Plague, Politics, and Pogroms: The Black Death, Rule of Law, and the persecution of Jews in the Holy Roman Empire

Finley, Theresa and Koyama, Mark

George Mason University, George Mason University

19 June 2016

Plague, Politics, and Pogroms:

The Black Death, Rule of Law, and the persecution of Jews in the Holy Roman Empire

Theresa Finley[§]   Mark Koyama[§]
George Mason University   *George Mason University*

This Version: June 16, 2016

Abstract: This paper explores the institutional determinants of persecution by studying the intensity of the Black Death pogroms in the Holy Roman Empire. Political fragmentation exacerbated competition for the rents generated by Jewish moneylending. This competition made Jewish communities vulnerable during periods of crisis. We test this hypothesis using data on the intensity of pogroms. In line with our model, we find that communities governed by Archbishoprics, Bishoprics, and Imperial Free Cities experienced more intense and violent persecutions than did those governed by the emperor or by secular princes. We discuss the implications that this has for the enforcement of the rule of law in weak states.

Keywords: Black Death, Political Fragmentation, Legal Fragmentation, State Capacity, Jewish History, Persecution

JEL Codes: N13, N43, K00

[§]Email:theresa.s.finley@gmail.com; Department of Economics, 4400 University Drive, Fairfax, VA 22030.

[§]mkoyama2@gmu.edu. Department of Economics, George Mason University, VA 22030.

1 Introduction

The rule of law entails equality before the law for all and the protection of minority rights (see Bingham, 2010). This paper sheds new light on the factors that make minority groups more or less vulnerable to persecution. It does so by studying the persecution of Jews in the Holy Roman Empire during the Black Death (1348-1350). The pogroms that accompanied the Black Death were the most severe of the Middle Ages and numerous scholars have seen these as marking a decisive point in Judeo-Christian relations (Cohn, 2007; Voigtländer and Voth, 2012). Large-scale massacres occurred across the Holy Roman Empire. In the some cities such as Mainz, Strasbourg, and Erfurt chroniclers report thousands of Jews being burnt alive (Jacobs (1912, 234), (Nohl, 1924, 181-192), Baron (1965a), and Breuer (1988, 145–150)). But in other parts of the Holy Roman Empire violence against Jews was insignificant.

This paper provides evidence that pogroms were most intense in communities where the political authority of the emperor was contested, specifically in communities under the immediate local authority of Imperial Free Cities, Archbishops or Bishops. Jews received more protection when they resided in lands directly governed by the Holy Roman Emperor or under the authority of one of major secular rulers. Drawing on a model of the fiscal anti-commons, these results are consistent with the argument that during periods of crisis strong centralized rulers have a greater incentive to protect minority groups like the Jews than do rulers of contested polities. Our findings suggest that fragmented legal authority was a major impediment to the protection of minority rights during the Middle Ages.

We are not the first authors to study the Black Death pogroms. Voigtländer and Voth (2012) analyze the persecutions that took place during these years in order to examine the persistence of antisemitic beliefs from the medieval period through to the twentieth century. As we discuss below, our paper is different from Voigtländer and Voth (2012) because our interest is in the institutional determinants of antisemitic violence during the period 1347-1350.

Our historical setting is well suited to explore how institutional variation at a local level can affect the rights of minorities. In contrast to the rule of law in modern states that promise equal legal protection to all citizens, the Holy Roman Empire, like other premodern polities, governed by laws based on differential rather than equal treatment. It relied on personal and identity rules rather than general rules or laws.[1] Identity rules are rules where either the form of the rule or the enforcement of the rule depends on the social identity of the parties involved. In contrast, impersonal or general rules are rules where both the form of the rule and the enforcement of the rule are independent of the identity or status of individuals subject to the rule.

---

[1]It is precisely the existence of general rules that legal scholars claim is a crucial feature of rule of law as it is understood in modern liberal societies—rules that are stable, consistent and applicable to all (Dicey (1908, 198–199), Hayek (1960), Fuller (1969), and Hadfield and Weingast (2012)). General rules help protect the rights of minority groups. See North et al. (2009); Acemoglu and Robinson (2012).

A classic example of identity rules that were used to generate rents for the political elite is provided by the condition of Jews in medieval Europe: their legal status differed from that of their Christian neighbors and they were subject to a series of discriminatory rules restricting their economic and social freedom. Their different legal status, however, made Jewish moneylending an important source of revenue as Jews were allowed to lend openly at interest whereas Christian usury was prohibited. Because Jewish moneylending provided an important source of rents to the both the emperor and to other elites, the position of Jews was conditional on their ability to generate tax revenues for the rulers. Viewed as chattel of the emperor, they relied on his authority for protection against violence. But as the *de jure* and *de facto* authority of the emperor varied greatly across the Holy Roman Empire, so did the degree of legal protection experienced by Jewish communities.

We provide evidence that variation in the institutional strength of the Holy Roman Emperor can explain variation in the severity of the persecutions that Jewish communities across the Holy Roman Empire faced during the pogroms that accompanied the Black Death in 1348-1350. Our analysis draws on a simple but robust theoretical prediction that rent contestation will undermine the incentives of rulers to protect unpopular minority communities from violence. Where the emperor had sole control over Jewish communities and uncontested right to tax them, he had an incentive to protect the Jews as indeed he did in his capital of Prague. Elsewhere in the empire, however, the authority of the Emperor to tax the Jews was challenged by the Imperial Free Cities, Archbishops, Bishops and by the secular electors. Simple theoretical reasoning therefore suggests that we should expect the Jews to be most vulnerable where the authority to tax them was most contested.

To substantiate this hypothesis we employ evidence from the *Germania Judaica* (1968) and a range of other historical sources. We use these sources to create a novel dataset of Jewish communities in the Holy Roman Empire. To measure antisemitic violence, we first code the intensity of a persecution or pogrom along a 1–5 scale by reading every entry of the *Germania Judaica*. Second we construct a binary measure that distinguishes between persecutions that are described as involving fatalities from those that did not.

Our empirical approach exploits the fact that political power within the Holy Roman Empire was highly fractured as the Emperor did not possess a territorial monopoly on violence and his ability to enforce his authority varied greatly across space (Volckart, 2002; Wilson, 2016). We find that Jewish communities where the authority of the emperor was challenged by an Archbishop, Bishop or an Imperial Free City are associated with an increase in the intensity of a pogrom by approximately 1/4th to 1/6th our measure of pogrom intensity. In contrast Jewish communities were less vulnerable if they resided in land directly controlled by the emperor.

To overcome the lack of experimental variation, we utilize a host of historical and geographic control variables using GIS software. The results are robust to the inclusion of measures of the underlying

2

wealth of a Jewish community, their experience of past pogroms and the spread of the plague. Furthermore our findings are unchanged when we use alternative empirical specifications, regional fixed effects, alternative indexes of pogrom intensity, and a propensity score matching approach. Finally, we use the approach developed by Altonji et al. (2005) and Oster (2013) to show that potential bias from unobservables cannot explain our results. Taken together, this analysis provides quantitative evidence that is highly supportive of our theoretical and historical analysis. This evidence is highly consistent with the claim that contested political authority made Jewish communities more vulnerable in the medieval Holy Roman Empire.

Studying the persecution of Jews in the Holy Roman Empire sheds light on several open questions in institutional economics and law and economics. First, late medieval Europe provides a laboratory for us to study which institutions were conducive to the emergence of institutions capable of protecting minority rights. The Holy Roman Empire was a polycentric legal order. Numerous scholars make the case for the importance of decentralized and polycentric legal and political institutions in promoting markets, rule of law, and constraints on government.[2]

A range of different forms of political organizations including independent city states flourished within the Holy Roman Empire each with their own courts and jurisdiction.[3] In this paper we show that within the Holy Roman Empire, independent city states were engaged in more intense and violent antisemitic pogroms than did territories ruled directly by the emperor or other feudal lords.

Our findings are more consistent with a different literature that emphasizes the importance of establishing a minimally effective central state in order to enforce rules, solve the problem of violence, and provide some measure of the rule of law. This view is expressed in Douglass North's writings (North, 1981) and the work of Mancur Olson (Olson, 2000). Recent historical work has shown that most European polities lacked 'minimally effective states' until the early modern period (Epstein, 2000; North et al., 2009; Dincecco, 2009, 2010; Grafe, 2012; Johnson and Koyama, 2014a; Hough and Grier, 2015).[4] Building on these insights, Johnson and Koyama (2014b) provide evidence that legal fragmentation in seventeenth century France was associated with more intense witch-trials and that a process of legal centralization was required to control the use of torture and curtail the panic over witchcraft. In contrast to the arguments in favor of a polycentric political order, these arguments

---

[2]Berman (1983); De Long and Shleifer (1993) and Jones (2003), apply this argument in a medieval context. More generally this argument draws on the work of Vincent and Elinor Ostrom (see Ostrom et al., 1961).

[3]This relates to a literature going back to Weber (1958) and Pirenne (1925) arguing that independent city states played a crucial role in spurring economic growth in preindustrial Europe. Stasavage (2014) provides evidence that suggests that while the rise of urban autonomy was associated with an initial increase in economic development in the long-run the institutions of the independent city states of medieval Europe became captured by oligarchic elites and adopted institutions that proved inhospitable to growth.

[4]Most research in this area has focused on England, France and Spain. To the best of our knowledge the Holy Roman Empire has not been intensively studied from an institutional perspective with the partial exception of Volckart (2000, 2002, 2004).

suggest that political centralization may be crucial to the emergence of the rule of law. In a similar vein, Leeson and Russ (2015) argue that contested religious markets help to explain the intensity of witch-hunts in the early modern period. These debates have contemporary relevance as many of the poorest parts of the world lie in those area of sub-Saharan Africa with little history of statehood (Gennaioli and Rainer, 2007; Chanda and Putterman, 2007; Borcan et al., 2014; Michalopoulos and Papaioannou, 2013) where the reach of the government does not extend far beyond the capital city (Michalopoulos and Papaioannou, 2014).

Looking are more recent periods of history, Jha (2013) finds that a history of trade mitigated anti-Muslim persecutions in coastal India cities. He argues that this was because in these cities the economic role played by Muslim minorities was highly complementary (and difficult to find substitutes for) to that of the Hindu majority. Miguel (2005) provides evidence that high levels of precipitation are associated with a higher number of witchcraft deaths in modern-day Tanzania. Shocks of this kind can interact with economic conditions in different ways. Jha (2014) studies the political and historical determinants of ethnic riots and violence in Gurajat in 2012. He finds that political incentive to incite violence interact with the history of a particular town but are dampened by the presence of inter-ethnic complementarities.

It is clear that ethnic violence in recent decades has been most intense in weak and failed states (e.g. Yanagizawa-Drott, 2014). But while a considerable body of research is devoted to the determinants of historical and contemporary persecutions, there has been less attention in the economics literature on the role played by political institutions as either facilitators of persecution or barriers to persecution.[5] One contribution of our paper is a focus on how fragmented political and legal institutions acted as a transmission mechanism for the shock of the Black Death leading to more intense persecutions in some parts of the Holy Roman Empire than in others.

In focusing on the institutional determinants of pogrom intensity, our research question differs from that of previous studies of antisemitic violence.[6] The principle interest of Voigtländer and Voth (2012) is in using medieval antisemitism as a measure of deep cultural beliefs which they argue persisted through to the twentieth century and helped to explain local variation in support for the Nazi party and Jewish persecution in the 1920s and 1930s.[7] Grosfeld et al. (2013) examine the persistence of

---

[5]Political scientists do focus on the role that politics and, in particular, elections play in stimulating ethnic violence. The literature on ethnic violence in developing counties in political science is extensive. We do not attempt to survey it comprehensively here. Classic references in the literature on ethnic violence include Wilkinson (2004).

[6]Our main data source, the *Germania Judacia*, was first employed by Voigtländer and Voth (2012) who have made their data publicly available. We returned to the original *Germania Judaica* to collect additional data on both Jewish communities that were wiped out during the Black Death period and on Jewish communities outside modern Germany but within the borders of the Holy Roman Empire. Furthermore, Voigtländer and Voth (2012) use data on the number of persecutions during the Black Death era while we collect data on the intensity of Black Death pogroms.

[7]Voigtländer and Voth (2013) provide evidence that these beliefs also continue to shape attitudes towards intermarriage with Jews in Germany today.

anti-market sentiments in the Pale of Settlement in eastern Europe where Jews were confined from the early nineteenth to the early twentieth century. Using a regression discontinuity design, they provide evidence that the anti-market values that developed in this region in the past have persisted to this day. Durante et al. (2015) finds evidence for both the role of economic supply shocks and for the role of economic segregation in explaining the pattern of pogroms in late nineteenth century Russia.[8] Ongoing work by Sascha Becker and Luigi Pascali studies how the pattern of antisemitic violence in Germany differed in Catholic and Protestant areas after the Reformation due to different patterns of economic specialization. Anderson, Johnson, and Koyama (2016) explore the economic and climatic factors behind Jewish persecutions throughout medieval and early modern Europe. They find that periods of cold temperature lowered agricultural productivity and made persecutions more likely and that this effect is largest in areas with weaker states. In contrast to these papers our primary interest is in studying the institutional determinants of persecutions.[9]

The structure of the paper is as follows. In Section 2 we provide necessarily details for our historical setting and outline our hypothesis that fragmented legal and political institutions made Jewish communities vulnerable to persecution. Section 3 describes our data and empirical strategy. We present our main empirical result that pogroms were more intense in political contested communities in Section 4. As our hypothesis is not the only possible explanation for why variation in the intensity of Jewish persecutions during the Black Death, in Section 5 we examine several other alternative hypotheses. Finally, Section 6 concludes by discussing the implications of our analysis.

2   The Rule of Law, the Protection of Minorities, and Legal Fragmentation in the Holy Roman Empire

The Holy Roman Empire offers a historical laboratory to study the conditions of minorities in a legally fragmented polity. In this section we describe how the prohibition of lending money at interest led to the emergence of politically regulated Jewish moneylending in the medieval Europe and this generated economic rents for rulers. We argue that rulers who had consolidated control over these rents had an incentive to protect Jewish communities. This can be called the *rent consolidation* motive. In contrast, where control for these economic rents was contested or dissipated, the incentive for rulers to invest in protecting minority groups was much weaker.

Medieval polities like the Holy Roman Empire had no monopoly on legitimate force; they subcontracted

---

[8]D'Acunto et al. (2014) study how medieval Jewish persecutions affect attitudes towards finance in Germany today. Pascali (2016) studies the role played by Jewish moneylenders in medieval and renaissance Italy. Other research has explored the long-run consequences of the Spanish inquisition (Vidal-Robert, 2014) and the persecution of individuals for speech crimes in Qing dynasty China (Koyama and Xue, 2015).

[9]Other related research focus on the economic attributes of Jewish communities in the medieval period (Botticini and Eckstein, 2012; Pascali, 2016; Johnson and Koyama, 2016).

many governmental functions to local lords and to the church; and they did not collect permanent taxation.[10] In this sense they were not states (Hoffman, 2015). They are better understood as corresponding to coalitions of elites that could prove stable for a period of time. North, Wallis, and Weingast (2009) use the terminology natural states to characterize the coalitions that constituted such premodern polities.

Political authority in the Holy Roman Empire was both fragmented and contested. The emperor was at the apex of the system. The emperor was elected from among the most important secular princes of the empire. From the thirteenth century onwards, the most important rulers below the emperor were the seven Electors—four of whom were secular princes: the King of Bohemia, the Count Palatine of the Rhine, the Duke of Saxony, and the Margrave of Brandenburg; and three of whom were Archbishops (those of Mainz, Trier, and Cologne). The other territorial princes ranked below the Electors but were sovereigns in their own territories and included the various dukes, counts, margraves, and landgraves of the empire.[11].

In addition to the secular princes, Archbishops and Bishops wielded independent political authority in the empire.[12] The Bishop of Constance owned two forests, eighteen manors, eight abbeys, as well as various mines, mints, and rights to tax various markets and to collect tolls (Arnold, 1991b, 220). Bishops across the Holy Roman Empire had similar lands, rights and powers: for example '[a]part from the cathedral town, the Bishop of Liège owned three counties, thirty castles, twenty monasteries, three dozen principal manors, and all the effects dependent upon these places, extending the bishops' judicial authority over the whole region of the middle Meuse' (Arnold, 1991b, 220).[13] The bishops of this period can be viewed as secular rulers. Wilson (2016) describes as instance in 1316 during an invasion of Rome by the German king and claimant to the title of Holy Roman Emperor, Henry VII when 'Archbishop Baldwin of Trier, the only senior German lord accompanying Henry, split the skull of a defender with his own sword' (Wilson, 2016, 68).

The Imperial Free Cities were also politically independent.[14] They were self-governing, maintaining

---

[10]See, for an analysis, Bonney (1999); Finer (1999a).

[11]Figure A.1 presents a stylized depiction of the political structure of the Holy Roman Empire in the late middle ages

[12]The independence of the Bishoprics and Archbishoprics was the result of the Investiture Controversy. It was confirmed by the Concordat of Worms in 1122 (Whaley, 2012, 26).

[13]The Archbishops of Trier and Mainz in the Rhineland were particularly powerful. But the Bishops of Saxony and Bavaria were also effectively independent rulers in their own lands while the Archbishops of Salzburg were particularly successful in extending their authority and independence (Arnold, 1991b, 27). For instance 'Archbishop Eberhard II (1200–46) was responsible for reinvigorating Salzburg as a notable power in the Empire. Although he aspired to no *ducatus*, he founded three propriety sees, at Chiemsee in 1215, Seckau in 1218 and Lavant in 1225, in order to extend his authority into Bavaria, Styria and Carinthia respectively ... The Archbishop also inherited countries from the Bavarian aristocracy, rebuilt castles and monasteries, and, above all, made good use of his forest rights to open up the Alpine valleys through colonization into a substantial principality in Salzburg's immediate hinterland' (Arnold, 1991b, 224).

[14]This designation refers to both the Imperial Cities that were nominally subject to the authority of the emperor and the Free Cities that had originally been subject to the authority of the Bishops. and Archbishops (Whaley, 2012, 26).

their own armies and forming alliances and leagues with and against one another. As autonomous powers in their own right, they could contest the authority of the emperor over local matters such as the right to collect taxes from Jewish moneylending. Finally, there were numerous free lordships ruled by lords who owed fealty to the emperor directly. However, these lordships were small and did not possess important Jewish populations in this period so we ignore them in our analysis. Next we will establish why the fragmented character of political authority and rent-seeking in a fragile natural state made minorities especially vulnerable during periods of crisis.

2.1 THE RESTRICTION ON MONEYLENDING

The roots of antisemitic violence in medieval Europe were complex and we do not purport to offer a complete explanation of them here.[15] Following Langmuir (1963), we label the sentiments that animated this violence antisemitic rather than stemming from purely religious antagonism as they drew upon a standard set of tropes and images that continue to inspire anti-Jewish hatred into modern times. Elements of medieval antisemitism can be traced back to classical antiquity (see Nirenberg, 2013, 13–182). But the heightened religiosity of western Europe after the Crusades sharpened the extent to which Jews came to be viewed as alien 'others'.

There was also an important political-economy element to antisemitic agitation in the medieval period. These political economy considerations hinged on the fiscal value of a Jewish community to rulers—a value that was itself largely determined by the demand for Jewish economic services, the most important of which was moneylending. Lending at interest was condemned as usury by the Church throughout medieval Europe and heavily restricted by secular governments (Koyama, 2010b; Rubin, 2010).[16]

The commercial revolution of the twelfth and thirteenth centuries increased the demand for credit in the economy (Spufford, 2002). As a consequence, the prohibition on moneylending generated considerable economic rents, which secular rulers tried to capture. From the twelfth century onward, the role of moneylender devolved increasingly onto Europe's Jewish community: 'moneylending was the mainstay of Jewish economic activity, the means by which the Jewish community as a whole maintained its economic viability and won the political support requisite to its survival' (Chazan, 1997, 26).[17] Lacking permanent sources of taxation, these monopoly rents constituted a non-negligible

---

By the late middle ages this distinction was obscure and both types of cities were referred to as Imperial Free Cities.

[15]For detailed historical examinations of this topic see Trachtenberg (1943); Poliakov (1965); Cohen (1982).

[16]For further historical details see de Roover (1967); Nelson (1949); Langholm (1992).

[17]Also see Noonan (1957, 35). In the early middle ages, Jewish had flourished as merchants and doctors as well as moneylenders but from the late twelfth century onwards they increasingly specialized in the latter occupation (Botticini and Eckstein, 2012, 153–247). Lombard moneylenders did continue to play a role in some parts of Europe—particularly after 1300. Clerical attitudes towards Jewish moneylending tended towards rhetorical denunciation but tacit collusion and approval (see Stow, 1981, 161). Of course, restrictions on usury were frequently evaded in practice. However, evading these laws required considerable financial sophistication. Therefore the bulk of the everyday credit for consumption smoothing purposes was providing by Jews or other licensed lenders (see Koyama, 2010b).

part of royal revenue.[18] Consequently, as residual claimants on Jewish incomes, rulers had a financial incentive to protect Jews from either elite or popular hostility (see Barzel, 1992; Chazan, 2010; Koyama, 2010b). As Nirenburg writes: 'This special relationship between Jews and rulers proved tremendously useful to European monarchs and magnates trying to establish and expand their power in the eleventh, twelfth, and thirteenth centuries' (Nirenberg, 2013, 194).

2.2 THE BLACK DEATH POGROMS

The Black Death pogroms were not the first to befall the Jewish communities of Europe. During the medieval period, Jewish communities spread across western and central Europe. The largest Jewish community was in Spain, but the communities in Germany—particularly along the Rhineland were prosperous and well established (Chazan, 2006, 2010). Following the First Crusade, massacres and pogroms took place across all of Europe, and in the late thirteenth and early part of the fourteenth century Jewish communities were expelled from England and France, and the Rintfleisch and Armleder pogroms afflicted Jewish communities in Germany.[19]

But the Black Death pogroms were the largest of the entire medieval period. The Black Death was perhaps the largest demographic shock in European history (Voigtländer and Voth, 2013; Jedwab et al., 2015).[20] It gave rise to a new round of antisemitic violence across Europe. Beginning in Switzerland in 1348, as rumors of the plague spread from Italy and France, Jews were accused of poisoning wells. Confessions were extracted through torture and the libel that the Jews were the perpetrators of the plague spread across Europe, particularly in the Holy Roman Empire.

The Papacy opposed antisemitic violence. Pope Clement VI issued two Papal Bulls condemning the attacks against Jews and denouncing the well-poisoning libel (Chazan, 2010, 153-154). Nevertheless, despite this condemnation, the majority of Jewish communities in the Empire suffered some level of violence during the period 1348-1350. These pogroms pose a puzzle for scholars. Traditional historians were perplexed by 'the complete helplessness of the authorities against these outbursts of popular fury' given that the 'loss to imperial and princely treasures was immense'. In particular, they struggled to understand why 'far from taking any steps to prevent outbreaks, the emperor in several instances gave beforehand practical immunity to the perpetrators of the crime, by making arrangements as to what

---

[18]Data does not enable us to measure the size of the rents generated by the usury prohibition accurately, but the data that we do have suggests that it was sizable (see Koyama, 2010a; Mundill, 2010). For example, in 1211 King John levied a tillage of £44,000 on the Jewish community of England at a time when the total annual revenue collected by the king during his revenue varied between £22,183 and £98,791 (Koyama (2010a, 384)). Even if this entire sum was not collected, the fact that the king could demand so much would only have been possible if the Jewish community was earning very considerable returns from moneylending.

[19]For details on the crusader massacres see Golb (1998) and Stow (1992, 102–120).

[20]Relatedly, Richardson and McBride (2009) show how the Black Death sparked both religious and economic change in England.

should be done with the houses and goods of the Jews in the event of a riot' (Jacobs, 1912, 278).[21]

Subsequent historians have sought to understand this puzzle. While traditional accounts of the plague pogroms emphasized mob violence and popular anger against Jews as the prime mover in the Black Death pogroms, Cohn (2007) forcefully argues, on the basis of chroniclers' records, that mobs of peasants or artisans did not drive these pogroms. Rather, in some cases, as in Strasbourg, the Jewish community was formally sentenced to death by the city elite 'before any peasant might have stabbed or drowned any escaping Jew' (Cohn, 2007, 18). Cohn argues that 'patrician-dominated city councils' made the conscious decision to expropriate, expel or massacre Jewish communities.[22] In many cases the persecutions of the Jews was legally sanctioned. But because the Jews had previously been promised protection by both imperial and local authorities these persecutions represent legally sanctioned breaches in the rule of law. In many cases, Jewish victims were accused and then tortured in order to obtain confessions of guilt that could be used against their peers. Cohn notes that

> 'city councils, mayors and noble castellans from Basel, Bern, Breisach am Rhein, Chillon, Colmar, Freiburg im Breisgau, Kenzingen, Lausanne, Mainz, Münsingen, Obernehenheim, Offenburg, Schlettstadt, Villeneuve, Waldkirch and Zofingen—supplied 'proof' that Jews had been found guilty in these cities' tribunals of causing the plague through poisoning. Notaries registered the accusations, and their courts duly examined the evidence and delivered their verdicts' (Cohn, 2007, 19).

Nevertheless, the existing historical literature has not systematically established when and where persecutions were more intense nor what factors were associated with pogrom intensity. Instead, the current state of the historical literature highlights the need for an institutional and political economy approach to understanding why so many Jewish communities in Germany were wiped out during the Black Death period.

Notwithstanding the example Cohn offers of Strasbourg, in most cases throughout the Holy Roman Empire, local authorities did not in general instigate or support the pogroms. But they were often lackluster in their attempts to protect the Jewish communities from violence. The two exceptions to this were King Casimir in Poland who was able to protect Jews and the Holy Roman Emperor Charles IV in Bohemia. However, in the rest of the Empire, Charles either failed to prevent pogroms from occurring or he explicitly handed over his rights to the Jews to cities like Frankfurt, Nuremberg, and

---

[21]For example, Nohl comments: '[t]he massacres of the Jews in the fourteenth century are so deeply revolting, because the ruling classes, as well as the clergy and the educated classes of that time, were perfectly conscious of the lack of foundation in the accusations brought by the people against the Jews' (Nohl, 1924, 181).

[22]He notes that 'city councils, majors and noble castellans from Basel, Bern, Breisach am Rhein, Chillion, Colmar, Freiburg, Bresigau, Kenzingen, Lausanne, Mainz, Münsingen, Oberneheneim, Offenburg, Schlettstadt, Villeneuve, Waldkirch and Zofingen—supplied 'proof' that Jews had been found guilty in these cities' tribunals of causing the plague through poisoning' (Cohn, 2007, 19).
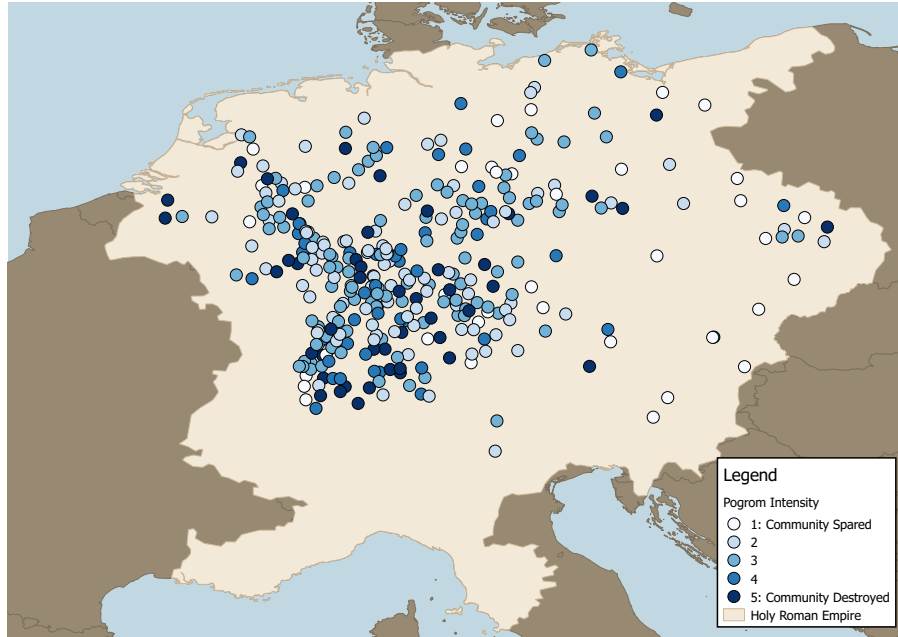
Figure 1: The intensity of pogroms in the Holy Roman Empire 1348–1350. A value of 5 means a community suffered extermination; a value of 1 means the Jewish community was expelled. For further details on coding see text.

Worms where they were massacred (Breuer, 1988).

There are many possible explanations for the variation of the response of political rulers to antisemitic violence. Of these the one that fits the evidence best is based on the incentives of local rulers to protect Jewish communities from violence. We suggest that where the rights to tax Jewish communities were securely possessed by the emperor, he had strong incentive to invest in protection. However, where the rents from Jewish moneylenders were contested by local rulers and no individual ruler had secure access to the future stream of revenue associated with Jewish lending, Jewish communities were much more vulnerable both to mob violence and to predation from local rulers themselves as was the case in Strasbourg.

Our dependent variable is pogrom intensity. We focus on pogrom intensity rather than the mere existence of a pogrom for several reasons. First, very few Jewish communities were entirely spared during the Black Death period (Toch, 1997, 70). Figure 1 depicts the Black Death pogroms in the Holy Roman Empire. Of the 340 Jewish communities in our dataset, all but 37 suffered some level of antisemitic violence during the Black Death period. Consequently in our analysis we distinguish between Jewish communities that were spared, expelled, suffered some violence, saw killings or massacres or were exterminated entirely.[23]

---

[23]While we use a map of the entire Holy Roman empire in 1348, the authority of the emperor no longer held sway in northern Italy, where in any case there were no pogroms recorded in the *Germania Judaica*.

Second, among those communities that suffered some form of persecution there was tremendous variance. In Strasbourg thousands of Jews were burnt alive by the population. Elsewhere, violence against Jews was ad hoc and sporadic, and did not result in the elimination of the community, whereas in other parts of Germany orderly expulsions were carried out. The richness of the *Germania Judaica* and the other sources allow us to exploit this variation in persecution intensity.

2.3 The Rent Contestation Hypothesis

To establish the economic logic underlying our argument we develop a simple model. Based on the above analysis, we study how the incentive of a ruler to protect a Jewish community depends on his ability to extract fiscal resources from them. This is greater when a single political authority has uncontested authority over the Jewish community than when multiple political authorities claim authority over them.

Rulers benefited from the presence of Jews in their territories in several ways. By the fourteenth century, the most important of these was their ability to directly or indirectly tax the profits of Jewish moneylending (Botticini and Eckstein, 2012). Consequently, in our model we focus on the revenue generated by Jewish moneylending. These rights were traditionally held by the emperor. However, as imperial authority waned in the fourteenth century these rights were increasingly contested by local authorities.

Let us first consider the profitability of taxing Jewish moneylending. The per period profits associated with a volume of moneylending x are valued at $V(x)$ where $V(x)$ is continuous and twice differentiable and $V'(x) > 0$, and $V''(x) < 0$. For illustrative purposes, we will consider a linear demand function $V(x) = \alpha x$ and quadratic costs $c = \frac{1}{2}x^2$.[24] We abstract from the market structure of Jewish moneylending and for simplicity assume that moneylending is competitive.[25]

We first consider the case where there is a single tax authority. The profit function of moneylenders is:

$$\max_{x} \pi = \alpha x (1 - \tau_C) - \left(\frac{x^2}{2} \right) . \tag{1}$$

The first order conditions to this maximization problem yield the optimal amount of moneylending: $x_C^* = \alpha(1 - \tau_c)$. As the revenue of the centralized ruler is $R_C = \tau_C x^*$, substituting in for x_C^*, we can determine the ruler's optimal tax rate as follows:

$$\max_{\tau_C} R_C = \max_{\tau_C} \tau_C(\alpha - \alpha \tau_c) . \tag{2}$$

---

[24]A general version is available upon request.

[25]This is purely to simplify notation and ensure our model is tractable. In reality moneylending was often monopolistic. But adding this more realistic feature into our model does not change our results.

The first order conditions can be rearranged to show that the revenue maximizing tax is $\tau_C^* = \alpha/2$. The corresponding equilibrium volume of moneylending activity is $x_C^* = \alpha/2$. Total revenue R_C is $\alpha^2/4$.

Now we can consider the taxes that accrue if the rights to tax Jewish moneylending are claimed by more than one ruler. This corresponds to the case where a local ruler such as a bishop or Imperial Free City's town council tries to tax the Jewish community as well as the emperor. The objective function of a representative moneylender is now:

$$\max_x \pi\alpha(1 - \tau_i - \tau_j) - \left(\frac{x^2}{2}\right) , \tag{3}$$

where i and j represent two rulers with the authority to tax in a given locality. The optimal amount of lending is $x_F^* = \alpha(1 - \tau_i - \tau_j)$. From the symmetric solution we obtain the equilibrium tax imposed by each ruler: $\tau_i = \tau_j = \frac{\alpha}{3}$. Consequently, the volume of moneylending when there are two tax authorities is $\frac{\alpha}{3}$ while revenue for each ruler is $R_i = R_j = \frac{\alpha^2}{9}$. Clearly $R_i + R_j < R_c$. Furthermore, it is straightforward to show that this result generalizes and that if there are n tax-collecting authorities, tax revenue for each individual authority will be equal to $\frac{\alpha^2}{(n+1)^2}$, which is clearly declining in n.

Now let us consider what determines the number of tax authorities n. The decision whether or not to contest the authority of the emperor to tax Jewish moneylending was a costly one. It depended on the power and capacity of the local ruler vis-à-vis the emperor in that particular region. Now suppose that there are $m > n$ local authorities in a region. We can consider their decision to challenge the emperor's rights to tax Jewish moneylending as a binary decision represented by the indicator variable ϕ_i. Specifically let us denote the cost of contesting the emperor by κ_i where κ reflects the reflect the strength and capacity of ruler i in comparison to the emperor. The decision to contest the imperial right to tax the Jews is therefore given by:

$$\phi_i = \begin{cases} 1 & \text{if } R_i(n) - \kappa_i \geq 0 , \\ 0 & \text{if } R_i(n) - \kappa_i < 0 , \end{cases} \tag{4}$$

where $n = m\phi_i$. In equilibrium, therefore, the number of rulers who actively contest the emperor n will adjust until

$$\kappa^* = R_i(n) = \frac{\alpha^2}{(n+1)^2} , \tag{5}$$

where κ^* is equal to the cost of the marginal ruler. This model generates a simple testable hypothesis: where κ^* is high, the number of authorities who tax the Jews will be low: Jewish moneylending will remain a lucrative source of taxation. But where κ^* is low, more that one authority may seek to tax the Jewish community and, as a consequence of too many fiscal authorities, the rents associated with Jewish moneylending will be dissipated.

This simple framework predicts that where Jewish moneylending could be securely taxed by a single ruler, that ruler had a stronger incentive to retain their services and hence to protect them from violence. Of course, many factors could make Jewish communities vulnerable to persecution. As we have noted the libel of well-poisoning that accompanied the Black Death can be viewed as an exogenous source of greater antisemitic sentiment (and this is how it is interpreted by Voigtländer and Voth (2012)). Economic shocks in general made Jewish communities more vulnerable to violence as shown by Anderson et al. (2016). Patterns of economic complementarity and substitutability may also have shaped the vulnerability of Jewish communities as Jha's hypothesis suggests (Jha (2013, 2014)). What our model highlights is an additional institutional channel that can account for local variation in antisemitic violence in response to a common shock like the Black Death. In the next section we take this hypothesis to the data.

3 DATA AND EMPIRICAL IDENTIFICATION STRATEGY

We now discuss how we test our hypothesis that political fragmentation made Jewish communities more vulnerable during the Black Death period.

Data   Our data set is a combination of city-level data from the *Germania Judaica* (Avneri, 1968) and newly collected GIS data. We follow the example of Voigtländer and Voth (2012) in collecting data from settlements with a Jewish community that specifically mention the fate of the community during the Black Death period. Our data set includes a larger sample than Voigtländer and Voth (2012) since we are not concerned with matching our settlements to towns or cities in modern Germany. Unlike Voigtländer and Voth (2012), we include settlements that were part of the Holy Roman Empire but are now part of modern Austria, France or Switzerland. For each settlement that mentions the Black Death in Avneri (1968), we collect the description of the community's experience to code the intensity of the pogrom.

Our main measure of pogrom intensity varies from 1 to 5 and is taken from reading every entry of the *Germania Judaica*. A value of 1 means that the community was spared from the persecutions during this time. A value of 5 means that the entire community was eliminated through massacres and large-scale violence. Between these thresholds, we use the description of the persecutions from the text of *Germania Judaica* to code varying levels of the intensity of the persecutions. Communities for which records indicate that Jews were killed in large numbers (include several martyred or burnt), but not eliminated, received a value of 4. A community that had a few deaths (but no indication of widespread deaths) received a value of 3. Communities that were expelled received a value of 2. Further detail on the scale of pogrom intensity is included in Table A.3. This coding is ordinal and not cardinal. A level 4 persecution was more intense than a level 2 persecution but it was not necessarily twice as intense. As an alternative to our main specification, we also code persecutions as either not

involving fatalities (1-2) or involving fatal violence (3-5). We also vary the specification of the index. Our results are not sensitive to different ways of coding the data.[26]

In order to measure political fragmentation in the Holy Roman Empire, we examine the towns in Avneri (1968) to determine the local ruler overseeing the Jewish community, including Imperial Free City town councils, Bishops, Archbishops as well as the secular princes, lords, landgraves, margraves, etc.[27] As we have argued, the Bishops and Archbishops of the Holy Roman Empire in this period were by and large secular rulers. Nevertheless, we are aware that in studies of the Protestant Reformation (e.g. Rubin, 2014), Bishoprics are also used as a proxy for prior levels of Christianity. To assuage concerns that Bishoprics and Archbishoprics are proxies for Christianization, we conduct a range of robustness checks in Section 5.

In addition, we collect GIS data on the Holy Roman Empire during this time to account for the territorial boundaries of the secular princes. We are able to include whether a town was under the jurisdiction of five of the main political houses (Hapsburg, Luxembourg, Wettin, Wittelsbach, Wurtemberg). The location of these measures of political fragmentation for the settlements in our data set are depicted in Figures 4a to 4c.[28] The figures make it clear that Imperial Free Cities, Bishoprics, and Archbishoprics were fairly even distributed across the Empire.

Our hypothesis is that political fragmentation meant that the rents associated with taxing Jewish moneylending became contested between the emperor and local rulers. This dissipated the value of these rents and made Jewish communities less valuable both to the emperor and to local rulers and hence more vulnerable to violence during the wave of antisemitism that accompanied the Black Death.

In testing this hypothesis we estimate a reduced form relationship between political fragmentation and pogrom intensity as we do not have data on the profitability of Jewish moneylending or the specific contributions made by Jewish communities to the coffers of the either the Emperor or local authorities.

Figures 2 and 3 depict our main results non-parametrically. Figure 2(a) compares the mean intensity score of communities that are located in Imperial Free Cities with those that are not. Figure 2(b) compares the mean intensity score of communities that are located in Archbishoprics with those that are not. Figure 2(c) compares the mean intensity score of communities that are located in Bishoprics with all other communities. Figure 2(d) compares all communities combined in Imperial Free Cities, Bishoprics and Archbishoprics with other communities. In all cases there is a visible difference in persecution intensity in those communities where the emperor faced a challenge to his direct authority.

Figure 3 performs a similar exercise showing the kernel density of the persecution intensity score. The

---

[26]We discuss these alternative specifications in section 5.1 and report the results in Tables A.8 to A.10.

[27]We follow Voigtländer and Voth (2012) by using data from Jacobs (1912), which we augment with information from Avneri (1968).

[28]The data on these territories comes from Shepherd (1911), which contains a map of Europe in 1378.

14
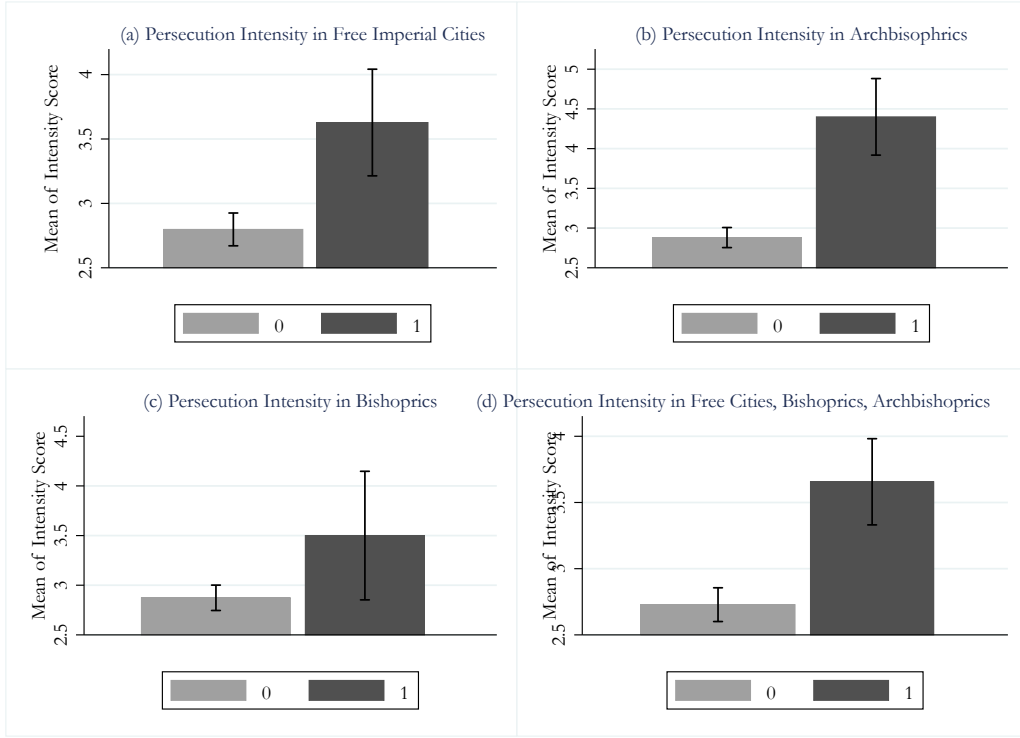
Figure 2: Panel (a) depict persecution intensity in Imperial Free Cities verses other communities. Panel (b) compares persecution intensity in Archbishoprics compared to other communities. Panel (c) compares persecution intensity in bishoprics compared to other communities. Panel (d) compares communities located in Imperial Free Cities, Bishoprics and Archbishoprics in comparison with all other communities. 95% confidence internal.

kernel density score of communities located in Imperial Free Cities, Bishoprics, and Archbishoprics is shifted to the left of the kernel density score of all other communities implying that these 'treated' communities experienced more severe persecutions. We now conduct a more formal analysis to show that these relationships in the data are borne out in a regression framework.

Our theory predicts that in areas where there were multiple political authorities vying for fiscal authority over the Jews, Jewish communities were more likely to face intense persecutions. To test this we estimate:

$$\text{Pogrom Intensity}_l = \alpha + \beta \text{Politically Contested}_l + \mathbf{X}'\mathbf{\Omega} + \Lambda_i + \epsilon_l \,, \tag{6}$$

where our dependent variable is *Pogrom Intensity* varies from 1 to 5 and our variable of interest Politically Contested$_l$ takes a value of one if a community is located at the seat of a Bishopric, seat of an Archbishopric or an Imperial Free City and zero if it was ruled directly by a secular prince or the emperor. We estimate this model as both an ordered Probit and as a linear probability model.

As, our setting is non-experimental, we are cautious about interpreting our results as reflecting the
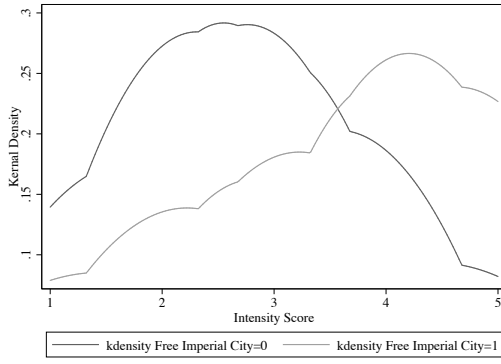
(a) Kernel density plot (bandwidth=0.75) comparing communities in Imperial Free Cities with other communities.
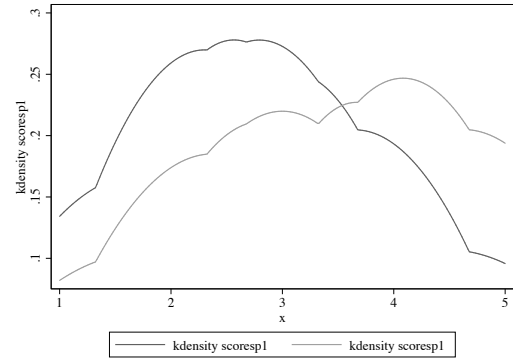
(b) Kernel density plot (bandwidth=0.75) comparing communities in Bishoprics with other communities.
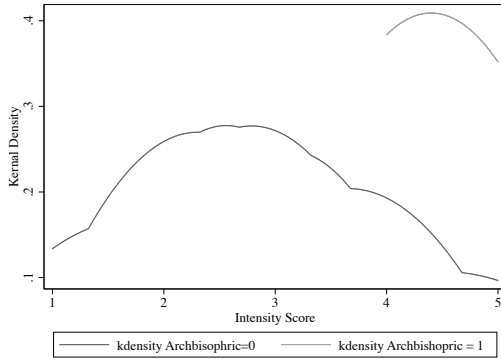
(c) Kernel density plot (bandwidth=0.75) comparing communities in Archbishoprics with other communities.
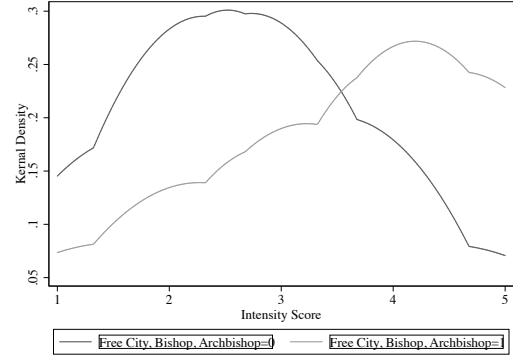
(d) Kernal density plot (bandwidth=0.75) comparing communities in either Imperial Free Cities, Bishoprics, or Archbishoprics with all other communities.

Figure 3

causal impact of political contestation on pogrom intensity. Identification relies on our ability to control for differences between communities ruled by ecclesiastical authorities or free cities, that is, on the extent to which our vector of controls $\mathbf{\Omega}$ picks up the relevant geographic, political and economic city-level characteristics that might affect persecution intensity, our estimate of β will reflect the effect of contested political authority on persecution intensity. Considering the challenges associated with obtaining data for the medieval period, we believe that we are able to control for as many of the most important economic and political differences between different communities as is feasible. But, by definition, we are unable to directly control for unobservable differences between to different communities. To limit the possibility of bias from such unobservables, we employ fixed effects for higher level political units Λ_i in most specifications. These political units correspond to aggregate regions within the Holy Roman Empire such as Bavaria, Franconia, and Saxony.[29] Finally, we will

---

[29]We also cluster our standard errors at the political unit level.

carry out several exercises to quantify the magnitude of potential bias from unobservables and conduct a range of placebo tests.

Baseline Controls   To control for underlying geographic and economic characteristics that might make some communities more likely to engage in persecutions we use a range of controls. We employ data on wheat suitability from the FAO.[30] We include two additional geographic controls *Ruggedness* and *NavRiver.* On the one hand, geographic isolation may make communities more hostile to outsiders. On the other hand, Nunn and Puga (2012) shows that rugged areas in sub-Saharan African were better able to escape from the slave trade; similarly, Jews in more rugged areas may have been less vulnerable to antisemitic violence. *NavRiver* is a dummy variable that takes a value of 1 if a settlement is located on a navigable river. Access to navigable rivers might make Jewish communities more accessible and more hence more vulnerable. For similar reasons, we employ a measure of urban density consistent with other work on early modern Europe.[31] Our urban density variable is called *PopDensity* and we construct it with the Bosker et al. (2013) dataset of cities. To construct measures for each of our settlements, not all of which are included in the Bosker et al. (2013) dataset, we use geospatial data to create a population heatmap. We are then able to extract a value for each settlement that represents how close a settlement was to a major urban center.

Another potential source of bias comes from the openness of a settlement to trade and migration. Commerce might make communities more tolerant towards outsiders such as Jews—as predicted by the *doux commerce* hypothesis (Hirschman, 1977; Jha, 2013). Alternatively, the existence of a trade route might make a Jewish community especially valuable from a fiscal point of view. If the location of trade networks are correlated with the extent of political centralization in the Holy Roman Empire, this may bias our results in favor of our hypothesis. Proximity to a navigable river already helps to control for access to trade. Using historical maps, we are also able to extract the location of major trade routes during the time of the Black Death (Figure A.2a). We construct a variable called *TradeRoutes* for each settlement that indicates if they are within five kilometers of a major trade route.[32] We also control for the presence of major economic centers known for either grain production, wine cultivation, or the textile industry. We create three variables, called *Grain*, *Linen* and *Wine* that take a value of 1 if the settlement is located in the area and 0 otherwise. As indicated by Figure A.2b the center for the exporting of grain was concentrated in the Baltic region whereas wine and textile production

---

[30]This data is based on information on crop characteristics and climatic and geographic data including measures of precipitation, frequency of wet days, mean temperature, daily temperature range, vapor pressure, cloud cover, sunshine, ground-frost frequency, and wind speed. The geographic data include information on soil types and slope characteristics. We assume a 'moderate' level of inputs to wheat cultivation. This is consistent with farmers who produce primarily for home consumption, but sell some of their produce to the market.

[31]See De Long and Shleifer (1993) and Acemoglu et al. (2005).

[32]Other specifications which control for the accessibility of trade routes and distance to industry centers do not affect our results and are available upon request.

were more prevalent in western Germany. Textile production was mostly concentrated in the Flanders region while wine production was based in Burgundy, the Rhineland and central Germany.

Past Pogroms Voigtländer and Voth (2012) establish that the extent of antisemitism varied considerably at a local level within Germany and that latent antisemitism persists for long periods of time. Our best proxy for antisemitism is to include a binary variable that takes a value of 1 if the community experienced a previous pogrom and a 0 otherwise based on data contained in Voigtländer and Voth (2012) and Avneri (1968). [33]

Spread of the Black Death Christakos et al. (2005) provides data on on the incidence and intensity of the Black Death in Europe. Following Jedwab, Johnson, and Koyama (2015) we code this data for the Holy Roman Empire. In our baseline regressions we control for whether or not a community was said to be affected by the Black Death.[34]

4 Main Results

Our theory predicts that the degree to which political authority was contested was an important determinant of pogrom intensity. We report our baseline results in Table 1. Our three explanatory variables are whether or not a community was located in an Imperial Free City, the seat of an Archbishopric or the seat of Bishopric. Columns (1)-(4) present our results using OLS. In Columns (5)-(8) we report our results using an ordered probit. In all specifications we report robust standard errors clustered at the level of the political unit.[35]

Column 1 presents our baseline result without controls. The coefficient we report suggests that the presence of an Imperial Free City is associated with a greater pogrom intensity of 0.841 or just less than 1/5th of the range of our intensity measure. The subsequent columns (2-4) show that this estimate remains comparable in magnitude when we introduce our baseline controls, include information about past pogroms, and explicitly control for spread of the Black Death. In Columns (5)-(8) we conduct the same analysis using an ordered Probit specification. The coefficient we obtain in Column (5) implies an odds ratio of 4.249.[36] This implies that a community governed by a Imperial Free City had a 4 to 1 greater chance of having a higher intensity score.

During this period, archbishops and bishops represented particular obstacles to the authority of the emperor: they had religious authority and they were territorial rulers in their own right. We therefore expect to see an especially large coefficient for our variables Archbishoprics and Bishops. Indeed, in

---

[33]Specifically, we include pogroms from 1096, 1146, 1287, 1298, 1336 and 1337.

[34]See Figure A.3a.

[35]There are 22 clusters in all. See Colin Cameron and Miller (2015) for a discussion of the appropriate number of clusters. A map of the clusters is provided in Figure 4d.

[36]We replicate Table 1 reporting odds ratio in the Web Appendix (Tables A.16.)

Figure 4: Explanatory Variables and Selected Controls

(a) Imperial Free Cities.

(b) Bishoprics and Archbishoprics.

(c) Political Houses.

(d) Regions

Figure 5: Sources: GIS data compiled from Avneri (1968), Jacobs (1912) and Shepherd (1911).

Table 1 we show that the effect of a Bishopric on pogrom intensity is comparable in size to the effect we obtain for an Imperial Free City while Archbishoprics are still more strongly associated with more intense pogroms. Even after controlling for a range of controls, the results in Column (4) suggest that the existence of the seat of a bishopric increases intensity by 1.055 while the existence of the seat of an Archbishopric increases the pogrom intensity by 1.156.

This is highly consistent with our model and with recent studies of the dilemma facing bishops in the Holy Roman Empire. In the words of one historian: 'the bishops, in their twofold role as prelates of the Church and territorial rulers, felt the tension between the demands of Canon Law, on the one side, and the exigencies of their political interests, on the other' (Cluse, 2013, 1). These findings are consistent with our argument, but on their own they do not rule out alternative hypotheses. A

possible alternative hypothesis is simply that the bishops were unable to tax Jewish moneylending due to concerns about usury. If this was the case then they would clearly have less of an incentive to offer protection to Jewish communities. However, evidence from Berenbaum and Skolnik (2007), Cluse (2013), and Haverkamp (2015) provides plenty of evidence of bishops taxing Jewish moneylenders. In their capacity as secular as well as religious authorities, the bishops enforced repayment of debts to Jews. In 1344, the Bishop of Augsburg went so far as to excommunicate the city of Augsburg for the non-repayment of Jewish debts (Berenbaum and Skolnik, 2007). The Archbishop of Trier is described as having 'built the financial foundation of his policies . . . with the help of "his Jews"' (Haverkamp, 2015, 39-40).

However, it was indeed the case that ability of bishops to tax Jewish communities were often less securely grounded than those of the Emperor. When bishops tried to assert their authority to tax Jewish communities these were often contested by local cathedral chapters.[37] This conflict within the ecclesiastical hierarchy further weakened the position of Jews in territories ruled by bishops. This is not an alternative to our argument but in fact complements it.

Pogroms were less severe where imperial authority was strong and unchallenged. As we have noted, the Emperor Charles IV protected Jews where his authority was strong as it was in Prague. And all the evidence suggests that he viewed the Jews as an important fiscal resource.[38] Outright massacres were most common where imperial authority was weaker. In these territories the Emperor in some cases anticipated violence against the Jewish community and 'sold or transferred the holdings of the Jews, if and when they should be killed, to the cities and nobles who saw fit to support him (Breuer, 1988, 146–147). Perhaps the most striking example of this is provided by Archbishop Baldwin of Trier to whom Charles IV granted the rights to collect the property and debts of Jews in event of them being massacred; in the wake of this 'sale' the Jews of Trier were indeed killed.

The Imperial Free Cities also witnessed tension and conflict over the right to tax Jewish moneylending. In Frankfurt in the period prior to the Black Death the taxes collected from Jewish lending were claimed by both the city and the Emperor. Haverkamp observes that in many towns 'the municipal leadership's interest in protecting the Jews was reduced by the fact that they had little or no share in

---

[37]In some cities like Osnabruck, the bishop specific issued maximum interest rates (in this case a rate of $36\frac{1}{9}\%$) that could be charged by Jewish lenders and they fined Jewish lenders who charged higher rates (Berenbaum and Skolnik, 2007). In contrast to the position of the higher churchmen, the lower clergy tended to hold that 'the traditional demands for tolerating the Jews could apply only as long as those Jews were not active, as "public usurers"' (2 Cluse, 2013).

[38]Soon after he ascended the throne, he renewed a Bohemian privilege of 1254, which established principles of incorporating Jews into Bohemian society. Additionally, he subscribed to the traditional relationship of granted protection of the Jews in exchange for higher taxes, as seen in September 1347 when he recommended that the Jews of Breslau be given protection of the city council. He also founded a new Jewish settlement, Neustadt, on the outskirts of Prague that was organized as a municipality apart and granted its residents special privileges. One of these privileges is that Jews were promised tax exemption if they settled permanently and built brick houses (see Agnew, 2004; Baron, 1965b).

Table 1: Baseline Results

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
				Dependent Variable: Pogrom Intensity (1-5)				
			OLS				Ordered Probit	
Imperial Free City	0.841***	0.746***	0.746***	0.791***	0.827***	0.806***	0.806***	0.829***
	(0.208)	(0.265)	(0.254)	(0.277)	(0.247)	(0.255)	(0.242)	(0.264)
Archbishopric Seat	1.563***	1.275***	1.276***	1.156***	1.661***	1.296***	1.295***	1.153***
	(0.288)	(0.413)	(0.358)	(0.383)	(0.139)	(0.324)	(0.246)	(0.282)
Bishopric Seat	0.735***	0.915***	0.916***	1.055***	1.018***	0.893***	0.893***	0.958***
	(0.211)	(0.241)	(0.234)	(0.278)	(0.232)	(0.209)	(0.202)	(0.223)
Baseline Controls	No	Yes	Yes	Yes	No	Yes	Yes	Yes
Previous Pogroms	No	No	Yes	Yes	No	No	Yes	Yes
Plague Spread	No	No	No	Yes	No	No	No	Yes
Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	340	340	340	340	340	340	340	340
Adj. / Pseudo R^2	0.121	0.131	0.129	0.151	0.033	0.046	0.047	0.071

Table Notes: This table reports the effect of a community being located near an Imperial Free City, or the seat of a Bishopric or Archbishopric on the intensity of Black Death pogroms between 1348-50. Columns (1)-(4) report our OLS estimates. In Columns (5)-(8) we report our ordered Probit results. Baseline controls include whether a community was close to navigable rivers or land routes, measures of textile, wine, and grain production, urbanization, wheat suitability, and ruggedness. Fixed Effects refer to larger political unit fixed effects. Robust standard errors clustered on the political unit level in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

the fiscal rights over the Jews, who were subjects of the town lord or other authorities (Haverkamp, 2015, 48). In these cities, the Emperor recognized that he did not have the power to protect the Jews so he 'sold them' thereby condoning whatever antisemitic violence he could not prevent. In Nuremberg, the Emperor 'presented the city council with a letter exonerating it in advance from any responsibility for whatever harm might befall the "servants" of the imperial treasury'. In this case, 'Charles's foresight was justified; for when the plague at length appeared, late in 1349, the Jews were driven to a square, therefore known as the Judenbühl, and burned or slaughtered to a man' (Lowenthal, 1964, 129).[39] The results we present in Table 1 suggest that experience of Trier and Nuremberg were indeed generalizable.

In Table 2 we show that our results are robust when we control for the identity of the secular princes of the empire. By the mid-fourteenth century, the major secular princes of the Holy Roman Empire were independent rulers in their own right. And, though the emperor was nominally the lord of all Jews in the empire, the right to tax Jews in their territories had been claimed by the more powerful

---

[39]Lowenthal summarizes this as follows: 'Charles IV who began by forbidding the people to touch as much as a hair of his Jews ended by contracting with the city councils to share in the spoils' (Lowenthal, 1964, 127).

secular princes. As in Table 1, in Table 2 we include both our OLS and Ordered Probit specifications. The coefficients we obtain on Archbishoprics, Bishoprics and Imperial Free Cities remain unaffected. The coefficients we obtain on the identity of the houses are largely insignificant when we employ our full suite of controls.

The two exceptions are the lands under control of the Luxembourg family, which produces a negative and weakly significant coefficient while lands controlled by the Habsburgs were more likely to experience a higher intensity pogrom. The political environment of the time of the Black Death can partly account for this finding. Emperor Charles IV was from the House of Luxembourg and he laid claim to the crown in 1346 in opposition to the then emperor, Louis IV of Wittelsbach. Lands under control of the Luxembourg family were therefore under the direct control of the Emperor or his relatives. A negative coefficient on our dummy variable for communities in Luxembourg lands, therefore, is consistent with the emperor having more consolidated authority in these lands.

The positive coefficient associated with lands control by the Habsburg family is more surprising as Albert II, the Habsburg Duke of Austria, Styria, and Carinthia was known as 'the supporter of Jews' from his enemies and he was known for his attempts to protect Jewish communities during the Black Death (Haverkamp, 2015, 47). One possible explanation for this coefficient is conflict between the Emperor and the Habsburgs. The Habsburg family were a major competitor to the Luxembourg family. A positive coefficient, therefore, on our indicator for Habsburg lands could be consistent with the Emperor's authority being more contested in communities under the domain of the Habsburg family.

5 Alternative Explanations and Robustness Checks

We have provided robust evidence of a correlation between political contestation as measured by the presence of an Imperial Free City or a Bishopric of some kind and pogrom intensity. In this Section we consider a range of other potential explanations for the variation in the level of Black Death persecutions. We show that these hypotheses either fail to find empirical support or do not affect the coefficients we obtain for our explanatory variables.

5.1 Alternative Explanations

Spread of the Black Death   A natural explanation of the intensity of the pogroms faced by Jewish communities in this period would be the intensity of the Black Death itself as the antisemitic violence was sparked by the libel that the Jews caused the plague by poisoning wells (see Nohl, 1924). Among modern historians Aberth (2000), for instance, makes the case for the pogroms as a seemingly rationale

Table 2: Major Political Houses:

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
			Dependent Variable: Pogrom Intensity (1-5)					
			OLS				Ordered Probit	
Imperial Free City	1.034***	0.958***	0.954***	1.031***	0.945***	0.888***	0.886***	1.016***
	(0.200)	(0.187)	(0.185)	(0.261)	(0.218)	(0.206)	(0.207)	(0.290)
Archbishopric Seat	1.877***	1.463***	1.428***	1.321***	1.741***	1.368***	1.337***	1.378***
	(0.184)	(0.278)	(0.226)	(0.277)	(0.290)	(0.362)	(0.318)	(0.380)
Bishopric Seat	0.906***	0.803***	0.797***	1.145***	0.836***	0.774***	0.767***	1.269***
	(0.252)	(0.211)	(0.214)	(0.191)	(0.248)	(0.215)	(0.218)	(0.257)
Habsburg	0.728*	0.672*	0.673*	0.891***	0.656*	0.620**	0.620**	0.939***
	(0.352)	(0.325)	(0.323)	(0.223)	(0.337)	(0.311)	(0.309)	(0.207)
Luxembourg	-0.357	-0.436*	-0.446*	-0.255	-0.395	-0.473*	-0.485*	-0.331
	(0.272)	(0.216)	(0.217)	(0.168)	(0.305)	(0.262)	(0.267)	(0.204)
Wettin	0.406	0.491	0.488	0.597	0.417*	0.541**	0.538**	0.702
	(0.265)	(0.302)	(0.302)	(0.486)	(0.231)	(0.264)	(0.264)	(0.472)
Wittelsbach	-0.0313	-0.0750	-0.0675	0.171	-0.0268	-0.0688	-0.0604	0.186
	(0.221)	(0.205)	(0.223)	(0.186)	(0.219)	(0.197)	(0.215)	(0.200)
Wurtemberg	0.00616	-0.0595	-0.0383	0.0409	0.0372	-0.0388	-0.0167	0.0464
	(0.191)	(0.208)	(0.161)	(0.141)	(0.178)	(0.191)	(0.148)	(0.130)
Baseline Controls	No	Yes	Yes	Yes	No	Yes	Yes	Yes
Previous Pogroms	No	No	Yes	Yes	No	No	Yes	Yes
Plague Spread	No	No	No	Yes	No	No	No	Yes
Fixed Effects	No	No	No	Yes	No	No	No	Yes
Observations	340	340	340	340	340	340	340	340
Adjusted R^2 / Pseudo R^2	0.142	0.175	0.176	0.246	0.047	0.061	0.061	0.094

Table Notes: This table reports the effect of a community being located near an Imperial Free City, or the seat of a Bishopric or Archbishopric on the intensity of Black Death pogroms between 1348-50 controlling for the identity of the major secular rulers. Columns (1)-(4) report our OLS estimates. In Columns (5)-(8) we report our ordered Probit results. Baseline controls are the same as in Table 1. Robust standard errors clustered on the political unit level in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

response to the plague.[40]

Despite being a plausible hypothesis, it does not accord with the evidence. Our main specifications in Table 1 control for the spread of the Black Death and demonstrate that this is not driving our results. In fact, we find no meaningful relationship between plague incidence and pogrom intensity. Our findings are therefore inconsistent with a simple scapegoating story whereby Jews were killed

---

[40]He writes: 'what lay behind the pogroms was a quite rational attempt to avert or end the plague, an unprecedented and unexpected catastrophe the fear of which trumped all other considerations' (Aberth, 2000, 163).

simply in response to a natural disaster. Instead it is consistent with the comments of contemporary chroniclers who observed that "The ready cash of the Jews was also the poison which killed them. Had the Jews been poor, they would not have been burned"' (quoted in Breuer, 1988, 150).

The Wealth of Jewish Communities The above quote lends credence to an alternative hypothesis: that rioting mobs specifically targeted wealthier or more prominent Jewish communities. This goes directly against our hypothesis, as our model suggests that communities would have been wealthier where they were more secure and where they were protected by a single ruler such as the Emperor or another powerful secular ruler. It is hard to test this perfectly as information on the incomes and wealth of Jewish communities in the Holy Roman Empire has not survived. *Germania Judaica* and Haverkamp (2002) provide documentation of Jewish properties seized following the various forms of persecution These properties are proxy for the wealth of Jewish community. Perhaps communities were persecuted for their properties and wealth and not necessarily as a result of fragmented authority?

Table A.4 presents our analysis controlling for a variety of measures of the wealth of a Jewish community. In Column (1) and (4) we show that our baseline coefficients remain qualitatively the same once we control for whether or not a community had a synagogue. Another measure of the wealth of a community is its age. Haverkamp (2015) speculates that areas with older settlements tended to experience more intense persecutions and this might be one reason why. If the presence of an older community was correlated with the existence of a bishopric or an Imperial Free City this could bias our coefficients upwards. Therefore we collect data on settlement age from the entries in *Germania Judaica* to test this possibility. Columns (2) and (5) indicates our results are unchanged when we control for the age of a Jewish community. Finally, historians observe that the most prosperous Jewish communities were located along the river Rhine (Chazan, 2010). To ensure that this is not a source of bias, we control for distance to the river Rhine in Columns (3) and (6). The coefficient estimates we report are largely unchanged by the inclusion of these controls. Thus while we cannot rule out the possibility that wealth played a role in the pogroms; the best evidence we have suggests that this effect was less important than the incentive that rulers had to permit or prevent antisemitic violence.[41]

Other Differences in Political Institutions We have focused on the differences between Jewish communities governed by Imperial Free Cities or ruled directly by Archbishops or Bishops. Thus one source of potential bias could arise due to the different legacies of different political arrangements in various parts of the Holy Empire. This would be the case if these factors also affected the location of Bishoprics and Imperial Free Cities. For example, Stasavage (2011) argues that the pattern of state formation in medieval Europe was decisively shaped by the partition of the Carolingian empire at the Treaty of Verdun in 843. In particular, he argues that collapse of the Kingdom of Lothariginia, which

---

[41]For a theoretical perspective, it is not clear that greater wealth, all else equal would increase the incentive to destroy the community because a wealthier community could be expected to generate larger tax revenues in the future.

lay between Western and Eastern Francia bisecting the Low Countries, the Rhineland, Switzerland, and Northern Italy, can help explain why political authority remained weak and fragmented in that part of western Europe through the medieval and early modern period.[42] He provides evidence that the borders of the Middle Kingdom cut across linguistic and ethnic lines and did not correspond to prior political divisions. Figure A.2c in the Appendix shows the borders of Lothariginia. In Table A.5, Columns (1) and (4) we control for the whether or not a Jewish community was located in a part of the Empire that had previously belonged to Lotharingia. The estimates we obtain on our variables of interest remain unaffected. Columns (2) and (5) include a measure whether or not a community was in the territory of one of the Electors of the Empire. In Columns (3) and (6), we include another proxy for the authority of the Emperor, measured as the natural log of the distance from Prague, the capital of Emperor Charles IV, and the communities in our sample. The coefficients for our variables of interest remain largely unchanged, but this alternative measure of the authority of the emperor similarly predicts less intense persecutions as predicted by our framework.

Different Patterns of Economic Specialization Among Jews   Research by Jha (2013, 2014) argues that patterns of economic complementarities and substitutability affect the ability of a minority community to survive. This line of reasoning is consistent with older work which argued that the Jews suffered expulsions and persecutions in England and France following the emergence of Italian merchants who could substitute for the role they played in the medieval economy (Veitch, 1986).

While we cannot test this alternative hypothesis directly, we are able to control for many of the factors that historians have identified as playing a crucial role in shaping the economic role played by Jews within the medieval economy. Haverkamp (2015), for example, writes that Jews played an important commercial role 'in the regions characterized by viticulture' (p 15). For this reason we control for areas where wine production was important (notably in the Rhine valley, Alsace, Franconia and Swabia). We also control for economic variables such as distance to trade routes and urbanization that should control for differences in levels of economic development that might give rise to Jews playing a different role in different parts of the Empire. We do not find evidence that any of these controls affect the coefficients we obtain for our variables of interest.

Prior Levels of Christianization   Another possible explanation for pogrom intensity could be that prior levels of Christianization or the influence of the Catholic Church led to worse antisemitic violence. Many historians argue that the Catholic Church played a key role in generating antisemitic stereotypes: associating Jews with both heretics and the antichrist (see, for example, Nicholls, 1963; Cohen, 1982;

---

[42]He observes that '[t]he divisions laid out at Verdun in 843 would have lasting implications not only because Lothariginia collapsed but also because stronger kingdoms emerged elsewhere in the other parts of the former Carolingian Empire . . . Lotharingia, in strong contrast, remained a border zone of fragmented and shifting political control, flanked by larger powers on either side' (Stasavage, 2011, 99).

Lehmann, 1995). St. Augustine, however, taught that the Jews were to be protected because they were meant to serve as 'witnesses' to the errors of their ancestors who had turned away the Savior Jesus Christ. And, as we have seen, during the antisemitic violence of 1348-1350, the Pope condemned the violence and sought to protect Europe's Jewish communities. Haverkamp, for instance, observes that '[i]n the German Kingdom as elsewhere, many churchmen shared the view that Jews were useful, even indispensable, for key concerns of Christian traditions and belief' (Haverkamp, 2015, 30).

For this reason we do not expect a direct relationship between Christianization *per se* and antisemitism. Nevertheless, traditional historians like Nohl (1924) indicted the lower clergy and the monks as guilty of fermenting hatred against the Jews. Nohl wrote that 'The clergy were opposed to the Jews because they were increasing in the towns and reducing the incomes of the parishes. Besides, by letters of privilege granted by the princes, they were exempt from the far-reaching ecclesiastical jurisdictions' (Nohl, 1924, 192).

To test whether the lower clergy and monks were indeed associated with the intensity of violence directed against Jewish communities, we control for the presence of a monastery before the onset of the Black Death. Following Pfaff and Corcoran (2012), we use Jürgensmeier and Schwerdtfeger (2008) to collect information on whether or not the town had a monastery established before the Black Death. The results of these robustness checks are given in Table A.6, Columns (1) and (4).[43] The results remain largely unchanged.

Flagellants The flagellants were bands of religious zealots who roamed much of western Europe in the wake of the plagues. They sought to atone for the sins that they supposed responsible for the plague by flagellating their own bodies. Traditional historians saw their progress as closely associated with antisemitic violence. Ziegler (1969), for instance, notes that 'In July, 1349 when the Flagellants arrived in procession at Frankfurt, they rushed directly to the Jewish quarter and led the local population in wholescale slaughter. At Brussels the mere news that the Flagellants were approaching was enough to set off a massacre, which in spite of the effort of the Duke of Brabant, some six hundred Jews were killed' (Ziegler, 1969, 106). Flagellants were associated with antisemitic violence in Freiburg, Augsburg, Nüirnberg, Munich, Königsberg, and Regensburg (Nicholls, 1963, 246). More recent accounts downplay the idea that the flagellants were antisemitic mobs. Aberth writes: 'The simple fact is that the timing is not quite right in many places for the Flagellants to have instigated Jewish pogroms' as in many cases Jews were killed prior to the arrival of the flagellants (Aberth, 2000, 155). To test this alternative hypothesis we collect data on the known path of flagellant movements. The results of these robustness checks are given in Table A.6, Columns (2) and (5). We find that the path of the flagellants does not explain antisemitic violence.

---

[43]We also conducted tests with the number of monasteries. The results were unchanged.

In summary, our analysis allows us to rule out some of the explantations for pogrom intensity suggested by historians. In contrast, our hypothesis that it was political fragmentation that made Jewish communities vulnerable to persecution appears to be a relatively robust one.

5.2 ROBUSTNESS ANALYSIS

We perform a number of robustness checks in our Web Appendix where we provide additional tables and results. Here we summarize the main robustness results.

Propensity Score Matching As an alternative to regression analysis and to allow our covariates to vary in a non-linear way, we construct a propensity score based on our main geographic and economic covariates (previous pogroms, navigable rivers, trade routes, urbanization, wheat suitability, textile production, ruggedness, wine production, distance to the Rhine and whether or not a community was in Lotharingia). We then estimate the average treatment effect on the treated (ATET) for the effects of an Archbishopric, Bishopric, and Imperial Free City on the intensity of persecution in Table A.7. The ATET coefficients are comparable in magnitude to our OLS results.

A Binary Measure of Persecution Intensity To ensure that our results are robust to specification bias, we employ three binary measures from our intensity scale. Table A.10 includes our three binary measures using varying specifications. The results confirm that the presence of an Imperial Free City or a bishop was associated with worse persecutions regardless of the specification. The results from Column (1) of Table A.10 indicate that communities located in an Imperial Free City were 25% more likely to experience a violent pogrom (a value greater than or equal to a 3 on our scale indicating some fatalities). Communities located in a bishopric were 20% more likely to experience a violent pogrom. Communities in an archbishopric were 37% more likely to experience a violent pogrom. These results complement our baseline findings shown in Table 1.

Sample Selection Bias Another possible source of bias comes from our data source. The length of each entry in the *Germania Judaica* varies according to the importance of the settlement (how large it was, how long it lasted, and how much information we have about it). It is possible that our measure of intensity is partially picking up better known communities which therefore received lengthier treatment in the *Germania Judaica*. Voigtländer and Voth (2012, 1374) note that Imperial Free cities and Bishoprics possessed 'older Jewish communities, which suggests that they were the most attractive to Jews'. If more established or better known communities were disproportionately located in areas ruled by Bishops or in Free Cities this could be a source of upwards bias in our estimates. This suggests that we should directly control for the length of each entry in the *Germania Judaica*.

Table A.13 reports the results controlling for both entry length and the number of citations. The

coefficients we obtain for Imperial Free Cities, Archbishoprics and Bishoprics shrink somewhat but remained precisely estimated with the inclusion of the natural log of the entry length and the number of citations. Some caution is required in interpreting these estimates as more extreme violence in a community could itself have led to a longer entry in the *Germania Judaica* by making a town notorious especially amongst Jewish chroniclers. Therefore, there is a danger that by directly controlling for entry length we may mechanically reduce some of the legitimate variation in pogrom intensity. It is nonetheless reassuring that our results remain robust.

Randomized Treatment As a further robustness check we use a pseudo-random number generator to assign the status of Imperial Free City, Bishopric, or Archbishopric to each community. To ensure that our analysis is comparable we randomly assign a community to a 'Randomized Imperial Free City' using a uniform distribution where the proportion of randomly treated communities is restricted to be equal to the proportion of Imperial Free Cities in our dataset. We perform the same exercise for Bishoprics and Archbishoprics. Finally, we also generate a random intensity score measure assuming that communities are allocated to an intensity score based on a uniform distribution. Table A.14 presents the results of these placebo tests. It is evident that when we randomized either treatment (Col. 1-4) or outcome (Col. 5-8) we find no relationship between political institutions and persecutions. This strengthens our confidence that the effects we obtain reflect the impact of fragmented institutions on pogrom intensity.

5.3 Potential bias from unobservables

As a final check we perform a series of tests to show that results are not contaminated by bias from unobservable variables. We follow procedure suggested by Altonji et al. (2005) and Oster (2013) to place bounds on how large any bias from unobservables would have to be to undermine our results.

One concern in all non-experimental settings is the possibility of selection on unobservables. Table 3 shows the amount of selection on unobservables relative to selection on observables in order to produce a coefficient equal to our baseline estimates. In Panel A we show the magnitude of selection on unobservables relative to selection on observables needed to produce a treatment effect of zero for a given R^2. The R^2 in our baseline specification is 0.19; we label this $\tilde{R}$. Oster (2013) suggests setting $R_{max}=1.3\tilde{R}$. Under this assumption the ratio of selection on unobservables relative to observables (δ) would have to equal 21 in order to generate a treatment effect of zero. Oster (2013) suggests a benchmark value for $\delta \geq 1$ for us to reject the hypothesis that the treatment effect we estimate is the product of selection on unobservable characteristics. It is evident from Table 3 that all of our results survive this procedure with the narrow exception of Row 9 which reports the effect of an Archbishopric on pogrom intensity under the demanding assumption that $R_{max} = 1$.

Table 3: Selection on Observed and Unobserved Variables

	Panel A: Varying R_{max}							
	Baseline Effect $[R^2]$		Controlled Effect $[R^2]$		Null Reject		δ	
	Imperial Free City							
1. R_{max}=1.3$\tilde{R}$	0.82993	[0.055]	0.81983	[0.193]	Yes		21.76690	
2. $R_{max} = 0.6$	0.82993	[0.055]	0.81983	[0.193]	Yes		13.18521	
3. $R_{max} = 1$	0.82993	[0.055]	0.81983	[0.193]	Yes		9.08963	
	Bishopric							
4. R_{max}=1.3$\tilde{R}$	0.62654	[0.013]	0.75678	[0.193]	Yes		-1.50453	
5. $R_{max} = 0.6$	0.62654	[0.013]	0.75678	[0.193]	Yes		-0.83884	
6. $R_{max} = 1$	0.62654	[0.055]	0.75678	[0.193]	Yes		-0.55712	
	Archbishopric							
7. R_{max}=1.3$\tilde{R}$	1.51940	[0.024]	1.24582	[0.193]	Yes		1.79084	
8. $R_{max} = 0.6$	1.51940	[0.024]	1.24582	[0.193]	Yes		1.28951	
9. $R_{max} = 1$	1.51940	[0.024]	1.24582	[0.193]	No		0.97695	

	Panel B: Assume $\delta = 1$				
	Imperial Free City				
	$R_{max} = 0.6$	R_{max}=1.3$\tilde{R}$	Controlled Effect	$[R^2]$	
10. Estimated β	0.79009	0.81566	0.81983	[0.193]	
	Bishopric				
	$R_{max} = 0.6$	R_{max}=1.3$\tilde{R}$	Controlled Effect	$[R^2]$	
11. Estimated β	1.05090	0.79804	0.75678	[0.193]	
	Archbishopric				
	$R_{max} = 0.6$	R_{max}=1.3$\tilde{R}$	Controlled Effect	$[R^2]$	
12. Estimated β	0.58635	1.15331	1.24582	[0.193]	

Table Notes: The table shows the amount of selection on unobservables relative to selection on observables in order to produce a coefficient equal to our baseline estimates, and shows estimated treatment effects under the assumption of equal selection on observables and unobservables. Panel A shows the magnitude of selection on unobservables relative to selection on observables needed to produce a treatment effect of zero under different R_{max}. Rows 2, 5, and 7 use an R_{max} equal to 0.6. Rows 1, 4, and 7 use the cutoff suggested by Oster (2013), R_{max}=1.3$\tilde{R}$. Rows 3, 6, and 9 use the largest possible R-squared, which is 1. Panel B assumes the effect of unobservables is equal to the effect of observable ($\delta = 1$). It then reports the corresponding estimate of β. In both panels,'the column of 'controlled effect' refers to the case where all controls in Table 1 are included. We exclude fixed effects from these regressions. Results including fixed effects are available upon request.

Panel B of Table 3 assumes that the amount of selection on unobservables is equal to that on observables ($\delta = 1$). We then reports the corresponding estimate of β under different hypothesized values of R_{max}. It is evident that for R_{max}=1.3$\tilde{R}$, our estimated values of β are very close in magnitude to the coefficients we obtain under our benchmark analysis. This provides reassurance that our results are not driven by unobserved differences in the treated and untreated Jewish communities.

6 IMPLICATIONS AND CONCLUSION

This paper asks what institutions make minority groups vulnerable to persecution? To address this question we study the Holy Roman Empire in the fourteenth century, a fragmented and weak state, troubled by perennial warfare between different claimants to the throne and power struggles between religious and secular authorities.

We study the persecution of Jews during the Black Death. We show that legal and political fragmentation within the Holy Roman Empire was associated with more intense persecutions. Despite Pope Clement VI calling for Jews to be protected during the Black Death, pogroms convulsed all of the Holy Roman Empire in the Black Death period. But persecutions in communities controlled by Archbishoprics, Bishoprics and Imperial Free Cities were significantly more intense than in areas controlled by the emperor or the major houses. This finding is robust to controlling for previous pogroms, the geographical and economic characteristics of each community and a range of other economic, political and institutional variables. We conduct a propensity score analysis based on observables and an Altonji et al. (2005); Oster (2013) style analysis to quantify potential bias from unobservables. This analysis provides confidence that the effect of political fragmentation on pogrom intensity is a genuine one.

These findings are significant for several reasons. First, the events we study were of decisive importance for the history of Jewish communities in Europe—large numbers of Jews left Germany for Poland and Eastern Europe in the wake of these massacres. They only returned during the seventeenth century. This had important economic consequences as recent research has provide empirical evidence that Jews had higher levels of human capital than their Christian neighbors (Botticini and Eckstein, 2012), that Jewish communities provided financial services in this period (D'Acunto et al., 2014; Pascali, 2016), and that cities with Jewish communities grew faster than other cities in the early modern period (Johnson and Koyama, 2016).

Voigtländer and Voth (2012) demonstrate that the pogroms in the Black Death period left a lingering and persistent legacy of antisemitism that can be detected in the 20th century. They treat the Black Death as an event that lowered the countywide threshold for antisemitic violence. Importantly, as they make clear, the correlates of medieval pogroms do not explain twentieth-century antisemitism (Voigtländer and Voth, 2012, p. 1344). This conclusion is consistent with our analysis. Their empirical

strategy identifies the importance of antisemitic culture and beliefs, while we identify the separate role played by political institutions. While cultural values have been shown to be remarkably persistent since the political institutions of the medieval Holy Roman empire have long since been dismantled there is little reason to support that medieval political institutions would continue to influence modern antisemitism.[44]

Second, our account helps shed light on the political development of central Europe. In western Europe, the medieval period saw the establishment of comparatively powerful monarchies in England, France and later in the unified kingdoms of Castile and Aragon (Strayer, 1971; Given, 1989; Bisson, 2009). This process of medieval state building set the foundation for the rise of powerful polities in the early modern period (Tilly, 1990; Ertman, 1997; Finer, 1999b; Gennaioli and Voth, 2015). Legal centralization played an important role in this process—a process that led eventually to the rise of states governed by the rule of law. In the Holy Roman Empire, however, this process stalled and went into reverse and as a result central Europe remained politically fragmented until the nineteenth century (Scales, 2005; Wilson, 2016). The fragmentation of the Holy Roman Empire had important consequences for the success of the Reformation, an event that greatly shaped subsequent European history (see Becker et al., 2016). Our analysis sheds lights on the causes of this political weakness at a crucial point in the institutional history of the Holy Roman Empire.

Finally, our results have implications for understanding what institutions make minority groups vulnerable to violence and persecutions (Horowitz, 2001; Wilkinson, 2004; Jha, 2013, 2014). While ethnic and religious minorities receive the protection of strong states and the rule of law in modern developed economies, in other parts of the world such as the Middle East, they remain vulnerable to the threat of violence. Alawites, Druze, Christian Copts, Yazidis, Samaritans, Zoroastrians have all faced intensified religious persecution in recent years as the authority of centralized states has collapsed in the region (Russell, 2014). There are many notable examples of powerful and centralized states persecuting and exterminating minority groups particularly in the twentieth century.[45] But the number of persecutions associated with the absence of political direction is often not well appreciated (see Chua, 2004). Our analysis suggests that Mancur Olson's reasoning about the incentives of a stationary bandit is highly relevant for understanding what conditions make ethnic or religious minorities vulnerable. That is, in the absence of the rule of law, minorities groups may be better protected under the authority of a single autocrat and that they become particularly exposed to the threat of violence in periods when power is contested. Future research should explore further how political institutions interact

---

[44]This is not to say the culture factors did not interact with institutional ones. In regressions that include an interaction between past pogroms and our explanatory variables we find that Black Death pogroms were more severe in communities that had suffered from previous outbreaks of antisemitism and were located in Imperial Free Cities (see Table A.15) in the Web Appendix.

[45]The most infamous are the Armenian genocide and the Holocaust. Even in these cases historians have argued that the worst massacres occurred after the destruction of state authority in a particular area (see Synder, 2015).

with economic or epidemiological shocks in order to make minority groups become vulnerable.

References

Aberth, J. (2010, 2000). *From the Brink of the Apocalypse: Confronting Famine, War, Plague, and Death in the Later Middle Ages.* London: Routledge.

Abulafia, D. (1988). *Frederick II: A Medieval Emperor.* Oxford: Oxford University Press.

Acemoglu, D., S. Johnson, and J. Robinson (2005, June). The rise of Europe: Atlantic trade, institutional change, and economic growth. *American Economic Review 95*(3), 546–579.

Acemoglu, D. and J. A. Robinson (2012). *Why Nations Fail.* New York: Crown Business.

Agnew, H. L. (2004). *The Czechs and the Lands of the Bohemian Crown.* Hoover Press.

Altonji, J. G., T. E. Elder, and C. R. Taber (2005, February). Selection on Observed and Unobserved Variables: Assessing the Effectiveness of Catholic Schools. *Journal of Political Economy 113*(1), 151–184.

Anderson, R. W., N. D. Johnson, and M. Koyama (2016). Jewish persecutions and weather shocks 1100-1800. *Economic Journal Forthcoming.*

Arnold, B. (1991a). *Court and Bishop in Medieval Germany.* Philadelphia: University of Pennsylvania Press.

Arnold, B. (1991b). *Princes and Territories in Medieval Germany.* Cambridge: Cambridge University Press.

Arnold, B. (2000). Emperor Frederick II (1194–1250 and the political particularism of the German princes. *Journal of Medieval History 26*(3), 239–252.

Avneri, Z. (1968). *Germania Judaica, Bd. 2: Von 1238 bis zur Mitte des 14 Jahrhunderts.* Tübingen: JCB Mohr.

Baron, S. W. (1965a). *A Social and Religious History of the Jews*, Volume IX: Under Church and Empire. New York: Columbia University Press.

Baron, S. W. (1965b). *A Social and Religious History of the Jews*, Volume X: On the Empire's Periphery. New York: Columbia University Press.

Barzel, Y. (1992). Confiscation by the ruler: The rise and fall of Jewish lending in the Middle Ages. *Journal of Law and Economics 35*, 1–13.

Becker, S. O., S. Pfaff, and J. Rubin (2016). Causes and consequences of the protestant reformation. 206, Centre for Competitive Advantage in the Global Economy.

Berenbaum, M. and F. Skolnik (2007). *Encyclopedia Judaica* (2nd ed.). USA: Macmillan Reference.

Berman, H. J. (1983). *Law and Revolution, the Formation of the Western Legal Tradition.* Cambridge, Massachuestts: Harvard University Press.

Bingham, T. (2010). *The Rule of Law.* New York: Penguin.

Bisson, T. (2009). *The Crisis of the Twelfth Century: Power, Lordship, and the Origins of European Government.* New Jersey: Princeton University Press.

Bonney, R. (Ed.) (1999). *Economic Systems and State Finance.* Oxford: Oxford University Press.

Borcan, O., O. Olsson, and L. Putterman (2014, August). State History and Economic Development: Evidence from Six Millennia. Working Papers in Economics 602, University of Gothenburg, Department of Economics.

Bosker, M., E. Buringh, and J. L. van Zanden (2013). From Baghdad to London: unravelling urban development in Europe and the Arab world 800–1800. *Review of Economics and Statistics 95*(4), 1418–1437.

Botticini, M. and Z. Eckstein (2012). *The Chosen Few.* Princeton, New Jersey: Princeton University Press.

Breuer, M. (1988). The "Black Death" and Antisemitism. In S. Almog (Ed.), *Antisemitism Through the Ages*, Oxford, pp. 139–151. Vidal Sassoon International Center for the Study of Antisemitism: Pergamon Press.

Chanda, A. and L. Putterman (2007, 06). Early starts, reversals and catch-up in the process of economic development. *Scandinavian Journal of Economics 109*(2), 387–413.

Chazan, R. (1997). *Medieval Stereotypes and Modern Antisemitism.* Berklely, U.S.A: University of California Press.

Chazan, R. (2006). *The Jews of Western Christendom.* Cambridge: Cambridge University Press.

Chazan, R. (2010). *Reassessing Jewish Life in Medieval Europe.* Cambridge: Cambridge University Press.

Christakos, G., R. A. Olea, M. L. Serre, L.-L. Wang, and H.-L. Yu (2005). *Interdisciplinary Public Health Reasoning and Epidemic Modelling: The Case of Black Death.* Berlin: Springer.

Chua, A. (2004). *World on Fire: How Exporting Free Market Democracy Breeds Ethnic Hatred and Global Instability.* New York: Anchor Books.

Cluse, C. (2013, July). Ecclesiastical courts and the issue of 'usury' in the fifteenth century. paper delivered at the 16th World Congress of Jewish Studies, Jerusalem.

Cohen, J. (1982). *The Friars and the Jews*. Ithaca: Colombia University Press.

Cohn, S. K. (2007). The Black Death and the burning of Jews. *Past & Present 196*(1), 3–36.

Colin Cameron, A. and D. L. Miller (2015). A practitioner's guide to cluster-robust inference. *Journal of Human Resources 50*(2), 317–372.

D'Acunto, F., M. Prokopczuk, and M. Weber (2014, June). Distrust in finance lingers: Jewish persecution and households' investments. memo.

De Long, J. B. and A. Shleifer (1993, October). Princes and merchants: European city growth before the industrial revolution. *Journal of Law & Economics 36*(2), 671–702.

de Roover, R. (1967). The scholastics, usury, and foreign exchange. *The Business History Review 41*, 257–271.

Dicey, A. (1908). *Introduction to the Study of the Law of the Constitution*. London: MacMillan and Co. Limited.

Dincecco, M. (2009). Fiscal centralization, limited government, and public revenues in Europe, 1650–1913. *Journal of Economic History 69*(1), 48–103.

Dincecco, M. (2010, September). Fragmented authority from ancien régime to modernity: a quantitative analysis. *Journal of Institutional Economics 6*(03), 305–328.

Durante, R., I. Grosfeld, S. O. Sakalli, and E. Zhuravskaya (2015, August). Middleman minorities and intergroup conflict. Memo.

Epstein, S. R. (2000). *Freedom and Growth, the rise of states and markets in Europe, 1300–1700*. London: Routledge.

Ertman, T. (1997). *Birth of Leviathan*. Cambridge: Cambridge University Press.

Finer, S. (1999a). *The History of Government from the Earliest Times*, Volume I. Oxford: Oxford University Press.

Finer, S. (1999b). *The History of Government from the Earliest Times*, Volume II. Oxford: Oxford University Press.

Fuller, L. L. (1969). *The Morality of Law*. New Haven: Yale University Press.

Gennaioli, N. and I. Rainer (2007, September). The modern impact of precolonial centralization in Africa. *Journal of Economic Growth 12*(3), 185–234.

Gennaioli, N. and H.-J. Voth (2015). State capacity and military conflict. *Review of Economic Studies*. Forthcoming.

Given, J. B. (1989, April). The inquistors of Languedoc and the medieval technology of power. *The American Historical Review 94*(2), 336–359.

Golb, N. (1998). *The Jews in Medieval Normandy*. Cambridge: Cambridge University Press.

Grafe, R. (2012). *Distant Tyranny: Markets, Power, and Backwardness in Spain, 1650-1800*. Princeton Economic History of the Western World. Princeton University Press.

Grosfeld, I., A. Rodnyansky, and E. Zhuravskaya (2013, August). Persistent anti-market culture: A legacy of the Pale of Settlement after the Holocaust. *American Economic Journal: Economic Policy 5*(3), 189–226.

Hadfield, G. K. and B. R. Weingast (2012). What is law? a coordination model of the characteristics of legal order. *Journal of Legal Analysis 4*(1), 1–44.

Haverkamp, A. (2002). *Geschichte der Juden im Mittelalter von der Nordsee bis zu den Sudalpen: kommentiertes Kartenwerk*. Hannover: Hahnsche Buchhandlung.

Haverkamp, A. (2015). Jews in the Medieval German Kingdom. In *Corpus der Quellen zur Geschichte der Juden im spätmittelalterlichen Reich*, Trier. Arye Maimon-Institut für Geschichte der Juden: Universitätsbibliothek Trier.

Hayek, F. (1960). *The Constitution of Liberty*. London: Routledge.

Hirschman, A. O. (1977). *The Passions and the Interests: Political Arguments For Capitalism Before Its Triumph*. Princeton, New Jersey: Princeton University Press.

Hoffman, P. T. (2015, 6). What do states do? politics and economic history. *The Journal of Economic History 75*, 303–332.

Horowitz, D. (2001). *The Deadly Ethnic Riot*. Berkeley: University of California Press.

Hough, J. F. and R. Grier (2015). *The Long Process of Development: Building Markets and States in Pre-Industrial England, Spain, and their Colonies*. Cambridge: Cambridge University Press.

Jacobs, J. (1912). Black death. In I. Singer (Ed.), *The Jewish Encyclopedia: A Descriptive Record of History, Religion, Literature, and Customs of the Jewish People From Earliest Times to the Present Day*, Volume III, New York, pp.

233–238. Funk and Wagnalls Company.

Jedwab, R., N. D. Johnson, and M. Koyama (2015, August). Bones, bacteria, and breakpoints. Memo.

Jha, S. (2013, 11). Trade, institutions, and ethnic tolerance: Evidence from South Asia. *American Political Science Review 107*, 806–832.

Jha, S. (2014). "Unfinished business": Historic complementarities, political competition and ethnic violence in Gujarat. *Journal of Economic Behavior Organization 104*, 18 – 36. Economics, Religion, and Culture.

Johnson, N. D. and M. Koyama (2014a). Tax farming and the origins of state capacity in England and France. *Explorations in Economic History 51*(1), 1–20.

Johnson, N. D. and M. Koyama (2014b). Taxes, lawyers, and the decline of witch trials in France. *Journal of Law and Economics 57*.

Johnson, N. D. and M. Koyama (2016, March). Jewish communities and city growth in preindustrial Europe. Memo.

Jones, E. (2003). *The European Miracle, 3rd edition*. Cambridge, U.K.: CUP.

Jordan, W. C. (1998). Jews, regalian rights, and the constitution in Medieval France. *AJS Review 23*, 1–16.

Jürgensmeier, F. and R. E. Schwerdtfeger (2005–2008). *Orden und Klöster im Zeitalter von Reformation und katholischer Reform, 1500-1700*, Volume 65. Munster: Aschendorff.

Koyama, M. (2010a). Evading the 'taint of usury': The usury prohibition as a barrier to entry. *Explorations in Economic History 47*(4), 420–442.

Koyama, M. (2010b, December). The political economy of expulsion: The regulation of Jewish moneylending in medieval England. *Constitutional Political Economy 21*(4), 374–406.

Koyama, M. and M. M. Xue (2015, February). The literary inquisition: The persecution of intellectuals and human capital accumulation in imperial China. Working Paper.

Langholm, O. (1992). *Economics in the Medieval Schools, wealth exchange, value, money, and usury according to the Paris theological tradition 1200–1350*. Leiden: E.J. Brill.

Langmuir, G. I. (1963). The Jews and the archives of Angevin England: Reflections on medieval anti-semitism. *Traditio 19*, 183–244.

Leeson, P. and J. Russ (2015, June). Witch trials. memo.

Lehmann, H. (1995). The Jewish minority and the Christian majority in early modern central Europe. In R. P.-C. Hsia and H. Lehmann (Eds.), *In and Out of the Ghetto: Jewish-Gentile Relations in Late Medieval and Early Modern Germany*, Cambridge, pp. 305–311. Cambridge University Press.

Lowenthal, M. (1964). *The Jews of Germany: A Story of Sixteen Centuries*. New York: Russell & Russell.

Michalopoulos, S. and E. Papaioannou (2013, 01). Pre-colonial ethnic institutions and contemporary African development. *Econometrica 81*(1), 113–152.

Michalopoulos, S. and E. Papaioannou (2014). National institutions and subnational development in Africa. *Quarterly Journal of Economics 129*(1), 151–213.

Miguel, E. (2005, October). Poverty and witch killing. *Review of Economic Studies 72*(4), 1153–1172.

Mundill, R. R. (2010). *The King's Jews: Money, Massacre and Exodus in Medieval England*. London: Continuum.

Nelson, B. (1969, 1949). *The Idea of Usury*. London, UK: University of Chicago Press.

Nicholls, W. (1963). *Christian Antisemitism: A History of Hate*. Northvale, New Jersey: Jason Aronson Inc.

Nirenberg, D. (2013). *Anti-Judaism: The Western Tradition*. New York: W.W. Norton & Company.

Nohl, J. (1924). *The Black Death: A Chronicle of the Plague*. George Allen & Unwin LTD. translated by C.H. Clarke.

Noonan, J. T. (1957). *The Scholastic Analysis of Usury*. Cambridge, Massachusetts, U.S.A: Harvard University Press.

North, D. C. (1981). *Structure and Change in Economic History*. New York, U.S.A: Norton.

North, D. C., J. J. Wallis, and B. R. Weingast (2009). *Violence and Social Orders: a Conceptual Framework for Interpreting Recorded Human History*. Cambridge: Cambridge University Press.

Nunn, N. and D. Puga (2012, February). Ruggedness: The blessing of bad geography in Africa. *The Review of Economics and Statistics 94*(1), 20–36.

Olson, M. (2000). *Power and prosperity: outgrowing communist and capitalist dictatorships*. New York: Basic Books.

Oster, E. (2013, May). Unobservable Selection and Coefficient Stability: Theory and Validation. NBER Working Papers 19054, National Bureau of Economic Research, Inc.

Ostrom, V., C. Tiebout, and R. Warren (1961). The organization of government in metropolitan areas: a theoretical inquiry. *The American Political Science Review 55*(4), 831–842.

Pascali, L. (2016). Banks and development: Jewish communities in the Italian Renassiance and current economic performance. *Review of Economics and Statistics 98*(1), 140–158.

Pfaff, S. and K. E. Corcoran (2012). Piety, power, and the purse: religious economies theory and urban reform in the Holy Roman Empire. *Journal for the Scientific Study of Religion 51*(4), 757–776.

Pirenne, H. (1925). *Medieval Cities.* New York: Doubleday Anchor Books.

Poliakov, L. (1977, 1965). *Jewish Bankers and the Holy See.* London: Routledge & Kegan Paul. translated by Miriam Kochan.

Richardson, G. and M. McBride (2009). Religion, longevity, and cooperation: The case of the craft guild. *Journal of Economic Behavior and Organization 71*(2), 172–186.

Rubin, J. (2010, April). Bills of exchange, interest bans, and impersonal exchange in Islam and Christianity. *Explorations in Economic History 47*(2), 213–227.

Rubin, J. (2014, May). Printing and Protestants: An Empirical Test of the Role of Printing in the Reformation. *The Review of Economics and Statistics 96*(2), 270–286.

Russell, G. (2014). *Heirs to Forgotten Kingdoms: Journeys into the Disappearing Religions of the Middle East.* New York: Basic Books.

Scales, L. (2005). Late medieval Germany: an under-stated nation? In L. Scales and O. Zimmer (Eds.), *Power and the Nation in European History*, Cambridge, pp. 166–191. Cambridge University Press.

Shepherd, W. R. (1911). *Historical Atlas.* New York: H. Holt.

Spector, S. and G. Wigoder (2001). *The Encyclopedia of Jewish Life Before and During the Holocaust.* New York: NYU Press.

Spufford, P. (2002). *Power and Profit: the Merchant in Medieval Europe.* London: Thames & Hudson.

Stasavage, D. (2011). *States of Credit.* Princeton: Princeton University Press.

Stasavage, D. (2014). Was Weber right? the role of urban autonomy in europe's rise. *American Political Science Review 108*(2), 337–354.

Stow, K. R. (1981). Papal and royal attitudes toward Jewish lending in the thirteenth century. *AJS Review 6*, 161–184.

Stow, K. R. (1992). *Alienated Minority, the Jews of Medieval Latin Europe.* Cambridge, MA: Harvard University Press.

Strayer, J. (1969, 1971). France: the holy land, the choosen people and the most Christian king. In J. F. Benton and T. N. Bisson (Eds.), *Medieval Statecraft and the Perspectives of History*, Princeton, New Jersey, pp. 300–314. Princeton University Press.

Stubbs, W. (1969, 1908). *Germany in the Later Middle Ages, 1200-1500.* New York: Howard Fertig.

Synder, T. (2015). *Black Earth: The Holocaust As History and Warning.* New York: Tim Duggan Books.

Tilly, C. (1990). *Coercion, Capital, and European States, AD 990-1990.* Oxford: Blackwell.

Toch, M. (1997). The formation of a diaspora: The settlement of Jews in the medieval German Reich. *Aschkenas 7*, 55–78.

Trachtenberg, J. (1943). *The Devil and the Jews.* Philadelphia: The Jewish Publication Society.

Veitch, J. M. (1986). Repudiations and confiscations by the medieval state. *Journal of Economic History 46*, 31–36.

Vidal-Robert, J. (2014). Long-run effects of the Spanish Inquisition. CAGE Online Working Paper Series, Competitive Advantage in the Global Economy (CAGE) 192.

Voigtländer, N. and H.-J. Voth (2012). Persecution perpetuated: The medieval origins of Anti-Semitic violence in Nazi Germany. *Quarterly Journal of Economics 127*(3), 1–54.

Voigtländer, N. and H.-J. Voth (2013, May). Married to intolerance: Attitudes toward intermarriage in Germany, 1900–2006. *American Economic Review 103*(3), 79–85.

Voigtländer, N. and H.-J. Voth (2013). The three horsemen of riches: Plague, war, and urbanization in early modern Europe. *Review of Economic Studies 80*, 774–811.

Volckart, O. (2000). State buildng by bargaining for monopoly rents. *Kyklos 53*(3), 265–291.

Volckart, O. (2002, June). No utopia: Government without territorial monopoly in medieval central Europe. *Journal of Institutional and Theoretical Economics (JITE) 158*(2), 325–343.

Volckart, O. (2004, July). The economics of feuding in late medieval Germany. *Explorations in Economic History 41*(3), 282–299.

Weber, M. ([1921] 1958). *The City*. New York: The Free Press.

Whaley, J. (2012). *Germany and the Holy Roman Empire 1493–1806*, Volume 1. Oxford: Oxford University Press.

Wilkinson, S. I. (2004). *Votes and Violence: Electoral Competition and Ethnic Riots in India*. Cambridge.: Cambridge University Press.

Wilson, P. H. (2016). *The Holy Roman Empire: A Thousand Years of Europe's History*. New York: Penguin Books.

Yanagizawa-Drott, D. (2014). Propaganda and conflict: Evidence from the Rwandan genocide. *The Quarterly Journal of Economics 129*(4), 1947–1994.

Ziegler, P. (1969). *The Black Death*. London: Collins.

A Web Appendix

In this online appendix we provide further details concerning (1) data collection; (2) the administrative and political structure of the Holy Roman Empire (3) additional maps of some of our control variables; and (4) the results of various robustness exercises that we have described in the main text.

A.1 Data Collection

The main source for our persecution intensity score is the *Germania Judaica* (Avneri, 1968). This is a on-going multivolume project that aims to document all aspects of Jewish life in German speaking central Europe from the middle ages to the modern period. We focus on volume I which covers the medieval period. The *Germania Judaica* is the basis for most historical studies of the Jews in the Holy Roman Empire and it also provides the main source for recent work in economics on antisemitic violence such as Voigtländer and Voth (2012).

To collect our dependent variable we personally went through every entry for the volume covering the time of the Black Death reading the description of each communities experience during the Black Death. The vast majority of entries include detailed descriptions of the persecutions suffered during these years.

We collect the description for every town with a specific mention of the fate of the Jewish community during the persecutions of the Black Death. We were concerned that towns that were spared may not be mentioned so we collected information on towns or communities that mention a community within twenty years or so of the Black Death but without any specific mention of a persecution.

While many of the towns have descriptions that match directly with our persecution intensity score categories, some descriptions were vague or nonexistent. To address these, we checked with two additional sources, *Encyclopedia Judaica* (2007) and the *Encyclopedia of Jewish Life Before and During the Holocaust* (2001). After dropping towns without any distinct description in any of our sources, we are left with 340 towns with a Jewish community.

For these 340 towns, we also collected from *Germania Judaica* our main explanatory variables: whether the town was an Imperial Free City, the seat of the Bishop or Archbishop and under the rule of a member of one of the major political houses.

A.2 The Political and Administrative Structure of the Holy Roman Empire

In Section 2 we provide as brief an overview of the history and administrative structure of the Holy Roman Empire as is necessary to understand our analysis. Here we provide more details concerning the state of the Empire during the mid-fourteenth century.

The Holy Roman Empire was established by Charlemagne in 800. Following the decline of the Carolingian empire, the title was revived by Otto I in the mid-tenth century. A series of strong emperors in the twelfth and thirteenth century partially succeeded in building a powerful feudal monarchy along the lines that the kings of England and France were able to do in their respective realms.

But their attempts to build such a centralized monarchy were repeatedly thwarted by conflicts between the Church and Emperor. Emperors were repeatedly excommunicated throughout the late eleventh century and twelfth centuries. And in the thirteenth century, this conflict between the papacy and the emperor intensified. Frederick (r. 1212–1250) challenged papal power in Italy; but from a German perspective he was an absentee ruler for most of his reign and conceded power and authority to the electors and princes in return for their support for him in Germany while he focused on maintaining imperial authority in Italy (Abulafia, 1988; Arnold, 2000). The resulting political fragmentation and 'the jurisdictional autarky of the princes' that characterized the Holy Roman empire was thus a response to the needs of a weakened emperor to maintain some semblance of peace and order, but it had 'the inevitable result' of the 'territorial particularism of churchmen, lay princes, and interstitial cities which persisted until modern times' (Arnold, 2000, 244).[46] The legacy of these developments was such that by the fourteenth century 'the nadir of the medieval *Reich*, viewed as a system of power' occurred. (Scales, 2005, 177). This provides the setting for our study.

In particular, the years prior to 1348 were years of civil war. Louis IV of Bavaria (r. 1328–1347) was first elected in 1314, but it took years of civil wars and conflicts against rival claimants backed by the papacy before he was actually crowned. Upon his coronation Louis deposed Pope John XXII on the grounds of heresy, setting up a rival in his stead. His policies, however, brought him into conflict with many of the German princes who together with the Pope backed a rival claimant, Charles of the House of Luxembourg, as emperor.

Thus for the period with which we are concerned the Holy Roman Emperor was both an imperial overlord and a great territorial prince in his own right, but he was not did have the power to subdue his nobility or to make laws for the entire empire (Stubbs, 1908; Arnold, 1991b,a, 2000; Scales, 2005).[47]

The weakness of the Holy Roman Emperor saw the emergence of Imperial Free Cities, Bishoprics, and

---

[46]Frederick established a centralized state administration in Sicily but in Germany he left a legacy of decentralized and contested authority. Arnold discounts the possibility of Frederick reversing this situation and imposing centralized control in Germany because '[t]he German magnates were so well equipped with economic, jurisdictional, and military resources and opportunities, all of which were phenomenally expanded during the twelfth and thirteenth centuries' (Arnold, 2000, 243).

[47]'Although the western Roman emperor was respected as overlord and sovereign from 962 until 1806, his powers were not of a kind to convert the inherited drives of the princes and the Church away from regional and territorial autarky, let alone to subvert the resulting structure of independent principalities, bishoprics, and evacuees, with the urban states as an interstitial element.' (Arnold, 1991b, 280).

Archbishoprics and the lands of the major Dukes and Electors as *de facto* independent territories. Figure A.1 provides a stylized depiction of the political structure of the Holy Roman Empire. It is a simplification: the number of independent sovereign entities within the Holy Roman Empire is unknown, but is estimated to have exceed one thousand, but it captures the most important distinctions between the secular princes such as the Count Palatine of the Rhine or the Duke of Saxony, the Archbishops, the Bishops, and the Imperial Free Cities. The Holy Roman Emperor's claim of ownership over all Jews within the empire was central to the overall assertion of imperial authority.[48] The fate of the Jews during the Black Death pogroms therefore encapsulates the failure of the emperor to assert his claims to sovereignty over the religious and secular princes of the empire.
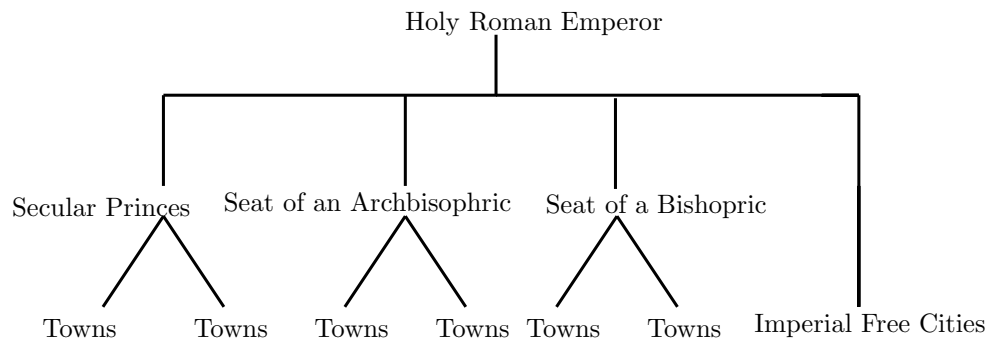
Figure A.1: A stylized depiction of the political structure of the Holy Roman Empire. The Imperial Free Cities includes both Free Cities and Imperial Cities.

---

[48]Jordan (1998) discusses how asserting rights to tax all Jews in the realm was one of the ways that Philip Augustus asserted royal authority in France during the previous century.

A.3 Select Summary Statistics

Table A.1: Summary Statistics

	All Towns	Imperial Free City	Archbishopric Seat	Bishopric Seat
Urbanization	0.3053	0.2798	0.3583	0.2269
Wheat Suitability	0.5402	0.611	0.5612	0.3658
Ruggedness	16.7698	11.3604	14.2352	17.6522
Trade Routes	0.1147	0.2093	0.4	0.25
Navigable Rivers	0.1441	0.093	0.8	0.3125
Previous Pogroms	0.2058	0.2326	0.6	0.1875
Textile Production	0.1265	0.093	0.2	0
Grain Production	0.0559	0	0.2	0
Wine Production	0.2794	0.279	0.4	0

Table A.2: Balance Table

Variable	Untreated	Mean	Treated	Mean	Mean Difference
Previous Pogroms	276	0.196	64	0.250	-0.054
Ruggedness	276	17.607	64	13.158	4.449*
Wheat Suitability	276	0.539	64	0.546	-0.007
Navigable Rivers	276	0.130	64	0.203	-0.073
Trade Routes	276	0.087	64	0.234	-0.147***
Textile Production	276	0.138	64	0.078	0.060
Wine Production	276	0.293	64	0.219	0.075
Grain Production	276	0.065	64	0.016	0.050
Urbanization	276	0.313	64	0.273	0.040*

Table Notes: Treated communities include communities located in either Imperial Free Cities, seats of Bishoprics or seats of Archbishoprics. Untreated communities refer to all other communities.

Table A.3: Pogrom Intensity

Pogrom Intensity	Description	Frequency
1	Spared	37
2	Expelled	98
3	Few deaths	112
4	Many deaths	47
5	Destroyed	46
Total		340

A.4 Additional Tables

Table A.4: Jewish Wealth

	Dependent Variable: Pogrom Intensity (1-5)					
	(1)	(2)	(3)	(4)	(5)	(6)
	OLS			Ordered Probit		
Imperial Free City	0.831***	0.834***	0.808***	0.795***	0.797***	0.770***
	(0.269)	(0.258)	(0.236)	(0.282)	(0.270)	(0.252)
Archbishopric Seat	1.150***	1.153***	1.152***	1.153***	1.152***	1.150***
	(0.274)	(0.285)	(0.241)	(0.374)	(0.389)	(0.343)
Bishopric Seat	0.953***	0.981***	0.933***	1.046***	1.081***	1.047***
	(0.233)	(0.220)	(0.222)	(0.286)	(0.273)	(0.282)
Synagogue	0.0286			0.0542		
	(0.124)			(0.120)		
Settlement Age		-0.0271			-0.0285	
		(0.0485)			(0.0494)	
Proximity to the Rhine			0.328			0.361
			(0.331)			(0.346)
Baseline Controls	Yes	Yes	Yes	Yes	Yes	Yes
Previous Pogroms	Yes	Yes	Yes	Yes	Yes	Yes
Plague Spread	Yes	Yes	Yes	Yes	Yes	Yes
Observations	340	340	340	340	340	340
Adj. / Pseudo R^2	0.281	0.282	0.285 8	0.116	0.116	0.118

Table Notes: Columns 1 and 4 control for the presence of a synagogue. Columns 2 and 5 include a variable of 100 times the age of the settlement. Columns 3 and 6 include a dummy that takes a value of 1 if the community is within 5 kilometers of the Rhine and 0 otherwise. Robust standard errors clustered on the political unit level in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A.5: Alternative Institutions

	(1)	(2)	(3)	(4)	(5)	(6)
	Dependent Variable: Pogrom Intensity (1-5)					
	OLS			Ordered Probit		
Imperial Free City	0.854***	0.815***	0.828***	0.817***	0.776***	0.796***
	(0.267)	(0.266)	(0.264)	(0.285)	(0.278)	(0.272)
Archbishopric Seat	1.192***	1.234***	1.145***	1.195***	1.244***	1.143***
	(0.298)	(0.250)	(0.289)	(0.404)	(0.352)	(0.390)
Bishopric Seat	0.953***	0.946***	0.961***	1.058***	1.043***	1.068***
	(0.222)	(0.230)	(0.227)	(0.277)	(0.282)	(0.296)
Lothringia	-0.398			-0.372		
	(0.237)			(0.263)		
Prince-Elector		-0.184			-0.219	
		(0.242)			(0.257)	
$\ln(DistancetoPrague)$			0.0781			0.297
			(0.143)			(0.446)
Baseline Controls	Yes	Yes	Yes	Yes	Yes	Yes
Previous Pogroms	Yes	Yes	Yes	Yes	Yes	Yes
Plague Spread	Yes	Yes	Yes	Yes	Yes	Yes
Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	340	340	340	340	340	340
Adj. / Pseudo R^2	0.185	0.181	0.180	0.118	0.117	0.117

Table Notes: Results in Columns 1 and 4 include a dummy that takes a value of 1 if the community was in the Lothringian border. In Columns 2 and 5, we control for whether the owner was a prince-elector. In Columns 3 and 6 we include a variable for the natural log of the distance from the settlement to Prague. Robust standard errors clustered on the political unit level in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A.6: Religious Institutions

| | Dependent Variable: Pogrom Intensity (1-5) | | | |
| | (1) | (2) | (3) | (4) |
	OLS		Ordered Probit	
Imperial Free City	0.827***	0.822***	0.781***	0.773***
	(0.227)	(0.223)	(0.241)	(0.234)
Archbishopric Seat	1.255***	1.231***	1.170***	1.142***
	(0.231)	(0.224)	(0.335)	(0.312)
Bishopric Seat	0.761***	0.761***	0.804***	0.801***
	(0.185)	(0.189)	(0.223)	(0.223)
Monestaries_dummy	0.118		0.110	
	(0.123)		(0.129)	
Flagellants (10km)		0.0531		0.0317
		(0.235)		(0.223)
Baseline Controls	Yes	Yes	Yes	Yes
Previous Pogroms	Yes	Yes	Yes	Yes
Plague Spread	Yes	Yes	Yes	Yes
Fixed Effects	Yes	Yes	Yes	Yes
Observations	340	340	340	340
Adj. / Pseudo R^2	0.134	0.132	0.071	0.071

Table Notes: Results in Columns 1 and 4 include a dummy that takes a value of 1 if the community was located near a monastery and 0 otherwise. In Columns 2 and 5 we control for the path of the flagellants with a dummy variable that takes a value of 1 if the community was within 10km of the flagellant path and 0 otherwise. Robust standard errors clustered on the political unit level in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A.7: Propensity Score Matching

	ATE (1)	ATET (2)	ATE (3)	Intensity Score ATET (4)	ATE (5)	ATET (6)
Imperial Free City	0.359 (0.395)	0.791*** (0.178)				
Bishopric Seat			0.482 (0.777)	1.500*** (0.407)		
Archbishopric Seat					1.176* (0.658)	2*** (0.239)
Observations	340	340	340	340	340	340

Table Notes: This table reports the propensity score matching average treatment effects and average treatment effects for the treated for the explanatory variables of interest. Columns (1) and (2) present the results for Imperial Free Cities, Columns (3) and (4) present the results for Bishopric Seats and Columns (5) and (6) present the results for Archbishopric Seats. All variables were matched on the following controls: Previous Pogroms, Navigable Rivers, Trade Routes, Urbanization, Wheat Suitability, Ruggedness, Lothringian and Proximity to the Rhine. Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A.8: Alternative Index Specifications

	Dependent Variable: Pogrom Intensity (1-5)					
	(1)	(2)	(3)	(4)	(5)	(6)
		OLS			Ordered Probit	
Imperial Free City	0.547** (0.216)	0.694** (0.300)	0.413 (0.250)	0.739** (0.329)	0.610** (0.300)	0.541 (0.348)
Archbishopric Seat	0.998*** (0.132)	1.088*** (0.362)	0.933*** (0.225)	5.513*** (0.275)	1.086** (0.469)	5.366*** (0.462)
Bishopric Seat	0.746*** (0.191)	0.879*** (0.206)	0.668*** (0.123)	1.083*** (0.292)	0.938*** (0.243)	0.943*** (0.202)
Baseline Controls	Yes	Yes	Yes	Yes	Yes	Yes
Previous Pogroms	Yes	Yes	Yes	Yes	Yes	Yes
Plague Spread	Yes	Yes	Yes	Yes	Yes	Yes
Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	340	340	340	340	340	340
Adj. / Pseudo R^2	0.169	0.191	0.172	0.080	0.069	0.079

Table Notes: This table presents the results of the baseline regression using different index specifications. These alternative specifications are outlined in Table A.9. Columns (1) and (4) use Alternative Index 1. Columns (2) and (5) use Alternative Index 2. Columns (3) and (6) use Alternative Index 3. Robust standard errors clustered on the political unit level in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A.9: Alternative Index Specifications

	Index Value			
	Main	Alternative		
Community's Experience	Specification	Specification		
		(1)	(2)	(3)
Spared	1	1	1	1
Expelled	2	2	3	3
Few killed	3	3	2	2
Many killed	4	4	4	4
Massacred	5	4	5	4

Table A.10: Binary Intensity Scores

| | OLS | | | Logit | | |
	(1)	(2)	(3)	(4)	(5)	(6)
Imperial Free City	0.251***	0.395***	0.305***	1.295***	2.196***	2.627***
	(0.0612)	(0.121)	(0.0607)	(0.386)	(0.651)	(0.359)
Archbishopric Seat	0.392***	0.616***	0.192	0	0	0.884
	(0.0800)	(0.0659)	(0.221)	(.)	(.)	(1.553)
Bishopric Seat	0.281**	0.362***	0.217*	1.623**	2.269***	1.794**
	(0.110)	(0.0920)	(0.110)	(0.739)	(0.436)	(0.822)
Baseline Controls	Yes	Yes	Yes	Yes	Yes	Yes
Previous Pogroms	Yes	Yes	Yes	Yes	Yes	Yes
Plague Spread	Yes	Yes	Yes	Yes	Yes	Yes
Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	340	340	340	321	313	314
Adjusted R^2	0.065	0.202	0.185	0.097	0.245	0.340

Table Notes: This table presents OLS results and logit for binary coding of the pogrom persecution values. The dependent variable for Columns 1 and 4 is a dummy variable that takes a value of 1 if the community experienced a fatal pogrom and 0 otherwise. Columns 2 and 5 presents the results with a dependent variable that takes a value of 1 if many (or all) Jews died and 0 otherwise. In Columns 3 and 6 the dependent variable is a dummy variable that takes a value of 1 if the community was massacred and 0 otherwise. Robust standard errors clustered on the political unit level in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A.11: Varying the Sample

	Dependent Variable: Pogrom Intensity (1-5) OLS					
	(1)	(2)	(3)	(4)	(5)	(6)
Imperial Free City	0.640***	0.882*	0.884***	0.907***	0.808***	0.833***
	(0.166)	(0.499)	(0.214)	(0.232)	(0.232)	(0.244)
Archbishopric Seat	1.075***	1.373***	1.155**	1.266***	1.194***	1.199***
	(0.243)	(0.282)	(0.434)	(0.263)	(0.248)	(0.242)
Bishopric Seat	0.675***	0.709***	0.861***	0.632	0.797***	0.697***
	(0.200)	(0.197)	(0.190)	(0.431)	(0.181)	(0.207)
Dropped Region	Franconia	Lorraine	Swabia	Saxony	Thuringia	Bavaria
Baseline Controls	Yes	Yes	Yes	Yes	Yes	Yes
Previous Pogroms	Yes	Yes	Yes	Yes	Yes	Yes
Plague Spread	Yes	Yes	Yes	Yes	Yes	Yes

	Ordered Probit					
	(7)	(8)	(9)	(10)	(11)	(12)
Imperial Free City	0.578***	0.809	0.858***	0.864***	0.753***	0.790***
	(0.152)	(0.516)	(0.229)	(0.243)	(0.241)	(0.254)
Archbishopric Seat	0.870***	1.293***	1.042*	1.166***	1.089***	1.153***
	(0.282)	(0.366)	(0.556)	(0.363)	(0.348)	(0.342)
Bishopric Seat	0.691***	0.765***	0.895***	0.745	0.856***	0.690***
	(0.199)	(0.237)	(0.218)	(0.457)	(0.215)	(0.227)
Dropped Region	Franconia	Lorraine	Swabia	Saxony	Thuringia	Bavaria
Baseline Controls	Yes	Yes	Yes	Yes	Yes	Yes
Previous Pogroms	Yes	Yes	Yes	Yes	Yes	Yes
Plague Spread	Yes	Yes	Yes	Yes	Yes	Yes
Observations	250	267	294	310	319	320
Adjusted R^2	0.107	0.127	0.161	0.142	0.147	0.131

Table Notes: In this Table we systematically exclude the most populous political units from our analysis. Columns 1 and 7 excludes Franconia (where 90 Jewish communities were located. Columns 2 and 8 exclude the Dutch of Lorraine. Columns 3 and 9 exclude the Duchy of Swabia. Columns 4 and 10 drop the Duchy of Saxony. Columns 5 and 11 exclude the Langrave of Thuringia. Finally Columns 6 and 12 exclude the Duchy of Bavaria. Robust standard errors clustered on the political unit level in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A.12: Sample Selection Issues

| | Dependent Variable: Pogrom Intensity (1-5) | | | | | | | |
| | OLS | | | | Ordered Probit | | | |
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Imperial Free City	0.695***	0.551***	0.455*	0.409**	0.647***	0.483***	0.416*	0.342*
	(0.184)	(0.151)	(0.217)	(0.183)	(0.175)	(0.145)	(0.213)	(0.179)
Archbishopric Seat	1.358***	0.998***	1.151***	0.874***	1.290***	0.931***	1.190***	0.871***
	(0.219)	(0.250)	(0.153)	(0.226)	(0.243)	(0.321)	(0.208)	(0.329)
Bishopric Seat	0.688***	0.624***	0.863***	0.802***	0.640***	0.599***	0.882***	0.853***
	(0.166)	(0.169)	(0.174)	(0.191)	(0.163)	(0.177)	(0.211)	(0.228)
Ln(EntryLength)	0.202*		0.283**		0.170		0.266**	
	(0.110)		(0.109)		(0.110)		(0.115)	
Citations		0.0110**		0.0136***		0.0118**		0.0154***
		(0.00409)		(0.00296)		(0.00528)		(0.00465)
Baseline Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Previous Pogroms	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Plague Spread	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Fixed Effects	No	No	Yes	Yes	No	No	Yes	Yes
Observations	340	340	340	340	340	340	340	340
Adjusted R^2 /Pseudo R^2	0.100	0.120	0.162	0.181	0.036	0.054	0.090	0.107

Table Notes: In this table we present the OLS and Ordered probit results for our baseline regression after controlling for two measures of possible sample selection: the length of the entry and number of citations in *Germania Judaica*. Robust standard errors clustered on the political unit level in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A.13: Sample Selection Issues

	Dependent Variable: Pogrom Intensity (1-5)			
	(1)	(2)	(3)	(4)
	OLS		Ordered Probit	
Imperial Free City	0.695***	0.551***	0.647***	0.483***
	(0.184)	(0.151)	(0.175)	(0.145)
Archbishopric Seat	1.358***	0.998***	1.290***	0.931***
	(0.219)	(0.250)	(0.243)	(0.321)
Bishopric Seat	0.688***	0.624***	0.640***	0.599***
	(0.166)	(0.169)	(0.163)	(0.177)
Ln(EntryLength)	0.202*		0.170	
	(0.110)		(0.110)	
Citations		0.0110**		0.0118**
		(0.00409)		(0.00528)
Baseline Controls	Yes	Yes	Yes	Yes
Previous Pogroms	Yes	Yes	Yes	Yes
Plague Spread	Yes	Yes	Yes	Yes
Fixed Effects	No	No	No	No
Observations	340	340	340	340
Adj. / Pseudo R^2	0.100	0.120	0.036	0.054

Table Notes: In this table we present the OLS and Ordered probit results for our baseline regression after controlling for two measures of possible sample selection: the length of the entry and number of citations in *Germania Judaica.*Robust standard errors clustered on the political unit level in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

|	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Dependent Variable: Pogrom Intensity (1-5)							
	Intensity Scores (OLS)				Randomized Intensity Scores (OLS)			
Randomized Imperial Free City	0.0355	0.0427	0.0437	0.0412				
	(0.183)	(0.183)	(0.179)	(0.202)				
Randomized Bishropic	-0.310	-0.322	-0.331	-0.250				
	(0.320)	(0.336)	(0.355)	(0.406)				
Randomized Archbisophric	-0.137***	0.0475	0.0742	0.0776				
	(0.0371)	(0.0546)	(0.0636)	(0.0874)				
Imperial Free City					0.227	0.189	0.211	0.181
					(0.333)	(0.377)	(0.377)	(0.376)
Archbishopric Seat					-0.230	0.0545	0.182	0.397
					(0.304)	(0.475)	(0.497)	(0.578)
Bishopric Seat					-0.483	-0.551	-0.512	-0.389
					(0.399)	(0.376)	(0.351)	(0.312)
Baseline Controls	No	Yes	Yes	Yes	No	Yes	Yes	Yes
Previous Pogroms	No	No	Yes	Yes	No	No	Yes	Yes
Plague Spread	No	No	No	Yes	No	No	No	Yes
Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	340	340	340	340	340	340	340	340
Adjusted R^2	0.050	0.083	0.082	0.108	-0.009	-0.004	-0.002	0.012

Table Notes: This table replicates our baseline OLS analysis for randomly assigned Imperial Free Cities, Bishoprics and Archbishoprics and a randomly generated intensity score measure. Columns (1)-(4) report our OLS estimates using randomized treatments. In Columns (5)-(8) we report our results using a randomized intensity score. Baseline controls include whether a community was close to navigable rivers or land routes, measures of textile, wine, and grain production, urbanization, wheat suitability, and ruggedness. Fixed Effects refer to larger political unit fixed effects. Robust standard errors clustered on the political unit level in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$
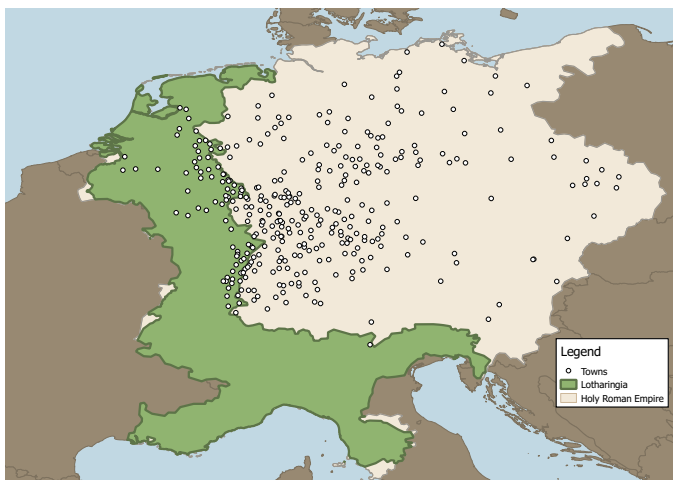
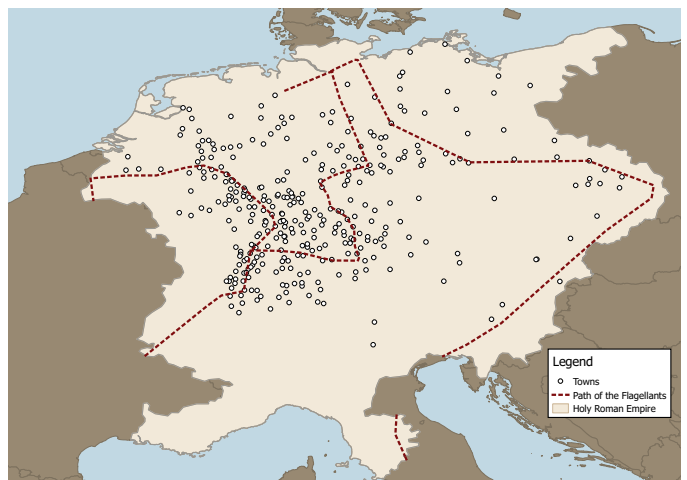Figure A.2: Additional Maps
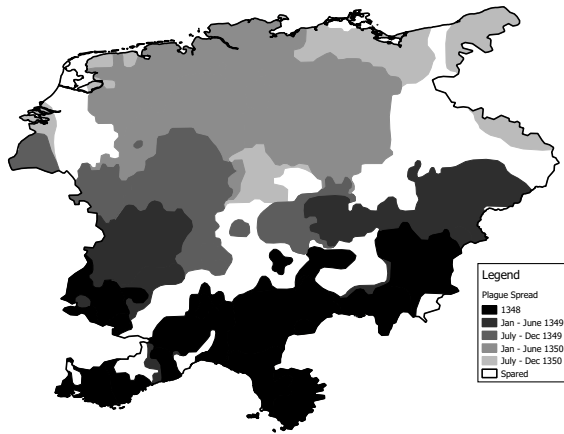

(a) Navigable Rivers and Trade Routes.
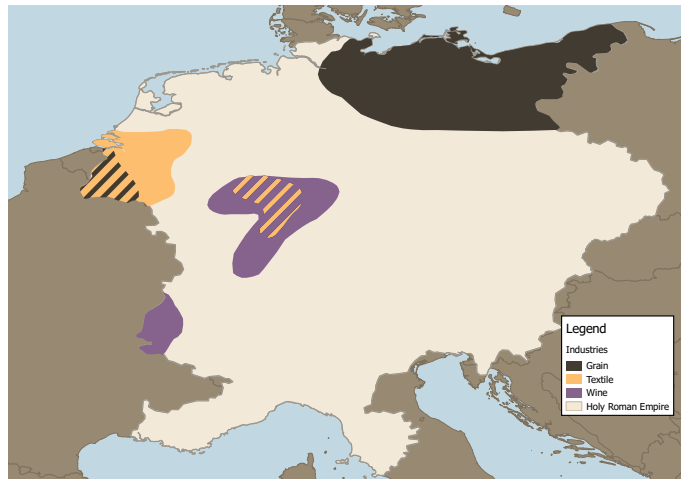
(b) Industrial Centers.

(c) The borders of Lotharingia.

(d) Path of the Flagellants.

Figure A.3: The Black Death and Pogrom Incidence

| | Plague Spread | | |
Year	Month	Frequency	
	Pre-1349	4	
1349	Jan-Mar	4	
	Apr-June	54	
	July-Sept	148	
	Oct-Dec	29	
1350	Jan-Mar	56	
	Apr-June	85	
	July-Sept	30	
	Oct-Dec	5	
Spared from plague or later		34	

Table notes: "Spared or later" category includes communities that experienced the plague after 1350.

(a) Spread of the Black Plague between 1348 and 1350

(b) Distribution of the spread of the Black Plague

Source: Christakos et al. (2005) and Germania Judaica.

Table A.15: Interactions with Previous Pogroms

	Dependent Variable: Pogrom Intensity (1-5)			
	(1)	(2)	(3)	(4)
Free Imperial City	0.749***	0.718**	0.689***	0.661**
	(0.204)	(0.252)	(0.210)	(0.261)
Archbishopric Seat	0.699*	0.280	0.582*	0.241
	(0.359)	(0.469)	(0.339)	(0.474)
Bishopric Seat	0.701***	0.876***	0.730***	0.958***
	(0.152)	(0.171)	(0.171)	(0.212)
Previous Pogrom	-0.00703	-0.0836	-0.0228	-0.111
	(0.236)	(0.224)	(0.210)	(0.198)
Past Pogrom*Free Imperial City	0.328*	0.496**	0.405**	0.612***
	(0.158)	(0.191)	(0.179)	(0.231)
Previous Pogroms	Yes	Yes	Yes	Yes
Plague Spread	Yes	Yes	Yes	Yes
Fixed Effects	No	Yes	No	Yes
Observations	340	340	340	340
Adj. / Pseudo R^2	0.103	0.188	0.0	0.1

Table Notes: In this table we present the OLS and Ordered probit results for our baseline regression including an interaction term for previous pogroms in communities ruled by Free Imperial Cities. The interaction term of archbishoprics and bishoprics is dropped due to collinearity. The interact term is significant but it does not detracted from the coefficient we obtain for our main explanatory variables in our baseline specification.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

A.5 Tables with Odds Ratios

Table A.16: Baseline Results: Odds Ratios

	Dependent Variable: Pogrom Intensity (1-5)			
	(1)	(2)	(3)	(4)
	Ordered Probit: Odds Ratios			
Imperial Free City	4.249***	4.225***	4.239***	4.750***
	(2.88)	(2.86)	(3.01)	(2.82)
Archbishopric Seat	15.17***	8.780***	8.932***	7.499***
	(6.05)	(3.07)	(3.67)	(3.03)
Bishopric Seat	6.050***	5.134***	5.167***	6.351***
	(3.70)	(3.63)	(3.77)	(3.64)
Baseline Controls	No	Yes	Yes	Yes
Previous Pogroms	No	No	Yes	Yes
Plague Spread	No	No	No	Yes
Fixed Effects	Yes	Yes	Yes	Yes
Observations	340	340	340	340
Adj. / Pseudo R^2	0.100	0.120	0.036	0.054

Table Notes: In this table we present the Odds Ratios for the Baseline Regression presented in Table 1. Robust standard errors clustered on the political unit level in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A.17: Major Political Houses: Odds Ratios

	Dependent Variable: Pogrom Intensity (1-5)			
	(1)	(2)	(3)	(4)
	Ordered Probit: Odds Ratios			
Imperial Free City	6.665***	6.616***	6.654***	7.404***
	(4.05)	(3.89)	(4.08)	(3.53)
Archbishopric Seat	23.43***	14.44***	14.97***	13.02***
	(6.45)	(3.92)	(4.74)	(4.06)
Bishopric Seat	8.725***	7.211***	7.303***	9.342***
	(4.29)	(4.28)	(4.46)	(4.53)
Habsburg	4.924***	4.597***	4.631***	5.710***
	(4.38)	(4.26)	(4.26)	(4.69)
Luxembourg	0.663	0.429*	0.433*	0.478
	(-0.90)	(-2.28)	(-2.19)	(-1.83)
Wettin	2.888	2.647	2.665	2.860
	(1.42)	(1.31)	(1.35)	(1.27)
Wittelsbach	1.363	1.390	1.368	1.356
	(1.04)	(0.87)	(0.74)	(0.78)
Wurtemberg	1.054	1.026	1.006	1.083
	(0.15)	(0.07)	(0.02)	(0.32)
Baseline Controls	No	Yes	Yes	Yes
Previous Pogroms	No	No	Yes	Yes
Plague Spread	No	No	No	Yes
Fixed Effects	Yes	Yes	Yes	Yes
Observations	340	340	340	340
Adj. / Pseudo R^2	0.100	0.120	0.036	0.054

Table Notes: In this table we present the Odds Ratios for the Major Houses Regression presented in Table 2. Robust standard errors clustered on the political unit level in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A.18: Alternative Institutions: Odds Ratios

	Dependent Variable: Pogrom Intensity (1-5)			
	(1)	(2)	(3)	(4)
	Ordered Probit: Odds Ratios			
Imperial Free City	5.152**	4.580**	5.053**	4.730**
	(2.89)	(2.75)	(2.73)	(2.83)
Archbishopric Seat	8.382**	9.272***	7.577**	7.223**
	(3.00)	(4.03)	(3.24)	(2.84)
Bishopric Seat	6.391***	6.244***	6.438***	6.536***
	(3.70)	(3.55)	(3.59)	(3.47)
Lothringia	0.459			
	(-1.70)			
Prince-Electors		0.639		
		(-0.83)		
Monasteries			1.451	
			(1.32)	
ln(*Distance to Prague*)				1.679
				(0.57)
Baseline Controls	No	Yes	Yes	Yes
Previous Pogroms	No	No	Yes	Yes
Plague Spread	No	No	No	Yes
Fixed Effects	Yes	Yes	Yes	Yes
Observations	340	340	340	340
Adj. / Pseudo R^2	0.100	0.120	0.036	0.054

Table Notes: In this table we present the Odds Ratios for the Baseline Regression presented in Table A.5. Robust standard errors clustered on the political unit level in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$