economic History*, 2019, *23* (2), 193–213.

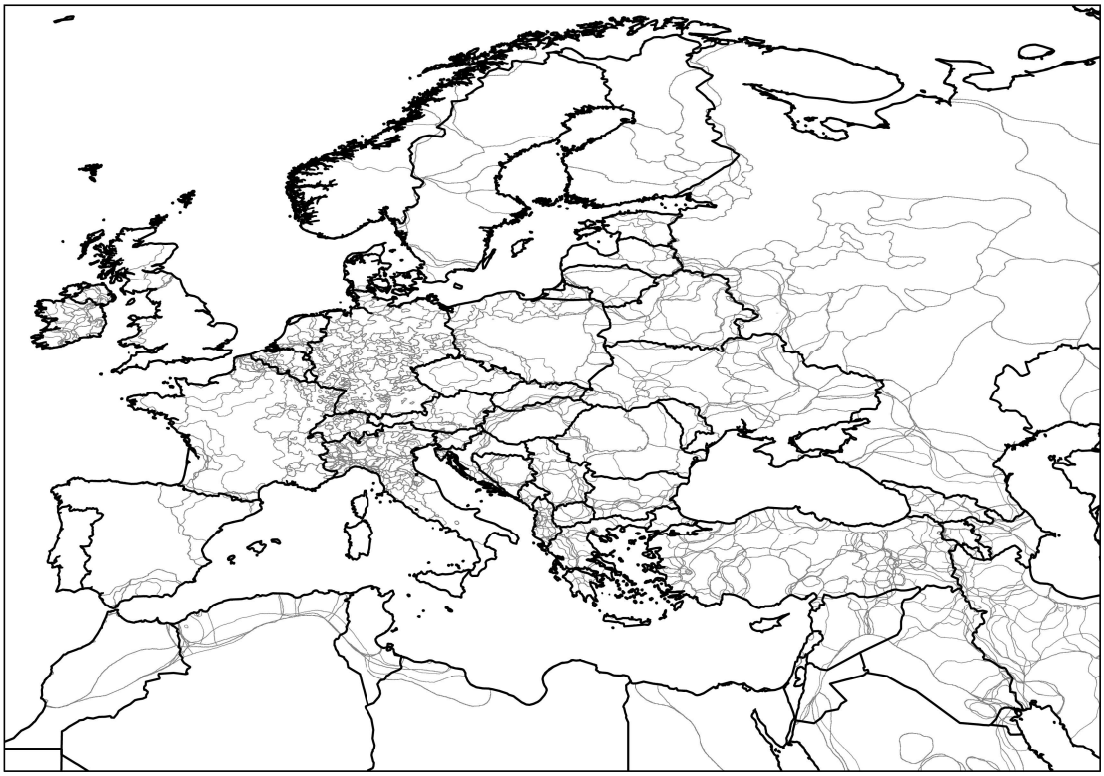
Weber, Max, "Die Stadt. Eine Soziologische Untersuchung," *Archiv für Sozialwissenschaft und Sozialpolitik*, 1921, *47* (3), 621–772.

_ , *Wirtschaftsgeschichte: Abriß der Universalen Sozial und Wirtschaftsgeschichte. Aus Den Nachgelassenen Vorlesungen*, Duncker & Humblot, 1923/1981. Reprinted in 1981.

Wilson, Peter H., *Europe's Tragedy: A New History of the Thirty Years War*, Penguin, 2009.

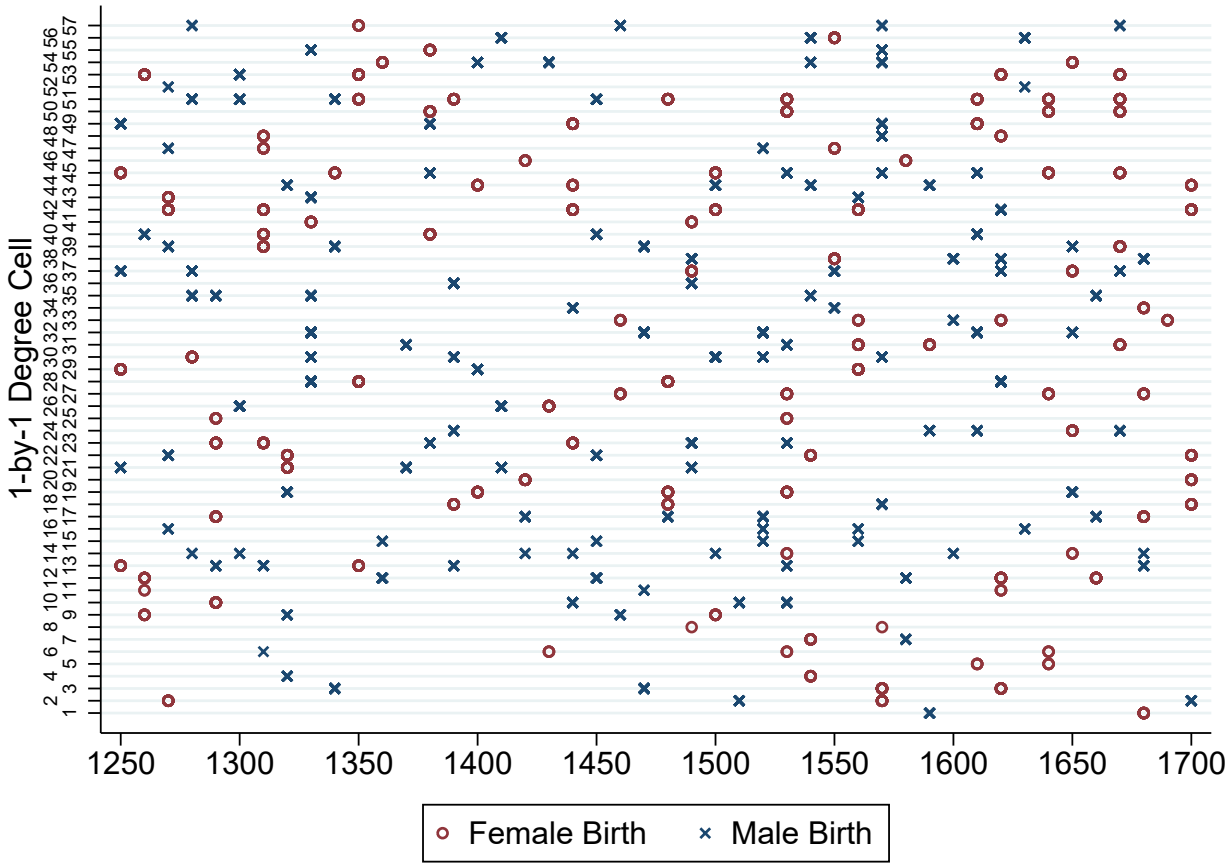
Figures

Figure 1: De Facto Territorial Boundaries in Europe, the Middle East and North Africa, 1250-1710



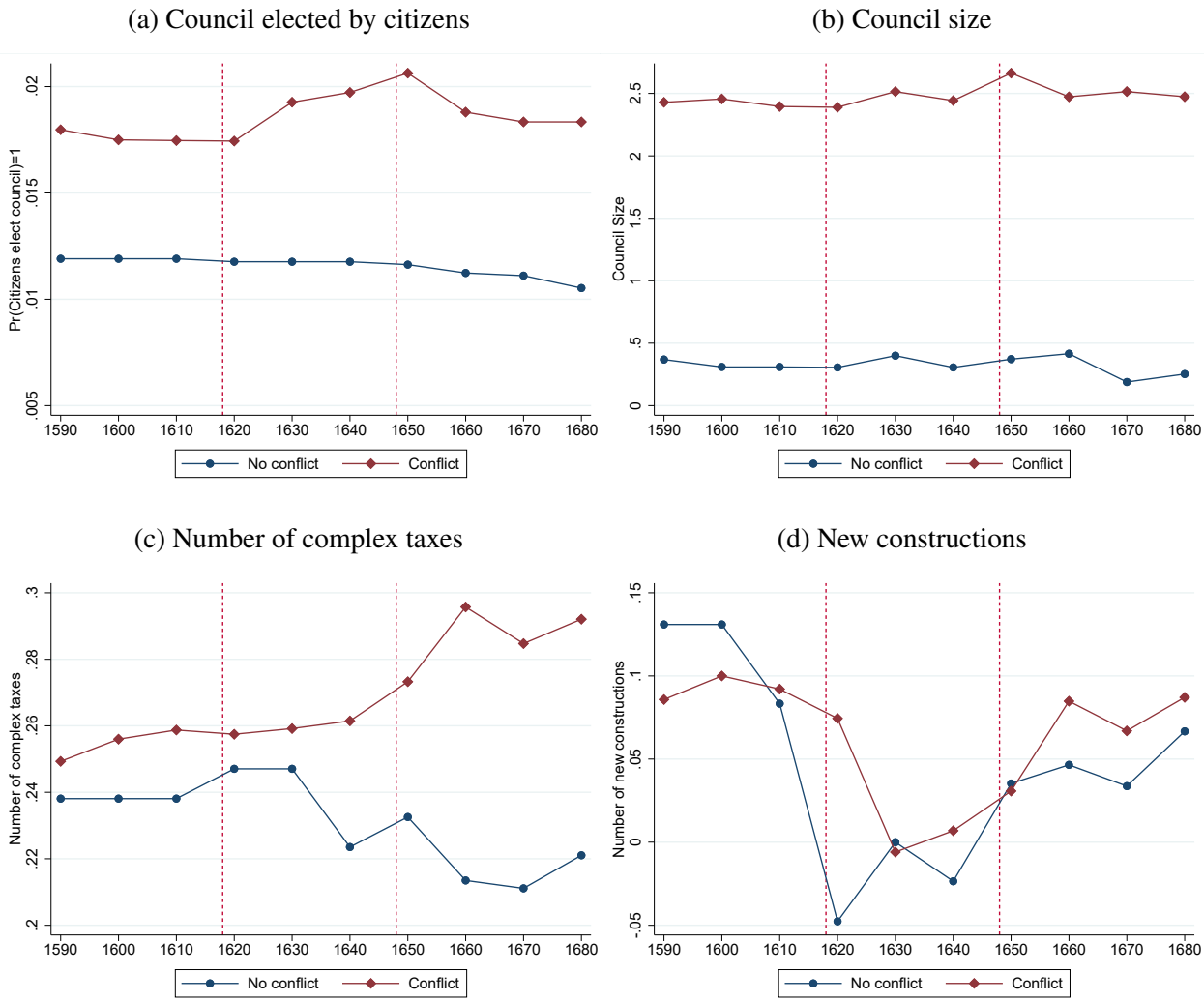
Note: De facto territorial boundaries from the Centennia Historical Atlas (Clockwork Mapping, 2018) overlapped at decadal intervals for the period 1250-1710 (light grey). Modern state boundaries also shown (black).

Figure 2: Birth Events by Cell and Decade



Note: Male and female firstborn children of the most connected noble in a given 1×1 degree cell in the German lands between 1250 and 1710 by decade. The most connected noble is identified as the person with the most links in the family network of the German and European nobility.

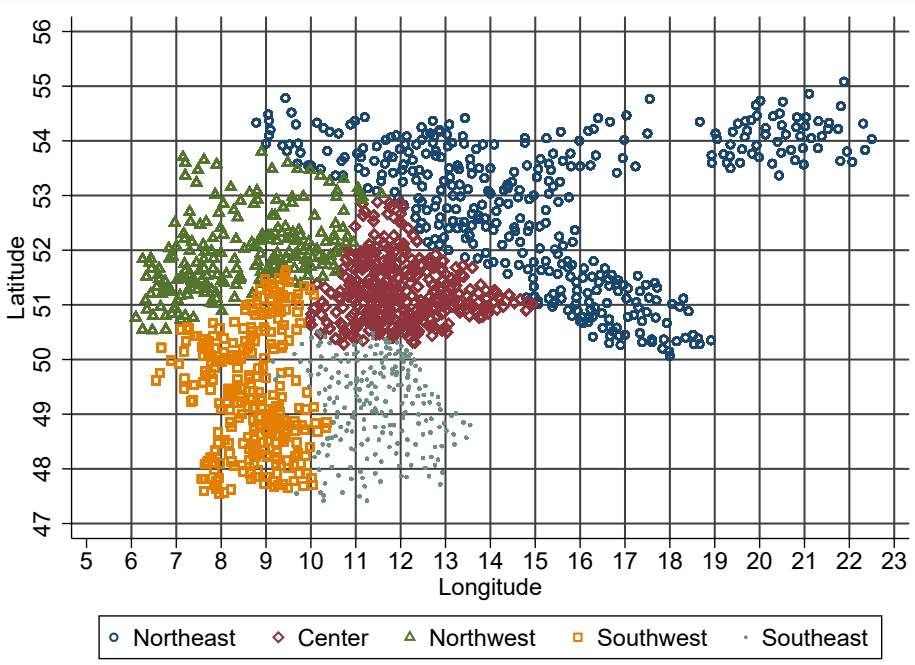
Figure 3: Political, Taxation, and Construction Outcomes in the 30 Year's War



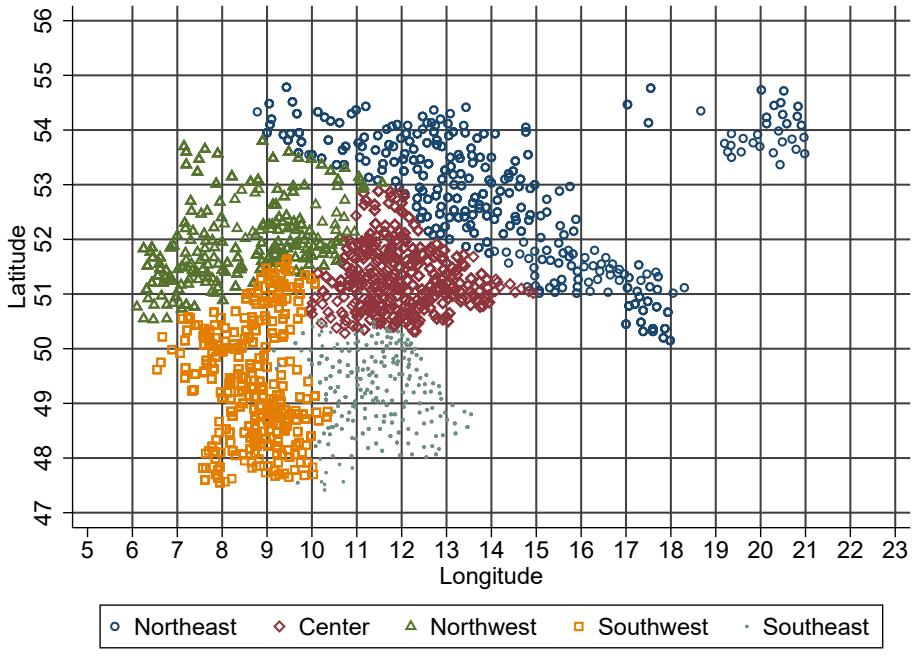
Note: Evolution of political, taxation, and construction outcomes for cities located in 1×1 degree grid cells that did or did not experience a conflict during the 30 Year's War. The probability of citizens electing their local city council equals one if citizens can hold such elections without the interference of the local ruler. Council size is the number of members on the city council. Complex taxes refer to those taxes that require a register or administrative infrastructure to levy them because the taxed items are not easily observed, which includes income, wealth or business taxes. New constructions refers to the number of new constructions of secular, military, or religious buildings in a given decade. The start end end dates of the war are marked by the vertical dashed lines in 1618 and 1648, respectively. Data are at the city-decade level.

Figure 4: Cities by Region and Sample

(a) Full Sample



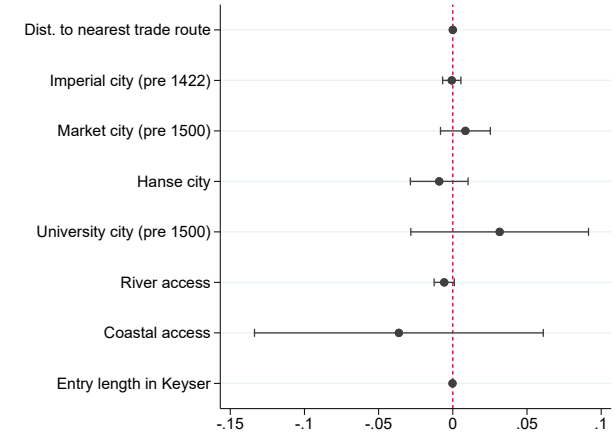
(b) First Child Sample



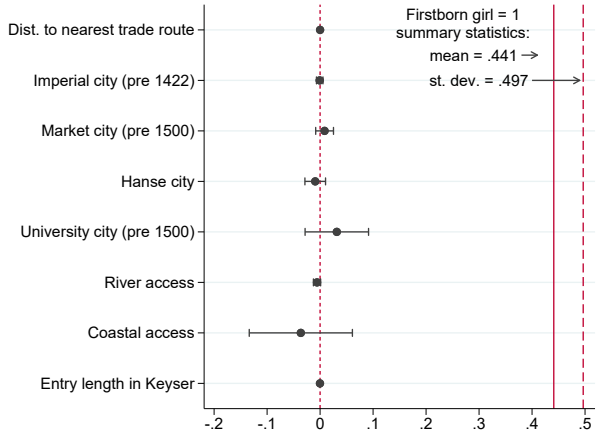
Note: Map of the 2,340 cities in the Keyser books by region for the full sample (panel a) and the sample of cities lying in cells that receive values for our firstborn-child gender instrument at any point in the sample period between 1250 and 1710. Regions are defined by the Keyser volume a city appears in. Latitude and longitude lines show the 1×1 degree grid cells.

Figure 5: Instrumental Variable Balancing on Observables

(a) Coefficient Plot



(b) Coefficient Plot with Outcome Summary Statistics



Note: Coefficients from a regression of an indicator for whether the firstborn child of the most connected noble in a given 1×1 degree cell in the previous decade was female on observable city characteristics. The most connected noble is identified as the person with the most links in the family network of the German and European nobility. The comparison group are cities in cells where the most connected noble had a male firstborn child in the previous decade. Hence the regression tests whether cities with firstborn girls are significantly different from cities with firstborn boys for the most connected noble in terms of observable city characteristics. The unit of observation is the city-decade observation for the sample of German cities between 1250 and 1710. Panel (a) shows the coefficients only while panel (b) relates them to the mean and standard deviation of the instrument to put the coefficient sizes into perspective. The short dashed line marks zero, the solid line marks the average of the instrument, and the long dashed line marks its standard deviation. All regressions include 1×1 degree cell and decade fixed effects. Error bars show 95% confidence intervals and standard errors are clustered at the 1×1 degree cell level.

Tables

Table 1: Summary Statistics for the City-Decade Panel

	count	mean	sd	min	max
Panel A: Full Sample					
Conflict (1x1 degree cell-level)	65660	0.310	0.462	0	1
Citizens elect council	65660	0.021	0.143	0	1
Council size	65660	2.656	8.633	0	341
Guilds on council	9330	0.009	0.093	0	1
City has a council	65660	0.245	0.430	0	1
Constructions (net)	65219	0.093	0.449	-15	10
No. of war taxes	65660	0.022	0.159	0	3
No. of complex taxes	65660	0.259	0.814	0	16
No. of mill taxes	65660	0.006	0.075	0	1
No. of trade taxes	65660	0.125	0.500	0	8
Dist. to nearest trade route (1500)	65660	171.884	96.779	24	514
Imperial city (pre 1422)	65660	0.034	0.180	0	1
Market city (pre 1500)	65660	0.359	0.480	0	1
Hanse city	65660	0.028	0.164	0	1
University city (pre 1500)	65660	0.005	0.072	0	1
River access	65660	0.071	0.257	0	1
Coastal access	65660	0.006	0.077	0	1
Entry length in Keyser	65660	2.704	3.737	0	51
Panel B: First Child Sample					
	count	mean	sd	min	max
Conflict (1x1 degree cell-level)	5566	0.337	0.473	0	1
Firstborn child is female (1x1 degree cell-level)	5566	0.445	0.497	0	1
Citizens elect council	5566	0.021	0.144	0	1
Council size	5566	2.783	7.583	0	90
Guilds on council	846	0.014	0.118	0	1
City has a council	5566	0.266	0.442	0	1
Constructions (net)	5566	0.106	0.462	-3	5
No. of war taxes	5566	0.026	0.176	0	2
No. of complex taxes	5566	0.248	0.797	0	10
No. of mill taxes	5566	0.004	0.061	0	1
No. of trade taxes	5566	0.120	0.506	0	8
Dist. to nearest trade route (1500)	5566	170.280	97.241	24	514
Imperial city (pre 1422)	5566	0.037	0.190	0	1
Market city (pre 1500)	5566	0.376	0.484	0	1
Hanse city	5566	0.023	0.149	0	1
University city (pre 1500)	5566	0.006	0.079	0	1
River access	5566	0.077	0.267	0	1
Coastal access	5566	0.006	0.077	0	1
Entry length in Keyser	5566	2.851	3.691	0	49

Note: The unit of observation is the city-decade and the sample consists of German cities from 1250 to 1710. The full sample includes all cities in all cells whereas the first child sample includes cities which lie in a cell to which an instrument value has been assigned in a given decade. The instrument equals one whether the most connected noble's firstborn child in the previous decade was a girl, which we use to predict conflicts in a given 1×1 degree cell. The number of observations for constructions (net) is slightly smaller because this is a change variable, hence for 441 cities with founding date after 1250 we lose the first observation in the differencing.

Table 2: First Stage Regressions

	Outcome: Pr(Conflict)=1						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Female child = 1	0.202***	0.188***	0.218**	0.203***	0.199***	0.318***	0.318***
	(0.059)	(0.060)	(0.100)	(0.061)	(0.062)	(0.056)	(0.056)
CityFE	yes	yes	yes	yes	yes	yes	yes
Region × Century FE		yes					
Cell × Century FE			yes				
Border × Century FE				yes			
Region-Decade Trend					yes		
Cell-Decade Trend						yes	
Border-Decade Trend							yes
Observations	5,566	5,566	5,565	5,566	5,566	5,566	5,566
Cells	57	57	57	57	57	57	57

Note: First stage regressions of the conflict probability for cities in the 1×1 degree cell c in decade t on an indicator for whether the most connected noble in the cell had a female firstborn child in the previous decade. The most connected noble is identified as the person with the most links in the family network of the German and European nobility. The comparison group are cities in cells where the most connected noble had a male firstborn child in the previous decade. The unit of observation is the city-decade observation for the sample of German cities between 1250 and 1710. The main specification is reported in column (1). All other columns probe for the robustness of the estimated relationship with respect to different fixed effects and linear time trends at varying unit-levels. All regressions include decade fixed effects. Standard errors are reported in parentheses and are clustered at the 1×1 degree cell level. Significance levels are denoted by * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 3: Conflicts and Democratically Elected City Councils

	Outcome: Pr(Citizens elect council)=1					
	(1)	(2)	(3)	(4)	(5)	(6)
Conflict	0.003***	0.009***	0.032*	0.002**	0.006**	0.027*
	(0.001)	(0.003)	(0.018)	(0.001)	(0.003)	(0.014)
Sample	full	first child	first child	full	first child	first child
Estimator	OLS	OLS	2SLS	OLS	OLS	2SLS
Controls				yes	yes	yes
Observations	65,660	5,566	5,566	65,660	5,566	5,566
Cells	89	57	57	89	57	57
Outcome mean	0.021	0.021	0.021	0.021	0.021	0.021
K-P F-Stat			11.545			10.746

Note: OLS and 2SLS regressions of an indicator for whether citizens in a city elect their own city councils without intervention of the local ruler on an indicator for whether a conflict occurred in the city's 1×1 degree cell in a given decade. The unit of observation is the city-decade observation and the sample consists of German cities from 1250 to 1710. The full sample includes all cities in all cells whereas the first child sample includes cities which lie in a cell to which an instrument value has been assigned. Conflicts are instrumented by an indicator for whether the most connected noble in the cell had a female firstborn child in the decade before the conflict. The most connected noble is identified as the person with the most links in the family network of the German and European nobility. All regressions include city and decade fixed effects. If included, the vector of controls consists of a city's distance to the nearest trade route in 1500, indicators for free imperial city status in 1422, market city status before 1500, Hanse cities, cities with a university before 1500, two indicators for cities with river or coastal access, as well as the city's article page length in the Keyser books, and region-by-century fixed effects. All time-invariant variables are interacted with century fixed effects. Standard errors are clustered at the 1×1 degree cell level. Significance levels are denoted by * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 4: Conflicts, Council Size, and Guild Representation

	Council Size						Guilds on Council	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Conflict	0.208***	0.900***	2.619**	0.173***	0.772***	3.309**	0.170**	0.159**
	(0.071)	(0.246)	(1.151)	(0.061)	(0.199)	(1.338)	(0.075)	(0.071)
Sample	full	first child	first child	full	first child	first child	first child	first child
Estimator	OLS	OLS	2SLS	OLS	OLS	2SLS	2SLS	2SLS
Controls				yes	yes	yes		yes
Observations	65,660	5,566	5,566	65,660	5,566	5,566	846	846
Cells	89	57	57	89	57	57	52	52
Outcome mean	2.656	2.783	2.783	2.656	2.783	2.783	0.014	0.014
K-P F-Stat			11.545			10.746	11.625	11.470

Note: OLS and 2SLS regressions of the number of members of a city's council on an indicator for whether a conflict occurred in the city's 1×1 degree cell in a given decade (columns 1 to 6), as well as 2SLS regressions of an indicator for guild representation on the city council on the same conflict variable (columns 7 and 8). The unit of observation is the city-decade observation and the sample consists of German cities from 1250 to 1710. The full sample includes all cities in all cells whereas the first child sample includes cities which lie in a cell to which an instrument value has been assigned. Conflicts are instrumented by an indicator for whether the most connected noble in the cell had a female firstborn child in the decade before the conflict. The most connected noble is identified as the person with the most links in the family network of the German and European nobility. All regressions include city and decade fixed effects. If included, the vector of controls consists of a city's distance to the nearest trade route in 1500, indicators for free imperial city status in 1422, market city status before 1500, Hanse cities, cities with a university before 1500, two indicators for cities with river or coastal access, as well as the city's article page length in the Keyser books, and region-by-century fixed effects. All time-invariant variables are interacted with century fixed effects. Standard errors are clustered at the 1×1 degree cell level. Significance levels are denoted by * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 5: Conflicts and War Taxes

	Outcome: Number of War Taxes			
	Panel A: 2SLS estimates without controls			
	t	t+10	t+20	t+30
Conflict	0.026*	0.021	0.008	0.007
	(0.014)	(0.014)	(0.018)	(0.015)
Observations	5,566	5,566	5,566	5,566
Cells	57	57	57	57
Outcome mean	0.026	0.027	0.027	0.027
K-P F-Stat	11.545	11.545	11.545	11.545
	Panel B: 2SLS estimates with controls			
	t	t+10	t+20	t+30
Conflict	0.027*	0.022	0.007	0.004
	(0.015)	(0.017)	(0.017)	(0.014)
Observations	5,566	5,566	5,566	5,566
Cells	57	57	57	57
Outcome mean	0.026	0.027	0.027	0.027
K-P F-Stat	10.746	10.746	10.746	10.746

Note: 2SLS regressions of the number of war taxes in a city on an indicator for whether a conflict occurred in the city's 1×1 degree cell in a given decade instrumented by an indicator for whether the most connected noble in the cell had a female firstborn child in the decade before the conflict. The most connected noble is identified as the person with the most links in the family network of the German and European nobility. The unit of observation is the city-decade observation and the sample consists of German cities from 1250 to 1710. Each column is a separate regression for a given timing of the outcome variable whereas conflict and instrument are always measured in t and $t-10$, respectively. All regressions include city and decade fixed effects. If included, the vector of controls consists of a city's distance to the nearest trade route in 1500, indicators for free imperial city status in 1422, market city status before 1500, Hanse cities, cities with a university before 1500, two indicators for cities with river or coastal access, as well as the city's article page length in the Keyser books, and region-by-century fixed effects. All time-invariant variables are interacted with century fixed effects. Standard errors are clustered at the 1×1 degree cell level. Significance levels are denoted by * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 6: Conflicts and Complex Taxes

	Outcome: Number of Complex Taxes			
	Panel A: 2SLS estimates without controls			
	t	t+10	t+20	t+30
Conflict	0.104	0.058	0.194**	0.163*
	(0.074)	(0.063)	(0.082)	(0.082)
Observations	5,566	5,566	5,566	5,566
Cells	57	57	57	57
Outcome mean	0.248	0.261	0.260	0.263
K-P F-Stat	11.545	11.545	11.545	11.545
	Panel B: 2SLS estimates with controls			
	t	t+10	t+20	t+30
Conflict	0.045	0.012	0.183**	0.143
	(0.081)	(0.065)	(0.088)	(0.088)
Observations	5,566	5,566	5,566	5,566
Cells	57	57	57	57
Outcome mean	0.248	0.261	0.260	0.263
K-P F-Stat	10.746	10.746	10.746	10.746

Note: 2SLS regressions of the number of complex taxes in a city on an indicator for whether a conflict occurred in the city's 1×1 degree cell in a given decade instrumented by an indicator for whether the most connected noble in the cell had a female firstborn child in the decade before the conflict. The most connected noble is identified as the person with the most links in the family network of the German and European nobility. The unit of observation is the city-decade observation and the sample consists of German cities from 1250 to 1710. Each column is a separate regression for a given timing of the outcome variable whereas conflict and instrument are always measured in t and $t-10$, respectively. All regressions include city and decade fixed effects. If included, the vector of controls consists of a city's distance to the nearest trade route in 1500, indicators for free imperial city status in 1422, market city status before 1500, Hanse cities, cities with a university before 1500, two indicators for cities with river or coastal access, as well as the city's article page length in the Keyser books, and region-by-century fixed effects. All time-invariant variables are interacted with century fixed effects. Standard errors are clustered at the 1×1 degree cell level. Significance levels are denoted by * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 7: Conflicts and Construction

	Outcome: Number of New Constructions			
	Panel A: 2SLS estimates without controls			
	t	t+10	t+20	t+30
Conflict	-0.043	0.011	0.157	0.249**
	(0.092)	(0.077)	(0.112)	(0.124)
Observations	5,566	5,566	5,566	5,566
Cells	57	57	57	57
Outcome mean	0.106	0.087	0.098	0.094
K-P F-Stat	11.545	11.545	11.545	11.545
	Panel B: 2SLS estimates with controls			
	t	t+10	t+20	t+30
Conflict	-0.084	0.012	0.153	0.287**
	(0.090)	(0.071)	(0.106)	(0.135)
Observations	5,566	5,566	5,566	5,566
Cells	57	57	57	57
Outcome mean	0.106	0.087	0.098	0.094
K-P F-Stat	10.746	10.746	10.746	10.746

Note: 2SLS regressions of the number of new constructions in a city on an indicator for whether a conflict occurred in the city's 1×1 degree cell in a given decade instrumented by an indicator for whether the most connected noble in the cell had a female firstborn child in the decade before the conflict. The most connected noble is identified as the person with the most links in the family network of the German and European nobility. The unit of observation is the city-decade observation and the sample consists of German cities from 1250 to 1710. Each column is a separate regression for a given timing of the outcome variable whereas conflict and instrument are always measured in t and $t-10$, respectively. Constructions refer to any kind of new construction including secular, religious, and military buildings. All regressions include city and decade fixed effects. If included, the vector of controls consists of a city's distance to the nearest trade route in 1500, indicators for free imperial city status in 1422, market city status before 1500, Hanse cities, cities with a university before 1500, two indicators for cities with river or coastal access, as well as the city's article page length in the Keyser books, and region-by-century fixed effects. All time-invariant variables are interacted with century fixed effects. Standard errors are clustered at the 1×1 degree cell level. Significance levels are denoted by * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Appendix: Additional Figures and Tables

Figure A1: Sovereign States in Europe and China, 1–1800

Note: The number of sovereign states in Europe and China at century intervals between 1 and 1800 CE. Source: Ko, Koyama and Sng (2018).

Figure A2: Examples of Relevant *Deutsches Städtebuch* Entries for the City of Dortmund

(a) Paragraph 5b: Construction Events

noldikirche, Mittelpunkt des ehemaligen Archidiakonates D. Älteste Kirche (Stiftskirche bis um 1065) 1232 verbrannt; Neubau 1250–70 als dreischiffige Pfeilerbasilika im rom.-got. Übergangsstil; 1421–40 Neubau des Chores, 1444 Neubau des Turmes durch Meister Roseer; 1661 Turmeinsturz, Verkleinerung des Langschiffes um 6 Joch,

(b) Paragraph 9a: Political Institutions

und „neuer Rat" bzw. „sitzender Rat" und „gesessener Rat"). Infolge der Revolution von 1400 werden nur die 12 oberen Ratsstellen mit „Erbsassen" (= Großbürgern) und die 6 unteren Ratsstellen mit Vertretern der 6 Gilden besetzt. Der

(c) Paragraph 10b: Conflicts

burg und dem Erzbischof von Köln. Schlacht am Wulveskamp bei D.-Brechten 1254. Um 1388 bis 1389 wurde D. 20 Monate lang belagert durch Erzbischof von Köln, Grafen von der Mark, viele geistliche und weltliche Fürsten, 20 Städte, gegen 1200 Ritter usw. Es bewahrte seine Reichsfreiheit, geriet aber in große Kriegsverschuldung.

(d) Paragraph 13b: Taxation

Ende 13. Jh. Kriegssteuern: die „opkome" (1391 ff.), eine Umsatzsteuer von $^1/_{48}$ des Verkaufswertes, die „puntinge", eine 5%ige Steuer vom Gesamtvermögen (3mal, 1393, 1395, 1396, erhoben). Reichssteuern (1241/42; gemeiner Pfennig 1499; Türkensteuer usw.), Fremdensteuern

Note: Examples from the *Städtebuch* of the relevant paragraphs for our data collection. These particular excerpts correspond to the city of Dortmund and describe the siege and its aftermath described in the Introduction.

Figure A3: The Peerage Example

Wolfgang Herzog von Braunschweig-Grubenhagen

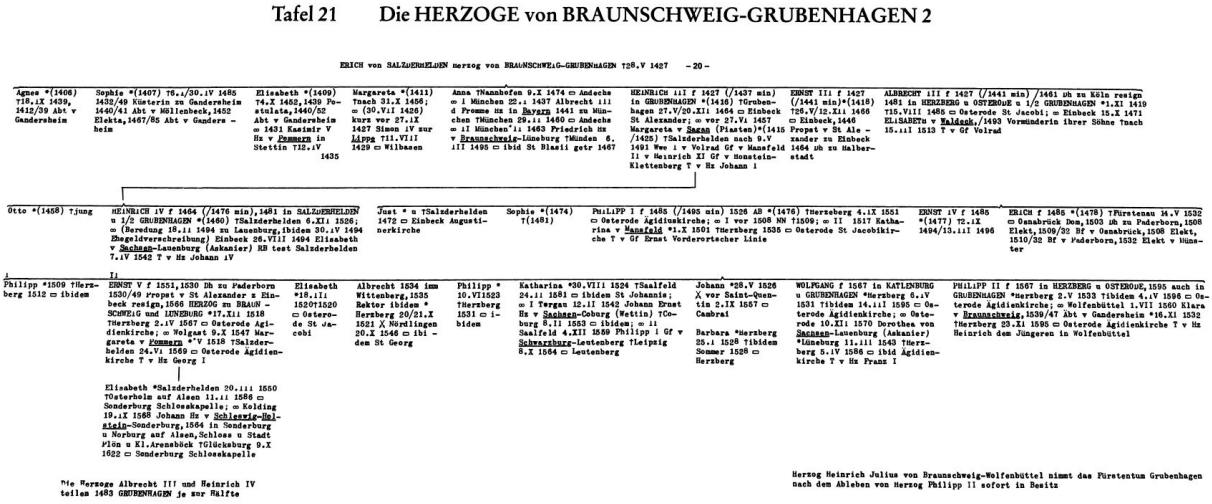
M, #7388, b. 6 April 1531, d. 14 March 1595

Last Edited=10 May 2003

Wolfgang Herzog **von Braunschweig-Grubenhagen** was born on 6 April 1531. He was the son of Philip Herzog **von Braunschweig-Grubenhagen** and Catherine **von Mansfeld**. He married Dorothea **von Sachsen-Lauenburg**, daughter of Franz I Herzog **von Sachsen-Lauenburg** and Sybille **von Sachsen-Freiberg**, on 10 December 1570 at Osterode, Germany[G]. He died on 14 March 1595 at age 63.
He gained the title of *Herzog von Braunschweig-Grubenhagen*.

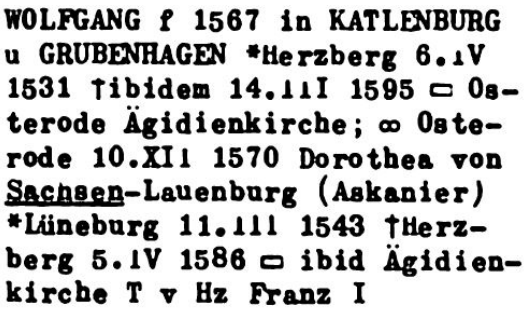
Note: Example from Darryl Lundy's genealogical website *The Peerage* (http://www.thepeerage.com/, accessed 04/11/2017) for Wolfgang, Duke of Braunschweig-Grubenhagen. Wolfgang is one of the over 680,000 nobles we use to reconstruct the European nobility network each year (see text for details).

Figure A4: Family Tree Example - The Dukes of Braunschweig-Grubenhagen



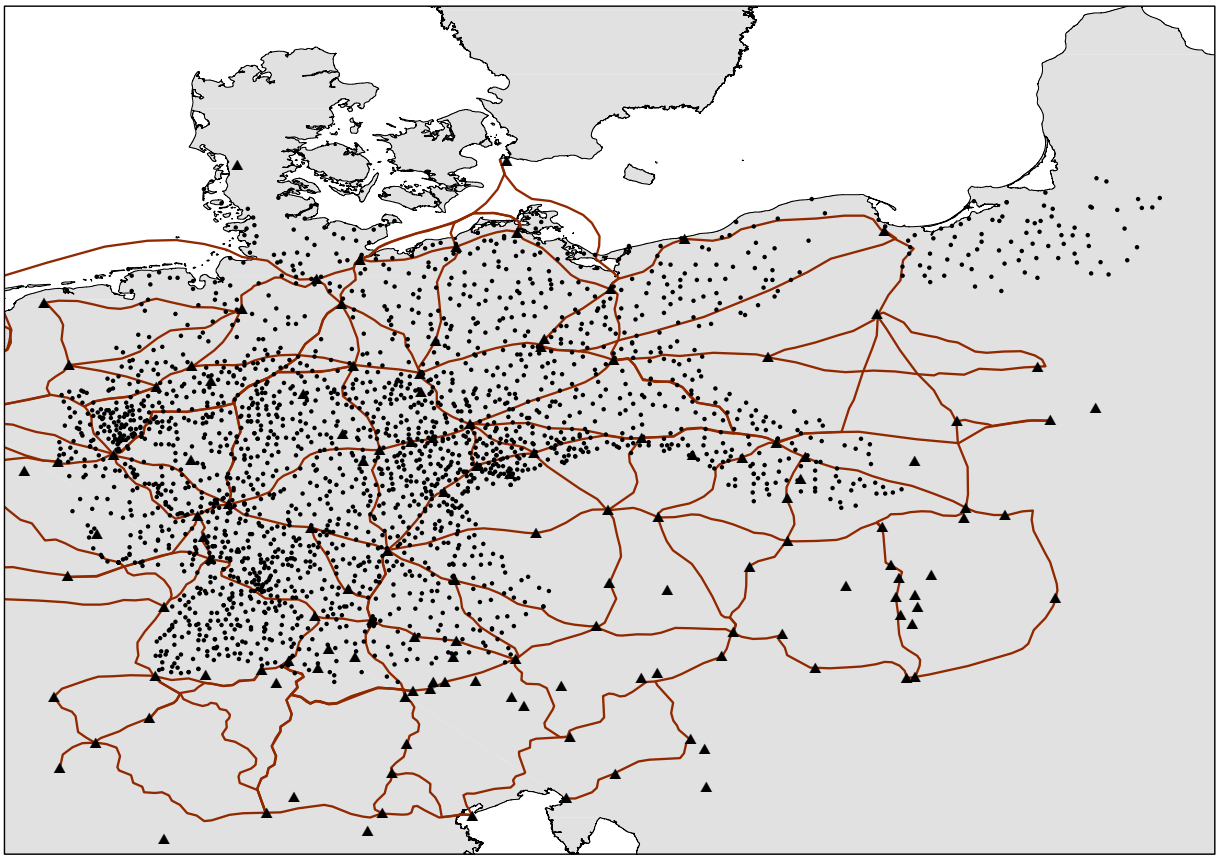
Note: Family tree example from the *Europäische Stammtafeln* (Schwennicke, 1998). Life events are represented by the following symbols for birth *, deaths †, marriage ∞, burial ▭, battle deaths are marked by two crossed swords. We use these family trees primarily to associate nobles to cities and territories within the German lands, but also to supplement the information from the *Peerage*.

Figure A5: Family Tree - Individual Entry



Note: Individual entry within a family tree (zoomed in) from the *Europäische Stammtafeln* (Schwennicke, 1998). The example shows Wolfgang, Duke of Braunschweig-Grubenhagen. The most relevant information of the entry include the cities of residences and death, year of birth, marriage, and death, the name and title of his wife and her family (Dorothea von Sachsen-Lauenburg).

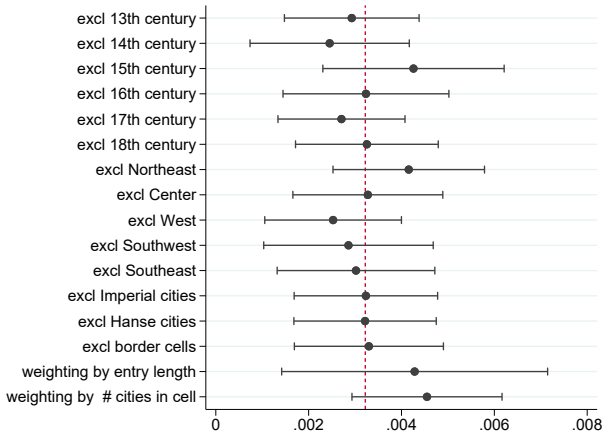
Figure A6: Trade Routes



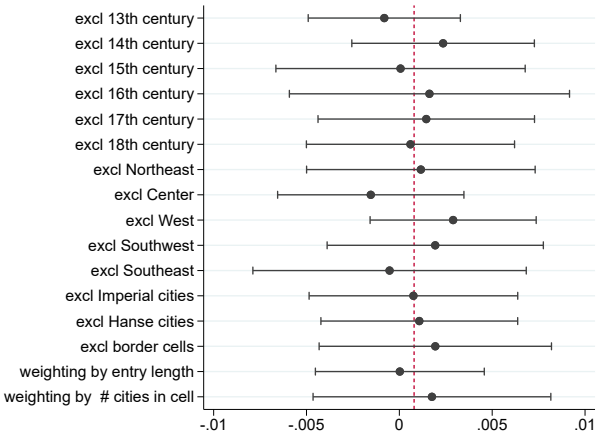
Note: Map showing trade routes in the German lands, circa 1500. Red lines indicate trade routes, black dots indicate the cites in our sample, triangles indicate main trading centres. Hand-digitised from the original, Berthold (1976).

Figure A7: Sensitivity Check for Conflicts and Council Elections by Citizens

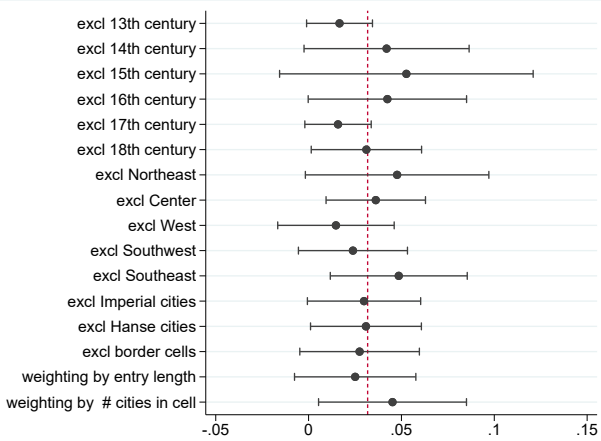
(a) OLS (Full Sample)



(b) OLS (First Child Sample)



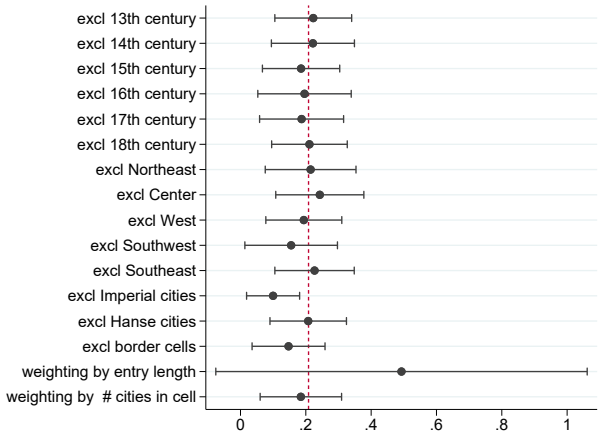
(c) 2SLS



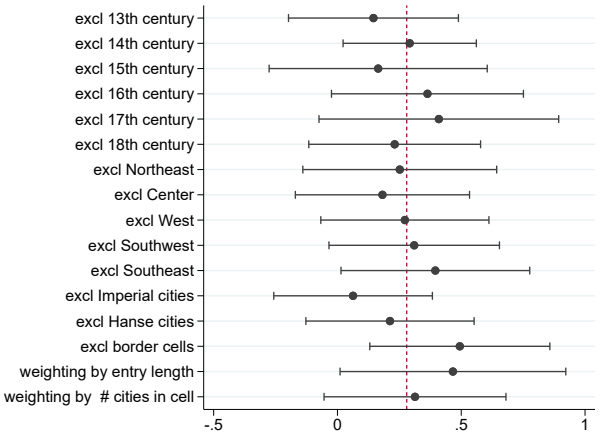
Note: OLS and 2SLS regressions of an indicator for whether citizens in a city elect their own city councils without intervention of the local ruler on an indicator for whether a conflict occurred in the city's 1×1 degree cell in a given decade. Each coefficient comes from a separate regression that omits a subset of the sample or weights observations as indicated. The red line marks the baseline estimate. The unit of observation is the city-decade observation and the sample consists of German cities from 1250 to 1710. The full sample includes all cities in all cells whereas the first child sample includes cities which lie in a cell to which an instrument value has been assigned. Conflicts are instrumented by an indicator for whether the most connected noble in the cell had a female firstborn child in the decade before the conflict. The most connected noble is identified as the person with the most links in the family network of the German and European nobility. All regressions include city and decade fixed effects. Standard errors are clustered at the 1×1 degree cell level. Errors bars display 90% confidence intervals.

Figure A8: Sensitivity Check for Conflicts and Council Size

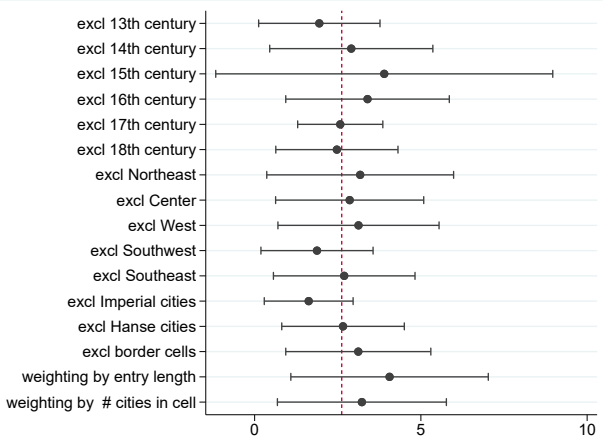
(a) OLS (Full Sample)



(b) OLS (First Child Sample)



(c) 2SLS



Note: OLS and 2SLS regressions of the number of members of a city's council on an indicator for whether a conflict occurred in the city's 1×1 degree cell in a given decade. Each coefficient comes from a separate regression that omits a subset of the sample or weights observations as indicated. The red line marks the baseline estimate. The unit of observation is the city-decade observation and the sample consists of German cities from 1250 to 1710. The full sample includes all cities in all cells whereas the first child sample includes cities which lie in a cell to which an instrument value has been assigned. Conflicts are instrumented by an indicator for whether the most connected noble in the cell had a female firstborn child in the decade before the conflict. The most connected noble is identified as the person with the most links in the family network of the German and European nobility. All regressions include city and decade fixed effects. Standard errors are clustered at the 1×1 degree cell level. Errors bars display 90% confidence intervals.

Table A1: Tax Classifications by Tax Type and Complexity

Level of Complexity	Tax Type	Description
Simple	beverages (Getränkesteuer)	Taxes on production and consumption of beer. Easily observed by the number of transported barrels of a bulky and fairly homogeneous good. Requires little administrative effort.
Simple	church (Kirchensteuer)	Taxes levied on churchgoers and church-related services such as weddings, baptisms, or funerals. Requires little administrative effort.
Simple	consumption (Verbrauchssteuer)	Taxes on certain goods (Fleischakzise = meat tax, Brotakzise = bread tax) levied on businesses via adding them to the good prices. Easily observed since they affected mostly daily consumption goods. Requires little administrative effort.
Simple	entertainment (Vergnügungssteuer)	Taxes on entertainment such as dance venues (Tanzbodenzins = dance floor tax) or gambling (Spielkartensteuer = playing card tax). Usually levied as fixed fee on immobile businesses such as taverns and bars. Requires little administrative effort.
Simple	general tax (Steuer)	General taxation or taxes without specification. Since insufficient information is available from archival sources to give a more detailed classification, we assume that these require little administrative effort.
Simple	grazing (Weidegeld)	Taxes on usage of the meadows for grazing animals. Requires little administrative effort.
Simple	in kind (Naturalleistung)	Taxes levied as in kind contributions, such as clothes or tools. Requires little administrative effort.
Simple	lease (Pachtgeld)	Taxes on leased land for agricultural production (Ackerpacht = land lease) and hunting grounds (Jagdpacht = hunting lease). Requires little administrative effort.
Simple	mill (Mühlensteuer)	Taxes on mill usage. Easily observed as individual farmers would bring their corn and grain to the local mills which would grind them and place a fee on the quantity milled. Requires little administrative effort.
Simple	trade (Handelssteuer)	Taxes on trade and usage of toll roads and harbors by merchants. Usually levied as fee when a traveling merchant sought entrance to a city or at toll stations. Requires little administrative effort.
Complex	administration (Verwaltungssteuer)	Taxes to finance the local administration. Usually levied as head tax (Ratsgeld = council tax) or as fees on administrative services (Gerichtsgebühren = judicial court fees, Eichgeld = gauging fee). Requires some basic administrative structure and a registry.

Continued on next page

Level of Complexity	Tax Type	Description
Complex	animals (Viehsteuer)	Taxes on animals and livestock. Requires some knowledge of number and quality of livestock and their associated output (e.g. milk or wool). Requires some basic administrative structure and a registry.
Complex	business (Gewerbesteuer)	Taxes levied on businesses and shops in the city (excl. traveling merchants and market stands). Usually levied as fixed sum (e.g. as rent) or via guild fees. Requires some basic administrative structure and a registry.
Complex	citizen (Bürgersteuer)	Taxes and fees for obtaining citizen rights which include the right to vote, access to the legal system, certain professions, protection, and other benefits. Requires some basic administrative structure and a registry.
Complex	construction (Baugeld)	Taxes on construction of new dwellings and infrastructure. Usually taxed as fees when new constructions were applied for. Requires some basic administrative structure and a registry.
Complex	guard (Wächtergeld)	Taxes to finance the protection and policing of the city via the city guard (Nachtwächtergeld = night watch tax). Usually levied from citizens only via a fixed sum. Requires some basic administrative structure and a registry.
Complex	harvest (Erntesteuer)	Taxes on agricultural output. Easily observed during a fixed period in the year. Requires some basic administrative structure and a registry.
Complex	head (Kopfsteuer)	Taxes on each individual in the city. Requires knowledge of the city's population but usually levied as fixed sum. Requires some basic administrative structure and a registry.
Complex	income (Einkommensteuer)	Taxes on income. Often determined as percentage of a person's total income, e.g. 20. Pfennig (20th cent) or social rank in the city, e.g. Klassengeld (class tax) or Rangsteuer (rank tax). Requires significant administrative effort to gain knowledge of amount and regularity of individuals' incomes.
Complex	inheritance (Erbschaftssteuer)	Taxes on inheritances. Generally levied on all kinds of inheritances (Erbsteuer = inheritance tax), but sometimes levied from citizens only (Bürgererbenzins = citizen inheritance tax) or in case the inherited values were moved out of the city. Requires significant administrative effort to gain knowledge of the kind and value of the inheritance.
Complex	land (Landsteuer)	Taxes on farm land. Requires some basic knowledge of the size and quality of the plot which is usually observed by agricultural output. Requires some basic administrative structure and a registry.
Complex	property (Eigentumssteuer)	Taxes on owned property. Usually determined by the size of the property as measured by the number of windows or doors. Requires significant administrative effort to gain knowledge of the kind and value of the property.

Continued on next page

Level of Complexity	Tax Type	Description
Complex	protection (Schutzgeld)	Taxes on foreigners and certain groups to receive protection from the city. Most commonly levied on foreigners who entered the city (Fremdensteuer = foreigner tax) or Jews (Judenzoll = Jew toll). Requires some basic administrative structure and a registry to know who enters and exits the city and to levy the respective fee.
Complex	real estate (Grundsteuer)	Taxes on real estate. Determined by the size, quality, and location of the plot of land and the structures built on it. Requires significant administrative effort to gain knowledge of size and quality of the real estate.
Complex	rental (Mietsteuer)	Taxes on rented properties. Requires significant administrative effort to gain knowledge of the kind and value of the property.
Complex	sales (Umsatzsteuer)	Taxes on sales by businesses and merchants with market rights. Requires knowledge of the businesses' or merchants' sales revenues. In the case of merchants this also involves knowledge of the number of days on which the merchant traded on the market and revenues made there (Marktumsatzakzise = market revenue tax) which requires significant administrative effort.
Complex	wealth (Vermögenssteuer)	Taxes on individual wealth. This includes capital value (Kapitalsteuer = capital tax), taxes on interest and other investment returns (Wertzuwachssteuer = tax on capital appreciation), and wealth in general (Vermögenssteuer = wealth tax). Requires significant administrative effort to gain knowledge of the amount of wealth and returns on investment and capital.

Note: Classification of taxes mentioned in the encyclopedia of German cities ("Deutsches Städtebuch") by Keyser (1939-1974). We hand-coded and classified all taxes and assigned a level of complexity to each category in the first column. Simple taxes are easily observed without the need for having a more sophisticated administrative institution set up to oversee and collect such taxes, for instance taxes on using the local mill or church taxes. Complex taxes require a registry of the persons/quantities to be taxed as well as a non-trivial level of administrative infrastructure to collect. For instance, land can be observed but to levy a tax on it it must be surveyed which requires special knowledge. This category additionally includes, for example, income and wealth taxes where not only the tax-liable individuals need to be known but also the value of their income and wealth. The second column reports 28 broader tax categories into which we classified all taxes mentioned in the text. The final column provides a brief description of each tax class and provides some examples where appropriate.

Table A2: First Stage Regressions with Full Set of Controls

	Outcome: Pr(Conflict)=1						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Female child = 1	0.191***	0.191***	0.219**	0.196***	0.172***	0.289***	0.289***
	(0.058)	(0.058)	(0.100)	(0.057)	(0.058)	(0.054)	(0.054)
CityFE	yes	yes	yes	yes	yes	yes	yes
Region × Century FE		yes					
Cell × Century FE			yes				
Border × Century FE				yes			
Region-Decade Trend					yes		
Cell-Decade Trend						yes	
Border-Decade Trend							yes
Observations	5,566	5,566	5,565	5,566	5,566	5,566	5,566
Cells	57	57	57	57	57	57	57

Note: First stage regressions of the conflict probability for cities in the 1×1 degree cell c in decade t on an indicator for whether the most connected noble in the cell had a female firstborn child in the previous decade. The most connected noble is identified as the person with the most links in the family network of the German and European nobility. The comparison group are cities in cells where the most connected noble had a male firstborn child in the previous decade. The unit of observation is the city-decade observation for the sample of German cities between 1250 and 1710. The main specification is reported in column (1). All other columns probe for the robustness of the estimated relationship with respect to difference fixed effects and linear time trends at varying unit-levels. All regressions include decade fixed effects and controls for the city's distance to the nearest trade route in 1500, indicators for free imperial city status in 1422, market city status before 1500, Hanse cities, cities with a university before 1500, two indicators for cities with river or coastal access, as well as the city's article page length in the Keyser books. All time-invariant variables are interacted with century fixed effects. Standard errors are reported in parentheses and are clustered at the 1×1 degree cell level. Significance levels are denoted by * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A3: Conflicts and Elected City Councils Robustness to Council Control

	Outcome: Pr(Citizens elect council)=1					
	(1)	(2)	(3)	(4)	(5)	(6)
Conflict	0.003***	0.009***	0.032*	0.001**	0.005*	0.022*
	(0.001)	(0.003)	(0.018)	(0.001)	(0.002)	(0.013)
Sample	full	first child	first child	full	first child	first child
Estimator	OLS	OLS	2SLS	OLS	OLS	2SLS
Controls				yes	yes	yes
Observations	65,660	5,566	5,566	65,660	5,566	5,566
Cells	89	57	57	89	57	57
Outcome mean	0.021	0.021	0.021	0.021	0.021	0.021
K-P F-Stat			11.545			10.745

Note: OLS and 2SLS regressions of an indicator for whether citizens in a city elect their own city councils without intervention of the local ruler on an indicator for whether a conflict occurred in the city's 1×1 degree cell in a given decade. The unit of observation is the city-decade observation and the sample consists of German cities from 1250 to 1710. The full sample includes all cities in all cells whereas the first child sample includes cities which lie in a cell to which an instrument value has been assigned. Conflicts are instrumented by an indicator for whether the most connected noble in the cell had a female firstborn child in the decade before the conflict. The most connected noble is identified as the person with the most links in the family network of the German and European nobility. All regressions include city and decade fixed effects. If included, the vector of controls consists of a city's distance to the nearest trade route in 1500, indicators for free imperial city status in 1422, market city status before 1500, Hanse cities, cities with a university before 1500, two indicators for cities with river or coastal access, as well as the city's article page length in the Keyser books, and region-by-century fixed effects. All time-invariant variables are interacted with century fixed effects. Standard errors are clustered at the 1×1 degree cell level. Significance levels are denoted by * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A4: Conflicts, Council Size, and Guild Representation Robustness to Council Control

	Council Size						Guilds on Council	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Conflict	0.208***	0.900***	2.619**	0.084	0.507***	2.476**	0.170**	0.142**
	(0.071)	(0.246)	(1.151)	(0.052)	(0.160)	(1.154)	(0.075)	(0.068)
Sample	full	first child	first child	full	first child	first child	first child	first child
Estimator	OLS	OLS	2SLS	OLS	OLS	2SLS	2SLS	2SLS
Controls				yes	yes	yes		yes
Observations	65,660	5,566	5,566	65,660	5,566	5,566	846	846
Cells	89	57	57	89	57	57	52	52
Outcome mean	2.656	2.783	2.783	2.656	2.783	2.783	0.014	0.014
K-P F-Stat			11.545			10.745	11.625	11.390

Note: OLS and 2SLS regressions of the number of members of a city's council on an indicator for whether a conflict occurred in the city's 1×1 degree cell in a given decade (columns 1 to 6), as well as 2SLS regressions of an indicator for guild representation on the city council on the same conflict variable (columns 7 and 8). The unit of observation is the city-decade observation and the sample consists of German cities from 1250 to 1710. The full sample includes all cities in all cells whereas the first child sample includes cities which lie in a cell to which an instrument value has been assigned. Conflicts are instrumented by an indicator for whether the most connected noble in the cell had a female firstborn child in the decade before the conflict. The most connected noble is identified as the person with the most links in the family network of the German and European nobility. All regressions include city and decade fixed effects. If included, the vector of controls consists of a city's distance to the nearest trade route in 1500, indicators for free imperial city status in 1422, market city status before 1500, Hanse cities, cities with a university before 1500, two indicators for cities with river or coastal access, as well as the city's article page length in the Keyser books, and region-by-century fixed effects. All time-invariant variables are interacted with century fixed effects. Standard errors are clustered at the 1×1 degree cell level. Significance levels are denoted by * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A5: OLS Estimates for Conflicts and War Taxes

	Outcome: Number of War Taxes			
	Panel A: OLS estimates without controls			
	t	t+10	t+20	t+30
Conflict	0.003**	0.002*	0.002*	0.003*
	(0.001)	(0.001)	(0.001)	(0.001)
Observations	65,660	65,660	65,660	65,660
Cells	89	89	89	89
Outcome mean	0.022	0.022	0.023	0.023
	Panel B: OLS estimates with controls			
	t	t+10	t+20	t+30
Conflict	0.002*	0.002*	0.002	0.002*
	(0.001)	(0.001)	(0.001)	(0.001)
Observations	65,660	65,660	65,660	65,660
Cells	89	89	89	89
Outcome mean	0.022	0.022	0.023	0.023

Note: OLS regressions of the number of war taxes in a city on an indicator for whether a conflict occurred in the city's 1×1 degree cell in a given decade. The unit of observation is the city-decade observation and the sample consists of German cities from 1250 to 1710. Each column is a separate regression for a given timing of the outcome variable whereas conflict is always measured in t. All regressions include city and decade fixed effects. If included, the vector of controls consists of a city's distance to the nearest trade route in 1500, indicators for free imperial city status in 1422, market city status before 1500, Hanse cities, cities with a university before 1500, two indicators for cities with river or coastal access, as well as the city's article page length in the Keyser books, and region-by-century fixed effects. All time-invariant variables are interacted with century fixed effects. Standard errors are clustered at the 1×1 degree cell level. Significance levels are denoted by * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A6: OLS Estimates for Conflicts and Complex Taxes

	Outcome: Number of Complex Taxes			
	Panel A: OLS estimates without controls			
	t	t+10	t+20	t+30
Conflict	0.008	0.008*	0.009*	0.013***
	(0.005)	(0.005)	(0.005)	(0.004)
Observations	65,660	65,660	65,660	65,660
Cells	89	89	89	89
Outcome mean	0.259	0.265	0.270	0.275
	Panel B: OLS estimates with controls			
	t	t+10	t+20	t+30
Conflict	0.008**	0.008**	0.010***	0.014***
	(0.003)	(0.003)	(0.003)	(0.004)
Observations	65,660	65,660	65,660	65,660
Cells	89	89	89	89
Outcome mean	0.259	0.265	0.270	0.275

Note: OLS regressions of the number of complex taxes in a city on an indicator for whether a conflict occurred in the city's 1×1 degree cell in a given decade. The unit of observation is the city-decade observation and the sample consists of German cities from 1250 to 1710. Each column is a separate regression for a given timing of the outcome variable whereas conflict is always measured in t. All regressions include city and decade fixed effects. If included, the vector of controls consists of a city's distance to the nearest trade route in 1500, indicators for free imperial city status in 1422, market city status before 1500, Hanse cities, cities with a university before 1500, two indicators for cities with river or coastal access, as well as the city's article page length in the Keyser books, and region-by-century fixed effects. All time-invariant variables are interacted with century fixed effects. Standard errors are clustered at the 1×1 degree cell level. Significance levels are denoted by * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A7: Conflicts and Trade Taxes

	Outcome: Number of Trade Taxes			
	Panel A: 2SLS estimates without controls			
	t	t+10	t+20	t+30
Conflict	-0.043	-0.070	-0.063	-0.059
	(0.046)	(0.046)	(0.040)	(0.049)
Observations	5,566	5,566	5,566	5,566
Cells	57	57	57	57
Outcome mean	0.120	0.130	0.130	0.131
K-P F-Stat	10.746	10.746	10.746	10.746
	Panel B: 2SLS estimates with controls			
	t	t+10	t+20	t+30
Conflict	-0.043	-0.070	-0.063	-0.059
	(0.046)	(0.046)	(0.040)	(0.049)
Observations	5,566	5,566	5,566	5,566
Cells	57	57	57	57
Outcome mean	0.120	0.130	0.130	0.131
K-P F-Stat	10.746	10.746	10.746	10.746

Note: 2SLS regressions of the number of trade taxes in a city on an indicator for whether a conflict occurred in the city's 1×1 degree cell in a given decade instrumented by an indicator for whether the most connected noble in the cell had a female firstborn child in the decade before the conflict. The most connected noble is identified as the person with the most links in the family network of the German and European nobility. The unit of observation is the city-decade observation and the sample consists of German cities from 1250 to 1710. Each column is a separate regression for a given timing of the outcome variable whereas conflict and instrument are always measured in t and $t-10$, respectively. All regressions include city and decade fixed effects. If included, the vector of controls consists of a city's distance to the nearest trade route in 1500, indicators for free imperial city status in 1422, market city status before 1500, Hanse cities, cities with a university before 1500, two indicators for cities with river or coastal access, as well as the city's article page length in the Keyser books, and region-by-century fixed effects. Standard errors are clustered at the 1×1 degree cell level. Significance levels are denoted by * $p<0.10$, ** $p<0.05$, *** $p<0.01$.

Table A8: Conflicts and Mill Taxes

	Outcome: Number of Mill Taxes			
	Panel A: 2SLS estimates without controls			
	t	t+10	t+20	t+30
Conflict	-0.004	-0.005	-0.002	-0.003
	(0.004)	(0.004)	(0.005)	(0.005)
Observations	5,566	5,566	5,566	5,566
Cells	57	57	57	57
Outcome mean	0.004	0.004	0.004	0.004
K-P F-Stat	11.545	11.545	11.545	11.545
	Panel B: 2SLS estimates with controls			
	t	t+10	t+20	t+30
Conflict	-0.009	-0.008	-0.004	-0.005
	(0.006)	(0.006)	(0.007)	(0.007)
Observations	5,566	5,566	5,566	5,566
Cells	57	57	57	57
Outcome mean	0.004	0.004	0.004	0.004
K-P F-Stat	10.746	10.746	10.746	10.746

Note: 2SLS regressions of the number of mill taxes in a city on an indicator for whether a conflict occurred in the city's 1×1 degree cell in a given decade instrumented by an indicator for whether the most connected noble in the cell had a female firstborn child in the decade before the conflict. The most connected noble is identified as the person with the most links in the family network of the German and European nobility. The unit of observation is the city-decade observation and the sample consists of German cities from 1250 to 1710. Each column is a separate regression for a given timing of the outcome variable whereas conflict and instrument are always measured in t and $t-10$, respectively. All regressions include city and decade fixed effects. If included, the vector of controls consists of a city's distance to the nearest trade route in 1500, indicators for free imperial city status in 1422, market city status before 1500, Hanse cities, cities with a university before 1500, two indicators for cities with river or coastal access, as well as the city's article page length in the Keyser books, and region-by-century fixed effects. All time-invariant variables are interacted with century fixed effects. Standard errors are clustered at the 1×1 degree cell level. Significance levels are denoted by * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A9: OLS Estimates for Conflicts and Construction

	Outcome: Number of New Constructions			
	Panel A: OLS estimates without controls			
	t	t+10	t+20	t+30
Conflict	-0.005	0.009*	0.002	0.004
	(0.005)	(0.005)	(0.005)	(0.005)
Observations	65,219	65,660	65,660	65,660
Cells	89	89	89	89
Outcome mean	0.093	0.093	0.093	0.094
	Panel B: OLS estimates with controls			
	t	t+10	t+20	t+30
Conflict	-0.007	0.007	0.001	0.003
	(0.005)	(0.005)	(0.005)	(0.005)
Observations	65,219	65,660	65,660	65,660
Cells	89	89	89	89
Outcome mean	0.093	0.093	0.093	0.094

Note: OLS regressions of the number of new constructions in a city on an indicator for whether a conflict occurred in the city's 1×1 degree cell in a given decade. The unit of observation is the city-decade observation and the sample consists of German cities from 1250 to 1710. Each column is a separate regression for a given timing of the outcome variable whereas conflict is always measured in t. Constructions refer to any kind of new construction including secular, religious, and military buildings. All regressions include city and decade fixed effects. If included, the vector of controls consists of a city's distance to the nearest trade route in 1500, indicators for free imperial city status in 1422, market city status before 1500, Hanse cities, cities with a university before 1500, two indicators for cities with river or coastal access, as well as the city's article page length in the Keyser books, and region-by-century fixed effects. All time-invariant variables are interacted with century fixed effects. Standard errors are clustered at the 1×1 degree cell level. Significance levels are denoted by * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A10: The Impact of Female Firstborn Children on Conflict in Different Decades

	Outcome: Pr(Conflict)=1				
	t-20	t-10	t	t+10	t+20
Female child = 1	-0.014	0.085	0.099	0.202***	-0.010
	(0.078)	(0.062)	(0.086)	(0.059)	(0.063)
Sample	first child	first child	first child	first child	first child
Estimator	OLS	OLS	OLS	OLS	OLS
Observations	5,495	5,524	5,566	5,566	5,566
Cells	57	57	57	57	57
Outcome mean	0.338	0.338	0.337	0.337	0.337

Note: First stage regressions of the conflict probability for cities in the 1×1 degree cell c in decade $t-20, t-10, t, t+10, t+20$ on an indicator for whether the most connected noble in the cell had a female firstborn child. The most connected noble is identified as the person with the most links in the family network of the German and European nobility. The comparison group are cities in cells where the most connected noble had a male firstborn child in the previous decade. The unit of observation is the city-decade observation for the sample of German cities between 1250 and 1710. All regressions include decade fixed effects. Standard errors are reported in parentheses and are clustered at the 1×1 degree cell level. Significance levels are denoted by * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.