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Religion, Division of Labor and Conflict:
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Religion, Division of Labor and Conflict:
Anti-Semitism in German Regions over 600 Years [*]

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Anti-Semitism continues to be a widespread societal problem rooted deeply in history. Using novel city-level data from Germany for more than 2,000 cities and county-level data, we study the role of economic incentives in shaping the co-existence of Jews, Catholics and Protestants. The Catholic ban on usury gave Jews living in Catholic regions a specific advantage in the moneylending sector. Following the Protestant Reformation (1517), the Jews lost this advantage in regions that became Protestant but not in those regions that remained Catholic. We show that 1) the Protestant Reformation induced a change in the geography of anti-Semitism with persecutions of Jews and anti-Jewish publications becoming more common in Protestant areas relative to Catholic areas; 2) this change was more pronounced in cities where Jews had already established themselves as moneylenders; 3) the Reformation reduced the specialization of Jews in the financial sector in Protestant regions but not in Catholic regions. We interpret these findings as evidence that, following the Protestant Reformation, the Jews living in Protestant regions lost their comparative advantage in lending. This change exposed them to competition with the Christian majority leading, eventually, to an increase in anti-Semitism.

Keywords: Anti-Semitism, Religion, Conflict, Division of Labor

JEL classification: Z12, O18, N33, N93, D73

I. Introduction

Anti-Semitism continues to be a widespread societal problem[1] that is deeply rooted in history.[2] Although a large body of literature has documented the cultural[3] and political[4] determinants of this phenomenon, little has been said about its economic roots. The aim of this article is to document how economic incentives have contributed to shaping the geography of anti-Semitism.

The economic underpinnings of ethnic/religious hostility have a long pedigree in disciplines as different as history, sociology, economics and political science. A large part of this literature has underlined the importance of business and labor rivalries in explaining ethnic conflicts and has focused on the role of labor division as a major determinant of the quality of inter-ethnic relations (see Bonacich (1972, 1973) and Horowitz (1985, p.113)). To the extent that the ethnic division of labor reduces competition among ethnicities in the local labor and product markets, it might also shield societies from internal ethnic tensions. Recently, Jha (2010, 2013) has argued that an ethnic division of labor is sufficient to reduce ethnic tensions when the specific advantage of a certain ethnicity cannot be replicated or expropriated by the others.

Can this theoretical framework explain the emergence and persistence of anti-Semitism? More specifically, can the presence or absence of complementarities in the labor market between the Jewish minority and the majority populations explain the variation in anti-Semitic sentiments and violence over time and regions?

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[1] On both sides of the Atlantic, major reports by US and EU bodies confirm that anti-Semitism continues to be a concern (see US Department of State (2005) and European Union Agency for Fundamental Rights (2013)).

[2] Although the term anti-Semitism was coined in the 19th century, anti-Jewish sentiments and massacres date back to classical times. According to the Roman historian Suetonius, Jews were expelled from Rome in 19 CE. The Jewish philosopher Philo of Alexandria describes an attack on Jews in Alexandria in 38 CE, in which several thousands of Jews were killed. There is evidence of anti-Jewish writings in Alexandria starting from 270 BCE (Feldman (1996)).

[3] Voigtländer and Voth (2015) find large effects of the Nazi indoctrination between 1933 and 1945 on the anti-Semitic beliefs of Germans in 1996 and 2006. Voigtländer and Voth (2012) document an exceptional geographic persistence in patterns of anti-Semitism, showing that German cities that experienced anti-Jewish pogroms in 1348 also showed higher levels of anti-Semitism in the inter-war period. Menache (1985) analyzes the importance of the blood libels and the stereotypes of Jews in explaining the expulsion of Jews from England and France in the 13th and 14th centuries.

[4] Scapegoat theories have long been used to explain outbreaks of violence against the Jews. The theory is that in periods of political and economic distress, politicians find it useful to deflect blame to the Jewish minorities. A large body of empirical literature has documented how anti-Semitism in European history responded to adverse climatic shocks (Anderson, Johnson and Koyama (2015)) and major outbreaks of the Black Death between 1348 and 1350 (Cohn (2007) and Breuer (1988) and Finley and Koyama (2016)).

To answer these questions, we use a natural experiment of history and document a historical episode in which the division of labor between the Jewish minority and the rest of the population had a crucial, causal role in shaping the geography of anti-Semitic sentiments. We focus on German history between 1300 and 1900. The Catholic ban on usury prevented Catholics from lending at interest (starting from the Catholic Council of the Lateran in 1215) while allowing the Jews to do so.[5] This gave Jews living in Catholic regions a specific advantage in the moneylending sector.[6] Following the Protestant Reformation in 1517, the German lands split between Catholics and Protestants (see Becker and Woessmann, 2009). Protestant views on usury were less restrictive, and Protestant moneylending was allowed (or at least tolerated). Hence, whereas in Catholic areas complementarities between Catholics and Jews persisted (and, in fact, were reinforced following the Catholic Council of Trent, held between 1545 and 1563, which equated usury with murder)[7], in Protestant areas Jews lost their prerogatives in the moneylending sector.

How did this change in complementarities between the Jewish minority and the rest of the population affect Jewish history? We show that following the Protestant Reformation, Jews became more specialized in finance and banking in Catholic Germany compared with Protestant Germany. Moreover, anti-Semitism increased in Protestant Germany relative to Catholic Germany, and this relative increase was more accentuated in areas in which Jewish moneylending was established before the Reformation, serving an important role in the economy.

To document these facts, we use three different datasets.

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[5] Canon 67 of the Lateran Council states, "Jews may not charge extortionate interest", but they *may* charge interest.

[6] From the entry "Germany" in the Encyclopedia Judaica (edited by Cecil Roth and Geoffrey Wigoder): "[In the twelfth and thirteenth centuries], the city guilds forced the Jews out of the trades and the regular channels of commerce; this coincided with the stricter appliance of the church ban on usury [...]. The combination of circumstances made serving as moneylenders and pawnbrokers the main occupation of Jews in Germany. [...] Moneylending, conceived by the Church as usury, became the hallmark of Jewish life in Germany". Earlier, Israel Abrahams (1896) wrote that "when the medieval Jews devoted themselves largely to commerce and moneylending, they were not obeying a natural taste nor a special instinct, but were led to these pursuits by the force of the circumstances, by exclusive laws, and by the express desire of kings and people."

[7] From the Catechism of the Council of Trent: "To this class also belong usurers, the most cruel and relentless of extortioners, who by their exorbitant rates of interest, plunder and destroy the poor. Whatever is received above the capital and principal, be it money, or anything else that may be purchased or estimated by money, is usury; for it is written in Ezechiel: He hath not lent upon usury, nor taken an increase; and in Luke our Lord says: Lend, hoping for nothing thereby. Even among the pagans, usury was always considered a most grievous and odious crime. Hence the question, 'What is usury?' was answered: 'What is murder?' And, indeed, he who lends at usury sells the same thing twice, or sells that which has no real existence."

First, we assemble a large panel dataset on pogroms and other anti-Semitic behavior with observations available every century from 1300 to 1900 for more than 2,000 German cities. We use these data to document that pogroms, the killings of Jews, and expulsions of Jewish communities increased in Protestant Germany relative to Catholic Germany following the Reformation.

Second, we assemble data on all known books and pamphlets published in German cities between 1450 and 1600. We use these data to construct a panel measure of anti-Semitic attitudes in 10-year intervals, and we provide quantitative evidence of the change in these attitudes in Germany following the Protestant Reformation. We find that the number of books with anti-Semitic titles printed in Protestant Germany increased relative to Catholic Germany following the Protestant Reformation.

The fact that the Reformation had a large impact on anti-Jewish attitudes and acts does not necessarily support our theory; that is, the Reformation's large impact on anti-Semitism could have stemmed from many channels unrelated to the division of labor between the Jewish minority and the Christian majority. For example, Martin Luther himself denounced the Jewish people and urged their persecution.[8] To support our theory, we have collected further city-level data on Jewish moneylending and sectorial specialization of the economy of the city before the Reformation. We use a difference-in-difference-in-differences analysis to show that the increase in anti-Semitism in Protestant areas relative to Catholic areas that followed the Reformation occurred exclusively in those cities in which the Jews had been moneylenders. This result corroborates the view that the Protestant Reformation had an impact on anti-Semitism through its effects on the ethics of usury; in cities in which Jews were not moneylenders, it did not produce any relevant impact. Notice that we do not assume that the cities in which Jews were moneylenders in 1500 are randomly distributed as, in all regressions, we control for city fixed effects and for the interaction between Jewish lending before 1500 and time fixed effects. A

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[8] In his book "On the Jews and their Lies," Martin Luther proposes the following actions against the Jews: "First, to set fire to their [the Jewish] synagogues or schools […] Second, I advise that their houses also be razed and destroyed. [..] Third, I advise that all their prayer books and Talmudic writings, in which such idolatry, lies, cursing, and blasphemy are taught, be taken from them. [...] Fourth, I advise that their rabbis be forbidden to teach henceforth on pain of loss of life and limb [...] Fifth, I advise that safe-conduct on the highways be abolished completely for the Jews. For they have no business in the countryside [...] Sixth, I advise that usury be prohibited to them, and that all cash and treasure of silver and gold be taken from them [...] But if we are afraid that they might harm us or our wives, children, servants, cattle, etc., [...] then let us emulate the common sense of other nations such as France, Spain, Bohemia, etc., and eject them forever from the country."

potential concern of this analysis is that we might still capture a lower bound of the impact of the Protestant Reformation in cities with Jewish lending. In fact, in these cities, although the rise of business rivalries might have increased anti-Semitism, the presence of a powerful Jewish bourgeoisie might have partially shielded the Jewish minority. To solve this problem, we use new data on the economic specialization of the city before 1500 to capture a measure of "need" for moneylending. We then use these data on sector specialization as instruments for Jewish lending before 1500. In this case, we are *not* assuming that the sector specialization in 1500 of German cities was random. Cities that specialized in different sectors differed across several dimensions, which are captured by the city fixed effects. Moreover, we add sector-by-century fixed effects in the regression to control for the fact that the geography of pogroms might have evolved differently for cities that specialized in different sectors.

In the last part of the paper, we use data on a cross-section of 452 counties in Prussia, the dominant state of the German Empire. We first isolate exogenous variation in Protestantism in the late 19th century using distance to Wittenberg,[9] where the Reformation was initiated and from where it spread in a concentric way. Second, we find that Protestantism had a strong positive effect on the vote shares for anti-Semitic parties in 1890, 1893 and 1898 in OLS regressions and IV regressions using distance to Wittenberg as instrumental variable. This finding complements our previous findings on the role of the Protestant Reformation in changing the geography of Anti-Semitism. Finally, using the 1882 Prussian occupational census, we find that the Reformation exerted a negative effect on the share of Jewish workers in banking and finance. This finding confirms that the Reformation reduced the comparative advantage of Jews in these sectors in Protestant areas at the same time as comparative advantages persisted in Catholic areas.

In summary, using a combination of city-level and county-level data, we show that the Protestant Reformation induced the following changes: 1) Jewish pogroms, the expulsion of Jews and anti-Semitic attitudes (captured by anti-Jewish publications and votes for anti-Semitic parties) worsened in regions that became Protestant compared to those that remained Catholic. 2) This increase in anti-Semitism in Protestant regions was more accentuated in regions in which

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[9] The identification strategy parallels the one used by Becker and Woessmann (2009), who argue that the spread of the Reformation around Luther's town of Wittenberg captures a part of the variation of Protestantism that is exogenous. They corroborate this identifying assumption by showing that distance to Wittenberg is unrelated to a series of proxies for economic and educational development before 1517.

Jewish moneylending had been established before the Reformation. 3) Jewish involvement in finance and banking decreased in the Protestant regions relative to the regions that remained Catholic.

We interpret these findings as evidence that with the Reformation, the Jews lost their comparative advantage in lending. This change exposed them to competition with the Christian majority and led to an increase in ethnic and religious hostility toward the Jews.

The paper proceeds as follows. Section II gives the historical background. Section III presents our data sources. Section IV gives the empirical results at the city level. Section V exploits the cross-sectional data on Prussian counties. Concluding remarks close the paper.

II. Historical background

In the first three centuries CE, there is no evidence of a systematic Christian ban on usury. It was in the First Ecumenical Council at Nicaea in 325 AD that the prohibition against usury entered Canon Law. The prohibition was limited to the clergy, and usury was defined as excessive interest.[10] Charlemagne extended the definition of usury to every loan that charged interest ("where more is asked than is given") and prohibited usury to everyone in his empire. With the Synod of Pavia in 850 AD, this prohibition entered Canon Law.[11] The Second (1139) and the Third (1179) Lateran Councils strongly reaffirmed the interest ban.[12] The immorality of interest was also asserted by St. Thomas Aquinas.[13] This put a tight lock on the practice of usury,

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[10] Canon 17 in the First Council of Nicaea: "Forasmuch as many enrolled among the Clergy, following covetousness and lust of gain, have forgotten the divine Scripture, which says, He has not given his money upon usury, and in lending money ask the hundredth of the sum [as monthly interest], the holy and great Synod thinks it just that if after this decree any one be found to receive usury, whether he accomplish it by secret transaction or otherwise, as by demanding the whole and one half, or by using any other contrivance whatever for filthy lucre's sake, he shall be deposed from the clergy and his name stricken from the list."

[11] The Synod of Pavia prescribed excommunication of lay usurers and called for restitution of interest to their victims.

[12] Canon 13 in the Second Lateran Council: "We condemn that practice accounted despicable and blameworthy by divine and human laws, denounced by Scripture in the old and new Testaments, namely, the ferocious greed of usurers; and we sever them from every comfort of the church". Canon 25 in the Third Lateran Council: "Nearly everywhere the crime of usury has become so firmly rooted that many, omitting other business, practice usury as if it were permitted, and in no way observe how it is forbidden in both the Old and New Testament. We therefore declare that *notorious* usurers should not be admitted to communion of the altar or receive Christian burial if they die in this sin."

[13] This is the answer given by St. Thomas Aquinas in the Second Part of the Summa Theologica (1274) to the question of whether usury is a sin: "To the objection, that a man may take a price for what he is not bound to do; but a man with money is not in every case bound to lend it, it is to be said that he who is not bound to lend may receive compensation for what he has done in lending, but ought not to exact more. But compensation is given him according to the equality of justice, if the exact amount is returned to him that he has lent."

"which would put the church in a theoretical bind for centuries because his writings were considered among its highest philosophical and theological teachings" (Geisst, 2013, p. 51).

Canon Law applied to the Catholics. In the words of Geisst (2013, p.23), "as canon law developed, an 'otherness' would come to characterize Jews and other moneylenders[14] who did not follow the precepts of the church." Jewish moneylending was tolerated. In fact, by forbidding the Jews to lend for an immoderate profit,[15] the Fourth Lateran Council de facto authorized them to lend for a moderate profit. Why did the Catholic Church tolerate Jewish usury? St. Thomas Aquinas gives the answer in the Summa Theologica: Jews were permitted to lend money to avoid the even greater danger that Christians would practice usury[16] (Geisst 2013, p. 51; Poliakov, 1977, p.26).

The Catholic tolerance towards Jewish lending, together with the fact that the city guilds forced the Jews out of their traditional occupations[17] in German cities in the 12th and 13th centuries, implied that moneylending and pawnbroking became the main occupations of the Jews in Germany.[18] The main specialization of Jews in German regions continued to be in finance and banking until the 19th century (for details, see the entry "Germany" in the Encyclopedia Judaica).[19]

With the Protestant Reformation, the German religious landscape changed dramatically. After a period of turmoil following the start of the Reformation in 1517 in Luther's city of Wittenberg, the Imperial Diet held in 1555 in Augsburg adopted the principle "Cuius regio, eius religio" ("Whose rule, his religion"). This meant that denominational choices were made only by the rulers of the large number of territories that constituted the fragmented German Empire at the

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[14] Jewish moneylenders were competing in the Middle Ages with the Lombards and Cahors. Originally, these two groups were Arians and, as such, did not acknowledge the Council of Nicaea. They were considered heretics and therefore fell outside Canon Law (Geisst, 2013, p. 23).

[15] Canon 67 in the Fourth Lateran Council: "Wishing, therefore, in this matter to protect the Christians against cruel oppression by the Jews, we ordain in this decree that if in the future under any pretext Jews extort from Christians oppressive and immoderate interest, the partnership of the Christians shall be denied them till they have made suitable satisfaction for their excesses."

[16] "As for their taking usury of strangers, that was not granted them as a thing lawful, but permitted for the avoidance of a greater evil" (Aquinas, 1274).

[17] For the impact of the city guilds on Jewish urban occupations in the German context, see Ogilvie (2014).

[18] According to Botticini and Eckstein (2007, 2011, 2014), the early specialization of Jews in urban occupations was the result of their higher levels of human capital with respect to the Christian population. The research by Botticini and Eckstein covers the time until 1492, before the Protestant Reformation.

[19] A similar transition of Jews from their traditional occupations (dyers, silk weavers and traders) to moneylending occurred in Italy. For a detailed description of the Italian context, see Pascali (2016).

time of the Reformation.[20] The Reformation brought about two important changes with respect to moneylending and the relationship between Christians and Jews. First, Jones (2004, p.87) argues that Luther "was principally opposed to lending money at interest, but made provisions for the practise, Calvin supported and defended the habit of usury, except in a few inherently unloving circumstances." Protestants were thus allowed (or at least tolerated) to engage in moneylending (see also Hattenhauer, 2015). Second, Protestants, with their emphasis on education (see Becker and Woessmann, 2009), acquired human capital that equipped them with the education necessary to enter highly skilled occupations such as moneylending.

The combination of these factors in Protestant areas might have disrupted the inter-ethnic complementarities that existed between Jews and Christians (who were all Catholic before the Reformation).[21] In a sense, the Reformation made Jews "redundant" in the moneylending business in Protestant areas, whereas they continued to provide inter-ethnic complementarities in banking in Catholic areas. In fact, in Catholic areas, the interest ban was, if anything, strengthened[22] during the Counter-Reformation, and it survived until the 18th century.[23]

According to our hypothesis, this should have led to a relative increase in anti-Jewish acts in Protestant areas versus Catholic areas following the Protestant Reformation, and this increase should have been driven by areas in which Jewish lending had been more relevant to the local

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[20] See Becker and Woessmann (2009) for historical details and long-term consequences of the Reformation on literacy and economic development from a regional perspective.

[21] It should be stressed that in Germany, Protestantism is mostly of the Lutheran type. For instance, in Prussia (the largest state by far), Lutherans constitute 94% of all Protestants, and only 6% of Protestants are Reformed Protestants. However, there are larger numbers of Calvinists in Southern Germany. As mentioned earlier, Luther's and Calvin's views on usury differed (see Jones, 2004), at least in their emphasis or toleration of everyday practice.

[22] De Roover (1948) writes, "In the sixteenth century, however, a reaction set in, apparently in an attempt to counteract the spread of the Reformation. The Church reaffirmed its traditional doctrine on the matter of usury and reverted to the uncompromising attitude, which had prevailed prior to the fifteenth century. The secular authorities, however reluctantly, continued to issue licenses, but the Church henceforth refused to grant dispensation to the Lombards. They were, and remained, excommunicated. According to Charles V's ordinance of January 30, 1546 (n.s.), licensed usurers were forbidden to attend mass or to enter any church under the penalty of forfeiting their licenses. The same prohibition applied to anyone who was in partnership with them, who owned a share in their *tables de prêt*, or who participated in their management" (De Roover, 1948: 151).

[23] In 1745, in the *Encyclica Vix Pervenit*, Pope Benedict XIV writes, "The sin [in usury] rests on the fact that sometimes the creditor desires more than he has given. Therefore he contends some gain is owed him beyond that which he loaned, but any gain which exceeds the amount he gave is illicit and usurious." In the following years, the Catholic definition of usury changed. Starting from the work of Scipione Maffei (whose "*Dell' impiego dell danaro*", i.e. "On the use of money", was widely discussed), usury is defined as "any increment – not beyond the principal – but beyond the moderate rate allowed by law or customs. The new definition represented a radical departure from the basic norms of scholastic economics" (De Roover, 1955). Finally, in 1830, the Church too abandoned punishment of usurers, although it did not formally revoke the usury doctrine (see Geisst, 2013).

population.[24] In the empirical section, we document the impact of the Reformation on the involvement of the Jewish minority in finance and banking. We also document anti-Jewish acts over the centuries and consider whether there was a changing pattern across Protestant and Catholic areas and across areas with more or less "need" for lending following the Reformation.

III.   Data and Descriptive Statistics

In the empirical section of this paper, we test three hypotheses: 1) the Protestant Reformation induced more killings of Jews, expulsions of Jews and anti-Jewish publications in the regions that became Protestant relative to the regions that remained Catholic; 2) this change was related to the fact that Jews lost their prerogatives in moneylending, and therefore it was accentuated in cities in which Jewish moneylending was established before the Reformation; and 3) Jewish involvement in finance and banking decreased disproportionally more in the Protestant regions than in the Catholic regions.

To empirically test these hypotheses, we need a wealth of data. We discuss various data sources in turn and provide more detailed information on how we coded key variables in the Data Appendix.

III.A. City-level data: 1300-1900

Our main sources for data about Jewish communities in Germany are Germania Judaica (1963–2009) and Alicke (2008). We consult the Encyclopedia Judaica (2007) for comparison as it only covers the largest Jewish communities, whereas Germania Judaica and Alicke cover all Jewish communities, large or small. Germania Judaica covers the period before the Reformation, whereas Alicke covers the entire period and thus constitutes our main source for the post-Reformation period. Germania Judaica is richer in breadth and allows us to measure, for instance, Jewish moneylending before the Reformation, which we use in our analysis. Anti-Semitic acts and Jewish presence are the key variables in our basic set of regressions. Other city-level data come from the *Deutsches Städtebuch*, a series of volumes edited by Erich Keyser (1939–1974) that provide information on each city in the German Empire incorporated prior to the compilation of the *Städtebuch*. The *Städtebuch* covers 2,344 cities. In most of our analysis,

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[24] Notice that even before the Reformation, Jews were by no means sheltered from attacks. Pogroms against Jews broke out occasionally, such as after the Black Death in 1348–50, for which Jews were partly blamed.

we follow Cantoni and Yuchtman (2014) and concentrate on the subset of 2,254 cities in the Holy Roman Empire.[25] These cities are depicted in **Figure A.1**. We now describe these sources and include details of the coding of variables in the Data Appendix.

1. Germania Judaica

We use volumes 2 and 3 of Germania Judaica, covering the centuries before the Protestant Reformation. These books contain city-level information for all Jewish settlements in the German Empire. Data collection started at the beginning of the 20th century and was initiated by the "Society for the Advancement of Jewish Studies" (*Gesellschaft zur Förderung der Wissenschaft des Judentums*). City-specific articles were drafted by a consortium of historians from across the German Empire to facilitate access to local archival sources. Volume 1, covering the years until 1238, was completed before World War II, and work on volumes 2 and 3 resumed after World War II. Voigtländer and Voth (2012) introduced *Germania Judaica* into the economics community. To be precise, they used volume 2. We go beyond their work by using a more extensive list of cities (to link the data with all cities covered in the *Deutsches Städtebuch* described below). We code information on pogroms not only in 1348-49 but at any point in the 14th and 15th century and beyond, using Germania Judaica 3 as well. We also code information about Jewish lending. Specifically, we define, century by century, the following variables: a) Jewish presence (minor Jewish settlements of less than 10 families and larger Jewish communities of 10 or more families); b) the persecution of Jews (expulsion of parts of the Jewish community; expulsion of the whole community; killings of parts of the Jewish community; killings of the whole Jewish community); and c) Jewish lending activity. Of course, absence of proof of Jewish lending activity is not proof of absence, but to our knowledge, Germania Judaica is the best available data. Note that we choose to code data century by century because the sources often do not provide more precise information than that. In some cases, entries might only state that there is "evidence of a Jewish community during the x-*th* century."

2. Alicke (2008)

Because the Germania Judaica project has only covered the period until 1519 (up to the Reformation), we draw on Alicke (2008) for the later centuries. This source was first introduced in the economics literature by Voigtländer and Voth (2012). It is an equally impressive collection

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[25] In robustness checks, we use all 2,344 cities, including those in East Prussia, outside the Holy Roman Empire.

of more than 4,600 pages on Jewish history covering thousands of cities. We use it to code Jewish presence and the persecution of Jews in the post-Reformation period in the same way as we do with Germania Judaica. Unfortunately, Alicke does not capture Jewish lending activity in a systematic way. Again, the Data Appendix gives examples of the coding of our variables based on Alicke.

3. *Deutsches Städtebuch*

The *Deutsches Städtebuch* is our source for variables that enter our regressions either as control variables or as instrumental variables. Anti-Semitism might be "collateral damage" of war activity in which cities are involved. We code information from the *Städtebuch* to capture whether there was a battle near a city; whether the city was besieged, sacked, partially destroyed, completely destroyed, or occupied; or whether the city was involved in a war (elsewhere).

To the extent that Protestant Reformers emphasized education (see Becker and Woessmann, 2009), education may have increased or decreased anti-Semitism depending on whether more educated Protestants increasingly competed with already well-educated Jews or whether education helped to reduce conflict potential. The *Städtebuch* contains information about the presence of a school, which is the best indicator available to capture schooling in a city.

Pogroms may be more likely to happen in larger cities if larger populations can be equated with a higher probability of inter-religious conflict. The *Städtebuch* has population data for less than half of all city-by-century observations, so this particular analysis is limited to an unbalanced panel of cities for which population data are available.

To the extent that lending activity was more important in some cities than in others, depending on the sector specialization, we code information about salient industries, as described in the *Städtebuch*. We use sector specialization before the Reformation as instrumental variables to predict Jewish lending activity before the Reformation. The Data Appendix gives examples of how we code these variables.

Table 1, Panel A shows descriptive statistics for the sample of 2,254 cities over six centuries (i.e., for 13,524 observations). For instance, on average, 8.7 percent of city-century observations have evidence of a Jewish community of 10 families or more. Importantly, the share of city-century observations with evidence of any Jewish presence, also fewer than 10 families, is considerably higher. Appendix **Table A.1** shows both indicators side by side. In the 14th century, 29 percent of cities show evidence of a Jewish presence, compared to just six

percent with a Jewish community of 10 or more families. By the 19th century, 39 percent of cities have evidence of Jewish presence, and 29 percent have a Jewish community of 10 or more families. Table 1 also shows that on average, 6.1 percent of city-century observations have evidence of any pogroms (i.e., killings or expulsions of Jews). Again, Table A.1 divides this indicator for categories of pogroms and by century.[26] **Figures A.2 to A.7** show the geographic distribution of cities with Jewish communities and pogroms over six centuries. Turning to military conflicts, the most common type are sackings, which affect 8.7 percent of city-by-century observations. There is evidence for the presence of a school for 54 percent of city-by-century observations for which there is information on schools in the *Städtebuch* (12,714 out of 13,524 observations). Table A.1 shows the school information by century and separately for Protestant and Catholic cities. Finally, population information can be obtained for 5,618 city-by-century observations, ranging from half a dozen inhabitants in a small town to 172,132 for Berlin at the beginning of the 19th century.

Table 1, Panel B presents a cross-sectional view of the same set of 2,254 cities for variables for which we use no variation over time. Protestant in 1546 is a dummy variable based on a detailed map in Zeeden (1984) showing the denomination of the ruler in the year 1546, which we digitized. This map for 1546 also underlies all maps displayed in Figures A.2 to A.8. Just over half of the 2,254 cities had a Protestant ruler in 1546. Jewish lending activity before 1500 is documented for 12 percent of the cities, or just under half of the cities with any presence of Jews (see Table A.1, showing a share of 29 percent of cities with Jewish presence in the 14th century and 26 percent in the 15th century.) The cities with documented Jewish lending before 1500 are displayed in **Figure A.8**. As for the sector structure of cities, 31.1 percent of cities have evidence of manufacturing before 1500, 16.4 percent list agriculture as a salient sector, 15.3 percent were important trading cities, and 4.6 percent mention other salient (service) sectors.

III.B. Anti-Jewish sentiment in books: 1450-1600

The Universal Short Title Catalogue (USTC) produced at the University of St. Andrews (2012) is the primary source of data on book and pamphlet editions that were published around the Protestant Reformation. The USTC is designed as a universal catalogue of all known books

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[26] Additionally, Table A.1 shows data separately for Protestant and Catholic cities (defined on the basis of whether a city was Protestant or Catholic in 1546).

printed in Europe in 1450-1600 and provides information for each book on the city in which it was published, the language and the year of publication.

Data on the number of anti-Jewish books published in each city/decade were constructed as follows. First, we downloaded the USTC catalogue for all books in German and Latin that were published in the cities in our sample. We identified a total of 88,517 books with complete information about the city and year of publication (40,758 in German and 47,759 in Latin). Second, we identified 5,000 books in the USTC that were clearly not anti-Jewish. Third, we used Christian Wolf's (1715) Bibliotheca Hebraea, a comprehensive catalogue of books printed before 1715 that has a dedicated section listing anti-Jewish content, to identify 201 anti-Jewish books published in either Latin or German. Fourth, we used the books identified as either anti-Jewish or not (the "training sample") to measure the distribution of words across the two categories of books. Generally, the titles of these books provide extended descriptions of the contents.[27] This allowed us to determine which features of language are important in identifying anti-Jewish books. Fifth, we used the Naïve Bayesian text algorithm to construct a ranking of books based on their probability of being anti-Jewish. Finally, we computed the total number of books in each city/decade that were classified among the top 0.2 percent[28] in terms of probability of being anti-Jewish.

The naïve Bayesian classifier is a probabilistic classifier that applies Bayes' theorem to compute the probability that a certain text pertains to a certain category under the assumption that words are conditionally independent of each other.[29] For instance, assume that a title is made of n words $X_1..X_n$; then,

$$\frac{P(antiSemitic\ |title=X_1..X_n)}{P(book\ antiSemitic)} = \frac{\Pi_{i=1}^n P(X_i|antiSemitic)}{\Pi_{i=1}^n P(X_i)}. \tag{1}$$

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[27] The median title in our data has 22 words (mean=23.75) and 159 characters (mean=176.65). See **Table A.2** in the Appendix.

[28] We choose this value because it minimizes the probability of classifying a book as either being anti-Jewish when it is not or not being anti-Jewish when it is within the training sample. In all the regressions, the choice of this cut-off affects the estimated constant but not the other coefficients.

[29] Many empirical comparisons between naïve Bayes and more complicated decision tree algorithms showed that the naïve classifier is one of the most efficient and effective classifiers for machine learning and data mining, even if the conditional independence assumption is rarely true in real-world applications (see Kononenko (1990), Langley, Iba and Thomas (1992), and Pazzani (1996)). Recent articles have shown that there are sound theoretical reasons for the apparently implausible efficiency of naïve Bayes classifiers (see Roth (1999), Hand and Yu (2001) and Zhang (2004)).

Notice that $P(X_i|antiSemitic)$ and $P(X_i)$ can be computed for every i once we have defined an initial set of books that are anti-Jewish and an initial set of books that are not. We then use the estimated $\frac{P(antiSemitic\,|title=X_1..X_n)}{P(book\,antiSemitic)}$ to construct a ranking of books from those with a higher probability of being anti-Jewish to those with the lowest probability.

To understand the type of books that are categorized among the top 0.2 percent in terms of probability of being anti-Jewish by the algorithm, here are some examples:[30]

- *"De veritate fidei christianae libri quinque in quibus de religionis nostrae fundamentis contra Ethicos Judaeos Agarenos sive Mahumetanos et perverse christianos plurima subtilissime simul atque exactissime disputantur."* [31]

- *"Epistola contra Judaeorum errores."* [32]

- *"Ratschlag ob Christlicher Obrigkeit gebueren muege das sie die Jueden unter den Christen zu wonen gedulden und wo sie zu gedulden welcher gestalt und mass."* [33]

- *"Frage. Ob ein rechtgleubiger Christ mit Unchristen als mit Juden Tuercken heiden oder mit offentlichen uberfuerten ketzern muege Buergerliche gemeinschafft haben mit inen essen und trincken"* [34]

There is a printing of at least one edition of a German or Latin language book in 149 German cities over the decades 1451-1600 (see **Figure A.10)**. This corresponds to 2,235 city-by-decade observations. As shown in **Table 1, Panel C**, the average number of books printed per city-by-decade observation is 39.4, ranging from zero in decades without printing to 1,719 editions in just one decade. The average number of editions with predicted anti-Semitic content is 0.117, ranging between zero and 9 editions. Our main estimation sample for the analysis of book titles is the set of cities that have at least 10 book editions over the decades 1451-1600, a total of 106 cities, for 1,590 city-by-decade observations. We run robustness regressions on the set of all

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[30] **Figure A.9** reports the word cloud for anti-Jewish Latin books. Not surprisingly, the most common words are "Contra" and "Iudei" ("Against" and "Jews"). Among the most frequent words, we also see "Errores" ("Mistakes"), "Adversus" ("Enemy"), Perfidia ("Perfidy"), "Foenore" ("Usury"), and "Infidels" ("Infidels").

[31] "Five books on the truth of the Christian faith, which discuss the fundamentals of our religion against Pagans, Jews, Muslims and on the side of the Christians in a keen and accurate way."

[32] "Letter against the Jewish mistakes."

[33] "Advice as to whether Christian rulers should permit Jews to live among Christians and where and to what extent they might be tolerated."

[34] "Question. Whether a righteous Christian should be allowed to have community or eat and drink with non-Christians such as Jews, Turks and heathens or with convicted heretics."

2,254 cities, on the set of 149 cities with at least one print edition in 1451-1600 and on the set of 63 cities with at least 100 editions during 1451-1600.

III.C. Prussian county data at the end of the 19th century

For the post-Reformation period, we also draw on Prussian census data (Becker et al. 2014) to study, in one cross-section, in more details, the link between Protestant Reformation, occupational specialization and anti-Semitism. The county-level data available for Prussia in the 19th century are generally viewed as a unique source of highest-quality data for micro-regional analyses (Galloway, Hammel, and Lee (1994)). Data during the 1880s and 1890s are available for 452 counties, displayed in **Figure A.11**. The Prussian Occupation Census of 1882 contains information on the number of Catholics, Jews, and Protestants in the population and in the work force in different occupations. The simplest and most obvious outcome is to look at the share of Jews in the county population to capture the residential pattern of Jewish communities at the end of the 19th century. This can be seen in **Figure A.12**. In contrast to our city-level dataset, for which we were only able to code binary indicators for the presence of small or large Jewish communities, the Prussian census data provided exact head counts. The Occupation Census also allowed us to compute the degree of occupational specialization of various religious groups. Our main outcome variable to capture Jewish occupational specialization in finance was the share of those working in "banking and insurance" (briefly, finance) who were Jews. As the descriptive statistics in **Table 1, Panel D**, show, the average share of Jews in finance across Prussian counties was 9.4 percent, which must be compared with the share of Jews in the Prussian population of only 1.1 percent. **Figure A.13** displays the regional distribution of this variable. The Occupation Census gives separate data on banking and insurance and has two hierarchical levels: the higher hierarchical level is labeled "self-employed and directors," and the lower level includes all other employees. Table 1 reveals that among the self-employed and company directors in banking alone, Jews constituted 27.5 percent, on average. **Figure A.14** displays the regional distribution of this variable.

We ran regressions with and without control variables. These were drawn from the 1871 Population Census previously used by Becker and Woessmann (2009). Control variables were the share of the population aged below 10, the share of females, the share born in the municipality, the share of Prussian origin, average household size, log population size, a dummy

variable for counties that are currently in Poland, and the share of the county population living in urban areas.

Election results for anti-Semitic parties are also important outcomes of interest. We use election results for the German Reichstag elections in 1890, 1893 and 1898. In 1890, for the first time, the anti-Semitic party stood for election to the Reichstag and was listed in the sources as *Anti-Semiten*. After being renamed, it was listed in 1893 as *Deutsche Reformpartei* (*Anti-Semiten*). In 1898, three anti-Semitic parties ran in the German Empire, but sources report their total vote count as *Anti-Semiten* (*Deutsche Reformpartei, Anti-Semiten, Christlich-soziale Partei*). We are interested in studying in which precincts candidates of those parties first stood for office (the extensive margin) and the vote share they obtained (the intensive margin). **Figures A.15, A.16** and **A.17** display the regional distribution of votes for anti-Semitic parties in 1890, 1893, and 1898.

IV.   Results based on city-level data

Our discussion of city-level data is presented in two parts. First, we show how pogroms against Jews changed over the course of six centuries in a basic difference-in-differences setup without control variables. We then probe the robustness of these results with respect to three factors: a) military conflict; b) education; and c) city size. Then, we consider the decades before and after the Reformation by examining anti-Jewish sentiment based on the titles of books printed in Protestant and Catholic cities across Germany to document the geographic shift in anti-Semitic sentiment before and after 1517 in towns with printing presses. We then return to the larger set of cities and consider economic factors involved in the shift in anti-Semitism from Catholic to Protestant cities in the century before and after the Reformation.

IV.A. City-level data: 1300-1900

We start with a basic difference-in-differences setup:

$$Y_{it} = \alpha Prot_i Post_t + X_{it}'\beta + \gamma_i + \gamma_t + \varepsilon_{it}, \qquad (2)$$

where *i* is a city in the *Städtebuch*, and *t* is one of six centuries t=1300-1400, …, 1800-1900. $Post_t$ is a dummy variable for the centuries 1500-1600 and later. $Prot_i$ denotes whether a city

was Protestant a few decades after the Reformation in 1546. X_{it} denotes a vector of control variables. Importantly, all regressions use city and century fixed effects. To the extent that there are any unexplained time-constant differences between cities in their likelihood of persecuting Jews, they are addressed by city fixed effects. We cluster standard errors at the city level.

We also estimate a more flexible specification that takes the following form:

$$Y_{it} = \sum_t \alpha_t Prot_i + X'_{it}\beta + \gamma_i + \gamma_t + \varepsilon_{it}, \qquad (3)$$

where we let the coefficient on the interaction term vary over the centuries. It is important to note that in this specification, the estimated coefficient α_t must be measured relative to a baseline time period, which we take to be the 14th century.

Table 2 displays the results of this regression for two outcomes. Columns 1 to 3 use pogroms (expulsions or killings of Jews) as the dependent variable, and columns 4 and 5 consider the presence of a Jewish community. In columns 1 and 4, the centuries 1300-1400 and 1400-1500 are combined as pre-Reformation, and all centuries from 1500 to 1900 are combined into a post-Reformation period. These regressions only have one difference-in-differences coefficient that shows how anti-Semitic acts (column 1) and Jewish presence (column 4) differ before and after the Reformation across cities that became Protestant and those that remained Catholic. Column 1 shows that after the Reformation, cities that became Protestant experienced an increase in anti-Semitic acts relative to cities that remained Catholic. The difference of 5 percentage points is quite substantial considering that the average frequency of city-by-century observations with anti-Semitic acts is six percent. In column 2, we use the fully fledged version of equation (1), where coefficients vary by century. The results of this regression are also displayed in **Figure 1**. This specification is interesting for two reasons. First, it allows us to check whether there is a pre-trend in anti-Semitism before the Reformation. Second, it allows us to see whether there is a shift in anti-Semitism immediately after the Reformation or whether it takes time to develop. Relative to the base century 1300-1400, Protestant cities are not more likely to have pogroms in 1400-1500, the century just before the Reformation. The coefficient of 0.0176 is small and statistically insignificant. This finding supports the hypothesis that the simple pre-post Reformation difference-in-differences setup in column 1 does not identify a secular trend but rather a genuine shift after the Reformation. At the same time, the pogrom

intensity is larger in Protestant cities from the Reformation century 1500-1600, and the coefficients in subsequent centuries are roughly of the same size. Column 3 adds a control for the presence of a Jewish community. This is by no means a tautological control variable because pogroms can happen in the absence or presence of a Jewish community; Jews might be persecuted when on business in a city even in the absence of a local Jewish community. The results show that anti-Semitic acts are not driven by the indicator of the presence of a Jewish community.

Columns 4 and 5 consider the presence of a Jewish community as an outcome variable. There does not seem to be an effect on the presence of Jewish communities in our century-specific regressions, except in the last century 1800-1900, when they are less frequent in Protestant areas. We will consider the 19th century separately when examining Prussian census data at the county level, which allows us to measure exactly the size of the Jewish population. For now, the relevant finding is that there was no immediate shift in the location pattern of Jewish communities after the Reformation, but Jews were subject to more persecution in Protestant areas after the Reformation.[35]

The results in Table 2 might be driven by confounding factors. One factor that comes to mind is that some cities might be involved in war activities more often and that these violent activities might affect the Jewish community in the city or Jews coming to the city on business. In **Table 3**, column 1, we control for different indicators of war activity in which a city is involved. Although some indicators of war activities affect the pogrom intensity, the main difference-in-differences coefficient remains unaffected. War activities do not explain away the Reformation effect identified in Table 2.

Column 2 examines the importance of education, which ex ante could go both ways. Although the presence of a school is associated with more pogroms, again, the main difference-in-differences coefficient remains unaffected.

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[35] The Appendix tables show robustness checks for three alternative samples: all cities in the *Städtebuch*, including those in East Prussia (**Table A.3**); all cities that had a Jewish community at least once during the years 1300-1900 (**Table A.4**); and all cities that had a Jewish community at least once during the years 1300-1500 (**Table A.5**). **Table A.7** shows the results of an additional exercise: using the sample of cities used by Voigtländer and Voth (2012), we run a two-period difference-in-differences regression (pogroms in 1349 and anti-Semitic acts in the 1920s-1930s) and find similar evidence as in our larger panel. (**Table A.6** shows descriptive statistics for this sample.)

Finally, we control for population size. As described in the data section, population data are available for less than half of city-by-century observations in our data. We first show, in column 3, that our results hold up in this smaller subsample. The coefficient estimate in the first row is nearly unaffected, but statistical significance drops just below the 10 percent significance level. Now, using this subsample, we include population data as a control variable and show that the main results remain the same. The point estimate in the first row remains the same, and population size as such does not seem to matter for pogrom incidence.

We take the combined results in Tables 2 and 3 as evidence that the Reformation brought about a change in the geography of anti-Semitism, namely, a shift toward Protestant cities. This shift is not explained by pre-trends or different location patterns of Jews before or after the Reformation or by war activities, education or population size. We argue that this shift relates to economic factors, and we document this in section V.C. However, before doing so, we want to further examine the Reformation period to determine whether the shift in anti-Semitic sentiments developed over time or could be seen quite soon after 1517. To this end, we use book titles from which we infer anti-Jewish content.

IV.B. Anti-Semitism in book titles: 1451-1600

The decades before and after the Reformation are particularly interesting. Although our main analysis covers several centuries, we also pay particular attention to the decades around the Reformation. In particular, for the decades from 1451 to 1600, we capture city-level anti-Jewish attitudes using new data on the anti-Jewish books and pamphlets that were published in the city. The underlying assumption is that the books produced measure the supply of and demand for content in that city.[36] The use of anti-Jewish publications as a measure of anti-Semitism has two advantages with respect to using the number of pogroms. First, pogroms, though terrible, do not occur at very high frequency.[37] Second, pogroms do not occur in cities that did not host Jewish

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[36] Dittmar (2011) cites Edwards (1995), who observes, "If, for example, there was an interest in Strasbourg for a work first published in Wittenberg, it was more common for a printer in Strasbourg to reprint the work than it was for the printer in Wittenberg to ship a large number of copies [500 kilometers] to Strasbourg." Dittmar provides additional evidence that in a first approximation, equating the place of print with local demand for these books is an acceptable assumption.

[37] Only one-quarter of the cities in our sample documented at least one episode of killings or expulsions of Jews over the years 1300-1900.

communities.[38] The main disadvantage of using anti-Jewish publications is the limited number of cities in which books were published.[39]

Using the equivalent of equation (1) at the decade level and restricting the sample to printing cities with books documented in the USTC, we can estimate whether there was a geographic pattern in anti-Semitic printing before and after the Reformation whereby Protestant cities developed differently from Catholic cities. Note that in this exercise, we define "post-Reformation" as 1511 onwards. Although the Reformation took place in 1517, the decade from 1511 to 1520 is the decade of the Reformation, and the printing of Luther's works started immediately after 1517, or within this decade. The results are robust to defining the post-Reformation period as 1521 onward.

Table 4 displays the results of this analysis. As expected, the estimated α is positive, statistically significant and has a value of 0.06. This finding reflects the fact that following the Protestant Reformation, the number of anti-Jewish books published in reformed cities increased by 7 percent, whereas those published in Catholic cities increased by less than 1 percent. Column 2 controls for the total number of books printed in a city. Although controlling for this matters, it is still the case that the coefficient on the number of anti-Semitic books remains statistically significant. In column 3, we allow difference-in-differences coefficients to vary decade by decade. The results of this regression are also displayed in **Figure 2** and show that although the pre-Reformation pattern is flat, a shift occurs just around the Reformation. Starting with the decade 1511-1520, when printing received a boost in the aftermath of the Reformation in 1517 in the second half of this decade, the estimated α coefficients become positive (8 times out of 9 decades) and statistically significant (3 times out of 9 decades). Although the results in columns 1 to 3 consider the set of cities that had at least ten book editions until the year 1600, columns 4 to 6 consider different subsamples. Column 4 repeats the analysis of column 1 for all cities, including those without a printing press. Column 5 considers all cities with a printing press and at least one printed edition of any book until 1600. Column 6 restricts the analysis to cities with at least 100 printed books. In all regressions in columns 4 to 6, the results from column 1 are confirmed.

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[38] In our sample, approximately 45 percent of cities never hosted a Jewish community in the years 1300-1900.
[39] Remember that only 153 cities published at least one book/pamphlet, and 108 (64) cities published more than 10 (100).

IV.C. The Economics of Anti-Semitism in the Century before and the Century after the Reformation

The estimates reported in Tables 2-4 show that Jewish pogroms, expulsions of Jews and anti-Jewish publications increased in Protestant areas relative to Catholic areas following the Protestant Reformation. How is this result related to the change in the ethics of usury induced by the Reformation?

To answer this question, we first divide the sample depending on whether there is evidence of Jewish lending before the Protestant Reformation and re-estimate equation (2). Initially, we consider only the century immediately before and immediately after the Protestant Reformation and measure anti-Semitism as evidence of Jewish expulsions or pogroms in those centuries (we cannot use data on anti-Jewish publications because the cities with a printing press are too few to split the sample and still have enough power to identify the relevant coefficients). The results are illustrated in **Table A.8** in the appendix. There is an increase in anti-Semitism in Protestant cities relative to the Catholic ones, but only in those cities in which the Jews had been moneylenders (columns 5-8), whereas there is no change in the rest of the sample (columns 1-4). This result is robust to controlling for city size (population) and Jewish presence in the city and to extending the sample to the centuries from 1300-1900. This result corroborates the view that the Protestant Reformation had an impact on anti-Semitism through its effects on the ethics of usury.

A more rigorous way to illustrate the differential impact of the Protestant Reformation on anti-Semitism in places in which Jews were moneylenders versus places in which they were not is to estimate the difference-in-difference-in-differences specification reported in the following equation:

$$Y_{it} = \alpha Prot_i Post_t JLend_i + \sum_t \eta_t^P Prot_i + \sum_t \eta_t^{JL} JLend_i + \gamma_i + \gamma_t + X'\beta + \varepsilon_{it}, \quad (4)$$

where $JLend_i$ is a dummy variable that identifies those cities for which there is evidence of Jewish lending before 1500. The second and the third terms on the right-hand side of the equation are summations over all centuries in the sample, except for the first one, which is the reference century. The second term controls for differences in the evolution of anti-Semitism between Protestant and Catholic places, whereas the third one controls for differences in the

evolution of anti-Semitism between cities with and without Jewish lending before 1500. Finally, we control for city- and century-fixed effects, and X is a vector of additional control variables.

Table 5 reports the coefficient on the triple interaction term. In column 1, we limit the analysis to the centuries 1400-1500 and 1600-1700. As shown, the triple interaction is statistically significant (the coefficient is 0.120). Moreover, the coefficient on the Protestant cities in the century 1600-1700 is not statistically significant (this is not reported in the table; the coefficient is 0.015, t-statistic is 1.48). This finding confirms the evidence from Table A.8: the Protestant Reformation induced a shift in anti-Semitism toward Protestant cities, but only in cities in which the Jews were moneylenders.

A potential confounding factor is that Jewish lending before 1500 might be a measure of the level of economic success of the city before 1500. More specifically, our results might capture the fact that the Protestant Reformation could have induced a differential impact on anti-Semitism depending on the level of development of the city. The estimates reported in columns 2 and 3 exclude this possibility. In column 2, we limit the analysis to cities/centuries for which population data are available. Population figures for these cities are our best estimates of their economic success. As shown in column 3, when controlling for population, the main difference-in-difference-in-differences coefficient remains unaffected with respect to column 2.

In columns 4 and 5, we ensure that our results are not driven by changes in the geography of Jewish communities that might be driven by the Protestant Reformation. In column 4, we control for the presence of a Jewish community, and in column 5, we limit the sample to cities that hosted a Jewish community. The results are practically unaffected.

Finally, in column 6, we expand the analysis to all centuries from 1300-1900. The triple interaction is still positive and large, but it is smaller with respect to column 1 and not significant. This might be because the relevant variation that explains our results is between the century before and after the Protestant Reformation. Adding further centuries might increase the noise in the data without adding much additional variation.

Notice that we do not assume that the cities in which Jews were moneylenders in 1500 are randomly distributed. These cities are clearly very different across several dimensions (for instance, they are larger and more involved in trade and manufacturing), which might have an impact on anti-Jewish sentiments and acts. We account for this by controlling for city-fixed effects and for the interaction between Jewish lending before 1500 and century-fixed effects.

However, we might still capture a lower bound of the impact of the Protestant Reformation in cities with Jewish lending. In fact, in these cities, although the rise of business rivalries might have increased anti-Semitism, the presence of a powerful Jewish bourgeoisie might have partially shielded the Jewish minority. In principle, this problem could be solved if we were able to measure the "need" for moneylending rather than the presence of Jewish lenders before the Reformation. To construct such a measure, we use data on the economic specialization of the city. In particular, we construct four dummy variables describing whether there is evidence of specialization in the city before 1500 in agriculture, manufacturing, trade, or other industries, respectively, relative to no industry information at all. We use these data as instrumental variables and estimate equation (4) by 2SLS. We want to emphasize that we are *not* assuming that the sector specialization of German cities in 1500 was random. Cities that specialized in different sectors differed across several dimensions that are captured in the 2SLS regressions by the city fixed effects. Moreover, we add sector-by-century fixed effects in the regression to control for the fact that the geography of pogroms might have evolved differently for cities that specialized in different sectors.

The results are reported in **Table 6**. In column 1, as expected, the difference-in-difference-in-differences coefficient is larger in the 2SLS estimates than in the OLS estimates. Moreover, as with the OLS estimates, 2SLS results are robust when controlling for population size (see columns 2 and 3), controlling for the presence of a Jewish community and limiting the sample to cities that hosted a Jewish community in the time interval of the regression (see columns 4 and 6) and extending the sample to the centuries from 1300-1900 (see column 7).

A potential problem with the 2SLS estimates is that larger cities have more information regarding the industries that operated there before 1500. For this reason, in column 5, we control for the number of industries that are mentioned in the *Städtebuch* as operating in the city before 1500. Again, the results are practically unchanged.

In conclusion, Tables 5 and 6 provide evidence that the increase in anti-Semitism following the Protestant Reformation was concentrated in Protestant areas with a greater need for local moneylenders. This finding is consistent with our assumption that the Catholic ethics of usury partially shielded the Jewish minority in cities in which Jewish moneylenders were particularly needed. When the Reformation erupted, Jews lost their prerogatives in these cities and were exposed to competition with the Christian majority; this eventually resulted in more anti-Semitic

acts. In the next section, we will document how the Protestant Reformation led the Jews to specialize in different sectors while maintaining their specialization in banking and finance in Catholic areas. We will also show that the impact of the Protestant Reformation on the geography of anti-Semitism persisted for at least four centuries and can be used to explain the emergence of the first anti-Semitic parties in the German Empire.

V. 19th-century Prussian county-level data

Census data from Prussia allow us to study in detail the economic geography of Jewish life and anti-Semitism at the end of the 19th century. The Prussian Statistical Office collected an impressive amount of data, the quality of which is generally accepted as having been outstanding already in the 19th century and that have survived at the county level in the archives. Data from various censuses have been digitized and are publicly available in iPEHD (see Becker et al., 2014). Data from the 1882 Occupation Census contain the population number of Jews, Protestants and Catholics as well as their occupational specializations. The data count the number of workers in each of approximately 30 sectors separately by religious denomination. The data also allow us to look separately at those who are self-employed or company directors, so we can also separately examine employment by hierarchical level.

To measure anti-Semitism in the same period, we use election data from elections to the Lower House of the German Empire parliament (the *Reichstag*) where, starting in 1890, anti-Semitic parties ran for parliament. Anti-Semitic candidates did not run in all electoral precincts, giving us the opportunity to look at the extensive margin of anti-Semitic candidates as well as the intensive margin (i.e., the vote share for anti-Semitic candidates).

The dependent variable in **Table 7** is the share of Jews in the county in 1882. Column 1 displays the results from a bivariate regression of the share of Jews on the share of Protestants in a county. The coefficient of -0.00874 indicates that, on average, all-Protestant counties have a Jewish population that is 0.874 percentage points smaller than all-Catholic counties. Comparing this to a Jewish population share of 1 percent in the average Prussian county, this is a considerable difference and indicates that 350 years after the Reformation, Jews in Prussia are much more likely to co-reside with Catholics. Column 2 adds a list of control variables: the share of the population aged below 10, the share of females, the share born in the municipality, the

share of Prussian origin, average household size, log population size, a dummy variable for counties that are currently in Poland, and the share of the county population living in urban areas.

To the extent that the Protestant population share itself is endogenous, we need to use an instrument for Protestantism. Becker and Woessmann (2009) propose distance to Wittenberg as an instrument, exploiting the concentric spread of the Reformation from Wittenberg, the birthplace of the Reformation. Column 3 shows that the share of Protestants falls rapidly with distance to Wittenberg: every 100 km of distance to Wittenberg is associated with a drop of 9.27 percentage points in the share of Protestants. Using the exogenous variation in the share of Protestants generated by distance to Wittenberg, we confirm the negative effect of the share of Protestants on the share of Jews (see column 4). These results are confirmed in columns 5 and 6, where we add the same control variables used in column 2.

In **Table 8**, we look at election results for anti-Semitic parties. Every coefficient displayed in Table 8 stems from separate OLS or IV regressions for elections to the Reichstag in 1890, 1893 and 1898. Because anti-Semitic candidates do not stand in all electoral precincts, we run regressions on the vote share of anti-Semitic candidates as well as on binary indicators of whether anti-Semitic candidates stand in a precinct. Note that in all regressions, we cluster by electoral precinct because electoral precincts are typically composed of two or three counties. All regressions show positive coefficient estimates that are statistically significant in nearly all specifications. The magnitude of the effect in the IV specifications varies from .0307 in 1890 to .131 in 1898; that is, all-Protestant counties, compared to all-Catholic counties, have a 3-percentage-point higher vote share in 1890 and a 13-percentage-point higher vote share in 1898, on average.

Finally, we look at the occupational specialization of Jews. In line with the rest of the paper, we concentrate on Jewish presence in banking and insurance. **Table 9** regresses the share of those working in banking who are Jews on the share of Protestants. The results show that in Protestant counties, Jews are less prominent in the banking and insurance sector than in Catholic counties. This is true both when looking separately at specialization in banking or in insurance as well as for both sectors combined. The results also hold, with smaller coefficient estimates, when we control for the size of the Jewish population. It is not surprising that some of the effect in columns 1 to 3 is driven by the size of Jewish population, which, as documented in Table 7, is larger in Catholic counties. Importantly, even conditional on Jewish population size, the

specialization effect holds. In columns 5 to 8, we look specifically at occupational specialization among the self-employed and company directors. The coefficient estimates are even larger, attesting to an even stronger complementarity between Catholics and Jews at upper hierarchical levels.

Table 10 goes beyond the results in Table 9 in two ways. First, it probes the robustness of the results when considering counties with a certain minimum number of employees in banking and insurance. It is important to note that the banking and insurance sectors were quite small in 1882. On average, 0.07 percent of the labor force worked in banking and insurance.[40] Several counties did not have a single employee (or only one, two, or three) in banking and insurance. It is therefore a useful exercise to consider the subset of counties with at least one, two, three, or four employees. The results in panel A confirm the previous findings: there is a stronger Jewish specialization in banking and insurance in Catholic areas. In panel B, we repeat the analysis of panel A using distance to Wittenberg as an instrument for the share of Protestants in a county. The results are broadly confirmed, although at a somewhat lower level of statistical significance.

Table 11 shows the results of a placebo exercise in which we attempt to determine whether there was a higher degree of Jewish specialization in banking in Catholic areas before the Reformation. We regress a binary variable capturing evidence of Jewish lending before 1500 (based on the city-level information from Germania Judaica) on the share of Protestants in 1882. We find no statistically significant relationship in the OLS regressions in columns 1 and 2 and, if anything, a positive coefficient in IV regressions. We take this as evidence that before the Reformation, there was not a stronger complementarity in Catholic areas compared to Protestant areas, but we do find this after the Reformation.

We can summarize the results in this section as follows: 350 years after the Reformation, the Jewish share of the population is lower in Protestant areas than in Catholic areas. The degree of anti-Semitism expressed by votes for anti-Semitic parties is larger in Protestant areas, and the share of bankers who are Jews is higher in Catholic areas than in Protestant areas, documenting a larger degree of complementarity between Jews and Christians in banking in Catholic areas than in Protestant areas.

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[40] For comparison, the financial sector in Germany today employs approximately 2.5 percent of the workforce.

VI. Conclusion

In the debate on the determinants of anti-Semitism, economic factors have received little attention. Although there is no doubt that cultural and political factors are at play, we show that economic factors also play a role. Using data on German cities and regions over six centuries, we show that the geography of anti-Semitism is related to the geography of economic interactions between the Jewish minority and the Christian majority. The Catholic ethics of usury gave Jews a comparative advantage in moneylending in Catholic regions. This produced a complementarity between Jews and Christians that was broken up in Protestant areas after the Reformation. Jews were by no means sheltered from pogroms even in Catholic areas, as evidenced by the well-known pogroms after the Black Death in 1349, well before the Reformation. However, our results document that anti-Semitic acts and attitudes became relatively more frequent in Protestant areas after the Reformation. We show that this differential effect of the Reformation is driven by the set of cities with documented Jewish lending activity before the Reformation and that Jews lost their prerogatives in banking and finance in Protestant Germany relative to Catholic Germany.

Our findings are important for both researchers and policymakers. For researchers, they provide empirical evidence that systematically identifies the effects of the division of labor on anti-Semitism. Moreover, the dataset that underlies the research provides researchers with a new and extensive source of information covering anti-Semitism in German cities and counties over six centuries. For policymakers who are willing to learn from history, our results suggest that anti-Semitism, and inter-ethnic conflict more generally, does respond to economic incentives. This is an important finding in light of ongoing contemporary ethnic conflicts worldwide.

References

Abrahams, Israel (1896) *Jewish Life in the Middle Ages*. Philadelphia: The Jewish Publication Society of America.

Aquinas, Thomas (1274) *Summa Theologica*.

Alicke, Klaus-Dieter (2008) *Lexikon der jüdischen Gemeinden im deutschen Sprachraum*: Bd.1: Aachen—Groß-Bieberau, Bd.2: Großbock—Ochtendung, Bd. 3 Ochtrup—Zwittau. Gütersloher Verlagshaus.

Anderson, Warren, Noel D. Johnson, and Mark Koyama (2015) Jewish Persecutions and Weather Shocks: 1100-1800, *Economic Journal,* forthcoming.

Becker, Sascha O., Francesco Cinnirella, Erik Hornung, and Ludger Woessmann (2014) iPEHD - The ifo Prussian Economic History Database. *Historical Methods: A Journal of Quantitative and Interdisciplinary History* 47(2): 57-66.

Becker, Sascha O., and Ludger Woessmann (2009) Was Weber Wrong? A Human Capital Theory of Protestant Economic History. *Quarterly Journal of Economics* 124(2): 531-596.

Bonacich, Edna (1972) A Theory of Ethnic Antagonism: The Split of the Labor Market, *American Sociological Review* 37(5): 547-559.

Bonacich, Edna (1973) A Theory of Middleman Miniorities, *American Sociological Review* 38(5): 583-594.

Botticini, Maristella and Zvi Eckstein (2005) Jewish Occupational Selection: Education, Restrictions, or Minorities? *Journal of Economic History*, 65(4): 922–948.

Botticini, Maristella and Zvi Eckstein (2007) From Farmers to Merchants, Conversions and Diaspora: Human Capital and Jewish History, *Journal of the European Economic Association*, 5(5): 885–926.

Botticini, Maristella and Zvi Eckstein (2014) *The Chosen Few: How Education Shaped Jewish History, 70-1492*. Princeton, NJ: Princeton University Press.

Breuer, Mordechai (1988) The "Black Death" and Antisemitism, in: S.Almog (ed.), *Antisemitism Through the Ages*, Oxford: Pergamon Press, pp. 139-151.

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

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

De Roover, Raymond (1948) *Money, Banking and Credit in Medieval Bruges: Italian Merchant-Bankers, Lombards and Money Chargers – A Study on the Origins of Banking*. Cambridge, MA: Medieval Academy of America.

De Roover, Raymond (1955) Scholastic Economics: Survival and Lasting Influence from the Sixteenth Century to Adam Smith, *The Quarterly Journal of Economics* 69(2): 161-190.

Dittmar, Jeremiah (2011) Information Technology and Economic Change: The Impact of The Printing Press, *The Quarterly Journal of Economics* 126 (3): 1133-1172.

Edwards, Mark U. (1995) *Printing, Propaganda, and Martin Luther*. Berkeley: University of California Press.

Encyclopedia Judaica (2006) 22-volume set, 2nd edition. Macmillan Reference USA.

European Union Agency for Fundamental Rights (2013) *Discrimination and hate crime against Jews in EU Member States: experiences and perceptions of antisemitism*. Luxembourg: Publications Office of the European Union.

Feldman, Louis H. (1996) *Studies in Hellenistic Judaism*. Leiden: Brill.

Finley, Thereas and Mark Koyama (2016) Plague, Politics, and Pogroms: The Black Death, Rule of Law, and the persecution of Jews in the Holy Roman Empire, *GMU working paper*.

Galloway, Patrick R. (2007) Galloway Prussia Database 1861 to 1914: PatrickGalloway.com.

Galloway, Patrick R., Eugene A. Hammel, and Ronald D. Lee (1994) Fertility Decline in Prussia, 1875–1910: A Pooled Cross-Section Time Series Analysis, *Population Studies*, 48(1): 135–158.

Geisst, Charles R. (2013) *Beggar Thy Neighbor: A History of Usury and Debt*. Philadelphia: University of Pennsylvania Press.

Germania Judaica, Bd. 1: Von den ältesten Zeiten bis 1238. (Tübingen: J. C. B. Mohr, 1963)

Germania Judaica, Bd. 2: Von 1238 bis zur Mitte des 14. Jahrhunderts (Tübingen: J. C. B. Mohr, 1968).

Germania Judaica, Bd. 3: 1350–1519. 1. Teilband: Aach – Lychen (1987). 2. Teilband: Mährisch-Budwitz – Zwolle (1995). 3. Teilband: Gebietsartikel, Einleitungsartikel, Indices (2003) Tübingen: J. C. B. Mohr, 1987, 1995, 2003).

Germania Judaica, Bd. 4: 1520–1650. Band 2: Landgrafschaft Hessen-Marburg (2009).

Hand, David J. and Keming Yu (2001) Idiot's Bayes - not so stupid after all? *International Statistical Review* 69(3): 385-389.

Hattenhauer, Christian (2015) "»… mehr, dann von der Obrigkeit erlaubt«. – Die Diskussion über Zins und Wucher im Spiegel evangelischer Kirchenordnungen" in *Ordnungen für die Kirche – Wirkungen auf die Welt: Evangelische Kirchenordnungen des 16. Jahrhunderts*, Sabine Arend u. Gerald Dörner (eds.), Tübingen: Mohr Siebeck.

Horowitz, D. L. (1985) *Ethnic Groups in Conflict.* Berkeley: University of California Press.

Jha, Saumitra (2010) A theory of ethnic tolerance. Mimeo, Stanford University.

Jha, Saumitra (2013) Trade, Institutions and Ethnic Tolerance: Evidence from South Asia, *American Political Science Review* 107(4): 806-832.

Jones, David W. (2004) *Reforming the Morality of Usury: A Study of the Differences that Separated the Protestant Reformers*, University Press of America.

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

Kononenko, Igor (1990) Comparison of inductive and naive Bayesian learning approaches to automatic knowledge acquisition. In: Wielinga, B. (ed.), *Current Trends in Knowledge Acquisition*. IOS Press.

Langley, Pat, Wayne Iba, and Kevin Thomas (1992) An analysis of Bayesian classifiers. In: *Proceedings of the Tenth National Conference of Artificial Intelligence*. AAAI Press. 223-228.

Luther, Martin (1543) *Von den Juden und ihre Lügen*.

Menache, Sophia (1985) Faith, myth, and politics: The stereotype of the Jews and their expulsion from England and France, *The Jewish Quarterly Review* 75(4): 351-374.

Ogilvie, Sheilagh (2014) The Economics of Guilds. *Journal of Economic Perspectives* 28(4): 169-192.

Pascali, Luigi (2016) Banks and Development: Jewish Communities in the Italian Renaissance and Current Economic Performance, *Review of Economics and Statistics* 98(1): 140–158.

Pazzani, M. J. (1996) Search for dependencies in Bayesian classifiers. In Fisher, D., and Lenz, H. J., eds., *Learning from Data: Artificial Intelligence and Statistics.* V. Springer Verlag.

Poliakov, Leon (1977) *Jewish bankers and the Holy Sea: from the thirteenth to the seventeenth century*. New York: Routledge.

Preussische Statistik (1875*) Die Gemeinden und Gutsbezirke des Preussischen Staates und Ihre Bevölkerung: Nach den Urmaterialen der allgemeinen Volkszählung vom 1. December 1871*. Berlin: Verlag des Königlichen Statistischen Bureaus.

Preussische Statistik (1884/85) *Die Ergebnisse der Berufsstatistik vom 5. Juni 1882 im preussischen Staat*. Preussische Statistik vol. 76. Berlin: Verlag des Königlichen Statistischen Bureaus.

Roth, Cecil (1960) The European Age in Jewish History. In *The Jews: Their History, Culture, and Religion*, Louis Finkelstein (ed.), 216-249. Philadelphia: Jewish Publication Society of America.

Roth, Dan (1999) Learning in natural language. In *Proceedings of IJCAI'99*. Morgan Kaufmann. 898–904.

US Department of State (2005) Report on Global Anti-Semitism, www.state.gov/j/drl/rls/40258.htm

USTC (2016) Universal short title catalogue, URL http://ustc.ac.uk

Voigtländer, Nico and Hans-Joachim Voth (2012) Persecution Perpetuated: The Medieval Origins of Anti-Semitic Violence in Nazi Germany, *The Quarterly Journal of Economics* 127(3): 1339-1392.

Voigtländer, Nico and Hans-Joachim Voth (2015) Nazi Indoctrination and Anti-Semitic Beliefs in Germany, *Proceedings of the National Academy of Sciences* 112(26): 7931-7936.

Wolf, Johann Christoph (1715-1733): *Bibliotheca Hebraea*, Hamburg: Christian Liebezeit

Zeeden, Ernst W. (1984) *Grosser Historischer Weltatlas: Teil 3. Neuzeit - Erläuterungen*. Munich: Bayerischer Schulbuch-Verlag.

Zhang, H. (2004a), The optimality of naive Bayes. In: *Proceedings of the Seventeenth Florida Artificial Intelligence Research Society Conference*. (pp. 562–567), The AAAI Press.

Data Appendix

City-level data

City-level data are compiled from various sources, described in the main text. Here, we provide further detail and bibliographic references for the sources, and we describe how we coded our variables of interest. Our two sources of data on Jewish communities, anti-Semitic acts, and Jewish lending activity are the multi-volume Germania Judaica (1963–2009) for the pre-Reformation period and Alicke (2008), which covers the whole period but is our only source for the post-Reformation period. Importantly, Alicke and Germania Judaica coincide in capturing pogroms in the pre-Reformation period, but Germania Judaica has additional detail on Jewish lending; therefore, we rely on it for all of the pre-Reformation period.

Figure Data.1 describes how we code Jewish presence, Jewish lending, and pogroms/conflicts using the example of the city of Schwabach:

Figure Data.1: Example of coding of Jewish presence, Jewish lending, and pogroms/conflicts based on the *Germania Judaica* for the city of Schwabach.

We use four different values for the **presence** of a Jewish community in a century:

999 The town is in the book but there is no relevant information about this variable

0 No (explicitly mentioned that Jews are not present in the city in that century)

2 Any mention of Jewish presence in the city

4 Evidence of a community of at least 10 families

Conflicts between Christians and Jews are coded as follows:

999 The town is in the book but there is no relevant information about this variable

0 No (evidence of a secure environment for the local Jewish community)

2 Small expulsion (single individuals or very few families)

4 Large expulsion (at least 3/4 of the community)

6 Some killings

8 Mass killings

In most of our analyses, we define pogroms as evidence of any expulsions or killings, so a value greater or equal than 2 in the categorization above.

Finally, evidence of **Jewish lending** is coded as follows:

999 The town is in the book but there is no relevant information about this variable

0 No (explicitly mentioned that Jews are not engaged in moneylending)

2 Jews explicitly mentioned to be engaged in legal lending

4 Jews explicitly mentioned to be engaged in illegal lending

In most of our analyses, we look at any evidence of Jewish lending, whether legal or illegal. Again, we want to stress a limitation of the data, namely that absence of proof is not proof of absence, but to our knowledge Germania Judaica is the best available data. Also note that we choose to code data century by century because the sources often do not give more precise information than that. In some cases, entries might just state that there is "evidence of a Jewish community during the x-*th* century".

Similarly, we use Alicke (2008) to code up information on Jewish presence and on pogroms, as can be seen in Figure Data.2.

"1337 first mention of a Jew's existence in Schwabach."

"A pogrom supposedly occurred here in 1384."

"Jews began to continuously settle in Schwabach after the 30-years war with an increasing tendency in the 18th century."

```
community_1600_1700 = 2
community_1700_1800 = 4
community_1800_1900 = 4
```

Figure Data.2: Example of coding of Jewish presence, Jewish lending, and pogroms/conflicts based on Alicke (2008) for the city of Schwabach.

Our source for further city-level data is the Deutsches Städtebuch. We use it to code up variables measuring the existence of a school (we note the first year a school is mentioned), a city's involvement in military conflict, important/salient industries in a city's economic activity, and population size. While it seems obvious how we code up the first year a school is mentioned (our measure of a city's human capital investments) and population size, in Figure Data.3 we illustrate how we code information on military activity and Figure Data.4 how we code up industrial structure:

"Looted and destroyed by Wallenstein in 1632."

"several march-throughs during the 30-years war"

Figure Data.3: Example of coding of battles based on the *Deutsches Städtebuch* for the city of Schwabach.

1371: Brewery   ->NACE: 15960
1400: Knife smith   ->NACE: 28610
1572: Needle maker->NACE: 28753
1572: Gold smith   ->NACE: 27410

Figure Data.4: Example of coding of industries based on the *Deutsches Städtebuch* for the city of Schwabach using 5-digit NACE sector codes.

County-level data from Prussia

The county-level data available for Prussia in the 19th century are generally viewed as a unique source of highest-quality data for micro-regional analyses (Galloway, Hammel, and Lee (1994)). We have compiled the county-level data used in this paper from several censuses.

The 1882 Occupation Census

The 1882 Occupation Census (*Berufsstatistik vom 5. Juni 1882*) collected information on employment across two-digit sectors. Employment is listed separately for two groups: first, the self-employed and directors; second, administrative personnel and workers.

We calculate the share of the total labor force working in banking or in banking and insurance. We use the classification provided by the Prussian Statistical Office to classify the two sectors. We also calculate the share of the labor force in banking (or in banking and industry) who are Jews.

The source of the Occupation Census data are the Preussische Statistik (1884/85), Vol. 76c, pp. 284–386. Preussische Statistik (1884/85) Die Ergebnisse der Berufsstatistik vom 5. Juni 1882 im preussischen Staat. Preussische Statistik vol. 76. Berlin: Verlag des Königlichen Statistischen Bureaus.

1871 Population Census

The 1871 Population Census provides information on the share of different religious denominations – in particular, Protestants, Catholics, and Jews – in a county. In addition, the majority of our control variables is drawn from the 1871 Population Census, including a host of

demographic characteristics, literacy rates (measured as the ability to read and write among the population aged 10 years or older), and shares of the population with physical or mental disabilities (blind, deaf-mute, and insane). The source of the 1871 Population Census data is

Preussische Statistik (1875) Die Gemeinden und Gutsbezirke des Preussischen Staates und Ihre Bevölkerung: Nach den Urmaterialen der allgemeinen Volkszählung vom 1. December 1871. Berlin: Verlag des Königlichen Statistischen Bureaus.

Reichstag Election results 1890, 1893 1898

Election results for the lower House of the German Empire Parliament ("Reichstag") are available at the level of electoral precincts. Those precincts remained unchanged throughout the years 1871-1914. Typically, an election precinct comprises two Prussian counties. In exceptional cases, there are one or three. In our analysis, we assign the same precinct-level election results to the Prussian counties nested in it. We cluster standard errors at the precinct level.

The sources of the election results are as follows:[41]

a) <u>For 1890</u>: Monatshefte zur Statistik des Deutschen Reichs 1890, April, pp. IV.23-IV.43. Edited by Kaiserliches Statistisches Amt, Berlin: Puttkammer & Mühlbrecht.

b) <u>For 1893</u>: Vierteljahreshefte zur Statistik des Deutschen Reichs, 1893, vol. 2, pp. IV.2-IV.33. Edited by Kaiserliches Statistisches Amt, Berlin: Puttkammer & Mühlbrecht.

c) <u>For 1898</u>: Vierteljahreshefte zur Statistik des Deutschen Reichs, 1903, vol. 12, pp. III.42-III.102. Edited by Kaiserliches Statistisches Amt, Berlin: Puttkammer & Mühlbrecht.

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[41] Election data were downloaded from the Galloway Prussia Database (Galloway, 2007).

1 Tables

Table 1: Descriptive Statistics

PANEL A: Observations: city X century (1300-1900)	*Mean*	*Median*	*St Dev*	*Min*	*Max*	*N*
Acts of Antisemitism (expulsions or killings)	0.061	0.000	0.240	0.000	1.000	13,524
Presence of a Jewish community	0.087	0.000	0.282	0.000	1.000	13,524
Military Conflict: Battle near to the city	0.010	0.000	0.100	0.000	1.000	13,524
Military Conflict: City besieged	0.014	0.000	0.120	0.000	1.000	13,524
Military Conflict: City sacked	0.087	0.000	0.282	0.000	1.000	13,524
Military Conflict: City partially destroyed	0.017	0.000	0.130	0.000	1.000	13,524
Military Conflict: City completely destroyed	0.017	0.000	0.131	0.000	1.000	13,524
Military Conflict: City occupied	0.044	0.000	0.205	0.000	1.000	13,524
Military Conflict: City involed in war	0.010	0.000	0.101	0.000	1.000	13,524
Presence of a school	0.542	1.000	0.498	0.000	1.000	12,714
Total Population	2,012.95	1,121.00	4,497.70	6	172,132	5,618
PANEL B: Observations: city	*Mean*	*Median*	*St Dev*	*Min*	*Max*	*N*
Protestant in 1546	0.537	1.000	0.499	0.000	1.000	2,254
Jewish Lending before 1500	0.120	0.000	0.325	0.000	1.000	2,254
Industry before 1500: Agriculture	0.164	0.000	0.370	0.000	1.000	2,254
Industry before 1500: Manufacturing	0.311	0.000	0.463	0.000	1.000	2,254
Industry before 1500: Trade	0.153	0.000	0.360	0.000	1.000	2,254
Industry before 1500: Others	0.046	0.000	0.210	0.000	1.000	2,254
PANEL C: Observations: city X decade in printing cities (1450-1600)	*Mean*	*Median*	*St Dev*	*Min*	*Max*	*N*
Number of books published	39.443	0.000	150.457	0	1,719	2,235
Number of anti-semitic books published	0.117	0.000	0.616	0	9	2,235
PANEL D: Observations: Prussian county in 1882	*Mean*	*Median*	*St Dev*	*Min*	*Max*	*N*
Share Jews 1882	0.011	0.007	0.012	0.000	0.109	452
Share Catholics 1882	0.348	0.157	0.373	0.0003	0.996	452
Share Protestants 1882	0.640	0.833	0.376	0.003	0.999	452
Share of votes for anti-Semitic parties (1890)	0.013	0.000	0.077	0.000	0.648	452
Share of votes for anti-Semitic parties (1893)	0.028	0.000	0.089	0.000	0.615	452
Share of votes for anti-Semitic parties (1898)	0.041	0.000	0.117	0.000	0.761	452
Jewish share of those working in banking	0.116	0.000	0.207	0.000	1.000	387
Jewish share of those working in insurance	0.051	0.000	0.176	0.000	1.000	340
Jewish share of those working in banking and insurance	0.094	0.000	0.179	0.000	1.000	417
Jewish share of self-employed and directors in banking	0.275	0.121	0.328	0.000	1.000	268
Jewish share of self-employed and directors in insurance	0.060	0.000	0.192	0.000	1.000	326
Jewish share of self-employed and directors in banking and insurance	0.160	0.000	0.256	0.000	1.000	369
Share of workforce in banking	0.000	0.000	0.001	0.000	0.023	452
Share of workforce in banking and insurance	0.001	0.000	0.002	0.000	0.027	452
Distance to Wittenberg in km	326.185	324.545	148.769	0.000	731.460	452
Share age below 10	0.247	0.249	0.025	0.153	0.299	452
Share females	0.510	0.511	0.015	0.440	0.546	452
Share born in municipality	0.590	0.579	0.124	0.320	0.872	452
Share of Prussian origin	0.991	0.997	0.020	0.742	1.000	452
Average household size	4.791	4.805	0.344	3.826	5.861	452
ln(Population size)	10.804	10.821	0.415	9.360	13.625	452
Poland dummy	0.263	0.000	0.441	0.000	1.000	452
Share of county pop. in urban areas	0.275	0.222	0.219	0.000	1.000	452

Note: Panel A shows descriptive statistics for the set of 2,254 cities in the Deutsches Städtebuch over six centuries used in the main regressions.
Panel B shows descriptive statistics for the set of 2,254 cities in the Deutsches Städtebuch used in the main regressions.
Panel C shows descriptive statistics for the set of 153 cities in Germany with any printing of German and Latin books in the period 1450–1650.
Panel D shows descriptive statistics for 452 counties in Prussia in the 1880s and 1890s.
See main text and data appendix for more details.

Table 2: Anti-semitism before and after Protestant Reformation: main results

	(1)	(2)	(3)	(4)	(5)
	Dependent variable is:				
	Expulsions or Killings of Jews			Presence Jewish Community	
Protestant (1546) X Post-Reformation	0.0533***			-0.00508	
	(0.0111)			(0.00914)	
Protestant (1546) X 1400-1500		0.0176	0.0176		0.000848
		(0.0163)	(0.0162)		(0.00924)
Protestant (1546) X 1500-1600		0.0713***	0.0705***		0.0115
		(0.0170)	(0.0168)		(0.0106)
Protestant (1546) X 1600-1700		0.0570***	0.0565***		0.00766
		(0.0168)	(0.0166)		(0.0111)
Protestant (1546) X 1700-1800		0.0564***	0.0555***		0.0131
		(0.0166)	(0.0165)		(0.0142)
Protestant (1546) X 1800-1900		0.0638***	0.0673***		-0.0508***
		(0.0165)	(0.0166)		(0.0190)
Presence Jewish Community			0.0681***		
			(0.0139)		
CENTURY FE	YES	YES	YES	YES	YES
CITY FE	YES	YES	YES	YES	YES
r2	0.0917	0.0919	0.0968	0.153	0.155
N	13524	13524	13524	13524	13524

Note: The table reports OLS estimates. The unit of observation is cityXcentury. Post-Reformation is a dummy variable for centuries 1500-1600 and later, so after the Reformation in 1517. Protestant (1546) is a dummy variable that identifies cities that were Protestant in 1546. Presence Jewish Community is a dummy variable which is equal to one if there is any evidence of a Jewish community in the city. Standard errors (reported in parentheses) are clustered at the city level. *** significant at 1 percent; ** significant at 5 percent; * significant at 10 percent.

Table 3: Anti-semitism before and after Protestant Reformation: Robustness checks

	(1)	(2)	(3)	(4)
	Dependent Variable is:			
	Expulsions or Killings of Jews			
Protestant (1546) X Post-Reformation	0.0523***	0.0528***	0.0951	0.0960*
	(0.0110)	(0.0117)	(0.0583)	(0.0578)
Military Conflict: Battle near to the city	0.0130			
	(0.0232)			
Military Conflict: City besieged	0.0169			
	(0.0291)			
Military Conflict: City sacked	-0.0154*			
	(0.00867)			
Military Conflict: City partially destroyed	-0.00599			
	(0.0184)			
Military Conflict: City completely destroyed	0.00491			
	(0.0172)			
Military Conflict: City occupied	-0.0687***			
	(0.0140)			
Military Conflict: City involed in war	0.0947**			
	(0.0391)			
Presence of a school		0.0533***		
		(0.00913)		
Total Population (standardized)				-0.00251
				(0.0145)
SAMPLE	All cities		Cities with pop. data	
CENTURY FE	YES	YES	YES	YES
CITY FE	YES	YES	YES	YES
r2	0.0973	0.102	0.116	0.116
N	13524	12714	5618	5618

Note: The table reports OLS estimates. The unit of observation is cityXcentury. Post-Reformation is a dummy variable for centuries 1500-1600 and later, so after the Reformation in 1517. Protestant (1546) is a dummy variable that identifies cities that were Protestant in 1546. Standard errors (reported in parentheses) are clustered at the city level.
*** significant at 1 percent; ** significant at 5 percent; * significant at 10 percent.

Table 4: Attitudes towards Jewish population and the Protestant Reformation: results based on the USTC data

	(1)	(2)	(3)	(4)	(5)	(6)
	Dependent variable is:					
	Log(1+ # Antisemitic Books)					
Protestant (1546) X Post-Reformation	0.0636*	0.0451*		0.00349*	0.0481*	0.103*
	(0.0343)	(0.0261)		(0.00183)	(0.0258)	(0.0550)
Log(1+#Books)		0.0681***				
		(0.0109)				
Protestant (1546) X 1461-1470			-0.0169			
			(0.0169)			
Protestant (1546) X 1471-1480			0.0523			
			(0.0393)			
Protestant (1546) X 1481-1490			-0.00909			
			(0.0639)			
Protestant (1546) X 1491-1500			0.00918			
			(0.0665)			
Protestant (1546) X 1501-1510			-0.0286			
			(0.0455)			
Protestant (1546) X 1511-1520			0.0640			
			(0.0455)			
Protestant (1546) X 1521-1530			0.0154			
			(0.0750)			
Protestant (1546) X 1531-1540			0.0404			
			(0.0619)			
Protestant (1546) X 1541-1550			0.0424			
			(0.0616)			
Protestant (1546) X 1551-1560			0.0960*			
			(0.0486)			
Protestant (1546) X 1561-1570			-0.0200			
			(0.0552)			
Protestant (1546) X 1571-1580			0.134**			
			(0.0620)			
Protestant (1546) X 1581-1590			0.0316			
			(0.0676)			
Protestant (1546) X 1591-1600			0.179***			
			(0.0631)			
DECADE FE	YES	YES	YES	YES	YES	YES
CITY FE	YES	YES	YES	YES	YES	YES
SAMPLE	All cities with at least the following number of published books:					
	10 books			0 books	1 book	100 books
r2	0.0349	0.176	0.0446	0.00178	0.0262	0.0558
N	1590	1590	1590	33810	2235	945

Note: The table reports OLS. The unit of observation is cityXdecade. Post-Reformation is dummy variable equal to one for decades starting with the decade 1511–1520. Standard errors (reported in paretheses) are clustered at the city level. *** significant at 1 percent; ** significant at 5 percent; * significant at 10 percent.

Table 5: The lending channel (part 1): OLS estimates

	(1)	(2)	(3)	(4)	(5)	(6)
	Dependent variable is: Expulsions or Killings of Jews					
Post-Reformation *Jew Lending pre 1500 *Protestant (1546)	0.120* (0.0660)	0.106* (0.0632)	0.290** (0.146)	0.300** (0.148)	0.116* (0.0681)	0.0563 (0.0478)
Presence Jewish Community		0.199*** (0.0496)				
Total Population (standardized)				0.206 (0.251)		
SAMPLE	1400s and 1600s All cities		1400s and 1600s Cities with pop. data		1400s and 1600s Cities with Jews	1300-1900 All cities
CITY FE	YES	YES	YES	YES	YES	YES
Jew Lending pre 1500 X CENTURY FE	YES	YES	YES	YES	YES	YES
Protestant (1546) X CENTURY FE	YES	YES	YES	YES	YES	YES
r2	0.185	0.206	0.333	0.339	0.191	0.165
N	4508	4508	380	380	2446	13524

Note: The table reports OLS estimates. The unit of observation is cityXcentury. Post-Reformation is a dummy variable for centuries 1500-1600 and later. Jewish Lending pre 1500 is a dummy variable that identifies all cities with any evidence of Jewish lending before 1500. Protestant (1546) is a dummy variable that identifies cities that were Protestant in 1546. Presence Jewish community is a dummy variable which is equal to one if there is any evidence of a Jewish community in the city. Standard errors (reported in parentheses) are clustered at the city level. *** significant at 1 percent; ** significant at 5 percent; * significant at 10 percent.

Table 6: The lending channel (part 2): 2SLS estimates

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
				Dependent variable is: Expulsions or Killings of Jews			
Post-Reformation *Jew Lending pre 1500 *Protestant (1546)	0.327* (0.188)	1.137*** (0.431)	1.081*** (0.397)	0.281 (0.185)	0.324* (0.185)	0.398 (0.269)	0.383** (0.153)
Total Population (standardized)			0.296 (0.242)				
Presence Jewish Community					0.189*** (0.0506)		
Post-Reformation *Num Recorded industries					-0.0672*** (0.0221)		

SAMPLE			1400s and 1600s				1300-1900
	All cities	Cities with pop. data		All cities		Cities with Jews	All cities
CITY FE	YES	YES	YES	YES	YES	YES	YES
CENTURY FE	YES	YES	YES	YES	YES	YES	YES
Jew Lending pre 1500 X CENTURY FE	YES	YES	YES	YES	YES	YES	YES
Protestant (1546) X CENTURY FE	YES	YES	YES	YES	YES	YES	YES
Agriculture pre 1500 X CENTURY FE	YES	YES	YES	YES	YES	YES	YES
Manufacturing pre 1500 X CENTURY FE	YES	YES	YES	YES	YES	YES	YES
Trade pre 1500 X CENTURY FE	YES	YES	YES	YES	YES	YES	YES
Other sectors pre 1500 X CENTURY FE	YES	YES	YES	YES	YES	YES	YES
F-stat exclud instr	22.34	5.760	6.101	21.91	22.35	11.53	22.36
N	4508	380	380	4508	4508	2446	13524

Note: The table reports 2SLS estimates. The unit of observation is cityXcentury. Post-Reformation is a dummy variable for centuries 1500-1600 and later. Jewish Lending pre 1500 is a dummy variable that identifies all cities with any evidence of Jewish lending before 1500. Protestant (1546) is a dummy variable that identifies cities that were Protestant in 1546. Presence Jewish community is a dummy variable which is equal to one if there is any evidence of a Jewish community in the city. Num Recorded Industries is the number of industries, which are active before 1500 in the city and are recorded in Keyser. The instruments are Agriculture<1500, Manufacturing<1500, Trade<1500, and Other Industries<1500 (dummy variables that identify cities with evidence of businesses operating in agriculture, manufacturing, trade or other industries before 1500) interacted with Post-Reformation* Protestant (1546). Standard errors (reported in parentheses) are clustered at the city level. *** significant at 1 percent; ** significant at 5 percent; * significant at 10 percent.

Table 7: Jewish presence in 1882 (Prussia)

	(1)	(2)	(3)	(4)	(5)	(6)
			Dependent variable is the share of Jews in the county in 1882			
	OLS estimates			2SLS estimates		
			First stage	Second stage	First stage	Second stage
Share of Protestant 1882	-0.00874*** (0.00146)	-0.00671*** (0.00145)		-0.0111*** (0.00397)		-0.00802*** (0.00308)
Distance from Wittenberg (100Km)			-0.0927*** (0.0110)		-0.115*** (0.0103)	
Controls	NO	YES	NO	NO	YES	YES
N	452	452	452	452	452	452
r2	0.0742	0.344	0.135		0.433	
F stat exclud instr				70.03		122.9

Note: The table reports OLS and 2SLS estimates. The unit of observation is the Prussian county in 1882. Controls: share age below 10, share females, share born in municipality, share of Prussian origin, average household size, ln(population size), Poland dummy, share of county pop in urban area. *** significant at 1 percent; ** significant at 5 percent; * significant at 10 percent.

Table 8: Anti-Semitic Parties and Protestants (Prussia)

	(1)	(2)	(3)
		Main Regressor: Share of Protestant (1882)	
Dependent variable:	OLS estimates	OLS estimates + Controls	2SLS estimates
Anti-Semitic parties in 1890 (voting shares)	0.0212*	0.0353**	0.0307*
	(0.0109)	(0.0161)	(0.0173)
Anti-Semitic parties in 1890 (running in elections)	0.0788	0.105	0.241**
	(0.0509)	(0.0679)	(0.0679)
Anti-Semitic parties in 1893 (voting shares)	0.0406***	0.0600***	0.0976***
	0.0126	(0.0166)	(0.0329)
Anti-Semitic parties in 1893 (running in elections)	0.136*	0.136*	0.656***
	(0.0722)	(0.0904)	(0.246)
Anti-Semitic parties in 1898 (voting shares)	0.0720***	0.110***	0.131***
	(0.0172)	(0.0248)	(0.0447)
Anti-Semitic parties in 1898 (running in elections)	0.247***	0.336***	0.777***
	(0.0796)	(0.0883)	(0.262)

Note: The table reports OLS and 2SLS estimates. The unit of observation is the Prussian county in 1882. Controls: share age below 10, share females, share born in municipality, share of Prussian origin, average household size, ln(population size), Poland dummy, share of county pop in urban area. *** significant at 1 percent; ** significant at 5 percent; * significant at 10 percent.

Table 9: Share of Jews in banking and insurance in 1882 (Prussia)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
		Dependent variable is the share of Jewish population working in:						
	Banking	Insurance	Banking or Insurance		Banking	Insurance	Banking or Insurance	
					as self-employed or company directors			
Share of Protestant 1882	-0.0746***	-0.107***	-0.0884***	-0.0526**	-0.137**	-0.121***	-0.140***	-0.0718**
	(0.0286)	(0.0258)	(0.0234)	(0.0236)	(0.0545)	(0.0286)	(0.0355)	(0.0351)
Share of Jews 1882				3.820***				6.957***
				(0.709)				(1.040)
N	387	340	417	417	268	326	369	369
r2	0.0174	0.0482	0.0332	0.0966	0.0233	0.0521	0.0407	0.145

Note: The table reports OLS. The unit of observation is the Prussian county in 1882. *** significant at 1 percent; ** significant at 5 percent; * significant at 10 percent.

Table 10: Share of Jews in banking and insurance in 1882 (Prussia)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Dependent variable is the share of Jewish population working in banking or insurance							
	in any position				as self-employed or company directors			
	in counties where the number of employees in the sector is							
	≥ 1	≥ 2	≥ 3	≥ 4	≥ 1	≥ 2	≥ 3	≥ 4
PANEL A: OLS estimates								
Share of Protestant 1882	-0.0746***	-0.107***	-0.0884***	-0.0526**	-0.137**	-0.121***	-0.140***	-0.0718**
	(0.0286)	(0.0258)	(0.0234)	(0.0236)	(0.0545)	(0.0286)	(0.0355)	(0.0351)
N	387	324	267	222	342	295	252	217
r2	0.0357	0.0481	0.0396	0.0555	0.0464	0.0629	0.0596	0.0659
PANEL B: 2SLS estimates								
Share of Protestant 1882	-0.0835	-0.137**	-0.145**	-0.137**	-0.244***	-0.319***	-0.323***	-0.314***
	(0.0611)	(0.0614)	(0.0582)	(0.0650)	(0.0822)	(0.0870)	(0.0918)	(0.0979)
N	387	324	267	222	342	295	252	217
F stat of exclud instrum	72.29	79.14	78.85	69.10	90.48	86.97	77.78	67.90

Note: The table reports OLS and 2SLS estimates. The unit of observation is the Prussian county in 1882. *** significant at 1 percent; ** significant at 5 percent; * significant at 10 percent.

Table 11: Placebo. Impact of the Protestant Reformation on Jewish lending before 1500 (Prussia)

	(1)	(2)	(3)	(4)	(5)	(6)
	Dependent Variable: Evidence Jewish lending in the county before 1500					
	OLS estimates		2SLS estimates			
			First stage	Second stage	First stage	Second stage
Share of Protestant 1882	-0.0810	-0.0498		0.580***		0.179
	(0.0603)	(0.0674)		(0.174)		(0.130)
Distance from			-0.0983***		-0.123***	
Wittenberg (100Km)			(0.0115)		(0.0101)	
Controls	NO	YES	NO	NO	YES	YES
N	398	398	398	398	398	398
r2	0.00454	0.143	0.156		0.487	
F stat exclud instr				73.04		144.1

Note: The table reports OLS and 2SLS estimates. The unit of observation is the Prussian county in 1882. Controls: share age below 10, share females, share born in municipality, share of Prussian origin, average household size, ln(population size), Poland dummy, share of county pop in urban area. *** significant at 1 percent; ** significant at 5 percent; * significant at 10 percent.

2 Figures

Figure 1: Protestant (1546) X Century Indicator

Note: Figure displays coefficient estimates and confidence intervals from regression results displayed in Table 2, col. 2.

Figure 2: Protestant (1546) X Decade Indicator

Note: Figure displays coefficient estimates and confidence intervals from regression results displayed in Table 4, col. 3.

A Appendix (For Online Publication)

A.1 Tables

Table A.1: Descriptive Statistics by century

PANEL A	ALL CITIES					
	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900
Acts of Antisemitism (expulsions or killings)	.18	.08	.07	.02	.008	.006
Acts of Antisemitism (mass expulsions or killings)	.18	.07	.06	.02	.004	.004
Acts of Antisemitism (killings)	.17	.01	.004	.002	.0004	.003
Acts of Antisemitism (mass killings)	.16	.003	.0009	.00	.00	.00
Evidence of Jewish Presence	.29	.26	.19	.23	.31	.39
Evidence of a Jewish Community	.06	.04	.02	.03	.09	.28
Presence of a school	.10	.21	.39	.76	.87	.93
PANEL B	**PROTESTANT CITIES**					
	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900
Acts of Antisemitism (expulsions or killings)	.15	.06	.08	.02	.007	.008
Acts of Antisemitism (mass expulsions or killings)	.15	.06	.07	.01	.003	.005
Acts of Antisemitism (killings)	.14	.006	.004	.0008	.0008	.003
Acts of Antisemitism (mass killings)	.13	.0008	.002	.00	.00	.00
Evidence of Jewish Presence	.26	.23	.18	.20	.28	.35
Evidence of a Jewish Community	.06	.03	.02	.03	.09	.25
Presence of a school	.07	.18	.37	.82	.89	.94
PANEL C	**CATHOLIC CITIES**					
	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900
Acts of Antisemitism (expulsions or killings)	.21	.10	.06	.02	.009	.003
Acts of Antisemitism (mass expulsions or killings)	.21	.09	.06	.02	.006	.002
Acts of Antisemitism (killings)	.20	.02	.004	.003	.00	.002
Acts of Antisemitism (mass killings)	.20	.005	.00	.00	.00	.00
Evidence of Jewish Presence	.32	.29	.21	.26	.35	.44
Evidence of a Jewish Community	.07	.04	.02	.03	.09	.31
Presence of a school	.12	.25	.41	.68	.84	.91

Note: Panel A shows descriptive statistics for the set of 2,254 cities in the Deutsches Städtebuch over six centuries used in the main regressions. Panel B shows descriptive statistics for the set of 1,211 cities in the Deutsches Städtebuch that had a Protestant ruler in 1546. Panel C shows descriptive statistics for the set of 1,043 cities in the Deutsches Städtebuch that had a Catholic ruler in 1546.

Table A.2: Descriptive Statistics on book titles

PANEL A: All books	Mean	Median	St Dev	Min	Max	N
Characters in the title	176.65	159.00	118.52	0.00	1,400.00	88,517.00
Words in the title	23.75	22.00	15.74	0.00	184.00	88,517.00
PANEL B: Books in Latin	Mean	Median	St Dev	Min	Max	N
Characters in the title	190.64	175.00	127.85	0.00	1,293.00	47,759.00
Words in the title	24.43	22.00	16.49	0.00	174.00	47,759.00
PANEL C: Books in German	Mean	Median	St Dev	Min	Max	N
Characters in the title	160.27	146.00	104.19	0.00	1,400.00	40,758.00
Words in the title	22.95	21.00	14.77	0.00	184.00	40,758.00

Note: Panel A shows descriptive statistics for the 88,517 German and Latin language book editions in the Universal Short Title Catalogue (USTC). Panel B shows descriptive statistics for the set of 47,759 Latin language book editions in the USTC. Panel C shows descriptive statistics for the set of 40,758 Latin language book editions in the USTC.

Table A.3: Anti-semitism before and after Protestant Reformation (SAMPLE: ALL CITIES INCLUDING EAST PRUSSIA)

	(1)	(2)	(3)	(4)	(5)
	Dependent variable is:				
	Expulsions or Killings of Jews			Presence Jewish Community	
Protestant (1546) X Post-Reformation	0.0562***			-0.00659	
	(0.0108)			(0.00894)	
Protestant (1546) X 1400–1500		0.0218	0.0216		0.00240
		(0.0158)	(0.0158)		(0.00896)
Protestant (1546) X 1500–1600		0.0755***	0.0747***		0.0122
		(0.0165)	(0.0163)		(0.0104)
Protestant (1546) X 1600–1700		0.0623***	0.0618***		0.00830
		(0.0164)	(0.0161)		(0.0108)
Protestant (1546) X 1700–1800		0.0621***	0.0613***		0.0123
		(0.0162)	(0.0160)		(0.0138)
Protestant (1546) X 1800–1900		0.0684***	0.0720***		-0.0544***
		(0.0161)	(0.0162)		(0.0187)
Presence Jewish Community			0.0673***		
			(0.0136)		
CENTURY FE	YES	YES	YES	YES	YES
CITY FE	YES	YES	YES	YES	YES
r2	0.0898	0.0902	0.0951	0.155	0.158
N	14064	14064	14064	14064	14064

Note: The table reports OLS estimates. The unit of observation is cityXcentury. Post-Reformation is a dummy variable that identifies the observations after 1517. Protestant (1546) is a dummy variable that identifies cities that were Protestant in 1546. Presence Jewish Community is a dummy variable which is equal to one if there is any evidence of a Jewish community in the city. Standard errors (reported in parentheses) are clustered at the city level. *** significant at 1 percent; ** significant at 5 percent; * significant at 10 percent.

Table A.4: Anti-semitism before and after Protestant Reformation (SAMPLE: CITIES THAT HAD A JEWISH COMMUNITY AT LEAST ONCE FROM 1300-1900)

	(1)	(2)	(3)	(4)	(5)
	Dependent variable is:				
	Expulsions or Killings of Jews			Presence Jewish Community	
Protestant (1546) X Post-Reformation	0.0659***			0.0104	
	(0.0188)			(0.0164)	
Protestant (1546) X 1400–1500		0.00236	0.00298		-0.00464
		(0.0289)	(0.0287)		(0.0170)
Protestant (1546) X 1500–1600		0.0998***	0.0988***		0.00748
		(0.0301)	(0.0297)		(0.0193)
Protestant (1546) X 1600–1700		0.0561**	0.0557**		0.00300
		(0.0285)	(0.0277)		(0.0205)
Protestant (1546) X 1700–1800		0.0504*	0.0456*		0.0363
		(0.0277)	(0.0270)		(0.0263)
Protestant (1546) X 1800–1900		0.0618**	0.0638**		-0.0146
		(0.0275)	(0.0269)		(0.0313)
Presence Jewish Community			0.133***		
			(0.0143)		
CENTURY FE	YES	YES	YES	YES	YES
CITY FE	YES	YES	YES	YES	YES
r2	0.167	0.168	0.184	0.297	0.298
N	7338	7338	7338	7338	7338

Note: The table reports OLS estimates. The unit of observation is cityXcentury. Post-Reformation is a dummy variable that identifies the observations after 1517. Protestant (1546) is a dummy variable that identifies cities that were Protestant in 1546. Presence Jewish Community is a dummy variable which is equal to one if there is any evidence of a Jewish community in the city. Standard errors (reported in parentheses) are clustered at the city level. *** significant at 1 percent; ** significant at 5 percent; * significant at 10 percent.

Table A.5: Anti-semitism before and after Protestant Reformation (SAMPLE: CITIES THAT HAD A JEWISH COMMUNITY AT LEAST ONCE FROM 1300-1500)

	(1)	(2)	(3)	(4)	(5)
			Dependent variable is:		
	Expulsions or Killings of Jews			Presence Jewish Community	
Protestant (1546) X Post-Reformation	0.0946***			0.00676	
	(0.0248)			(0.0213)	
Protestant (1546) X 1400–1500		-0.00158	-0.000684		-0.00821
		(0.0419)	(0.0418)		(0.0255)
Protestant (1546) X 1500–1600		0.147***	0.145***		0.0115
		(0.0424)	(0.0420)		(0.0283)
Protestant (1546) X 1600–1700		0.0806**	0.0806**		-0.000656
		(0.0369)	(0.0362)		(0.0285)
Protestant (1546) X 1700–1800		0.0693*	0.0642*		0.0464
		(0.0358)	(0.0353)		(0.0332)
Protestant (1546) X 1800–1900		0.0790**	0.0841**		-0.0466
		(0.0355)	(0.0354)		(0.0380)
Presence Jewish Community			0.109***		
			(0.0180)		
CENTURY FE	YES	YES	YES	YES	YES
CITY FE	YES	YES	YES	YES	YES
r2	0.271	0.273	0.281	0.213	0.215
N	4872	4872	4872	4872	4872

Note: The table reports OLS estimates. The unit of observation is cityXcentury. Post-Reformation is a dummy variable that identifies the observations after 1517. Protestant (1546) is a dummy variable that identifies cities that were Protestant in 1546. Presence Jewish Community is a dummy variable which is equal to one if there is any evidence of a Jewish community in the city. Standard errors (reported in parentheses) are clustered at the city level. *** significant at 1 percent; ** significant at 5 percent; * significant at 10 percent.

Table A.6: Descriptive Statistics of the variables in Voigtlander and Voth (2012)

	Mean	Median	St Dev	Min	Max	N
Pogroms 1348	0.72	1.00	0.45	0.00	1.00	325.00
Pogroms 1920s	0.06	0.00	0.24	0.00	1.00	320.00
Synagogues destroyed or damaged in 1938	0.77	1.00	0.42	0.00	1.00	325.00
Vote share DVFP 1925	0.04	0.02	0.05	0.00	0.31	325.00
Vote share NSDAP 1920	0.08	0.04	0.10	0.00	0.59	325.00
Number of deportees	197.06	21.00	839.46	0.00	10,049.00	301.00
Number anti-semitic letters to Sturmer	3.77	1.00	10.72	0.00	110.00	325.00
Protestant in 1546	0.43	0.00	0.50	0.00	1.00	324.00

Source: Data from Voigtlander and Voth (2012).

Table A.7: Benchmark Estimates: anti-Semitism before and after the Protestant Reformation (CITIES INCLUDED IN VV2012)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	1920s pograms	Synagogue attacks	NSDAP 1928	DVFP 1925	Deportations	Sturmer Letters	First Principal Component
Protestant (1546)	0.499*	0.0633	0.612**	0.544**	0.0598	0.0858	0.600**
X Post-Reformation	(0.293)	(0.200)	(0.243)	(0.253)	(0.213)	(0.230)	(0.249)
CENTURY FE	YES	YES	YES	YES	YES	YES	YES
CITY FE	YES	YES	YES	YES	YES	YES	YES
N	638	638	638	638	614	638	628
r2	0.643	0.719	0.677	0.643	0.720	0.667	0.684

Dependent variable is antisemitism measured as 1349 pograms and: (spanning columns 1–7)

The table reports OLS estimates. The unit of observation is cityXyear. Post-Reformation is a dummy variable that identifies the observations after 1517. Protestant (1546) is a dummy variable that identifies cities that were Protestant in 1546. Anti-semitism in the 14th century is proxied by 1349 pogroms, while anti-Semitism in the 20th century is proxied by either pogroms in the 1920s, or synagogue attacks in 1938, or vote share for NSDAP in 1928, or vote share for DVFP in 1925, or number of deportees from each locality, or number of anti-semitic letters to Der Sturmer, or from a first principal component of these six proxies. Standard errors (reported in parentheses) are two-way clustered (city and century). *** significant at 1 percent; ** significant at 5 percent; * significant at 10 percent.

Table A.8: Differences on the impact of the Protestant Reformations: cities with and without Jewish lenders before 1500

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Dependent variable is: Expulsions or Killings of Jews							
Protestant (1546)	0.0146	-0.000196	0.0147	0.0357***	0.135**	0.311**	0.110*	0.0920**
X Post-Reformation	(0.00990)	(0.0339)	(0.00986)	(0.00929)	(0.0652)	(0.139)	(0.0617)	(0.0468)
Total Population (standardized)		0.507***				-0.723		
		(0.0220)				(0.502)		
Presence Jewish Community			0.00951				0.389***	
			(0.0625)				(0.0697)	
SAMPLE	1400s and 1600s			1300-1900	1400s and 1600s			1300-1900
	Cities with no evidence of Jewish lending pre 1500				Cities with evidence of Jewish lending pre 1500			
CITY FE	YES	YES	YES	YES	YES	YES	YES	YES
CENTURY FE	YES	YES	YES	YES	YES	YES	YES	YES
r2	0.00874	0.239	0.00880	0.0606	0.325	0.390	0.397	0.343
N	3966	238	3966	11898	542	142	542	1626

Note: The table reports OLS estimates. The unit of observation is cityXcentury. Post-Reformation is a dummy variable for centuries 1500-1600 and later. Protestant (1546) is a dummy variable that identifies cities that were Protestant in 1546. Presence Jewish community is a dummy variable which is equal to one if there is any evidence of a Jewish community in the city. Standard errors (reported in parentheses) are clustered at the city level. *** significant at 1 percent; ** significant at 5 percent; * significant at 10 percent.

A.2 Figures

For higher-resolution figures click: `http://www.sobecker.de/BeckerPascali2016.html`

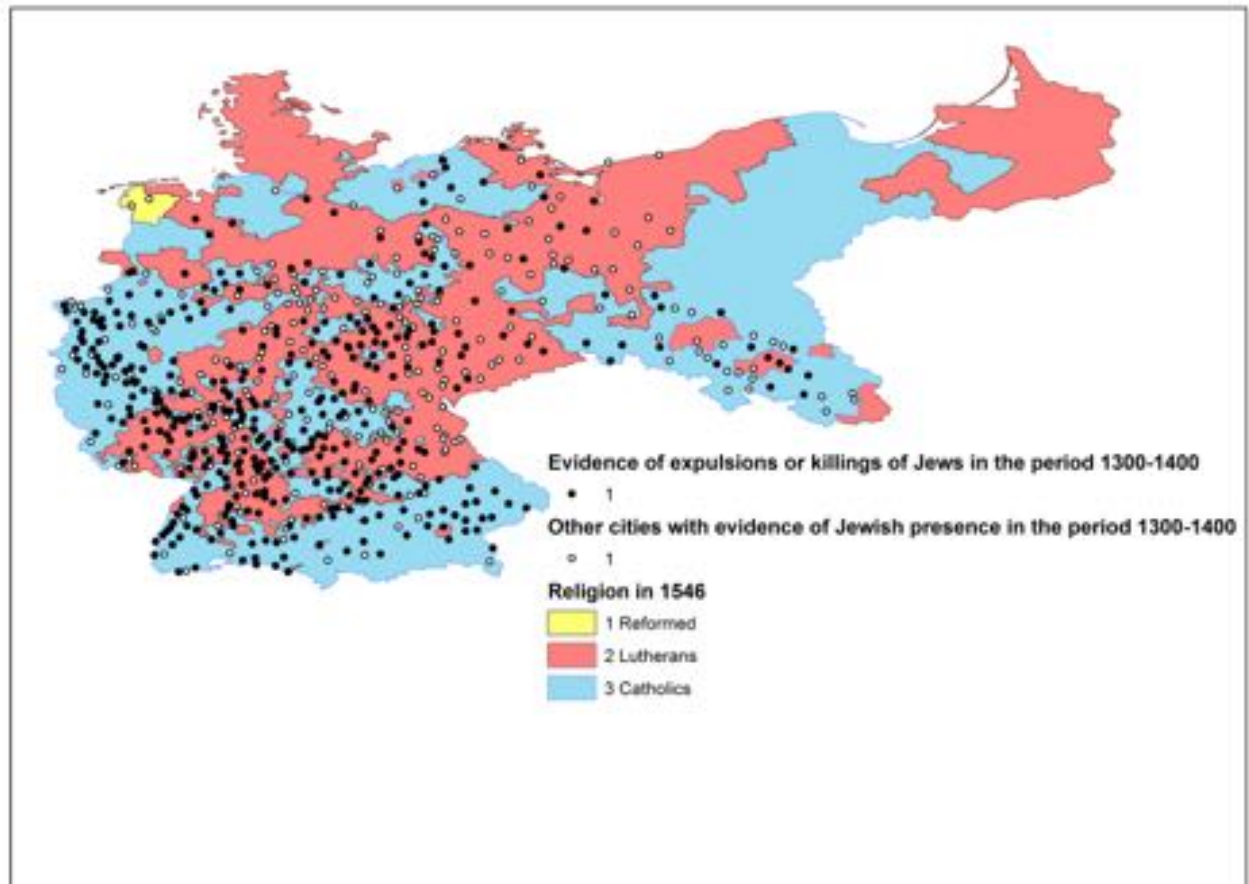Figure A.1: 2,254 Cities in the dataset
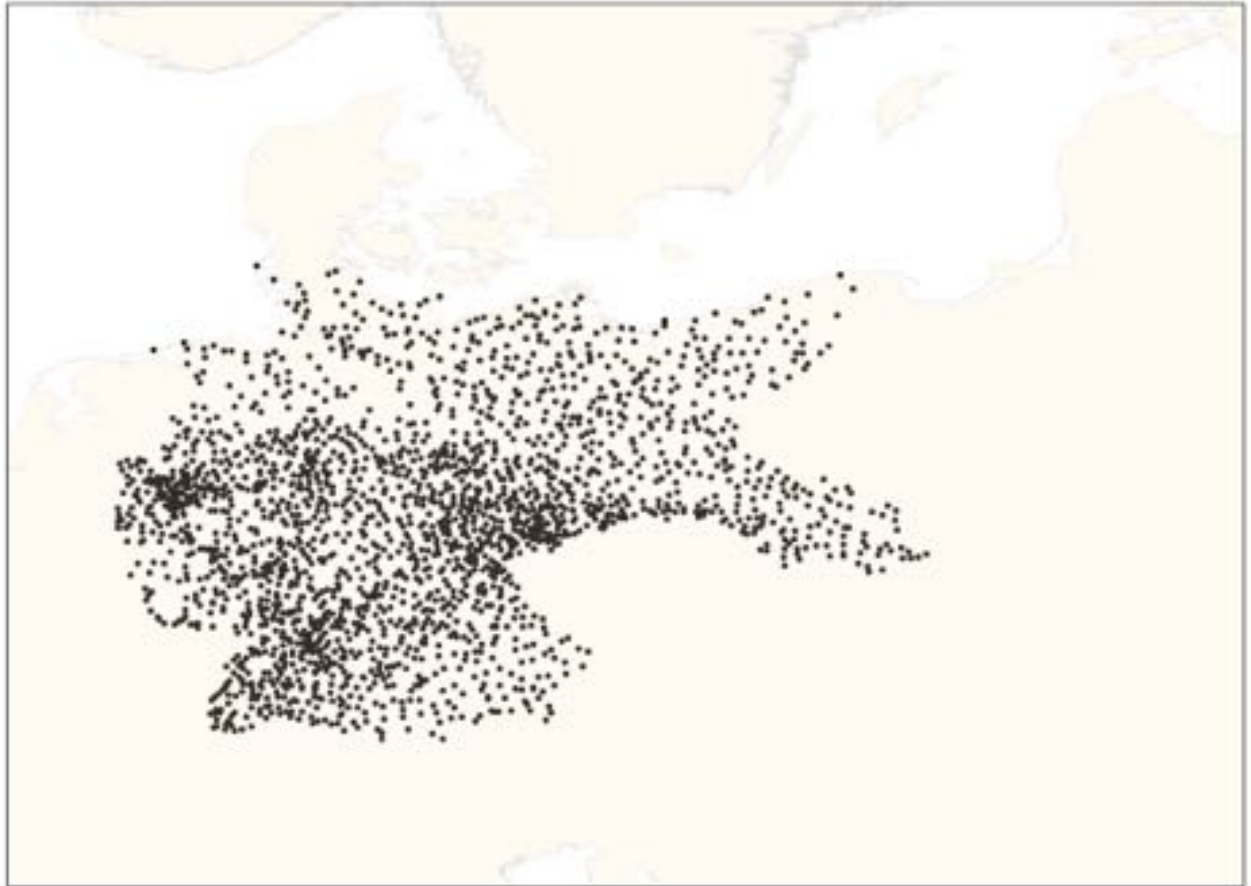
Note: Location of 2,254 cities used in main analysis.

Source: Deutsches Städtebuch. See main text and data appendix for details.
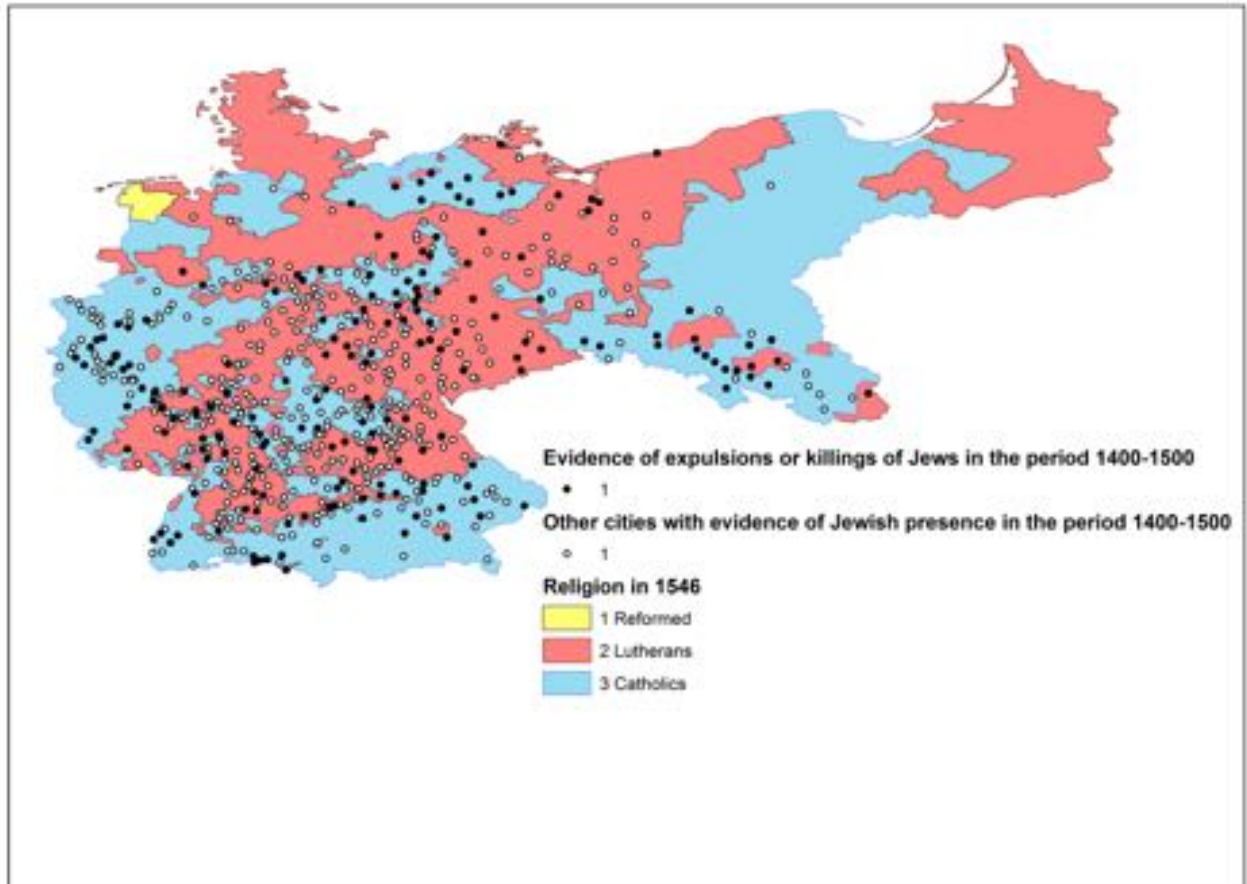
For higher-resolution figures click: `http://www.sobecker.de/BeckerPascali2016.html`
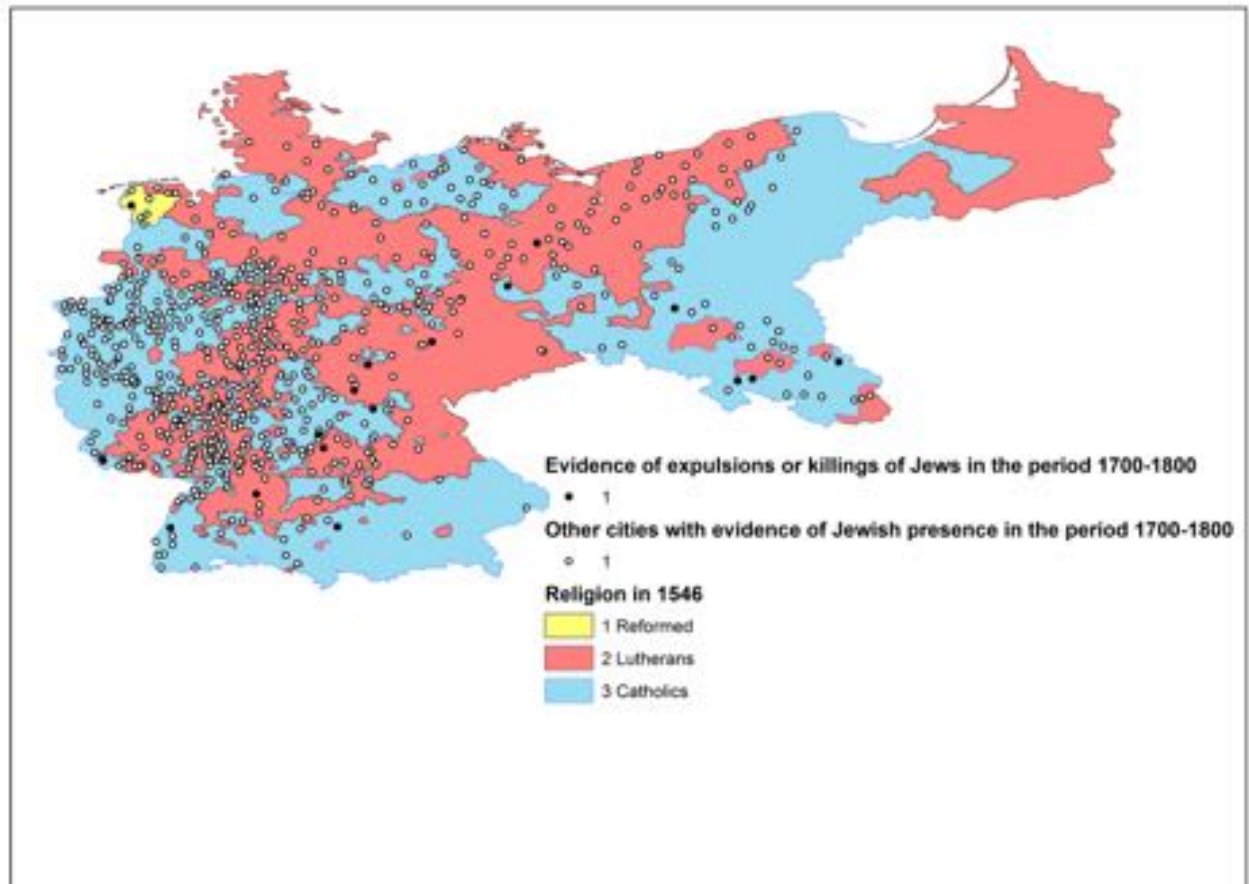
Figure A.2: Expulsions and killings of Jews in the 1300s

Note: Circles show locations with Jewish presence. Black circles are locations with evidence of expulsions or killings of Jews. Source: Germania Judaica. See main text and data appendix for details.

For higher-resolution figures click: http://www.sobecker.de/BeckerPascali2016.html

Figure A.3: Expulsions and killings of Jews in the 1400s

Note: Circles show locations with Jewish presence. Black circles are locations with evidence of expulsions or killings of Jews. Source: Germania Judaica. See main text and data appendix for details.

For higher-resolution figures click: `http://www.sobecker.de/BeckerPascali2016.html`
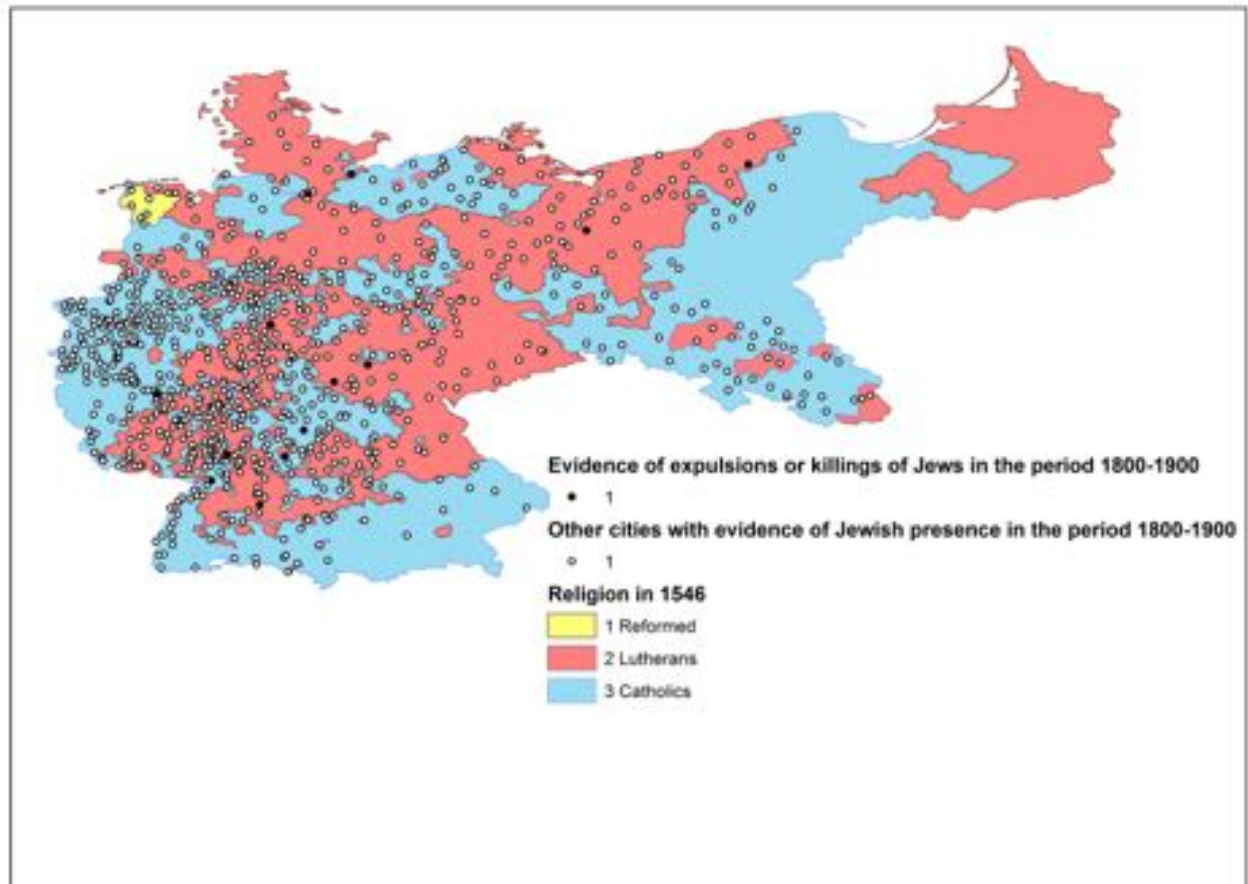
Figure A.4: Expulsions and killings of Jews in the 1500s
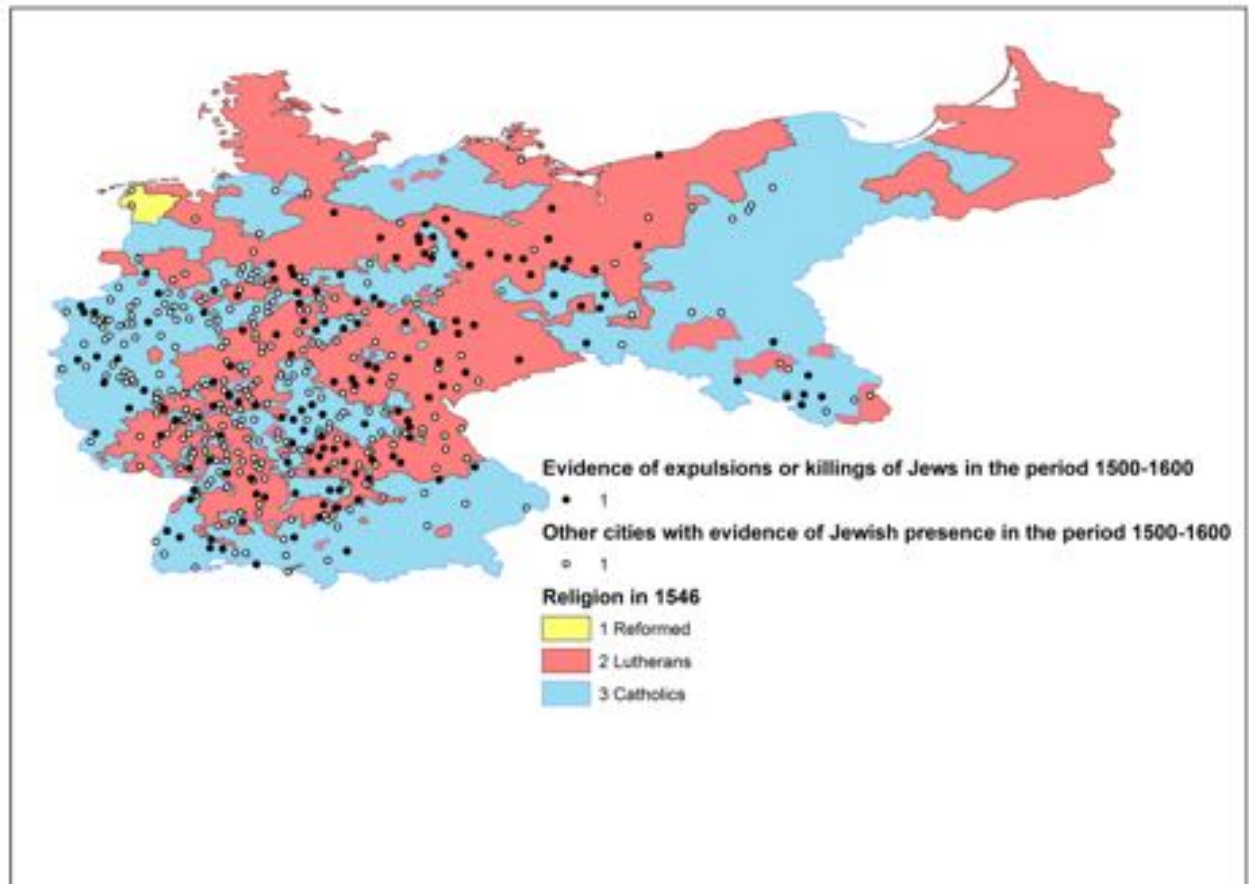
Note: Circles show locations with Jewish presence. Black circles are locations with evidence of expulsions or killings of Jews. Source: Germania Judaica and Alicke (2008). See main text and data appendix for details.

For higher-resolution figures click: `http://www.sobecker.de/BeckerPascali2016.html`

Figure A.5: Expulsions and killings of Jews in the 1600s
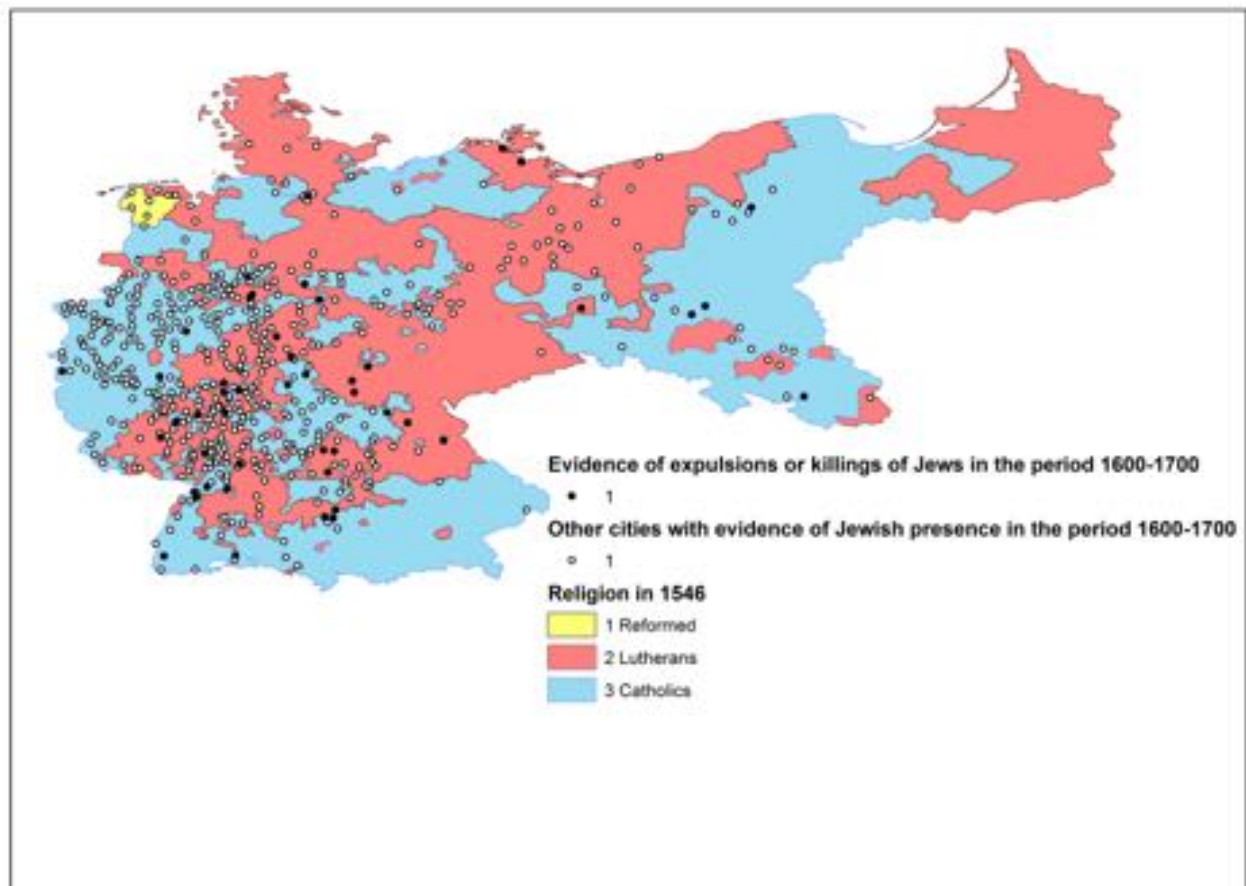
Evidence of expulsions or killings of Jews in the period 1600-1700
- • 1

Other cities with evidence of Jewish presence in the period 1600-1700
- ○ 1

Religion in 1546
- 1 Reformed
- 2 Lutherans
- 3 Catholics

Note: Circles show locations with Jewish presence. Black circles are locations with evidence of expulsions or killings of Jews. Source: Alicke (2008). See main text and data appendix for details.
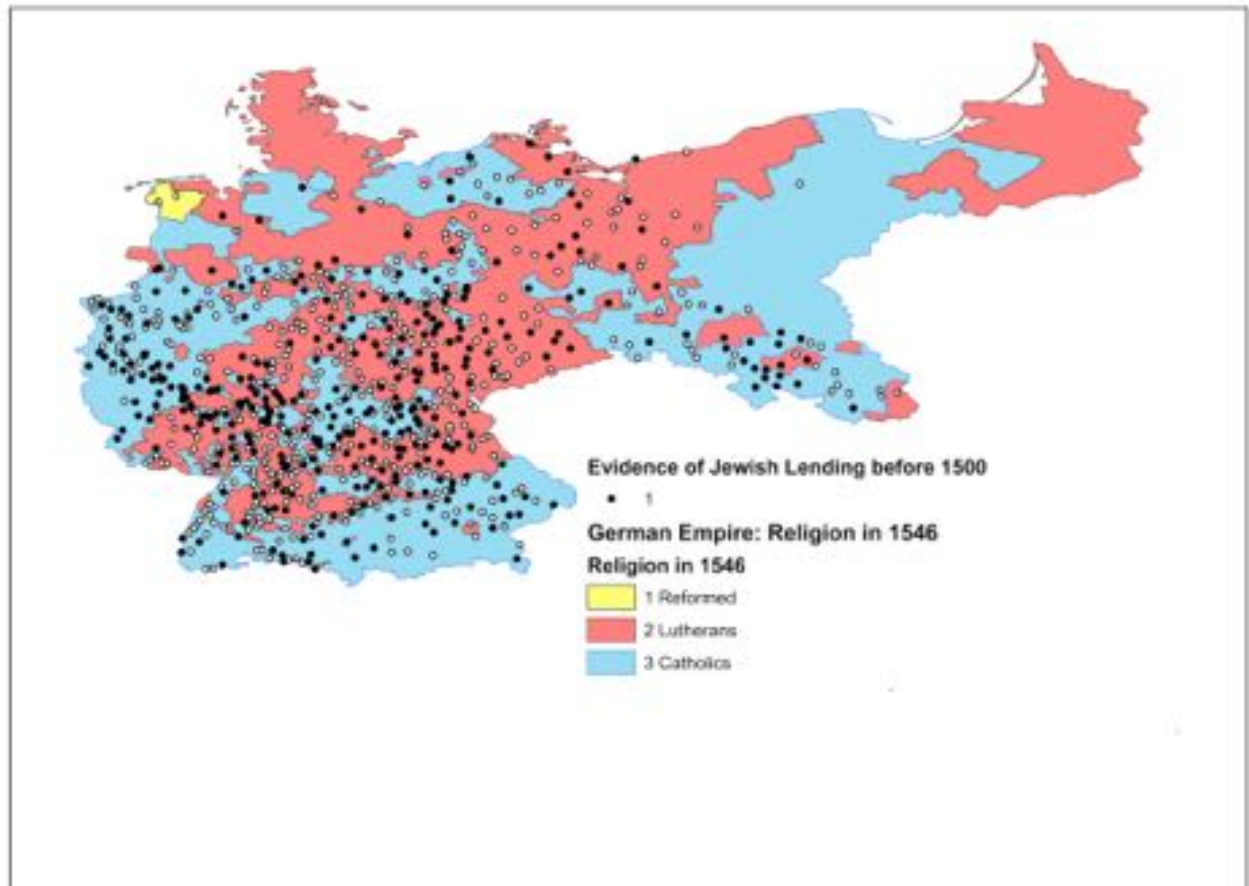
For higher-resolution figures click: `http://www.sobecker.de/BeckerPascali2016.html`

Figure A.6: Expulsions and killings of Jews in the 1700s

Evidence of expulsions or killings of Jews in the period 1700-1800
• 1

Other cities with evidence of Jewish presence in the period 1700-1800
◦ 1

Religion in 1546
1 Reformed
2 Lutherans
3 Catholics

Note: Circles show locations with Jewish presence. Black circles are locations with evidence of expulsions or killings of Jews. Source: Alicke (2008). See main text and data appendix for details.

For higher-resolution figures click: `http://www.sobecker.de/BeckerPascali2016.html`

Figure A.7: Expulsions and killings of Jews in the 1800s

Note: Circles show locations with Jewish presence. Black circles are locations with evidence of expulsions or killings of Jews. Source: Alicke (2008). See main text and data appendix for details.

For higher-resolution figures click: `http://www.sobecker.de/BeckerPascali2016.html`

Figure A.8: Jewish lending before 1500

Note: Circles show locations with Jewish presence. Black circles are locations with evidence of Jewish lending before the Reformation. Source: Germania Judaica. See main text and data appendix for details.

For higher-resolution figures click: `http://www.sobecker.de/BeckerPascali2016.html`

Figure A.9: Word Cloud of anti-Semitic books

Note: The figure reports the word cloud for anti-Jewish Latin books. Not surprisingly, the most common words are Contra and Iudei (Against and Jews). Among the most frequent words, we also see Errores (Mistakes), Adversus (Enemy), Perfidia (Perfidy), Foenore (Usury), and Infidels (Infidels). See Section III.B for details.

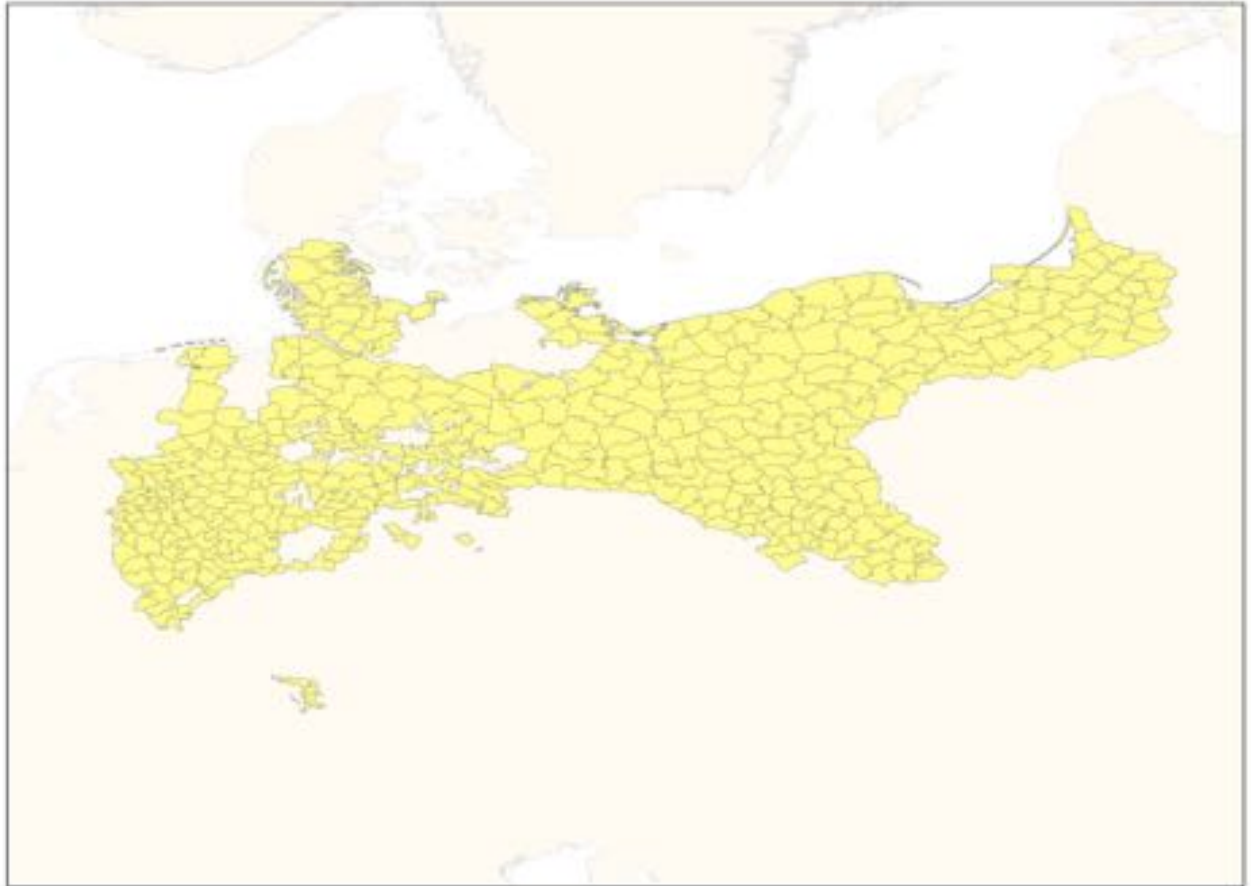For higher-resolution figures click: `http://www.sobecker.de/BeckerPascali2016.html`

Figure A.10: Cities in the USTC sample
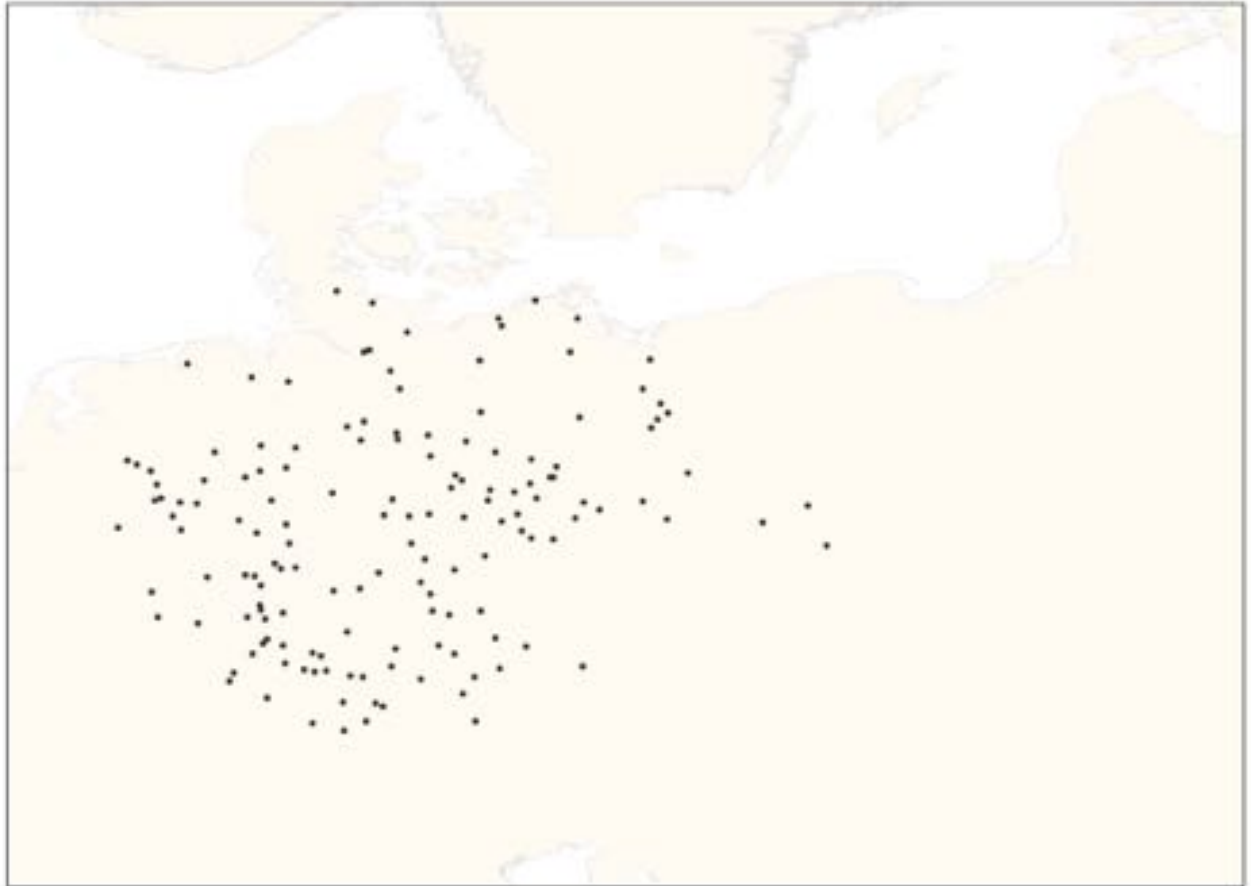
Note: Location of 108 cities with at least 10 book editions used in the main analysis of book titles. Source: Universal Short Title Catalogue (USTC). See main text and data appendix for details.

For higher-resolution figures click: `http://www.sobecker.de/BeckerPascali2016.html`
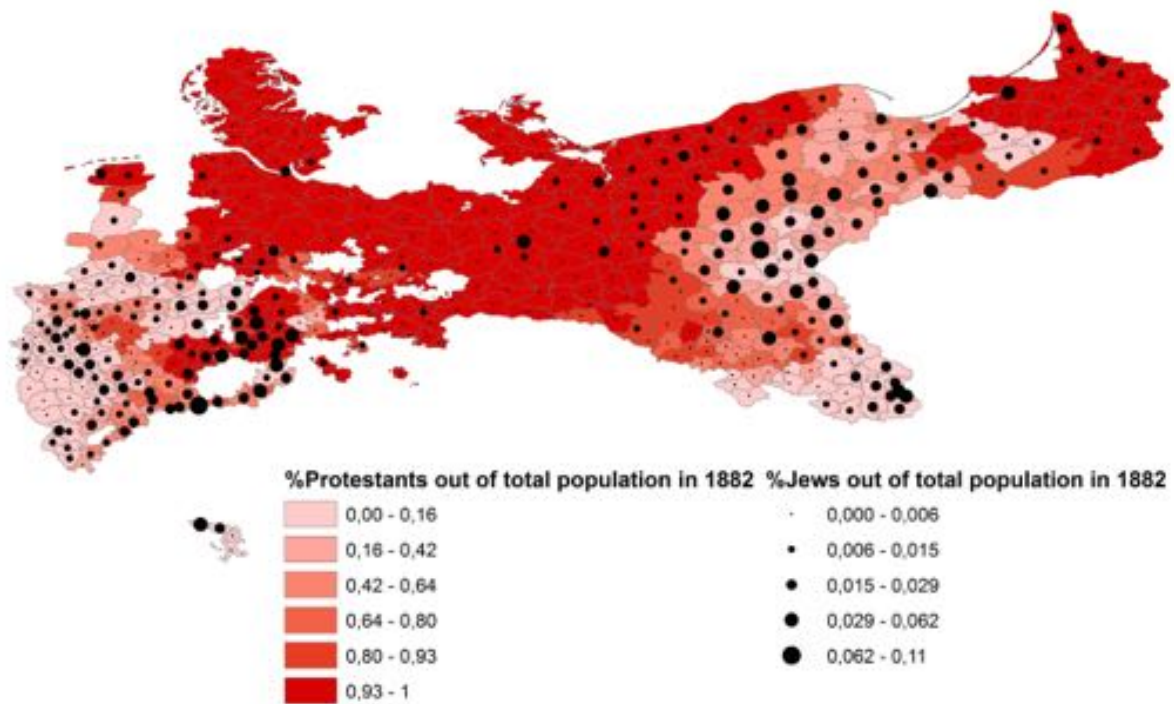
Figure A.11: Prussian counties in 1882

Note: Location of 452 Prussian counties used in Section V. Source: Various volumes of the *Preussische Statistik*. See data appendix for details.

For higher-resolution figures click: `http://www.sobecker.de/BeckerPascali2016.html`

Figure A.12: Share of Protestants and share of Jews in 1882

%Protestants out of total population in 1882   %Jews out of total population in 1882

0,00 - 0,16	0,000 - 0,006
0,16 - 0,42	0,006 - 0,015
0,42 - 0,64	0,015 - 0,029
0,64 - 0,80	0,029 - 0,062
0,80 - 0,93	0,062 - 0,11
0,93 - 1	

Note: Share of Jews in 1882 across 452 Prussian counties used in Section V. Source: Various volumes of the *Preussische Statistik*. See data appendix for details.

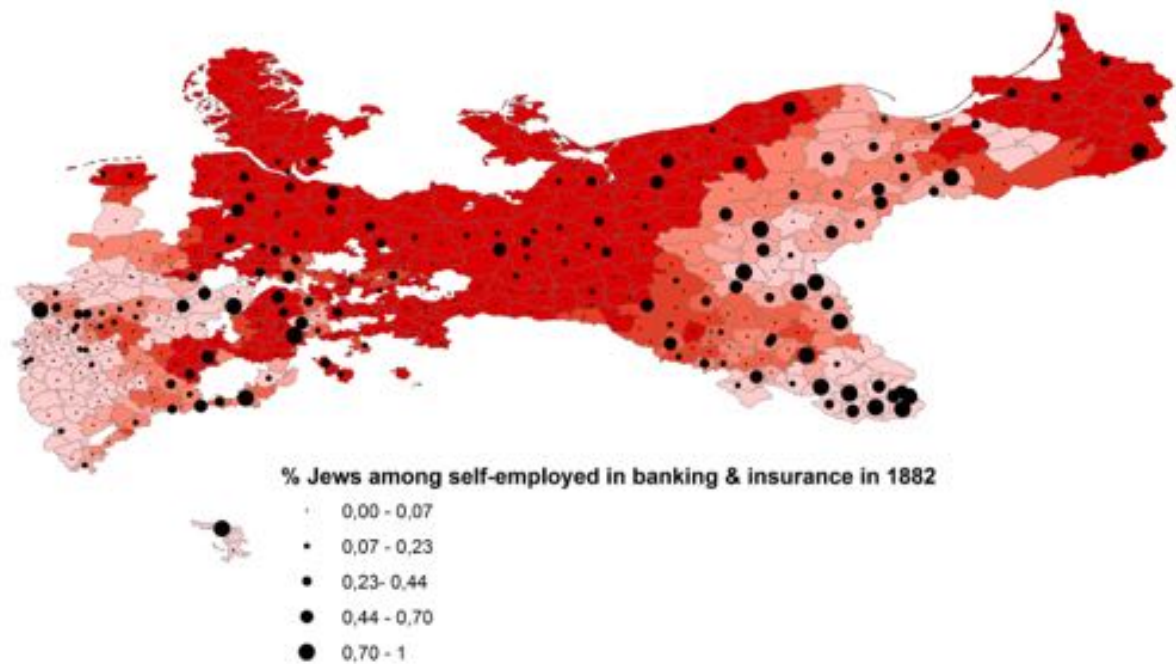For higher-resolution figures click: `http://www.sobecker.de/BeckerPascali2016.html`

Figure A.13: Share of Protestants and share of Jews among workers in banking and insurance in 1882
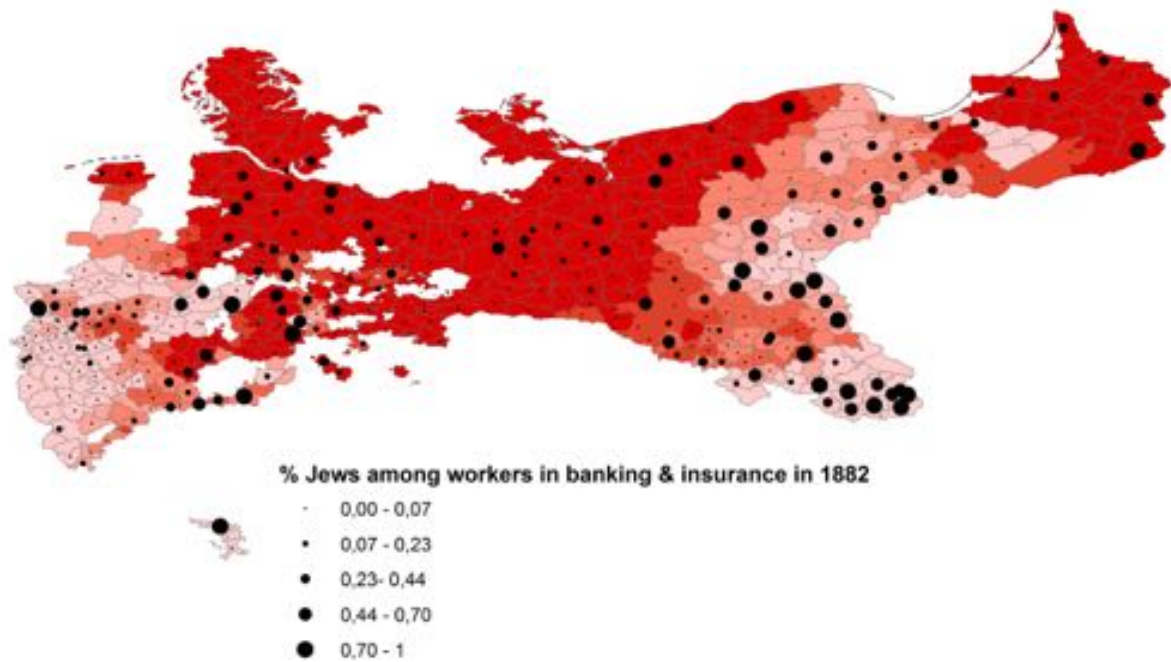
% Jews among workers in banking & insurance in 1882
- 0,00 - 0,07
- 0,07 - 0,23
- 0,23 - 0,44
- 0,44 - 0,70
- 0,70 - 1

Note: Share Protestants in whole population (background coloring) and share of Jews among workers in banking and insurance (circles) in 1882 across 452 Prussian counties used in Section V. Source: Various volumes of the *Preussische Statistik*. See data appendix for details.

For higher-resolution figures click: `http://www.sobecker.de/BeckerPascali2016.html`

Figure A.14: Share of Protestants and share of Jews among self-employed and company directors in banking and insurance in 1882

% Jews among self-employed in banking & insurance in 1882
- · 0,00 - 0,07
- · 0,07 - 0,23
- ● 0,23 - 0,44
- ● 0,44 - 0,70
- ● 0,70 - 1

Note: Share Protestants in whole population (background coloring) and share of Jews among self-employed and company directors in banking and insurance in 1882 (circles) in 1882 across 452 Prussian counties used in Section V. Source: Various volumes of the *Preussische Statistik*. See data appendix for details.
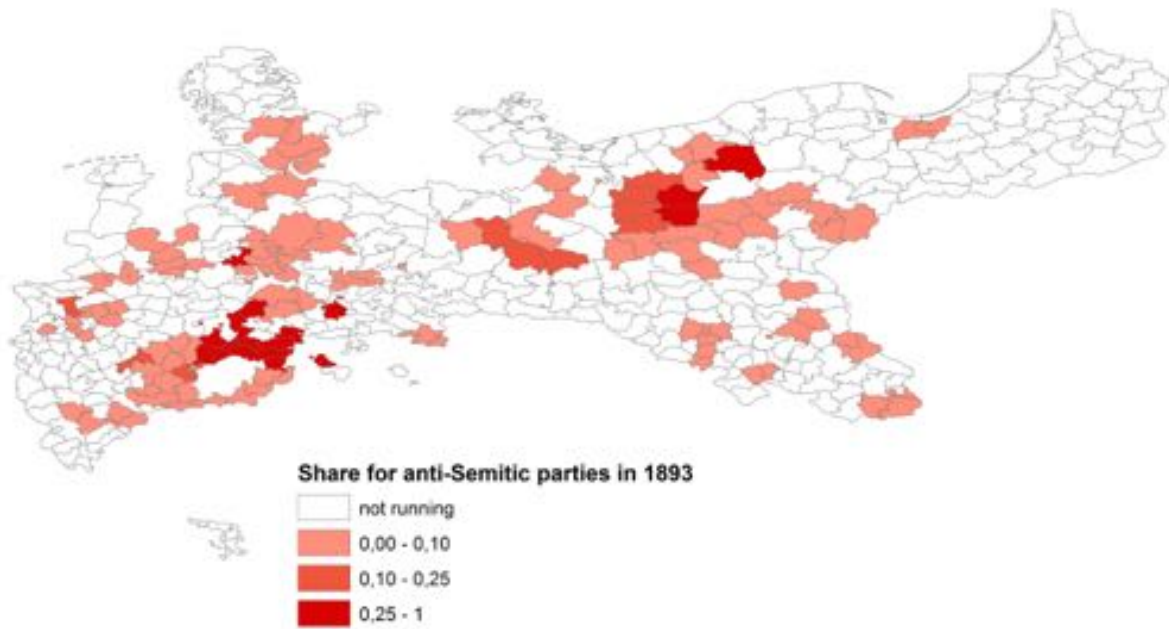
For higher-resolution figures click: `http://www.sobecker.de/BeckerPascali2016.html`

Figure A.15: Votes for anti-Semitic parties in Reichstag elections (1890)

Share for anti-Semitic parties in 1890

☐ not running
▨ 0,00 - 0,10
▨ 0,10 - 0,25
▨ 0,25 - 1
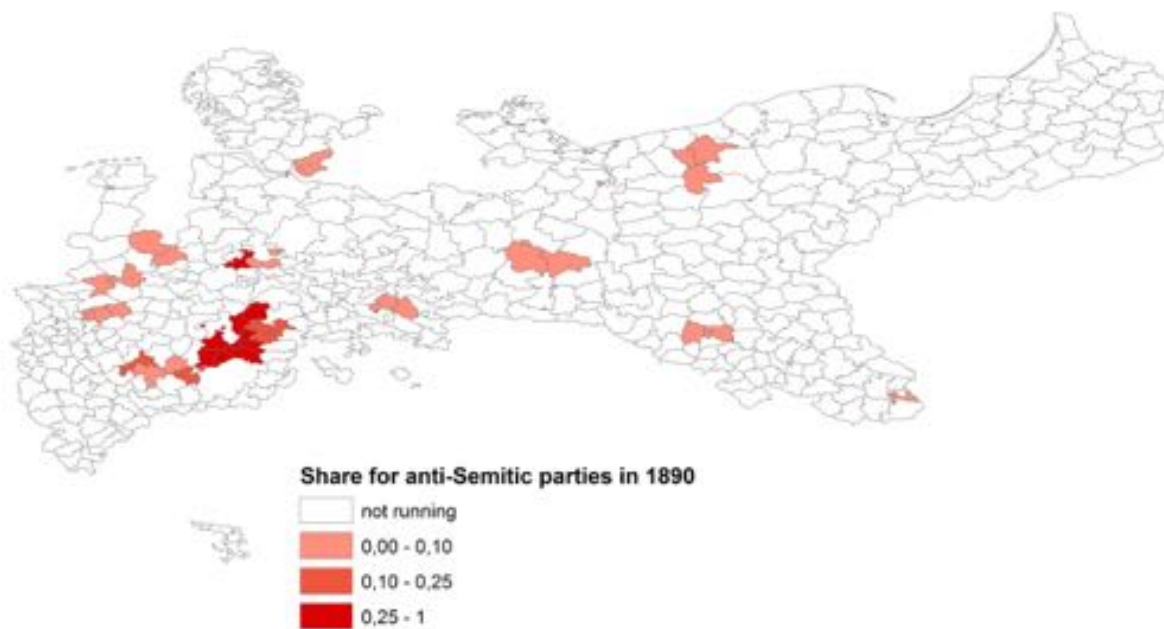
Note: Share of votes for anti-Semitic parties in Reichstag elections (1890). Source: Various volumes of the *Preussische Statistik*. See data appendix for details.

For higher-resolution figures click: `http://www.sobecker.de/BeckerPascali2016.html`
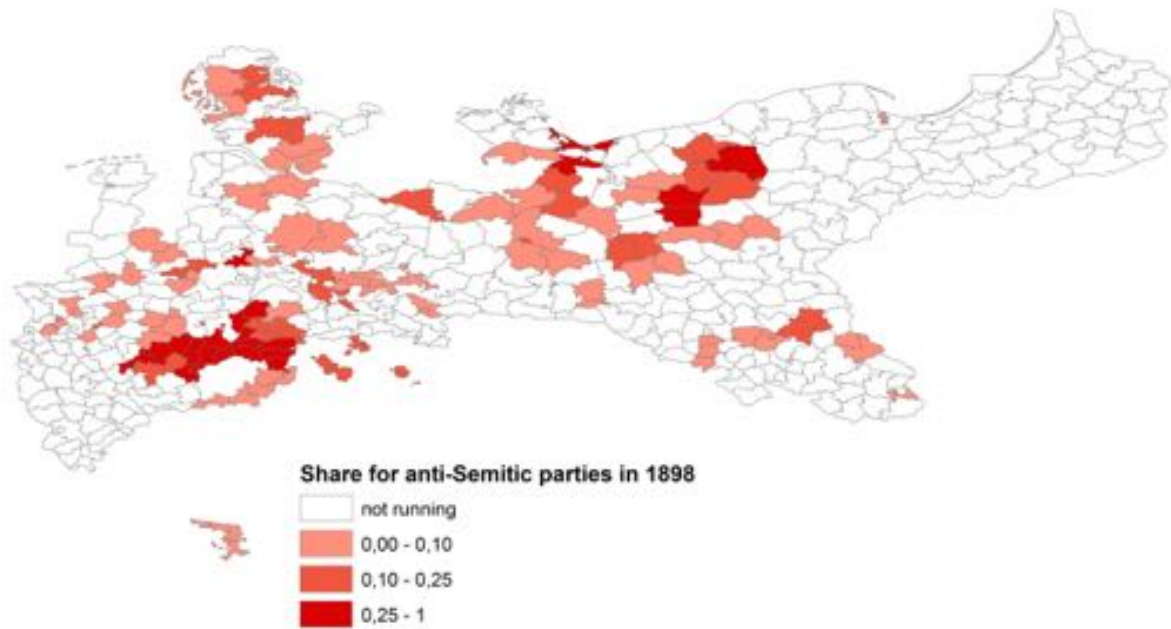
Figure A.16: Votes for anti-Semitic parties in Reichstag elections (1893)

Note: Share of votes for anti-Semitic parties in Reichstag elections (1893). Source: Various volumes of the *Preussische Statistik*. See data appendix for details.

For higher-resolution figures click: `http://www.sobecker.de/BeckerPascali2016.html`

Figure A.17: Votes for anti-Semitic parties in Reichstag elections (1898)

Note: Share of votes for anti-Semitic parties in Reichstag elections (1898). Source: Various volumes of the *Preussische Statistik*. See data appendix for details.