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Religion and persecution

Umair Khalil[1] · Laura Panza[2]

Abstract

This paper investigates the relationship between local religiosity and episodes of persecutions in Europe between 1100 and 1850. We introduce a novel proxy for measuring local religion: the cult of saints in early Western Christianity. Our findings show that cities with an established cult of a saint are 11% points more likely to engage in Jewish persecutions and witch trials. However, cities with more progressive gender norms, measured by the presence of a female saint cult, are less likely to persecute witches compared to male-only saint cities. Our baseline relationship persists after controlling for a range of city-level economic, geographic and institutional characteristics and after accounting for other major confounders. Suggestive evidence points towards two mechanisms behind the saints-persecution relationship: (i) changes in norms induced by longer exposure to Christianity; and (ii) proximity of religious groups due to congruence of religious festivities.

✉ Laura Panza
laura.panza@unimelb.edu.au

Umair Khalil
umair.khalil@deakin.edu.au

[1] Department of Economics, Deakin University, Melbourne, VIC, Australia

[2] Department of Economics, University of Melbourne and CEPR, Melbourne, Australia

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1 Introduction

> The role of religion is paradoxical. It makes prejudice and it unmakes prejudice. While the creeds of the great religions are universalistic, all stressing brotherhood, the practice of these creeds is frequently divisive and brutal. The sublimity of religious ideals is offset by the horrors of persecution in the name of these same ideals.

Allport (1954, p.466)

The effect of population diversity on growth has been studied extensively: it has been shown to be beneficial in some contexts, for instance via the cross-fertilisation of ideas and enhanced productivity, but detrimental in others, where it has been associated with mistrust, corruption and conflict (Ashraf and Galor, 2013; Montalvo and Reynal-Querol, 2005). One facet of this predisposition towards conflict has manifested itself in the persecution of minorities, a phenomenon which has, in turn, been proved to hinder economic development (Chaney and Hornbeck, 2016; Drelichman et al., 2021). The source of ethnic, religious, linguistic diversity is ingrained in human history, originating during the exodus of humans from Africa (Arbatlı et al., 2020), and its structure may have been reinforced by institutions over centuries (Bentzen and Gokmen, 2023; Coşgel et al. 2023). This paper attempts to shed light on the deep rooted determinants of persecution, focusing on the role played by Christian religiosity in shaping divisiveness within society.

The question of when and how religion is associated with persecution episodes continues to produce a large amount of scholarly work across multiple disciplines.[1] This is plausibly because of religion's dual relationship with violence. Throughout history, religion has contributed to violent conflicts, minority persecutions, and episodes of intolerance, a phenomenon that still plagues society. On the other hand, it has also acted as a bridge to peaceful coexistence and a resource for reconciliation (Appleby, 1999). This ambivalence stems from the intrinsically paradoxical nature of religion, which has a potential to both reduce conflict, by fostering sacred values of tolerance, and to create it, by generating out-groups. The latter is particularly true for monotheistic religions due to the notion of "the one true God" (Allport, 1954; Norenzayan, 2013; Iyigun 2015). In this paper, we contribute to such debates by investigating an underexplored aspect: whether localized religiosity, as measured by the veneration of local saints in Western Christendom, contributed to the perpetration of persecution episodes in Europe.

The role played by Christianity in promoting the use of violence against minorities has not been studied systematically across time and space: most of the existing literature focuses on a specific geographic area or time period.[2] Furthermore, cross-country studies on religion and popular religiosity, in particular, are relatively scarce, while those

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[1] See, for example: Appleby (1999), Yigun (2015), Juergensmeyer (2017), Johnson and Koyama (2019), Smelyansky (2020).

[2] See for example Pascali (2016) on role of the Catholic Church in Jewish expulsions in Italy; Becker and Pascali (2019) on the role of Protestantism in Jewish persecution in Germany; Finley and Koyama (2018) the role of bishopric and archbishopric cities in higher persecution intensity in the Holy Roman Empire during the Black Death; Spenkuch and Tillmann (2018) on Catholics lower likelihood to vote for the Nazi party than their Protestant counterparts.

investigating the influence of religion have focused primarily on economic development and education.[3]

In addition, a monolithic treatment of the religious landscape masks substantial spatial and temporal variation in religious practices, religiosity of local communities, and the institutionalisation of ecclesiastical power, among other things. This was particularly true for early Western Christianity with the decentralised structure of the church, a feature persisting until the eleventh century (Scheidel, 2019, p. 346).[4] This introduces a key challenge in studying the religiosity-persecution relationship across Europe: the ability to measure the spatial variation of religious practices and beliefs. To this end, we introduce a new proxy for local religiosity, the veneration of saints in Western Christianity across European cities.[5] We combine these with data on violence against minorities and city characteristics between 1100 and 1850, covering the vast majority of Europe (24 modern countries). This allows us to exploit wider historical and geographic variation in local religiosity to test the religion-persecution relationship in a comprehensive and systematic way.

The consolidation of a mainstream Christian doctrine and the power that Christianity enjoyed as the state religion after the Edict of Thessalonica (380 C.E.) contributed to the persecution of heretical groups and followers of other religions as well.[6] The massacres of the Jews during the Black Death, the campaigns against the pagan Balts and Slavs of northeastern Europe, the launching of the Crusades, the Inquisition, and the witch trials represent some of the most well known examples. Moore (2008) argues, at length, that the use of violence as a legitimate means to maintain power became formalised between the 10th and 13th centuries in Europe.

However, not all regions witnessed the same intensity or prevalence of persecution, engendering the need for a systematic analysis. While economic historians have empirically investigated various determinants of persecution episodes in the European Middle Ages and thereafter, limited attention has been paid to the potential role of local religiosity. For instance, it has been argued that Jewish persecutions intensified during periods of economic downturn (Grosfeld et al., 2020) and were more likely to occur following colder growing seasons (Anderson et al., 2017). Oster (2004) establishes similar channels for witch trials between the 15th and 18th centuries. Other studies have highlighted the role of non-price competition between Protestants and Catholics on the incidence of witch trials (Leeson and Russ, 2018) and the absence of economic complementarities and increased economic competition on Jewish persecutions (Becker and Pascali, 2019; Jedwab et al., 2019).

We contribute to this literature by studying the role of local religiosity on persecution episodes occurring during the period stretching from the Middle Ages to the end of the

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[3] A notable exception is Iyigun (2008), documenting that the Ottoman Empire's military activities in Europe reduced the incidence of military engagements between the Protestant Reformers and the Counter-Reformation forces. For a comprehensive survey of the recent literature on the economic history of religion, including the relationship between religion and violence, see Becker, Rubin, and Woessmann (2021).

[4] This changed after the introduction of the pontiff's election by the cardinals, which led to increased centralisation, enabling popes to acquire stronger powers, including supreme doctrinal authority (Scheidel, 2019).

[5] Saints generally were individuals who had lived a life of extreme piety or had died as martyr in the cause of Christianity. They became objects of reverence after death and could act as intercessors on behalf of the people they once lived among (Weinstein and Bell, 2010).

[6] Since the Edict of Thessalonica of Theodosius I, which utilises for the first time the term heresy in a legal context, the Church enjoyed the support of the state to counter what it perceived as heresy. The war against heresy was waged in many forms since late Antiquity.

early modern era. We argue that the veneration of saints provides an appropriate measure of local religiosity with adequate pan-European spatial variation.

Regional, localized cults of saints have embodied one of the central expression of Christian religiosity since at least Late Antiquity,[7] The *loca sanctorum*, places where the saints were believed to be present (their graves, and relics), were visited by pilgrims hoping to receive intercession and miraculous healing; they became sources of local pride and symbols of local identity (Klaniczay, 2014). The importance of the cult of saints in popular Christian culture is further manifested in the adoption of saints' names at baptism (Andersen and Bentzen, 2021), the popularity of burial *ad sanctos* (in close vicinity to the shrine), and their veneration throughout the liturgical year (Price, 2014). In addition, since the shrines of saints were not supposed to be disturbed after the formation of a cult, it created a permanent conduit of religioisity in a specific region, which was further reinforced by the celebration of patron days and saint feast days every year. This repeated exposure is likely to create persistence in religiosity over long time periods, which can then manifest itself on various outcomes of interest, persecution of minorities being one that we focus on here.[8]

A major issue we face in our setup is that saintly cults are unlikely to have been randomly assigned to cities and hence isolating the effect of other determinants of persecution, particularly non-religious ones, is complicated.[9] We implement a number of strategies and conduct a battery of test to probe these concerns. To this end, we primarily focus on saintly cults formed in the early stages of the Christianisation of Europe, specifically those formed before 1100 CE. This restriction is motivated by two related concerns: First, post-1100, in the wake of the reforms initiated by Pope Gregory the VII, the power of the bishop of Rome began to increase substantially; one aspect of this change was the control of the canonisation process of new saints, which was often used to mould and influence contemporaneous socio-political realities.[10] Second, since the early saints were primarily canonised as a result of local popular veneration with no de facto involvement from the Papacy, they are more likely to capture organically formed regional focal points of religiosity, rather than top down, potentially strategic, decisions from Rome reflecting pan-Christian concerns. Overall, this implies that using pre-1100 saint veneration allows us to employ cleaner spatial variation, which is likely to be impacted less by contemporaneous forces (post-1100) influencing the rise of religious persecution from the twelfth century onward.[11] In other words, using pre-1100 saints helps us both isolate the local religious landscape and alleviate reverse causality related concerns.

Saints veneration has been shown to be a good proxy for the strength of religious identity in other contexts as well: for instance, Saleh and Tirole (2021) use it to measure Coptic religious identity in medieval Egypt. Nevertheless, the veneration of saints, particularly in

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[7] The term cult of saints is commonly employed in academic scholarship to refer to the veneration/worship of a saintly figure. It originated from the Latin word for worship, *cultus* which is how the Catholic Church itself characterizes the veneration of saints in canon law, specifically Can. 1187. Throughout the paper, we use the terms veneration of saints or the cult of saints, interchangeably, where the latter use of the word 'cult' should not be confused with its modern usage, i.e., a small, usually fringe, religious group.

[8] We are extremely grateful to an anonymous referee for this point.

[9] As appendix Table 8 shows, saint cities have higher urban population density, and are more likely to be an archbishopric city, and have better secular institutions as well.

[10] This could create simultaneity related issues, for a proxy that uses post-1100 saints as well, since canonisations could be used to preempt future violent unrest in restive regions.

[11] Section 2.1 provides institutional background and support from historical literature marking 1100 as a crucial turning point in Western Christianity.

early Western Christianity, is a nebulous concept and hence we treat it broadly as a proxy for local religiosity in Medieval Europe. One can envision a three-tiered relationship linking religion and persecution, (i) a decentralized, local religiosity link operating through worship-based fervour among adherents; (ii) a centralized local aspect operating at the regional level via, for instance, the role of local bishops; and (iii) a more Pan-European centralized link, operating through the direct role of the papacy. We argue that our proxy, as defined above, is more likely to side-step (iii) and capture (i), a facet which has been particularly understudied. Furthermore, in our analysis we empirically try to rule out the role of (ii) and (iii), namely of ecclesiastical institutions distinct from religious veneration, by controlling for city-level presence of (arch)bishoprics, distance to nearest (arch)bishopric seat and to Rome, as well as the presence of large and prominent churches.[12]

Were local cult centers instrumental in the perpetration of violence against minorities? Or did a strong local Christian tradition induce tolerance, possibly due to the lower threat posed by non-Christians and heretics? To answer these questions we use our comprehensive dataset to study two major but distinct episodes of persecution of disadvantaged minorities: (1) the Jewish persecutions of 1100–1800 and (2) the witch trials of 1300–1850. While Jewish persecution was a persistent and recurring phenomenon during the European Middle Ages, witch trials surged around the fifteenth century and raged for two centuries. Christianity's supersessionist claims fostered a rivalry with Judaism from its inception, resulting in periodic episodes of anti-semitic fervour in the masses often led by the clergy itself.[13] On the other hand, witch trials represented a more direct persecution of heretics within the ambit of Christianity. Although throughout its history Christianity was opposed to black magic, which was viewed as the work of the devil, by the late fifteenth century the heresy and apostasy of the witch became more deliberate and 'threatening' to society, which led to the so-called European 'witch craze'.

Our baseline findings show that cities with an established cult of a saint were substantially more likely to witness episodes of both Jewish persecutions and witch trials, relative to locations with no saint presence. Fixed effects at the level of polities in 1800 help us control for sainthood practices and veneration within political entities since regions across Europe had their own peculiar paths to both Christianisation and acquisition of saintly cults. Population density controls at the city level, a proxy for economic development in a Malthusian setting, help us account for the economic drivers of persecutions, as argued in the literature using pre-industrial data. Our analysis is conducted both at the city-level and at the 25 × 25 km grid-level, which is particularly important for the study of witch trials, given that many persecution episodes were a rural-based phenomenon.[14]

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[12] In other words, it is hard to claim causal chains between the number of saints present in a city and their impact on religious persecution. Saintly cults thus capture a suite of phenomena encompassing various elements of the religious landscape around the city.

[13] The history of the Catholic treatment of the Jews is marked by this conflict. Elements of bigotry have prevailed at times, as illustrated by the following excerpt from a sermon by St. John of Chrysostom, one of the greatest saints of the church, written in the 4th century: "The synagogue is worse than a brothel [...] It is a criminal assembly of Jews [...] a den of thieves [...] I would say the same about their souls [...] We should not even salute them, or have the slightest converse with them" [cited in Allport (1954, p. 470)]. At other times, such negative portraits have been counterbalanced by sentiments of broader compassion and inclusion, as embodied in the messages of tolerance towards the Jews expressed for instance by Pope Gregory the Great (d. 604), who wrote that Jews "must have free license to observe and celebrate all their festivals and holidays, as both they and their ancestors have held for a long time past." [cited in Lipton (2014, p. 3)].

[14] We also perform robustness exercises using alternative grid sizes, see Fig. 11.

Previous work has explored how deterioration in economic conditions (Oster, 2004); non-price competition between Catholic and Protestant churches (Leeson and Russ, 2018); weak legal institutions (Johnson and Koyama, 2014) might explain the prevalence of the European witch trials. However, one obvious aspect of the witch trials was its gendered dimension with statistical evidence establishing that the vast majority of victims of witch trials were women.[15] Hence, one fundamental determinant could be local gender norms but since these are difficult to measure in a historical setting, such evidence has remained elusive. Our focus on saintly cults provides one potential measure of variation in gender norms: the existence of female saints. Schulenburg (1998) has provided extensive evidence linking these to relatively progressive local gender norms. We provide evidence that, indeed, cities which venerated female saints, were *less* likely to persecute witches relative to male-only saint cities.

It remains true that in our setup, it is difficult to construct purely exogenous variation in the location of saintly cults. Although restricting the saints' sample to pre-1100 helps allay some endogeneity concerns, it is not definitive. Therefore, we augment our analysis with a battery of robustness and specification checks to probe our main findings. Our proxy is likely to capture not only spatial variation in local religiosity, but may also reflect the power of local ecclesiastical authorities. All our findings remain robust to the inclusion of commonly used measures of ecclesiastic power at the city level, such as bishopric/archbishopric cities, number of churches, and their average size and the presence of monasteries. We also demonstrate that our results are not confounded by other plausible alternative explanations of violence against minorities, by accounting for a range of additional geographic, institutional, and political factors, such as ruggedness, soil quality, elevation, distance from Rome, university presence, parliamentary activity, capital cities and distance from the coast. Furthermore, two key historical episodes have been documented to have affected persecution of minorities: the Black Death and the spread of Protestantism. We study the robustness of our findings to the exclusion of persecution episodes in and around these events, and our findings carry through.[16]

The existence of saintly cults can influence persecution through a number of channels. For instance, if the teachings/hagiographies of particular saints included specific episodes of discrimination against out-groups, this could have encouraged their adherents to engage in similar acts. Pilgrimages to holy sites may have also created a worship-based environment of fervour which may have in turn manifested itself in the persecution of religious out-groups. Similarly, the long term existence of such cults may have actually altered pre-Christian norms. Notwithstanding the difficulty of estimating empirically distinct mechanisms behind the religion-persecution relationship, we provide some suggestive evidence for two plausible channels. First, we test whether longer exposure to *loca sanctorum* contributed to violence against out-groups. We find that longer exposure to Christian norms, measured as centuries since the beginning of a saintly cult, is indeed positively associated with a higher likelihood of violence against minorities.[17] Second,

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[15] Historians have offered a number of explanations for why women were more likely to be victims of witchcraft accusations: ranging from domestic disputes to a clerical emphasis of the innate susceptibility of women to demonic liaisons (Levack, 1995).

[16] We provide a further set of specification checks including testing sensitivity to outliers, saturating the model with finer fixed effects (Sect. 4.4.3), spillovers from neighbouring cities (Sect. 4.4.4), employing count data models (Sect. A.1), among other things.

[17] We use an alternative measure of exposure to Christian norms as well as employed by Schulz et al. (2019). Findings from this measure are consistent with our saint exposure measure.

historians have argued that saints' veneration may have played a role in increasing religious fervour among the local population, particularly around annual saint festivities Freeman (2011). Hence, minority groups can be particularly vulnerable in such settings. We show that persecution episodes were indeed more likely to occur in cities where Jewish religious festivals and saint festivities overlapped more often, potentially creating more opportunities for religious clashes.[18]

The rest of the paper is organised as follows. Section 2 provides historical background on the institution of sainthood in Europe as well as on the persecution episodes we study. Section 3 details the sources that we have used to compile our dataset. Section 4 discusses our empirical approach, presents the results and conducts robustness exercises. Section 5 provides some additional results on the generalizibility of to other violent episodes and a heterogeneity analysis. Section 6 investigates some potential mechanisms behind our main findings. Section 7 concludes.

2 Background

2.1 Saints veneration as a proxy for local religiosity

In early Western Christianity, saints were largely martyrs who had given their lives for their faith during the Roman persecutions.[19] By the end of the 6th century the graves of many of these early saints coalesced into being the religious focal point of their regions (Brown, 1981). In later centuries, holy people other than martyrs were also bestowed the honour of sainthood. In essence, saints were posthumously elevated into the "heavenly host and themselves became objects of reverence to the rest of the faithful, acting as intercessor for divine favor on behalf of those among whom they once had lived" (Weinstein and Bell, 2010). Their shrines and relics became the object of people's devotion who believed to benefit from being in their physical proximity in a number of ways: from witnessing miracles, to being cured of illnesses, to receiving protection from evil forces and misfortune Ferrero (2002). Alms and donations also generated a profitable business around shrine visits and through pilgrimages to these cult centres.[20]

Historians have long documented how these features of the religious landscape in Western Europe gave rise to a strong component of religiosity at the community level. For instance, Rothkrug (1980) argues that saint veneration in France and parts of the Holy Roman Empire allowed religion to "sustain its emotional force" at the very local level.[21] In a study on medieval Spain, Christian (1981) argues that local saint veneration reinforced community pride and chauvinism. Similarly, in their study on European sainthood,

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[18] This provides us with plausibly random variation in overlap and since the likelihood of contact among Christians and Jews as the former festivities follow the Gregorian calendar while the latter follow the lunar calendar.

[19] Martyrs continued to be beatified and venerated throughout the church's history.

[20] Since economic motives may have played an important role in both the saint making process and minority persecutions, we control for city-level proxies of economic development, namely population density (in all specifications), university presence and capital city status (see Table 1).

[21] Rothkrug (1980) extends his argument further and posits a strong link between these local religious practices and the resistance of these cities to the Protestant reformation. This was later empirically demonstrated by Pfaff (2013).

Weinstein and Bell (2010, pp. 166, 220) discuss at length the role of saints in cultivating local bonds of religiosity.

As mentioned earlier, an important feature of early Western Christianity was its decentralized nature at the local level. This was true for the process of saint making as well. Pre-1100, saint making was sanctioned by a tradition of popular worship: saints were typically designated by local communities who believed them to be able to perform miracles after death, and local bishops were either called to lend authority to a saint's cult or were instrumental themselves in initiating them at the local level. Throughout the first millennium of the church's life, saints veneration was a local, bottom up practice: *"canonisatio per viam cultus"*, i.e. canonisation by popular veneration (Barro and McCleary, 2016).

The first universal canonisation, involving a papal bull addressing all nations, occurred in 1041. Around two centuries later, in 1234, Pope Gregory IX asserted that only a pope had the authority to declare someone a saint (Kemp, 1948).[22] This evolution of saint making from a local, decentralised process to a unified one is what motivates our choice of using the year 1100 as a cutoff in our empirical analysis: pre-1100 saints are more likely to reflect local religion and religiosity rather than the Church's top down decision of nominating saints in potentially strategic locations. This early period of Christianity was also characterised by a higher share of martyrs, who are by nature unlikely to reflect strategic choices also correlated with minority persecutions a 1000 years later.

Finally, sainthood was predominantly a male feature throughout church history, a discrimination driven primarily by the lack of opportunity women had to hold leadership positions and hence to gain visibility, within the church and medieval life in general. It is extremely difficult to quantify the number of saints and their sex ratios in the first centuries of Christianity, but the data become more reliable from the 6th century. Female saints shares grew from around 8.6% in the 6th century to 12.8 in the twelfth century (Schulenberg, 1978). The most common ways to achieve sainthood for women were proselytisation, monastic/ascetic life, founding abbeys or monasteries or as mystics.[23] In the late medieval period female saints increased their prestige based on charismatic and mystical powers. The ascendancy of female saints has been considered a sign of female emancipation through religious life (Vauchez, 1999). In our empirical setup, we also employ the existence of the cult of a female saint as a proxy for the prevalence of relatively progressive gender norms.

2.2 Persecutions

Since the promulgation of the Edict of Thessalonica in 380, the church was able to resort to state-sponsored support to counter what it perceived as heresy, thus turning Christianity from a persecuted into a persecuting religion. Religious coercion was common practice and one of the "facts of life" during Late Antiquity and the Early Middle Ages (Brown, 1964).[24] However, it is the period between the eleventh and twelfth centuries that characterises a turning point in the history of violence in Europe (Moore, 2008).

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[22] This eventually culminated in 1634 into a fully controlled papal process, when pope Urban VIII formalised it into a posthumous procedure.

[23] For instance St Catherine of Siena and St Bridget of Sweden were female mystics.

[24] Priscillan was the first heretic to be officially executed in 385. The edict of the Theodosius II (435) envisaged the death penalty for the followers of Nestorius and Arius (Gordon and Simón, 2010, pp. 135–6). Monophysitism (in its various forms) and Donatism feature among the main persecuted heretical move-

2.2.1 Jewish expulsions and pogroms

While Christianity and its supersessionist claims fostered a rivalry with Judaism from its inception, the eleventh century represents a critical moment in the church's policy towards Judaism, as demonstrated by the antisemitic legislation passed by the Fourth Lateran Council.[25] This period coincides also with a shift in attitudes towards the Jews, who turned from unwitting witnesses to the truth of Christianity, hence being allowed limited toleration, to being a direct conversionary target (Carlebach and Schacter, 2011, pp. 1–4). Local clergy often headed anti-Jewish movements. Antisemitism in popular European Christian culture, based on beliefs such as blood libels and well poisonings, escalated in the thirteenth century. Similarly, antisemitic imageries such as the Judensau (representing Jews in obscene contact with a large female pig), became more widespread in Christian art and architecture.

The extensive literature studying the drivers of violence against Jews points to a variety factors motivating it. Among them, economic determinants play a key role: specifically, it has been argued that Jewish expulsions took place when their presence was no longer considered an economic necessity (Mundy, 2014) and that Jews were used as scapegoats during periods of economic downturn (Voigtländer and Voth, 2012; Anderson et al., 2017; Grosfeld et al., 2020). These episodes were further aggravated as a direct results of worship-based fervour engendered in local communities particularly through saint and relic worship (Rothkrug, 1980).[26]

Other explanations focus on political drivers, highlighting how religiously motivated antisemitism was used strategically by kings to reinforce their own standing: thus the hatred of the Jew in Christian societies legitimised persecutions and strengthened monarchs' political power (Menache, 1987).[27] More recently, the literature has also emphasised the role played by economic incentives and competition: Becker and Pascali (2019) show that labour market complementarities in the financial sector between the Jewish minority and the Protestant majority explain the variation in anti-Semitic sentiments and violence in Germany during 1300–1900.

2.2.2 Witch trials

Belief in supernatural phenomena like witchcraft, sorcery, astrology and even sainthood and its associated miracles persisted in Europe and around the world for millenia. However, around the turn of the fifteenth century the active persecution of one set of 'practioners' of such arcane arts begun to intensify, that of the medieval witch.

Between 1400 and 1750 around 110,000 people, mostly women, were tried for witchcraft; and about half of them were executed, usually by burning at the stake (Levack, 2016; Leeson and Russ, 2018). While the Catholic inquisition began implementing witchcraft trials in the thirteenth century within the context of the persecution of heretics,

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Footnote 24 (continued)

ments during early Christianity. See Brown (1964) on Augustine's legitimisation of the use of violence against Donatists.

[25] Supersessionism is the belief that once Christianity was established, Judaism as a religion was made unnecessary.

[26] For instance, Creasman (2002) discusses the encouragement of anti-Jewish pogroms and polemic as a result of Marian pilgrimages in Regensburg, Germany.

[27] For instance, the antisemitic sentiment clearly expressed in the anti-Jewish legislation of the Fourth Lateran Council triggered Jewish persecutions in both England and France (Chazan, 2019).

there was a dramatic increase in the early sixteenth century, triggering an intensive witch-hunt in the subsequent 150 years. Witch-hunting involved the identification of individuals, predominantly by the local community, who were believed to be engaged in black or maleficent magic and used it to perform harmful deeds (*maleficia*). Misfortunes suffered by individuals in the local community ranging from infertility to reduced milk production of livestock (Thomas, 1971), could all lead to allegations of *maleficia*. However, these instances were naturally more likely to occur in areas with a stronger belief in supernatural practices. Subsequently, religious fervour of the local community has been argued as a major determinant of the incidence of witch-hunts in a particular locality (Levack, 1995).

Nevertheless, there is no consensus on the reasons behind the witch trials. In his comprehensive account, Levack (2016) summarises the hypotheses put forward by the literature; they range from religious competition (the Reformation and Counter Reformation; the wars of religion; the attempt to wipe out paganism), to institutional (the rise of the modern state, the development of capitalism), to economic (agricultural crises) and cultural (religious zeal of the clergy, hatred of women).

The gendered nature of the witch-craze is clear from statistical evidence showing that the vast majority [around 75% (Levack, 1995)] of all alleged witches were female. Levack (1995) provides a summary of reasons that have been hypothesized to explain this empirical pattern: a clerical fear of female sexuality; susceptibility to demonic temptation; vulnerability of older, unmarried women due to their low socio-economic status[28]; and the involvement of women in childbirth related activities and childcare, all exposed them to a higher likelihood of witchcraft accusations. Based on the above, it is natural to expect that areas where gender norms were more egalitarian and women were held in relatively higher esteem might be less prone to witch trial accusations. However, owing to the difficulty of measuring variation in gender norms across regions in the Medieval era it has been difficult to test this directly. Our data on saintly cults provides a potential proxy through the presence of the cults of *female* saints.

3 Data

3.1 Saint presence

The data on the number of saints has been extracted from the *Martyrologium Romanum* (Roman Martyrology), the official martyrology of the Catholic Church, containing the list of recognised martyrs, saints and beati.[29] The Roman Martyrology was first published in 1583, underwent a few revisions over the following century, but after the 1748 edition by Pope Benedict XIV, there were only minor changes until 2001. We extract information on saints before 1100, namely before the centralisation of the canonisation process to capture

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[28] Miguel (2005) document a similar phenomenon governing witch killings in modern day Tanzania.

[29] The martyrology has been accessed using both physical copies Bibliotheca-Sanctorum, (1961) and the following websites: https://www.catholic.org/saints/ and http://www.boston-catholic-journal.com/roman-martyrology-complete-in-english-for-daily-reflection.htm; the latter reports the complete text of the Roman Martyrology circa 1900 A.D.

the local nature of sainthood and the fact that saint making was the result of popular decisions from a local community (Bartlett, 2015).[30]

Due to the decentralised nature of the path to sainthood pre-1100, it is impossible to compile a complete list of all saints ever sanctified (Delooz, 1983). While this may inevitably induce some measurement error in our measure of saints, it is unlikely that there was a systematic bias in misreporting saints from some locations and not others. With this caveat in mind, using the above sources, we extract information about several key characteristics of the saints: their year and place of birth/death, their gender, and their ecclesiastical or political status (bishop, abbot, abbess, priest, ruler, pope, monk, hermit). We assign to each saint a location, corresponding to the place where they were venerated, predominantly based on their place of death. To do so, we use the information contained in their hagiography. For instance, the hagiography of Saint Agata documents that she was born in Catania in first half of the 3rd century from a noble family and was martyred because of her faith during Emperor Decio's persecution on 5 February 251 in Catania. Appendix A2 provides short hagiographies on a subsample of saints used in the analysis.

We retrieved data on 1516 pre-1100 saints in 355 unique locations (cities) across 19 modern countries: 244 of them (16%) are women and 363 (24%) are martyrs. As illustrated in Fig. 6a, while there is widespread geographic variation in saints' veneration, the bulk of saints was concentrated in Italy (38.5%), France (18.9%), Spain (7%), the UK (5%), and Germany (4%). When looking at variation within countries, we observe that most cities with a saint had only one (53.9%): for this reason we use a dummy variable for saints presence as our preferred explanatory variable in our main regressions.[31] The cities with most saints were Rome (253 saints), followed by Milan (45), Perugia (42), Lyon (32) and Brescia (28). Figure 6b describes saints' main types, which we use as additional controls in our empirical specification, and Fig. 7 illustrates their spread across centuries.

3.2 Persecution data

We use Anderson et al. (2017)'s data on city-level Jewish persecutions, in turn extracted from *Encyclopedia Judaica*. These data indicate that between 1100 and 1800 Europe witnessed 795 episodes of Jewish expulsions and 616 pogroms. As illustrated in Fig. 8a, the country with the highest number of persecutions was Germany (30% of total persecution events), followed by France (18.5%), Spain (15.5%) and Italy (9.9%). The most intense period of persecution took place during the 14th and 15th centuries. The vast majority of the cities of our sample reported only one episode of pogrom or of expulsion: 64% and 70% of the sample, respectively. The towns recording most persecutions are: Mainz (Germany) with 4 pogroms and 7 expulsions; Arles (France) and Krakow (Poland), both experiencing 7 pogroms and 1 expulsion, see Fig. 9a for a breakdown in persecution types. We rely on Leeson and Russ (2018) for the witch-trial data, which report a total of 43,240 people prosecuted for witchcraft during 1300–1850, of which 16,333 were killed, see Fig. 9b.

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[30] The *Martyrologium Romanum* does not always indicate a saint's death date. In order to ensure that our dataset comprises only of pre-1100 saints we match it with data from Barro et al. (2011). The latter focus predominantly on post-Canonization saints and record both the date of birth and death. We remove all saints that appear in both datasets and whose death occurred after 1100. After this exercise we remain with 200 saints with missing dates. This does not impact our analysis since all of them lie within treated cities that already have at least one pre-1100 saint (Fig. 1).

[31] To ensure that outlier cities with a large number of saints do not drive our results, we drop locations with the top 1% of saints as a robustness check, see Table 14.
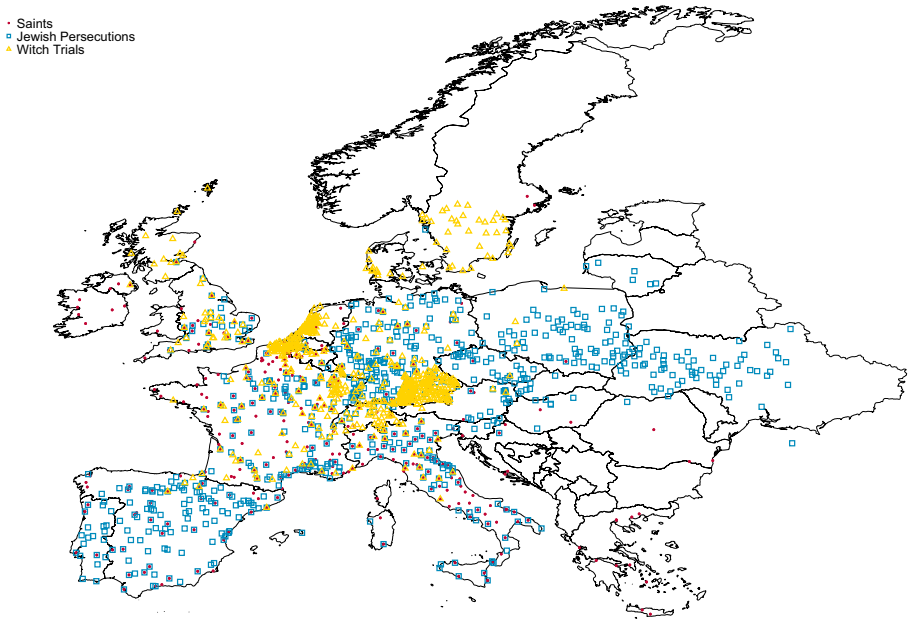
Fig. 1 Location of the cults of saints, witch trials, and Jewish persecution episodes. *Sources*: Saints' presence: *Martyrologium Romanum*; Jewish persecutions: Anderson et al. (2017), Witch trials Leeson and Russ (2018)

Figure 8b shows the geographic variation by country and time: while the bulk of trials took place in Germany (38%), Switzerland (22.6%) and the UK (11%) and France (9.6%), they occurred also in the rest of Europe.[32] Witch trials were evenly spread across centuries.

4 Empirical analysis

4.1 Baseline specification

To investigate the relationship between saint veneration and persecution, we use the following straightforward set up:

$$Persecution_{ic}^{post-1100} = \beta\, saint_{ic}^{pre-1100} + \mathbf{X}'_{ic}\boldsymbol{\gamma} + \theta_c + \varepsilon_{ic} \tag{1}$$

where $Persecution_{ic}^{post-1100}$ is a binary indicator for any persecution episodes (either witch trials or Jewish pogroms and expulsions) in city i and historical country c between 1100 and 1850. We also conduct the empirical analysis at the 25×25 km grid-level. Our main variable of interest is $Saint_{ic}^{pre-1100}$, which denotes a binary variable equal to 1 if location i in country c venerated a saint before 1100.

X'_{ic} includes a set of control variables: population density, latitude and longitude, saints types, and a dummy variable taking the value of one if a city was the seat of a

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[32] The two locations recording the highest number of trials were: Schwerin, in Mecklenburg–Vorpommern (Germany) and Navarra (Spain), with 3844 and 1577 women tried, respectively.

prince-archbishop or bishop. This variable aims to control for commonly used controls for ecclesiastical power in the literature (Cantoni, 2012; Pfaff, 2013; Finley and Koyama, 2018). To avoid sample selection concerns, when analysing Jewish persecutions, we restrict the sample only to cities which had a Jewish population following the approach in Anderson et al. (2017).[33]

Given the Malthusian setting, urban density captures location specific levels of economic development, consistent with a series of papers in the tradition of De Long and Shleifer (1993).[34] All locations with persecution episodes and witch trials have been assigned their population density, using data from Anderson et al. (2017) complemented by data from Buringh (2021).[35] Specifically, in the Jewish persecution regressions population density is an average of the 1100–1800 period, while for witch trials of the 1300–1850 period. The availability of population data eventually determines whether a city is part of our baseline estimation sample or not.[36] Appendix Table 8 shows that, as anticipated, cities with saints have higher population density then cities without one, therefore, controlling for this difference is crucial.

Latitude and longitude account for potential omitted geographic characteristics at the city level capturing economic development such as crop yields (Galor and Özak, 2016). Saint-specific characteristics such as high ranked secular occupations (queens and kings) control for the potentially confounding effect of secular power, and high ranked ecclesiastical occupations (popes, abbots, abbess, bishops) to account for their stronger ecclesiastical power (pope saints had wider cults, due to their prominent role among the faithful).

θ_c represents 1800 sovereign polities fixed effects and accounts for within region variation, such as the different processes governing the early spread of Christianity in Europe, or the differential power the church had over bishops. Finally, ε_{ic} represents the error term. We cluster the standard errors at the 1800 sovereign political entities level (39 clusters).

Using the year 1100 as a cut-off point for the presence of saint veneration is a crucial ingredient of our empirical strategy. From the twelfth century onward, the canonisation of new saints started becoming increasingly political and the bottom-up approach through local veneration withered away Delooz (1983). Hence pre-1100 centres of saint veneration are more likely to isolate local religious practices which formed as a result of historical accidents or as the interaction of various complex historical phenomena, as discussed in Sect. 2.1, as opposed to contemporary processes. This helps us avoid a potential reverse causality concern, given that post-1100 the Pope often strategically canonised Christian personalities in areas which had the potential of fomenting trouble or localised violence Goodich (1975). Motivated by a similar concern we focus on persecutions occurring only *after* 1100 to capture the effect of existing religiosity on future persecutions rather than an ex-post endogenous decision by the Papacy to start cults of saints in regions prone to persecution episodes.[37] The summary statistics are reported in Appendix Table 8.

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[33] In our sample the likelihood of hosting of Jewish community for saints and non saints cities is 0.69 (0.462) and 0.38 (0.49) respectively, (s.d. in parenthesis).

[34] City population is a widely used proxy for economic development; See, for instance, Dittmar (2011), Cantoni and Yuchtman (2014), Squicciarini and Voigtländer (2015).

[35] Buringh (2021)'s data represent an extension of Bairoch et al. (1998)'s dataset. While all locations experiencing persecution have a population density estimate, such data are available for 270 cities with a saintly cult (out of 360).

[36] The sample size drops further when using the specification with full controls: this is predominantly driven by data availability on parliamentary activity.

[37] This is an interesting research question in its own right for the literature studying the sociology and politics of canonisation in Europe especially from the thirteenth century onward.

4.2 Baseline results

Table 1 reports our main findings on the relationship between saint veneration and perse-
cution. Column (1) reports the results without any controls, thus showing the correlation
between the two variables. Column (2) controls for 1800 polities fixed effects, popula-
tion density, latitude and longitude, bishopric status and local saints type, specifically
for the number of saints members of the local ruling elite (queens and kings) or eccle-
siastical elite (popes, abbots, abbesses, bishops). This allows us to account for the role
played by cities with stronger secular power or where the hold of the Church's institu-
tional presence was more intense. These additional controls can also help us isolate the
effect of local religiosity, beyond that of key secular and ecclesiastical figures of medi-
eval Christendom.

The results point to a positive relationship between local religious institutions and epi-
sodes of Jewish persecution (expulsions and pogroms) during 1100–1800. Specifically, in
Panel A, we observe that the cult of a saint is associated with an 10.8 pp higher likelihood
of persecutions in the relevant city [column (2)]. This amounts to a relative effect size of
around 15% given the sample likelihood of persecution is around 73% for cities with a
Jewish population, i.e., the estimation sample in Panel A. In Table 9 we break down our
measure of Jewish persecutions into its subcomponents: expulsions and pogroms. Both
components have a statistically significant relationship with our main variable of interest
at the city-level. As outlined in Sect. 2.2.1, the church contributed in creating diabolic
images of the Jews, depicted as working in league with Satan for the downfall of Chris-
tendom Raphael (1972), in the same fashion as they did for sorcerers and witches (Cohn,
1975). Beyond diabolism, an ample literature has documented the Church's anti-Semitic
attitudes, often motivated by its condemnation of Jewish usury.[38] Jewish moneylenders
were vehemently opposed by the Church in general and even more so by Christian usurers
(Koyama, 2010).[39]

Turning to witch trials, Table 1, Panel B, shows that European cities where the cult of a
saint was present were around 11 percentage points (pp) more likely to witness a witch trial
episode. In relative terms, this amounts to substantial effect: the average rate of witnessing
witch trials for cities in our sample is also around 9.2%, implying a 119% higher likelihood
of trials given the presence of saintly cult. By uncovering a strong relationship between
the existence of local religious practices and the perpetration of episodes of witch hunting,
these results provide empirical evidence to the historical narrative outlined in Sect. 2.2.2.
In appendix Table 10 we consider only witch killings as the dependent variable and con-
tinue to find a positive and significant relationship albeit one that is slightly muted, which
is consistent with the more extreme nature of the outcome.

In columns (3)–(6) we introduce additional controls to our baseline specification, in
order to better account for geographical and institutional characteristics.[40] Specifically,
we include in all columns distance from Rome with the aim of accounting for the influ-
ence of the Church, which can help us further isolate local ecclesiastical power. In column
(3) we add a dummy variable for university presence and one for parliamentary activity:

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[38] For instance, while The Fourth Lateran Council of 1215 tolerated the practice of Jewish lending at an
interest, it declared that Jewish usurers had to be ostracised.

[39] For instance, the founding of *monti di pieta'* by Franciscans (loan-banks for the poor which could lend
at interest) in Italy was associated with the expulsion of the Jews (Pascali, 2016).

[40] The sources for the additional controls are from Bosker et al. (2013) and Anderson et al. (2017).

Table 1 Saints, persecutions and witch trials

	(1)	(2)	(3)	(4)	(5)	(6)
Panel A	Dep. var.: *Jewish persecutions-city level*					
Saints	0.292***	0.108***	0.097***	0.097***	0.103***	0.105***
Presence	(0.045)	(0.038)	(0.031)	(0.031)	(0.036)	(0.031)
N	1043	920	864	864	864	864
Adj. R^2	0.056	0.210	0.215	0.214	0.214	0.217
Panel B	Dep. var.: *witch trials-city level*					
Saints	0.052**	0.112***	0.094**	0.093**	0.091**	0.094**
Presence	(0.025)	(0.040)	(0.037)	(0.037)	(0.035)	(0.037)
N	2954	2175	2119	2119	2119	2119
Adj. R^2	0.001	0.203	0.215	0.217	0.217	0.217
Panel C	Dep. var.: *Jewish persecutions-grid level*					
Saints	0.236***	0.103***	0.091***	0.098***	0.102***	0.110***
presence	(0.046)	(0.031)	(0.026)	(0.030)	(0.035)	(0.031)
N	783	750	741	741	741	741
Adj. R^2	0.052	0.204	0.225	0.229	0.228	0.235
Panel D	Dep. var.: *witch trials-grid level*					
Saints	0.168***	0.119***	0.107**	0.106**	0.103**	0.107**
Presence	(0.029)	(0.040)	(0.040)	(0.040)	(0.039)	(0.041)
N	2288	1802	1750	1750	1750	1750
Adj. R^2	0.057	0.205	0.215	0.218	0.219	0.218
Polity FE	N	Y	Y	Y	Y	Y
Baseline controls	N	Y	Y	Y	Y	Y
Saints types	N	Y	Y	Y	Y	Y
Dist. from Rome	N	N	Y	Y	Y	Y
Institutions	N	N	Y	Y	Y	Y
Wheat suitability	N	N	N	Y	Y	Y
Capital city	N	N	N	N	Y	Y
Dist. from sea	N	N	N	N	N	Y

Fixed effects OLS regressions. Robust standard errors, clustered by sovereign political entities in 1800 (39 clusters). Stars indicate level of significance: ***(1%); **(5%); and *(10%). The baseline controls include: population density, latitude and longitude, (arch)bishopric dummy. Saints types refer to the number of saints in the following high rank occupations: pope, king, queen, abbot/abbess, bishops. Institutions include a dummy for university presence and parliamentary activity

universities, which started being established from around the twelfth century in Europe, have been shown to be positively related with growth (Cantoni and Yuchtman, 2014), and can thus be considered an additional proxy for economic development; moreover from the enlightenment onward, universities have been associated with religious toleration, opposition to bigotry and ecclesiastic authority (Domínguez, 2017).[41] The parliamentary activity

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[41] This however was not always the case, especially before the enlightenment. In fact in the Middle Ages universities were often dominated by the papacy (Le Goff, 1993).

dummy, which indicates whether a city had representatives in an active parliament, aims at capturing the institutional developments that have been associated with Europe's economic growth (Acemoglu et al., 2005). Column (4) includes wheat suitability, aimed at better capturing a location's agricultural potential and land productivity beyond the effect of latitude and longitude. We further control for capital city status as a proxy for a location's political importance, by adding a dummy variable equal to one if a city has even been the capital of a political entity between 1100 and 1800 [column (5)]; and distance from the sea [column (6)] to capture a city's potential for water-based trade (Bosker et al., 2013).

Studying the pattern of our point estimates across columns in Table 1 is instructive: their magnitude drops substantially from column (1), no controls, to col. (2) with ecclesiastical power controls. This can be explained by the fact that saint cities have higher population density and stronger ecclesiastical presence (see Table 8), both of which are likely to be positively associated with persecutions. However, as we add more controls from column (3) onward the coefficients do not change much, despite the fact that such controls exhibit non negligible differences across saint and non-saint cities (as shown in Table 8). This underscores that the unobservables we should be more concerned about are likely sacerdotal or ecclesiastical in nature. We thus pay special attention to these in Sect. 4.4.1.

Given the time period of our study, employing the city as the spatial unit can engender specification and/or estimation related concerns. For instance, local saints may have exerted influence beyond their focal city onto nearby settlements/villages. Similarly, persecution episodes may have arisen in neighbouring locations, possibly instigated by a local saint shrine in a city close by. While we directly explore such spillovers in Sect. 4.4.4, here we report estimates from an alternative aggregation exercise as well. We construct 25×25 km grids and repeat the baseline analysis using these as spatial units.[42] As Panels C and D of Table 1 show, our findings remain consistent with the city-level results, across specifications.[43] The grid-level setup is particularly important for the analysis of witch trials: this is because our data source (Leeson and Russ, 2018) records some trials only at the region level, due to the fact that many of such persecution episodes occurred in the countryside.[44] By using a grid-level analysis we are able to include such data and assign to each grid-cell the average number of trials that took place in the region.[45]

4.3 Heterogeneity by saints characteristics

Although the European Middle Ages were largely categorised with regressive gender norms, it is still reasonable to expect spatial variation in these norms across the European continent. Historians have long hypothesised how these could have contributed to the

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[42] The control variables in the grid specification are computed as the average value based on all locations within that grid. For instance, if two cities fall within the same grid, the grid's population density is the average population density of the two cites.

[43] We also explore the robustness of our findings to different levels of spatial aggregation. We construct $G \times G$ grids for the European continent, where $G \in \{50, 75, 100\}$ kilometres and assign each city in our sample to these grids. Figure 11 shows that our baseline findings, which we reproduce on the plot at 0 km, hold forth for both outcome variables as we increase the aggregation level. We lose statistical significance at the 95% level only for Jewish persecutions under the 100×100 grid, given this reduces our sample size substantially.

[44] For instance, a non negligible share of England's witch trials are only assigned to a region like Somerset, Suffolk, Northampton rather than to a specific city. Overall, around 42% of witch trials in Leeson and Russ (2018) were recorded at the regional level.

[45] For instance if a region had 20 trials and covered 4 grid-cells, each cell would get a value of 5.

witch craze of the sixteenth and seventeenth century (Levack, 1995). However, empirical evidence in this regard has been elusive. In Table 2, we contribute to this domain by using the veneration of female saints to capture the spatial variation in gender norms. In a seminal work, Schulenburg (1998) argues that regions where more female saints were venerated were more likely to have "a certain tolerance toward women; a favourable atmosphere which encouraged, appreciated, and valued women's active participation in society and the Church".[46] In other words, cities in our sample with a cult of female saint were more likely to have progressive gender norms, which can contribute towards ameliorating the impact of religious institutions on female related persecution, i.e., the European witch trials.

We start by adding a binary indicator to the specification estimated in Table 1 for whether the city had the cult of a female saint pre-1100. The point estimates reported in column (1) show that cities that venerated female saints were around 12 pp *less* likely to witness witch trial episodes compared to cities with only male saint presence. In column (2), we repeat the same exercise using the full battery controls specified in col. (6) of Table 1. We find a similar effect size of around 12 pp reduction in the likelihood of female saint cities engaging in with trials compared to male-only saint cities. This amounts to an effect size of 41% relative to the baseline rate of witch trials in the saint city sample. In column (3) we replace the binary indicator with an alternative measure, the percentage of female saints venerated, and obtain similar results.

These findings offer new insights into understanding the complex phenomenon of the spread of witch trials across Europe and documents a more fundamental determinant of such episodes: the status of women in local societies. However, it is important to note that progressive gender norms can also map into better opportunities for lay women to, say, pursue conventual life. This may have improved the average status of women in these cities and may also have led to lower witch trials. To test for this specific channel, we additionally control for the presence of monasteries in col. (4). Specifically, to account for the possible influence of convents, we digitise the ecclesiastical map of Western Europe and of the British Isles in the Middle Ages from the Historical Atlas by Shepherd (1923-1926) to construct a city-level binary indicator for monastic/conventual presence [col.(4)].[47] The results indicate that the female saints indicator continues to be negative and significant and barely changes magnitude, while that of monastic presence is positive and significant (Panel B). As the latter can be thought of another proxy of ecclesiastical presence, it confirms our prior discussion on its positive relationship with witch trials.

Crucially, the presence of female saints is *positively* associated with Jewish persecutions [panels A, C]. This provides an important falsification test of the progressive gender norms hypothesis when using witch trials as dependent variable: if the above negative effect was driven by some underlying unobservable characteristics that are negatively correlated with both female saints and religious persecution, then this relationship would have likely persisted in the case of Jewish persecutions as well.

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[46] Regions spanning the homelands of Germanic nations, England, France, Belgium, Germany, boast the highest proportion of female saints in Europe pre-1100. This can potentially be a continuation of the ancient Germanic respect for women as prophetesses and seers as observed by Tacitus in his famous work *Germania*.

[47] The ecclesiastical maps can be accessed at http://www.emersonkent.com/map_archive/western_europe_ecclesiastical.htm and http://www.emersonkent.com/map_archive/british_isles_middle_ages.htm. Note that these maps do not show monasteries in (arch)bishopric cities, but it acknowledges that "Many monasteries, of course, were located in the seats of archbishoprics and bishoprics". We code (arch)bishopric seats as having monastic presence, accordingly.

Table 2 Saints types and persecution, city level

	(1) Full sample	(2)	(3)	(4)	(5) Martyr	(6) Low rank	(7) High rank
	Panel A	Dep. var.: *Jewish persecutions-city level*					
Saints presence	0.096***	0.096***	0.097***	0.092***	0.118***	0.097***	0.115***
	(0.028)	(0.025)	(0.025)	(0.026)	(0.035)	(0.025)	(0.031)
Female saint	0.046	0.035		0.040			
Presence	(0.058)	(0.061)		(0.057)			
Female saint			0.005				
Share			(0.010)				
Monastic				−0.077			
Presence				(0.064)			
N	920	864	864	864	812	797	834
Adj. R^2	0.209	0.216	0.216	0.216	0.207	0.204	0.213
	Panel B	Dep. var.: *witch trials-city level*					
Saints presence	0.143***	0.125***	0.122***	0.126***	0.105***	0.119***	0.119***
	(0.042)	(0.040)	(0.040)	(0.045)	(0.037)	(0.044)	(0.039)
Female saint	−0.118***	−0.118***		−0.119***			
Presence	(0.024)	(0.024)		(0.025)			
Female saint			−0.017***				
Share			(0.005)				
Monastic				0.053**			
Presence				(0.025)			
N	2175	2119	2119	2119	2052	2033	2077
Adj. R^2	0.207	0.221	0.219	0.222	0.166	0.183	0.187
	Panel C	Dep. var.: *Jewish persecutions-grid level*					
Saints presence	0.094***	0.103***	0.102***	0.098***	0.110***	0.098***	0.119***
	(0.031)	(0.031)	(0.031)	(0.030)	(0.032)	(0.027)	(0.031)
Female saint	0.038	0.031		0.062			
Presence	(0.052)	(0.061)		(0.055)			
Female saint			0.005				
Share			(0.010)				
Monastic				0.070			
Presence				(0.061)			
N	750	741	741	741	684	675	709
Adj. R^2	0.204	0.234	0.234	0.221	0.220	0.223	0.230
	Panel D	Dep. var.: *witch trials-grid level*					
Saints presence	0.129***	0.119***	0.120***	0.124***	0.132***	0.119***	0.127***
	(0.040)	(0.041)	(0.042)	(0.041)	(0.042)	(0.037)	(0.036)
Female saint	−0.042***	−0.046***		−0.031*			
Presence	(0.012)	(0.011)		(0.017)			
Female saint			−0.008***				
Share			(0.002)				
Monastic				0.111***			

Table 2 (continued)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Full sample				Martyr	Low rank	High rank
Presence				(0.020)			
N	1750	1750	1750	1635	1673	1663	1706
Adj. R^2	0.204	0.219	0.219				
0.234	0.165	0.171	0.176				
Baseline controls	Y	Y	Y	Y	Y	Y	Y
Full controls	N	Y	Y	Y	Y	Y	Y

Fixed effects OLS regressions. Robust standard errors, clustered by sovereign political entities in 1800 (39 clusters). Stars indicate level of significance: ***(1%); **(5%); and *(10%). The baseline controls include: population density, latitude and longitude, (arch)bishopric dummy. Full controls include all variables specified in col. (6), Table 1. Cols. (5)–(7) keep in the sample cities with: only martyr saints, only lay saints, only high rank saints, respectively. Low rank saints is a dummy variable equal to 1 for cities venerating saints belonging to the following types: monks, hermits, priests, confessors, disciple, teacher. High rank saints is a dummy variable equal to 1 for cities venerating saints belonging to high-ranked ecclesiastical or political positions (pope, king, queen, abbot/abbess, bishop)

In columns 5–7, we exploit heterogeneity in saint types to assess whether their ecclesiastical/religious ranking differentially affected the probability of persecution. We divide pre-1100 saints into three categories: martyrs, low-rank and high-rank saints in terms of status.[48] Martyrs, being the first saints, symbolise the initial spread of Christianity; since martyrdom gave direct access to sainthood, they are less likely to be associated with entrenched ecclesiastical power.[49] Moreover, martyrs can also be thought of as a proxy for the intensity of persecution against Christians, before the establishment of Christianity as the dominant creed. The category low-rank saints comprises of layman and laywomen such as monks, hermits, priests, confessors, disciples, and teachers, while saints belonging to the political or ecclesiastical elite are designated as high-rank saints (queens, kings, bishops, abbots, abbesses, and popes).

We first keep only martyr saints in the sample [col. (5)] and then do the same for low rank [col. (6)] and high rank saints [col. (7)]. The results suggest that all types of saints led to a higher prevalence of both types of persecutions. In particular, the fact that high-rank saints contributed positively to anti-minority violence is consistent with the narrative that local medieval lords decided whether or not to protect the Jewish population under their domain (Baron, 1952). Nevertheless, it is reassuring that high-rank saints do not drive our results, since when we remove them from the sample [cols. (5) and (6)], our coefficient of interest remains stable. This is also informative in indirectly assessing whether our effects are purely due to the presence of a saint or whether their rank is also salient. In other words, if our controls were inadequate, then ex-ante one would expect high rank saints to have bigger point estimates as they, arguably, would combine the effect of both

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[48] Note that the categorisation of "low rank" versus "high rank" saints has been created by the authors with the purpose of identifying saints who were more likely to be associated with ecclesiastical power and is not a recognised category of sainthood in the Catholic Church.

[49] However, it can still be the case that ecclesiastical power coopted preexisting cults of martyrs to legitimize their control. Indeed, saint cities are more likely to have the seat of an archbishop than non-saint cities. Hence, adequately controlling for local ecclesiastical power is an important ingredient of our analysis. See also Sect. 4.4.1.

saint veneration and presence of local secular and/or ecclesiastical power. It is reassuring to see the stability of our estimates across columns (5)–(7) of Table 2 when keeping the control group fixed as non-saint cities.

Another issue that potentially plagues our setup is the tradition of the veneration of saintly relics, which could range from their body parts to bone fragments to personal possessions (Freeman, 2011). As these secondary cults could arise in cities other than the primary *locum sanctorum*, this would create a measurement bias. We offer two insights to probe this issue. First, this is likely to create a contamination bias, as some 'untreated cities' i.e., those without saints, might actually be hosting relics from a saint and are in fact treated, albeit in a weaker sense. Similarly, one could also have saints that were venerated in some of our control cities but were eventually forgotten and hence did not appear in any of the sources that we use to construct our measure. Both these issues are likely to bias our estimates towards zero, implying that our estimated effect may be a lower bound.[50] Second, since high-rank saints were more likely to have the proliferation of secondary cults based on their relics, under the assumption that non-saint cities around a primary *locum santorum* were more likely to have access to these relics, dropping grids with high-ranked saints will exclude these secondary 'treated' cities from the analysis. As columns (5) and (6) in panels C and D of Table 2 show, we continue to find positive and statistically significant point estimates.[51] Hence, this exercise also allows us to indirectly circumvent the problem of lack of exhaustive data on the location of saints' remains, and to indirectly, albeit imperfectly, allay the concern of not accounting for locations where devotion was predominantly relics-based.

4.4 Probing our empirical setup

4.4.1 Local religiosity and ecclesiastical power

In order to ensure that our saint presence proxy represents a measure of local religiosity, above and beyond the existence of localised structures of ecclesiastical power, we collect an array of measures of institutionalised religion commonly used in the literature, and add them as controls to our baseline regressions. In this way, we can interpret the coefficient of saints' veneration as being net of ecclesiastical power. To be clear, the purpose of this exercise is not to argue that the veneration of saints was driven *only* by local religiosity, but rather to control for a range of confounding factors associated with local church power which likely influenced the saint-making process.[52] The results are reported in Table 3: we start controlling for archbishopric and bishopric cities, first using separate dummy variables [col. (1)], then a single variable [cols. (2)–(6)], following Finley and Koyama (2018). Next, in column (3) we include the number of pre-1100 churches.[53] Churches reflected societies' religious and cultural aspirations, and were a clear sign of the influence of the ecclesiastical hierarchy (Buringh et al., 2020).

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[50] An analogous argument holds for cities that are considered treated in our sample but their resident saint is forgotten and their veneration has lapsed. This will create contamination in the set of treated cities, biasing our estimates towards zero.

[51] Our baseline grids are defined at the 25×25 km level but we also repeat this exercise with 50×50 km grids and results remain robust.

[52] As mentioned in the narrative before, despite being decentralised, local church power played a role in sanctification, given that in order to make a veneration official a bishop had to be involved (Delooz, 1983).

[53] The data on churches are from Buringh et al. (2020).

We then control for an additional signal of ecclesiastical power [col. (4)]: large church structures Pfaff and Corcoran (2012).[54] We define a pre-1100 large church by constructing a binary variable equal to one for buildings whose size was larger than 1000 m^2, as suggested by Buringh et al. (2020). To further account for late antiquity and early medieval church power we control for distance to the closest archbishopric/bishopric seat pre-1100, given that the official process of saint veneration required the involvement of a local bishop. Next, we explore an alternative yet plausible narrative: that saint veneration may have occurred in locations under less control by the church, namely in places of low state capacity, which has been associated with greater religious persecution Anderson et al. (2017). Given the lack of city-level data on administrative capacity during our time period, we use distance from the closest city which has ever been the capital of a political entity before 1100 as a proxy. Both distance measures are included in column (5). Finally, it might be argued that the influence of the church may have been stronger in areas that had been Christianised earlier. To account for the intensity of the legacy of the church before 1100, we control for the number of years since a city became an (arch)bishopric seat [col. (6)]. The coefficient of saints presence remains significant and of similar magnitude to our baseline results in Table 1 across all specifications, thus suggesting that ecclesiastical institutions were not the only component of religion associated with persecution.

Next, we look at an existing measures of historical religiosity within the context of late eighteenth century France, and test whether: (1) saints' veneration is correlated with it; (2) our empirical setup is robust to its inclusion. Specifically, we use data from Squicciarini (2020) who defines religiosity as the share of refractory clergy in a dèpartment in 1791, namely "the share of French clergy that did not swear the oath of allegiance to the Civil Constitution promoted by the revolutionary government, but instead confirmed their loyalty to the Catholic Church."[55]. In this set of regressions we use both our control variables (baseline and full controls), and Squicciarini (2020)'s full set of covariates (replicating her Table 3, col. 5).[56] We use 1800 historical administrative level fixed effects (n = 55) and cluster the standard errors at the historical administrative level.[57] Our results are presented in Table 11 and indicate that saint veneration is not correlated with refractory clergy [cols. (1)–(3)] and that our baseline findings continue to hold, both for Jewish persecutions [cols. (4)–(6)] and witch trials [cols. (7)–(9)].

Under the three-tiered relationship between religion and persecution argued in the Introduction, this finding could be rationalized as refractory clergy not being a clean proxy for local religiosity, but also encompassing the centralized link, i.e. local ecclesiastical power, while our saint measure capturing local popular religiosity. Indeed, the seminal work on this topic, Tackett (1986), argues that there are a number of interlocking patterns which

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[54] Pfaff and Corcoran (2012) find that both the number of monasteries and church height decreased the probability of abolishing the Catholic mass in the Holy Roman Empire post-Reformation.

[55] Squicciarini (2020)'s religiosity data covers 85 dèpartments. The author argues that this is a measure of religiosity, rather than ecclesiastical power, "since a clergyman's decision to accept or reject the oath was largely determined by the religious attitude of the local community" (Squicciarini, 2020, p.3455)

[56] These include: log total department population in 1891, temperature, precipitation, wheat soil suitability, an index of pre-industrial activities in France before 1500; log distance from Paris (in km); a dummy for departments where the king, before 1789, exerted particularly strong power; log number of subscribers to the Encyclopedie in 1777–1780; the ratio of students to school-age population (5–15 years).

[57] Historical administrative regions are smaller than dèpartments.

Table 3 Accounting for proxies of ecclesiastical power, city level

	(1)	(2)	(3)	(4)	(5)	(6)
	Panel A	Dep. var.: *Jewish persecutions-city level*				
Saints	0.108***	0.108***	0.112***	0.109***	0.109***	0.103***
Presence	(0.040)	(0.038)	(0.030)	(0.021)	(0.030)	(0.030)
Archbishopric	−0.050					
City	(0.047)					
Bishopric	−0.039					
City	(0.026)					
(Arch)bishopric		−0.043*	−0.102**	−0.096**	−0.014	−0.030
City		(0.026)	(0.040)	(0.045)	(0.040)	(0.040)
Church			0.009			
n			(0.016)			
Large				0.312***		
Church				(0.021)		
Distance from					−0.091	
(arch)bishopric					(0.144)	
Distance from					0.192	
State capital					(0.135)	
Years since						0.005
Bishophric						(0.004)
N	920	920	447	447	864	864
Adj. R^2	0.209	0.210	0.095	0.104	0.217	0.216
	Panel B	Dep. var.: *witch trials-city level*				
Saints	0.114***	0.112***	0.144***	0.144***	0.093**	0.095**
Presence	(0.038)	(0.040)	(0.041)	(0.041)	(0.037)	(0.040)
Archbishopric	0.022					
City	(0.072)					
Bishopric	0.064***					
City	(0.019)					
(Arch)bishopric		0.066***	0.070***	0.074***	0.005	0.012
City		(0.024)	(0.026)	(0.027)	(0.017)	(0.027)
Church			0.007			
n			(0.007)			
Large				0.160***		
Church				(0.029)		
Distance from					0.031	
(arch)bishopric					(0.085)	
Distance from					−0.013	
State capital					(0.067)	
Years since						−0.003
Bishopric						(0.008)
N	2175	2175	1313	1313	2119	2119
Adj. R^2	0.202	0.203	0.182	0.184	0.216	0.216
Baseline controls	Y	Y	Y	Y	Y	Y
Saints types	Y	Y	Y	Y	Y	Y

Table 3 (continued)

	(1)	(2)	(3)	(4)	(5)	(6)
Full controls	N	N	N	N	Y	Y
	Panel C	Dep. var.: *Jewish persecutions-grid level*				
Saints	0.102***	0.103***	0.121***	0.110***	0.108***	0.109***
Presence	(0.032)	(0.031)	(0.024)	(0.018)	(0.029)	(0.031)
Archbishopric	−0.054					
City	(0.052)					
Bishopric	−0.047					
City	(0.031)					
(Arch)bishopric		−0.054*	−0.107***	−0.114***	−0.009	−0.037
City		(0.029)	(0.037)	(0.040)	(0.033)	(0.035)
Church			−0.006			
n			(0.008)			
Large				0.267***		
Church				(0.016)		
Distance from					0.001	
(arch)bishopric					(0.001)	
Distance from					−0.001	
State capital					(0.001)	
Year since						0.003
Bishopric						(0.003)
N	750	750	381	381	741	741
Adj. R^2	0.203	0.204	0.145	0.153	0.234	0.234
	Panel D	Dep. var.: *witch trials-grid level*				
Saints	0.120***	0.119***	0.146***	0.148***	0.107**	0.106**
Presence	(0.039)	(0.040)	(0.035)	(0.037)	(0.041)	(0.043)
Archbishopric	−0.001					
City	(0.052)					
Bishopric	0.060***					
City	(0.020)					
(Arch)bishopric		0.059**	0.049***	0.068***	0.030	0.020
City		(0.024)	(0.013)	(0.018)	(0.018)	(0.033)
Church			0.023**			
n			(0.010)			
Large				0.225***		
Church				(0.018)		
Distance from					0.001	
(arch)bishopric					(0.001)	
Distance from					0.001	
State capital					(0.001)	
Year since						0.004
Bishophric						(0.007)
N	1802	1802	1021	1021	1750	1750
Adj. R^2	0.205	0.205	0.221	0.220	0.218	0.218

Table 3 (continued)

	(1)	(2)	(3)	(4)	(5)	(6)
Baseline controls	Y	Y	Y	Y	Y	Y
Saints types	Y	Y	Y	Y	Y	Y
Full controls	N	N	N	N	Y	Y

Fixed effects OLS regressions. Robust standard errors, clustered by sovereign political entities in 1800 (39 clusters). Stars indicate level of significance: ***(1%); **(5%); and *(10%). The baseline controls include: population density, latitude and longitude, (arch)bishopric dummy. Saints types refer to the number of saints in the following high rank occupations: pope, king, queen, abbot/abbess, bishop. Large church is a dummy equal to one for churches larger than 1000 m^2. Full controls refers to all control variables specified in col. (6) of Table 1

need to be taken into account in explaining the overall picture of oath-taking.[58] This act was not just the reflection of the opinion of the laity with whom the clergymen lived, but was also affected by a large set of other factors, such as the extent of clergymen's material benefits from the Civil Constitution, the cultural and political distance between a location and the revolutionary core of the country, local political and institutional structures, the independence from the Gallican Church, the local traditions of ultramontanism, proximity of Calvinist or Lutheran populations, clerical politicisation, as well as the presence of a significant non-French culture and language.[59] Tackett (1986, p. 290) also explicitly writes that in cities with a cathedral (usually larger towns) "the bishop and his assistants seem to have had some measure of success in influencing lower clergy" on the matter of oath-taking, clearly highlighting the centralized component of religion. Moreover, laity's opposition to the oath reflected a broader ideological opposition to the whole French Revolution, rather than a narrow expression of religiosity (Tackett, 1986, p. 288). Finally, the particularly strong relationship between religiosity and persecution within just the geographic confines of France is noteworthy, a finding that future research should probe more deeply.

4.4.2 Two major historical episodes as confounders: the black death and the reformation

In this section we examine two key plausible confounding factors that have the potential to explain our results: Black Death pogroms and the adoption of Protestantism. We attempt to rule them out to establish that our results above indeed capture the relationship between religiosity and persecutions. Major economic shocks, including those brought about by the Black Death, have been associated with an increase in hostility towards minorities and can thus be considered an exogenous trigger to persecution (Voigtländer and Voth, 2012; Finley and Koyama, 2018; Grosfeld et al., 2020). During economic downturns persecutions are likely to occur particularly if minorities are held responsible for the shock, like in the case of Jews during the Black Death, who were accused to have caused the plague by poisoning wells (and tortured into confession). To account for this potential confounder, we control

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[58] For a discussion of the range of factors influencing oath-taking, see especially pp. 287–300 in Tackett (1986).

[59] For instance, Tackett (1986) indicates that the following clergymen types were more likely to take the oath: elderly priests, migrant priests living far away from their home parishes, clerics from the lowest socioeconomic background, as well as clergymen who had recently received their first permanent status. These factors are clearly not a reflection of local religiosity.

Table 4 Accounting for the black death and the reformation

Dep. var	Black death intensity		W/o black death years		Pre-reformation		Protestant cities		Dist. to Prot/cath cities	
	Jewish persecutions	Witch trials	Jewish Persecutions	Witch trials	Jewish persecutions	Witch trials	Jewish persecutions	Witch trials	Jewish persecutions	Witch trials
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Panel A	*City level*									
Saints presence	0.108***	0.108***	0.160***	0.130**	0.166***	0.100***	0.108***	0.108***	0.100***	0.110***
	(0.039)	(0.038)	(0.042)	(0.050)	(0.042)	(0.036)	(0.038)	(0.040)	(0.037)	(0.039)
Plague years	0.006	0.001								
	(0.035)	(0.002)								
Protestant City							0.103	0.142***		
							(0.092)	(0.034)		
Distance to Protestant/Catholic city									−0.001**	−0.000
									(0.000)	(0.000)
N	920	2175	909	2175	920	2175	920	2175	920	2175
Adj. R²	0.209	0.203	0.192	0.210	0.451	0.202	0.212	0.220	0.217	0.203
Panel B	*Grid level*									
Saints presence	0.103***	0.114***	0.135***	0.144***	0.145***	0.119***	0.105***	0.117***	0.092***	0.116***
	(0.031)	(0.040)	(0.040)	(0.050)	(0.035)	(0.040)	(0.031)	(0.041)	(0.027)	(0.040)
Plague years	−0.002	0.002								
	(0.027)	(0.001)								
Protestant City							0.025	0.106***		
							(0.112)	(0.031)		
Distance to Protestant/catholic city									−0.001**	−0.000
									(0.000)	(0.000)
N	750	1802	745	1802	750	1802	750	1802	750	1802
Adj. R²	0.203	0.206	0.194	0.228	0.418	0.205	0.204	0.220	0.219	0.205

Table 4 (continued)

Dep. var	Black death intensity		W/o black death years		Pre-reformation		Protestant cities		Dist. to Prot/cath cities	
	Jewish persecutions	Witch trials	Jewish Persecutions	Witch trials	Jewish persecutions	Witch trials	Jewish persecutions	Witch trials	Jewish persecutions	Witch trials
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Baseline controls	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Saints types	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

Fixed effects OLS regressions. Robust standard errors, clustered by sovereign political entities in 1800 (39 clusters). Stars indicate level of significance: ***(1%); **(5%); and *(10%). The baseline controls include: population density, latitude and longitude, (arch)bishopric dummy. Saints types refer to the number of saints in the following high rank occupations: pope, king, queen, abbot/abbess, bishop. Cols. (1)–(2) control for plague years; cols. (3)–(4) exclude the Black Death period (1345–1354) from the sample. Cols. (5)–(6) restrict the sample to the pre-Reformation period (pre 1517); cols. (7)–(8) control for Protestant cities; cols. (9)–(10) control for distance to Protestant cities

for the number of plague years, using data from Anderson et al. (2017).[60] The results, illustrated in columns (1)–(2) of Table 4, show that the positive relationship between the presence of a saint's cult and persecution persists and has a coefficient of similar magnitude to the baseline. Furthermore, in order to ensure that our results are not driven by the Black Death, we remove the Black Death period (1345–1354) from the sample, and the results remain consistent with our previous estimates [cols. (3)–(4)].

The spread of the Reformation has been linked to an increase in persecution against minority groups: Jewish persecutions become more common in Protestant areas relative to Catholic areas, due to higher economic competition between the Jewish and the Protestant populations, who had less restrictive views on usury (Becker and Pascali, 2019). Similarly, the European witch trials have been shown to reflect non-price competition between the Catholic and Protestant churches for religious market shares (Leeson and Russ, 2018).[61] Not accounting for the role of Protestantism may therefore bias our estimates upwards. On the other hand, it is argued that the cult of the saints may have helped some European regions resist the spread of Protestantism (Pfaff, 2013), a pattern that may bias our estimates downwards. We use three strategies to account for protestant cities: in columns (5)–(6) of Table 4, we restrict our sample to persecution episodes occurring during the pre-reformation period (pre-1517); in columns (7)–(8) we assign a dummy variable equal to one to cities that embraced Protestantism by 1600, using data from Rubin (2014). In columns (9)–(10) we control for distance from Protestant (Catholic) cities for Catholic (Protestant) cities, as proximity would matter most when testing the Catholic-Protestant competition channel. The results remain robust to both specifications, at all levels of aggregation.

4.4.3 Other specification checks

This section presents some key tests to explore the robustness of our findings. First, to account for unobservables at a finer geographical level, we replicate columns (1)–(2) of Table 1 and column (2) of Table 2 controlling for 1800 historical administrative region fixed effects, and clustering the standard errors at the historical region level.[62] The results, reported in Appendixs Table 12, are robust to this demanding specification (there are 274 historical administrative regions in the Jewish sample and 434 regions in the witch trials sample). On the other hand, it may be the case that 1800 polities may not adequately capture the differences in political landscape across Europe within our sample period. Therefore as a robustness exercise, we keep our data at the city level but instead of polity fixed effects we employ grid fixed effects to capture city-invariant unobservables within broader regions defined agnostically, i.e., by picking up variation in historical political boundaries through a data-driven way of aggregation. For this analysis, we define $G \in \{150, 200, 500\}$ using larger grids to have enough cities to compare within grid cells. Figure 12 presents

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[60] A city had an average of 4.2 plague years.

[61] In addition to this, scholars have also argued how Protestantism shunned any form of Church magic yet recognized the existence of witchcraft and popular magic. Thomas (1971) argues that this loss of the protective power of Church magic in Protestant areas increased the likelihood of locally instigated witch trials and killings.

[62] These administrative regions are extracted from the 1800 Euratlas map; they are simple territorial units under the control of the main authority of their state and bear various denominations like provinces, counties, duchies, districts, dèpartments, etc. These additional fixed effects can help control for unobservables such as changes in administrative infrastructure or in the intellectual ability of monarchs Ottinger and Voigtländer (2021).

results from this analysis and the results are completely robust to this alternative set of fixed effects.[63]

Second, our binary measure of religiosity implicitly assumes that all cities have the same probability of hosting a saint, regardless of their size. While we control for population density in all our specifications, to further ensure that our results are not biased by city size differences, we replicate the results of Table 1 using log saints per capita as key regressor. The results, reported in Table 13 are consistent with our baseline findings and suggest that a one percentage increase in saints per capita is associated with 1.7 pp and 1.5 pp higher probability of persecutions and witch trials, respectively.

Third, we check whether our findings are driven by certain outlier cities both in terms of persecutions and saints. For instance, cities that saw persistently high rates of religious persecutions could be important centres of secular power and hence might also have venerable local saints as a correlate of city power. This could spuriously present itself as an association between saint presence and persecutions. We address these concerns in columns (1)–(2) of Appendix Table 14. In column (1) we drop the top 1% persecuting cities in our data, namely those that experienced six or more persecution events and still estimate a strong effect of similar magnitude of those reported in Tables 1, col. (2). In column (2) we drop the locations with the highest number of witch trials (top 1%), namely those which held more than 256 trials, and the results point to a slightly higher effects, relative to those shown in Table 1, col. (2).

Although the vast majority of cities have only between 1 and 3 saints, some cities were particularly prolific in venerating local heroes as saints, like Rome with 350 and Milan with 48.[64] Cities with a large number of saints might also be more prone to religious violence due to their role as the prime centres of power of Latin Christianity. It could be argued that stronger religious establishments reacted particularly forcefully to heretical behaviour and to other religions, a phenomenon which might be driving our baseline findings. In columns (3) and (4) we drop from our sample the cities which venerated more than 12 saints (top 1% of the distribution): these cities were spread across five countries, Italy (12 cities), France (nine cities), Germany (two cities), Greece and Spain (one city each). Our findings remain robust, signifying a fundamental underlying association between our proxy of local religious practices and persecution throughout the European Christian realm. Another potentially problematic outlier is represented by the witch trials data for Paris: these data cover the whole jurisdiction of the Parlement of Paris, which is rather large, but have all been assigned to the city of Paris. Hence, the mismatch between levels of aggregation can be a source of bias. While the grid-level analysis helps alleviate such aggregation concerns, in col. 5 and 6 we drop Paris from the analysis and find that our results continue to hold. Finally, we also implement a more formal check of the influence of outliers on our baseline results. We sequentially drop each observation and reestimate our preferred specification (column 6 in Table 1) storing 2119 coefficients of saints presence for witch trials and 864 for Jewish persecutions.[65] We then divide each of these point estimates by the standard error in our baseline specification. This gives us a measure of the sensitivity of our coefficient to outliers in units of our standard error. Over 99% of these coefficients lie within 0.1 units, i.e., no single observation is likely to have a large influence on the magnitude of our baseline point estimate. Furthermore, our results remain robust even when we trim the top and bottom 1% of observations by this measure.

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[63] We thank an anonymous reviewer for this suggestion.

[64] Conditional on venerating a saint, 45% of cities had one saint, 16% two and 12% three saints.

[65] These influence statistics to check the potential role of outliers are popular in statistics, see Belsley (1980) for more details.

A further concern may arise from the fact that the choice of restricting our proxy of local religion to pre-1100 may bias our estimates (upwards or downwards) for not accounting for successive developments in the spread of saintly cults across time and space. Bearing in mind that post-1100 *loca sanctorum* are more likely to suffer from endogeneity, due to the increased centralisation of the saint making process, we control for post-1100 saint cities in columns (7)–(10) of Appendix Table 14. We find that the magnitude of our main estimates diminishes slightly but the coefficients on both post-1100 saints and female saints are smaller and statistically insignificant.

Next, we examine whether our results are robust to individually dropping each historical polity in our sample, one by one. As illustrated in Fig. 2 for Jewish persecutions and appendix Figs. 13 for with trials, in all cases, our coefficient of interest remains stable and statistically significant. We conduct further robustness checks in Sect. A.1 of the Appendix: we investigate the religion-persecution relationship at the intensive margins, employing a continuous measure of persecutions (A.1.1) and perform a placebo analysis by randomly changing treatment assignment of sainthood across cities (A.1.2).

Another concern is the possibility of spatial autocorrelation. To address this issue we have replicated Table 1 and implemented Colella et al. (2019) 's method to account for this possibility. Specifically, we have run each regression specifications using a set of varying distance thresholds—100 km, and 200 km—and in each case we compute distance cutoffs geodesically or with a linear decay and reported the most conservative ones. As can be seen from Table 15 the standard errors are smaller than those computed in Table 1, thus suggesting that spatial autocorrelation may not be problematic in our set-up.

Furthermore, one may worry about Jews selecting whether or not to establish a community in a location, based for instance on observed attitudes towards minorities. Our analysis of Jewish persecution restricts the sample to locations which ever had a Jewish population; however, it may be argued that the very existence of a Jewish community might be an indicator of some level of tolerance.[66] We explore this by focusing on our full sample of cities, i.e., those with or without a Jewish community, and use a dependent variable that takes the value of one if a Jewish community was *never* persecuted. The results, reported in Table 16, indicate that saint venerating locations were indeed less likely to have never persecuted a Jewish community, thus confirming the negative religiosity-persecution relationship.

Finally, our results are robust to using alternative treatment cutoffs; specifically we choose 1234, the year Pope Gregory IX asserted that only a pope had the authority to declare someone a saint and 1634 when saint making became a formally centralised process under pope Urban VIII. While these alternative dates are more likely to include top-down decisions rather than just popular practices, the results reported in Table 17 corroborate our baseline findings.

4.4.4 Spillovers from neighbouring cities

So far we have focused on how pre-1100 cults of saints in a city impacted the likelihood of persecution episodes post-1100. However, part of our above findings could be, at least partially, driven by potential contagion effects in the spread of persecution episodes, especially if this contagion happens across closely connected saint cities. Although saint

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[66] Cities that are extremely intolerant may deter Jewish communities from moving there altogether. These cities in turn may also be more likely to host particularly fervent saintly cults. Together these two things will bias our point estimates towards zero as these saint cities are not being able to persecute due to lack of Jewish presence (we observe saint presence but no persecutions mechanically).
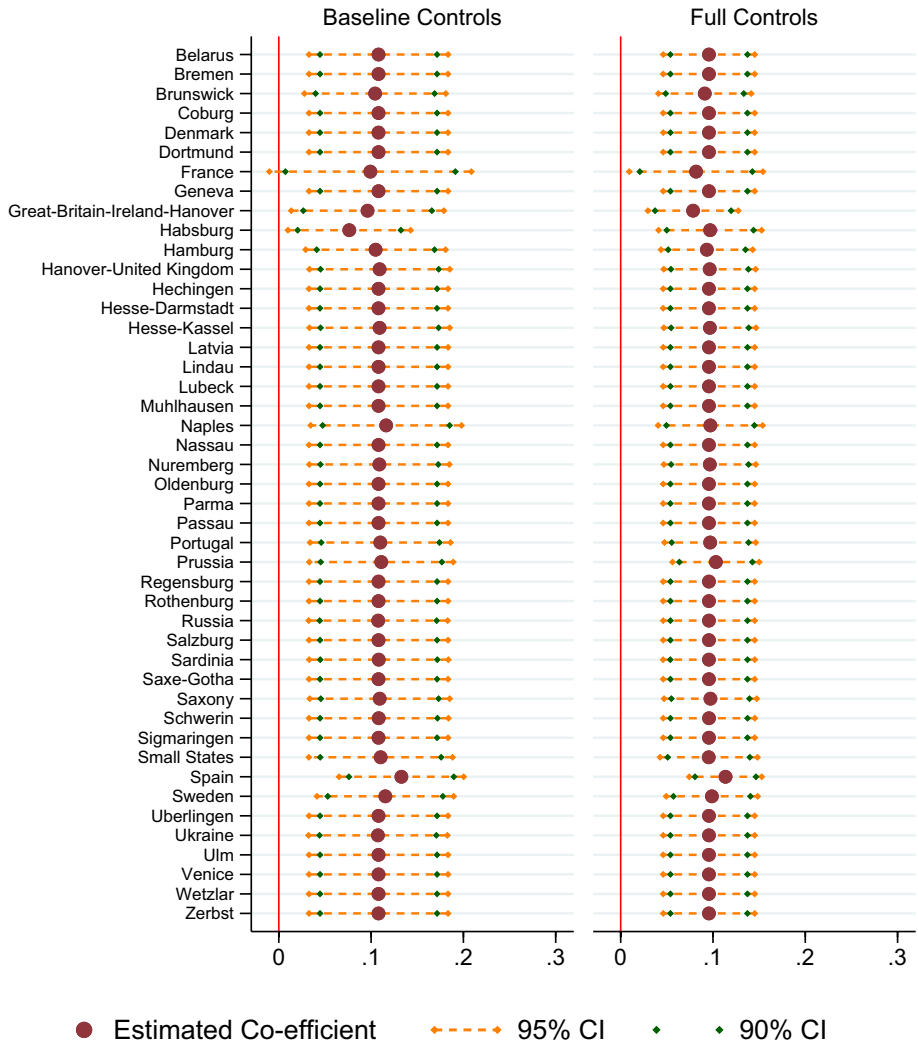
Fig. 2 Jewish persecutions—robustness to dropping regions one by one. *Notes*: This figure illustrates the coefficients and confidence intervals of saints' presence when dropping a specific region with the y-axis representing the dropped country. The baseline controls specification corresponds to column (2) in Table 1 while the full controls one corresponds to column (6).

cities are fairly spread out across Europe (see Fig. 5), they do tend to both cluster in certain geographic areas and to overlap with clusters of persecution episodes. To study whether this phenomenon can contribute to explaining our findings, we implement the following exercise: for each city in our estimation sample we calculate three attributes separately, namely: the percentage of nearby cities within 100 km that have saint presence and have witnessed the two types of persecution events.

In columns (1) and (5) of Table 5 we control for the percentage of nearby cities that host a saintly cult and our baseline estimate remains robust to this inclusion. Columns (2) and (6) repeat this exercise for the percentage of nearby cities that witnessed Jewish

Table 5 Spillover effects

	Jewish persecutions				Witch trials			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Saint presence	0.098**	0.099**	0.117**	0.121**	0.148***	0.142***	0.141***	0.146***
	(0.041)	(0.040)	(0.044)	(0.049)	(0.045)	(0.042)	(0.041)	(0.042)
% Saints within 100 km	0.001			−0.001	−0.002**			−0.001**
	(0.002)			(0.002)	(0.001)			(0.000)
% Trials within 100 km		0.000		0.001		0.006***		0.005***
		(0.001)		(0.001)		(0.001)		(0.001)
% Persecutions within 100 km			0.004***	0.005**			−0.002***	−0.001***
			(0.001)	(0.002)			(0.001)	(0.000)
Baseline								
Controls	Y	Y	Y	Y	Y	Y	Y	Y
Saints types	Y	Y	Y	Y	Y	Y	Y	Y
Bishopric city	Y	Y	Y	Y	Y	Y	Y	Y
N	915	915	915	915	2,168	2,168	2,168	2,168

Fixed effects OLS regressions. Robust standard errors, clustered by sovereign political entities in 1800 (39 clusters). Stars indicate level of significance: ***(1%); **(5%); and *(10%). The baseline controls include: population density, latitude and longitude, (arch)bishopric dummy. Saints types refer to the number of saints in the following high rank occupations: pope, king, queen, abbot/abbess, bishop

persecutions, while columns (3) and (7) control for the percentage of nearby cities that reported witch trials. In both cases our main findings remain robust, signifying that the effects we have uncovered are indeed likely to be more localised in nature, i.e. local religious power and religiosity seem to be driving persecution episodes. Finally, columns (4) and (8) adds all three forms of potential spillovers together with similar conclusions.

We also repeat this exercise by varying the distance threshold between 100 and 300 km with increments of 50 km. In all instances, the own city saint presence variable continues to be positively associated with both forms of persecution episodes. For brevity, appendix Table 18 shows the specification for spillovers within a 300 km radius. These findings also help allay concerns about spatial autocorrelation biasing our estimates, i.e., if persecutions and saint presence are correlated over geographic areas then this could contaminate our baseline specifications, leading to overtly stronger relationships.[67] It is heartening to see that our parameters of interest remain stable even for very large geographic definitions of spillovers.

5 Some additional results

5.1 Generalisability to other episodes of violence

While we have established the existence of a positive relationship between saints' veneration and the perpetration of violence against two important marginalised groups (Jews and

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[67] We thank an anonymous referee for this point.

women), in order to assess the extent to which these results can be generalised across other episodes of persecution, one would need to observe other forms of intolerance. Indeed, beginning with the eleventh and twelfth centuries, Europe witnessed a marked increase in persecution, shaped by more rigid definitions of religious orthodoxy and new methods of social control Moore (2008); Smelyansky (2020). However, despite the proliferation of violence against groups deemed to be deviant of the core values of Christianity, only a few of them have been systematically documented. We overcome these data constraint by gathering new data on two other contexts of religious persecution, allowing us to corroborate the external validity of our findings: the persecution of the Cathars, and episodes of violence against religious minorities during 1660–1789 France.[68]

The Cathar movement developed between the twelfth and fourteenth centuries, and their unorthodox beliefs were not tolerated by the Church. The condemnation of Cathars' practices and their persecution as heretics escalated into a 20-year military campaign, the Albigensian Crusade, initiated in 1209 by Pope Innocent III. The massacres of civilians committed during the crusade, together with the subsequent Inquisition's trials of the Languedoc, which punished those who did not repent by burning them at the stake, succeeded in eliminating Catharism as a popular movement (Peters, 1980). We compile a dataset containing all documented episodes of anti-Cathar persecutions in France between 1022 and 1328: these include both individual episodes of violence (e.g. the burning alive of 13 Cathars at Orleans in 1022) and of systematic violence during the Albigensian crusade (e.g. the siege of Carcassone in 1240).[69] We identify 71 acts of persecution in 34 locations.

We also use data on French violence against religious minorities during 1661–1789 and identify episodes of collective violence perpetuated against heretical movements, including assaults and attacks to property, buildings, and the belongings of these minorities.[70] One of the main persecuted minority groups featured in our data are France's Reformed Protestants, the Huguenots, outlawed after the revocation of the Edict of Nantes in 1685. Protestant churches and schools were shut down, and the the penalties for refusing to convert to Catholicism were severe, including lifelong imprisonment, deportation into slavery, or death.[71] Other important disadvantaged minorities included in the data are Jansenists, a Catholic splinter movement, following the teachings of Augustine of Hippo's, criticising the Catholic Church and its hierarchies.[72] We isolate 325 episodes of religious violence taking place in 123 localities, involving protestants (Huguenots), Jansenists, individuals practicing local rituals and beliefs and other religious minorities.

The findings, reported in Table 6 confirm the existence of a strong positive effect of saints on both types of violence. This additional evidence from different historical contexts helps corroborate our main result that cities with an established saintly cult were more likely to engage in minority persecutions. Given the limited geographic scope of these

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[68] France provides the ideal setting for exploring the effect of local religiosity, as measured through saint presence, on religiously motivated persecution due to the existence of 438 pre-1100 saintly cults spread across 116 distinct cities.

[69] The data on Cathar violence have been accessed at this link: https://www.cathar.info/.

[70] The data are from the Historical Social Conflict Database, accessed at https://www.unicaen.fr/hiscod/?locale=en. We are grateful to Cedric Chambru for sharing them.

[71] The persecution of the Huguenots lead to large-scale migration outside France Hornung (2014).

[72] Some examples of violent episodes include: casualties from the resistance of the Camisards (Huguenots of the Cévennes region and the Vaunage in southern France) against the persecutions following the revocation of the Edict of Nantes. Attacks to the Jesuits after the suppression of their order in 1764; episodes of violence against the Jansenists; clashes between Jesuit supporters and Jansenist supporters.

alternative outcomes, the subsequent analysis will focus on our baseline Europe-wide measures of persecution (against the Jews and witches).

5.2 Persecution dynamics

Appendix Fig. 10 plots the likelihood of persecution by saintly cult across centuries. We see a rise in persecution in non-saint cities around and after the Reformation. As mentioned in the previous subsection, Protestant cities saw a rise in both Jewish persecutions and witch trials and since saint cities were less likely to turn Protestant Pfaff (2013), this dampening effect could in part be driven by persecutions rising in non-saint cities. To examine how stable the relationship between religion and violence is over time, we divide our sample in century bins, and run separate regressions for every century.[73] As illustrated in Fig. 3, the point estimates highlight the existence of a positive and significant relationship between saint veneration and both Jewish persecutions (Panel A) and witch trials (Panel B) throughout the centuries, suggesting that our results are not driven by a specific time period. However, the relationship is not precisely estimated in the fourteenth century for Jewish persecutions and in the seventeenth–eighteenth centuries for witch trials.

Another concern rising from our approach is that we measure religiosity as an average of saint veneration during 300–1100 and the outcomes as an average of persecution episodes during 1100–1800, thus hinging on the implicit assumption that religiosity: (1) continued to be stable across time, including post-1100; and (2) had the same intensity across locations, irrespective of when they were Christianised. In order to ensure that our results are not driven by the averaging of our outcome and explanatory variables, we perform the following exercises: first, we focus only on countries that were fully Christianised by 900 and select saints venerated in the period 900–1100; second, we only use saints in the later part of our saint veneration period, i.e., between 900 and 1100 and analyse their relationship with persecutions in the early part of the persecution period (1100–1300 for Jews and 1300–1500 for witch trials). This allows us to further explore whether religiosity had an effect on persecution in a temporally reasonable window. The results, reported in Tables 19 and 20, respectively, confirm our baseline findings. Table 19 also helps us allay the concern that our results are driven by places that had been Christian for a longer time (hence had more saints): this set of results indicate that our proxy does not simply measure "years of Christian influence", but rather the level of religious intensity.

6 Potential mechanisms

So far we have established the existence of a strong relationship between saints' presence and minority persecution episodes. We now discuss, and provide empirical support, for two distinct but related potential mechanisms which might drive our findings.

A sizeable literature has argued how longer exposure to a cultural or religious system can alter prevailing norms, which can in turn have long-term influence within various domains of socio-cultural as well as economic interest. For instance, Grosjean (2011) has shown impacts of longer exposure to Ottoman rule on contemporary financial development in South Eastern Europe; Walker (2020) has studied length of Habsburg rule in Romania

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[73] Due to the process of saint making early on in Western Christianity, we do not have enough variation within city across centuries to employ a panel structure in our empirical analysis.

Table 6 Cathars' persecution (1022–1328) and religious violence in France (1660–1789)

	Cathars' persecutions (1022–1328)			Religious violence in France (1660–1789)		
	(1)	(2)	(3)	(4)	(5)	(6)
Saints Presence	0.069**	0.190**	0.205*	0.173***	0.229**	0.276***
	(0.029)	(0.085)	(0.108)	(0.045)	(0.082)	(0.082)
Female saint Presence			−0.041			−0.144
			(0.164)			(0.088)
Baseline Controls	N	Y	Y	N	Y	Y
Saints Types	N	Y	Y	N	Y	Y
N	415	105	105	415	347	347
Adj. R^2	0.044	0.114	0.118	0.044	0.114	0.118

Fixed effects OLS regressions. Robust standard errors, clustered by region. Stars indicate level of significance: ***(1%); **(5%); and *(10%). The baseline controls include: population density [1100–1300 in cols. (1)–(3), 1650–1800 in cols. (4)–(6)], latitude and longitude, (arch)bishopric dummy. Saints types refer to the number of saints in the following high rank occupations: pope, king, queen, abbot/abbess, bishop
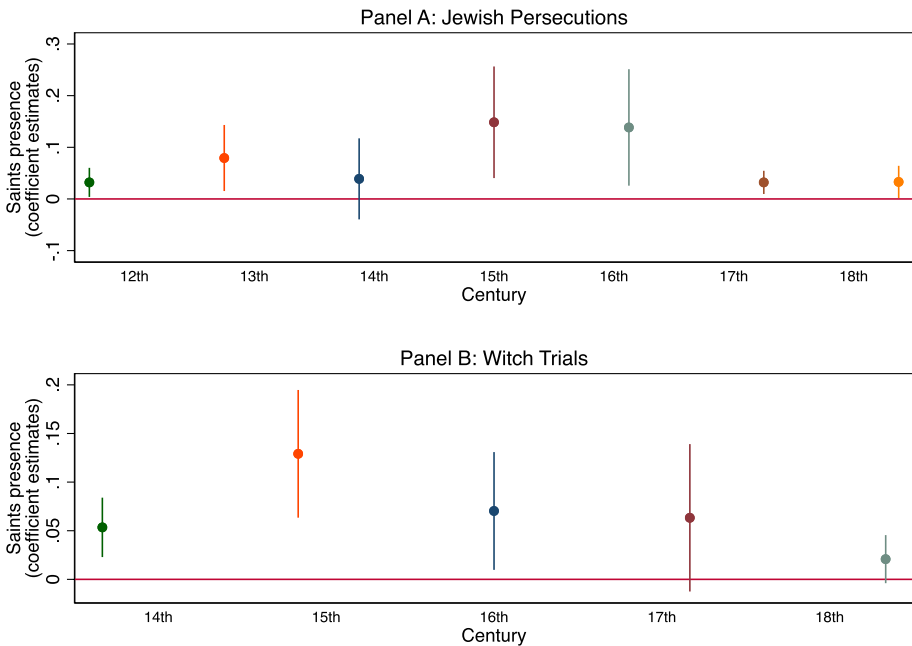

Fig. 3 Saints and persecution by century. *Notes*: This Figure represents the coefficient estimates of $saint_{ic}^{pre-1100}$ by century with the bars representing the 95% confidence interval; Panel A uses Jewish persecutions as the dependent variable, while the Panel B uses witch trials. All regressions control for: population density, latitude and longitude, (arch)bishopric dummy, and saints types

Table 7 Church exposure and persecutions

	Jewish Persecutions			Witch Trials		
	(1)	(2)	(3)	(4)	(5)	(6)
	City level					
Saint exposure	0.011***		0.009***	0.012***		0.011**
(0–1100)	(0.004)		(0.003)	(0.004)		(0.004)
Church exposure		0.019***	0.016***		0.015***	0.011*
(0–1100)		(0.003)	(0.003)		(0.005)	(0.006)
N	920	920	920	2175	2175	2175
Adj. R^2	0.204	0.205	0.207	0.183	0.177	0.185
	Grid level					
Saint exposure	0.011***		0.012**	0.002**		0.002*
(0–1100)	(0.004)		(0.005)	(0.001)		(0.000)
Church exposure		0.014***	0.014***		0.015**	0.010
(0–1100)		(0.003)	(0.005)		(0.006)	(0.009)
N	750	750	750	1802	1802	1802
Adj. R^2	0.192	0.191	0.211	0.193	0.186	0.194
Baseline controls	Y	Y	Y	Y	Y	Y
Saints Types	Y	Y	Y	Y	Y	Y

Fixed effects OLS regressions. Robust standard errors, clustered by sovereign political entities in 1800 (39 clusters). Stars indicate level of significance: ***(1%); **(5%); and *(10%). The baseline controls include: population density, latitude and longitude, (arch)bishopric dummy. Saints types refer to the number of saints in the following high rank occupations: pope, king, queen, abbot/abbess, bishop

and impact on savings rate, while Chaudhary & Rubin (2011) and Jha (2014) have studied the impacts of longer exposure to Muslims and Islam on contemporary outcomes in India.

We start by exploring whether cities with longer exposure to Christianity have stronger estimated effect sizes. For each city in our sample, we construct a measure of this exposure in two ways: (i) number of centuries since the establishment of a saintly cult as reported in the *Martyrologium*; (ii) number of centuries during which a city was bishopric up to 1100 CE. The choice of this latter variable follows recent work by Schulz al. (2019) and Henrich (2020) which highlights the importance of controlling for the exposure to a bishop to account for the role of local ecclesiastical institutions in shaping norms. Indeed, Henrich (2020) documents that a series of new policies implemented by the Church from the 4th century gradually corroded pre-Christian kinship-based practices and led to a radical shift in psychology of Western populations that persists today.[74] While such work leaves potential implications for non-Christian out-groups largely unexplored, it acknowledges that Christianity's new universalising moral value may have "caused troubles to the Jews, since morality was not all that universal" (Henrich 2020, p. 337). It has further been argued that non-kinship based societies may engage in more altruistic punishment of subgroups within the society that are deemed to be not abiding by the perceived moral consensus (Enke, 2019; Henrich and Muthukrishna, 2021).

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[74] This shift in culture has been shaped by a combination of religious prohibitions and prescriptions, predominantly involving rules around marriage patterns and family structure, such as the promotion of neolocal residence after marriage, and prohibitions on cousin marriage and polygamy Schulz al. (2019).

Table 7 shows that one additional century of exposure to a saintly cult leads to a 0.9 and 1.2 percentage point higher likelihood of Jewish persecutions and witch trials, respectively. The bishopric exposure measure also finds positive effects of similar magnitude, and the results continue to hold when both regressors are added together [cols. (3) and (6)]. We thus find a similar sized effect on persecutions for both exposure to saintly cults and bishops, but the effect for the former persists even when the latter is added to the regression, signifying that length of exposure to saint veneration helps develop a stronger ethic of popular religiosity, beyond just Church power, in turn leading to more persecutions. We now explore why this might be the case.

As argued earlier, saintly cults had a notion of permanence due to restrictions on disturbing the remains of the saint, as well as persistence via the celebration of saint feast days annually and during different parts of the liturgical year. These aspects would help inculcate and strengthen religiosity within the local population: participation in saints' festivals, which involved communal prayers and worshiping, was likely to cement communal identities around shared religious values Wilson (1985), sharpening divides with out-groups from different communities. Local religious festivals organised on saints' feast days and patron saints' days to commemorate the saints and ask for their intercession often involved ritual processions where the relics of the saint were paraded across the city, accompanied with singing and the carrying of candles. Such rituals generated a religiously charged atmosphere Freeman (2011) which could easily lead to violence, especially towards a demonised out-group. Indeed, extant empirical evidence suggests that religious riots are exacerbated by festivals due to their associated visible public displays of faith, and contestation over public spaces.[75]

To empirically explore evidence for the above mechanism we conduct the following exercise: first we find for every saint city the days in which it celebrated a saint festival. Each saint city in our sample celebrated at least two types of saint-related festivities: Patron Saint day, namely the day during which a city celebrated its patron or protector; and Saint Feast day, namely a day dedicated to the commemoration of a particular saint, usually coinciding with the date of their death. These feast days followed the Gregorian/Julian calendar and hence were fixed from year to year. Next, we find the days in which the main Jewish religious festivals took place every year between 1100 and 1800. Given that Jewish religious festivals follow the lunar calendar, their occurrence exhibits year-to-year variation.[76]

We hypothesise that locations in which festivals for both communities are temporally close were more likely to witness episodes of Jewish persecutions since Christian worshipers would have more opportunities to interact en-masse with Jewish devotees increasing the risk of potential clashes. Furthermore, the variation in overlap is likely to be plausibly random due to the difference in Jewish and Christian calendars.[77] For instance, there is evidence of Europe wide myths regarding purported Jewish ritual murders of adolescent

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[75] See, for example Iyer and Shrivastava (2018) on Hindu-Muslim riots in modern day India on days when Hindu-Muslim religious festivals align.

[76] We extract the Gregorian dates for saint feast and veneration days from the Martyrologium while dates for Jewish festivals (Rosh Hashanah, Yom Kippur, and Passover) across our 800 sample period are constructed following the methodology of Dershowitz and Reingold (2008) obtained from http://sagarin.com/sports/holydays.htm

[77] Iyer and Shrivastava (2018) employ this strategy for studying Hindu-Muslim riots. In their case Muslim Friday prayers are the fixed religious event while Hindu festivals change year to year also due to adhering to the lunar calendar.

Christian boys for Passover festivities.[78] Such concerns would create a direct link between festival alignment and Jewish persecutions.

We restrict our sample to only saint cities with a Jewish presence and then construct measures for log number of times a Jewish religious festival fell within a fixed window of days of a saint festival day. We vary this window between 0 (i.e. same day) and 60 days. Figure 4 presents our findings: a 1% increase in the number of times religious festivals fall on the same day leads to close to a 1% point (pp) increase in persecution episodes. This point estimate hovers around 1 pp, and is significant at the 10% level for festivals up to one month apart, but becomes noisy thereafter. Overall, these results provide some suggestive evidence that saint festivities could have facilitated coordination among believers, channelled religious fervour against out-groups, thus increasing persecution episodes.

7 Conclusion

The connection between religion and persecution, past and present, has long been debated. In this paper we document the role of Christianity in perpetrating violence against minorities through eight centuries of European history (1100–1850). We focus on two major waves of violence: the Jewish persecutions and witch trials. Given the key role played by Christianity in shaping Western societies' cultural norms and values, it is important to get a better understanding of the contribution of religion and religious beliefs to the dynamics of minority persecutions.

We have illustrated the spread of Christians beliefs across Europe using a novel proxy, the veneration of saints, which allowed us to systematically measure the religiosity of the population in a sample of over 2100 European cities. We then provide comprehensive empirical evidence of the existence of a strong positive relationship between well-established local religious practices and the perpetration of episodes of violence against minorities. *Loca sanctorum* were 11% points more likely to engage in Jewish persecutions and witchcraft trials. The latter effect diminished for cities with more progressive gender norms captured by presence of female saints.

Finally, we argue that longer "exposure" to Christian traditions as measured by saintly cults, may have contributed to changing attitudes towards out-groups at a popular level, a process similar to what (Henrich, 2020) has argued for exposure to the more formal channel of local bishoprics. We find that when saint-related celebrations coincided with Jewish religious festivals, persecution episodes were more likely to occur, potentially due to a combination of improved coordination among the faithful and heightened religious fervour against out-groups.

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[78] This myth engendered from the murder of William of Norwich in 1144 whose body bore signs of torture. It was asserted that Jews performed the ritual murder as an imitation of the Crucifixion, mocking the central belief of Christianity. As Rose (2015) details, this quickly gained currency among Christian communities across Europe.
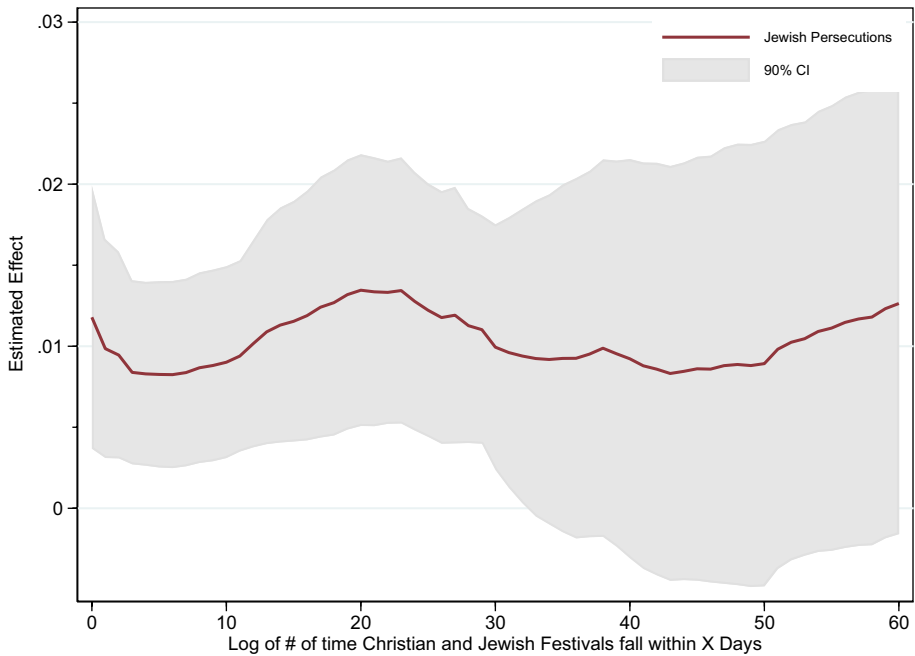
Fig. 4 Probability of Jewish persecutions and Jewish–Christian festival alignment*Notes*: The figure illustrates point estimates and 90% confidence intervals from separate regressions. The dependent variable is probability of Jewish persecution and the main variable of interest is log of the number of times Jewish and Saint festivals that fell within the relevant window on the x-axis. All regressions include country fixed effects, population density, 1100–1800 for Jewish persecutions; and latitude and longitude. The sample is restricted to only saint cities with a Jewish population (n = 186)

Appendix
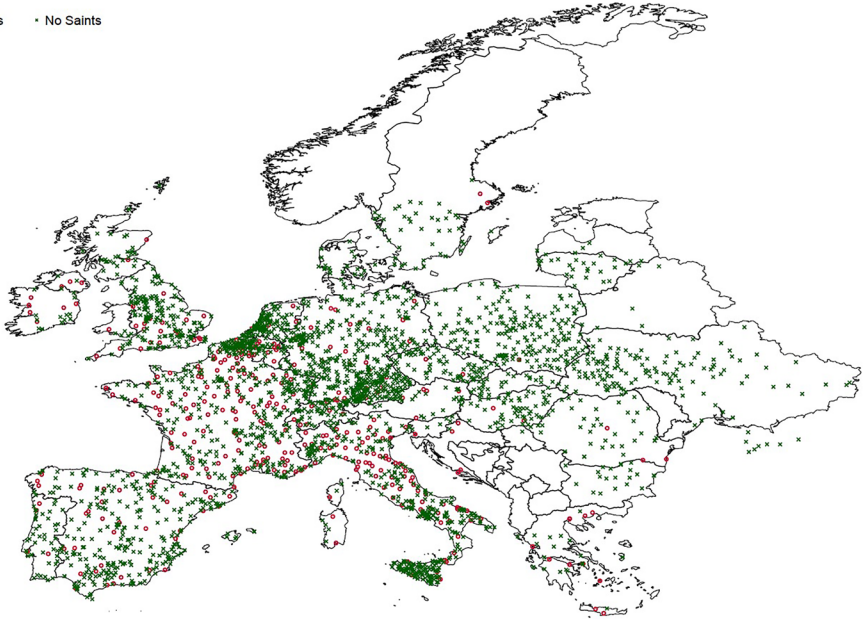
Fig. 5 Location of cities with (Red) and without (Green) a cult of Saints *Sources*: Saints' presence: *Martyrologium Romanum* (Color figure online)
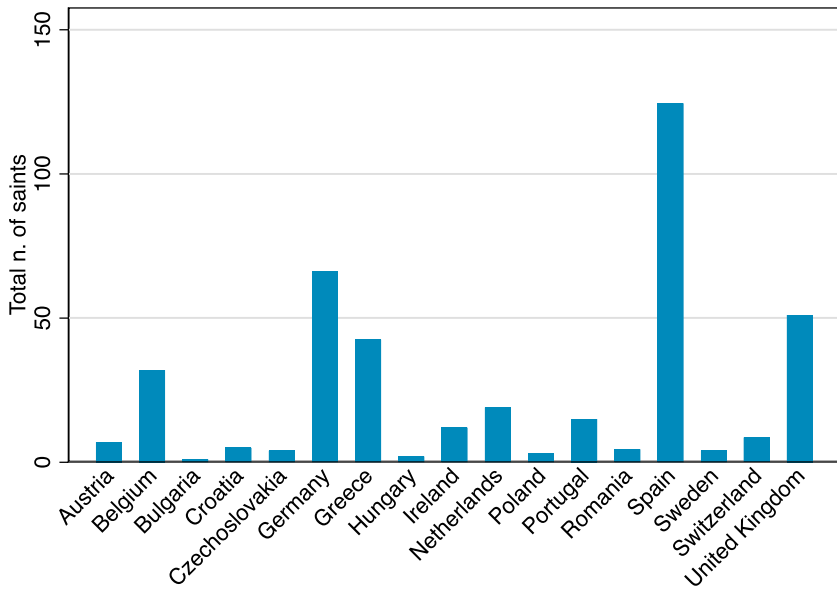
(a) Number of pre-1100 saints, by country
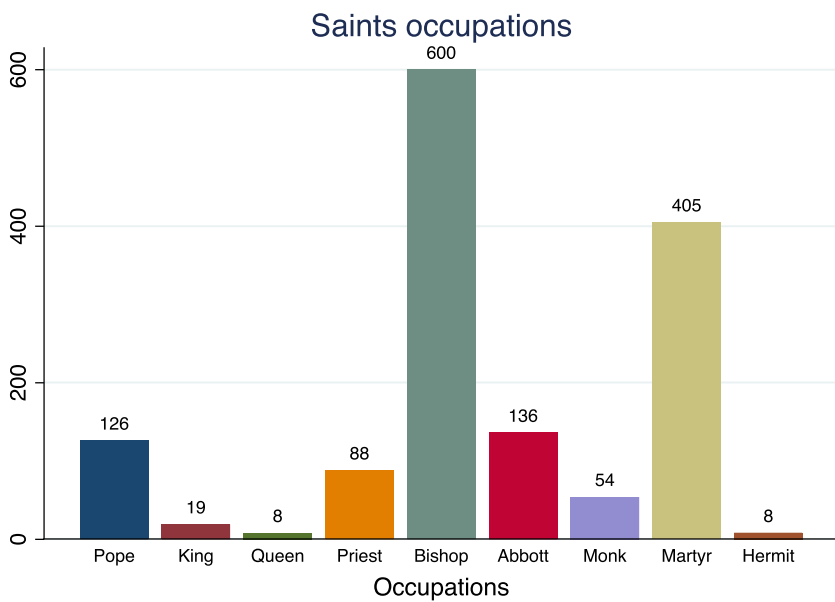
(b) Pre-1100 saints' types

Fig. 6 Number of Saints by country and their types *Note*: Italy and France have been omitted from panel A for y axis scaling purposes, due to the large number of saints. They have 862 and 438 saints, respectively. *Source: Martyrologium Romanum*
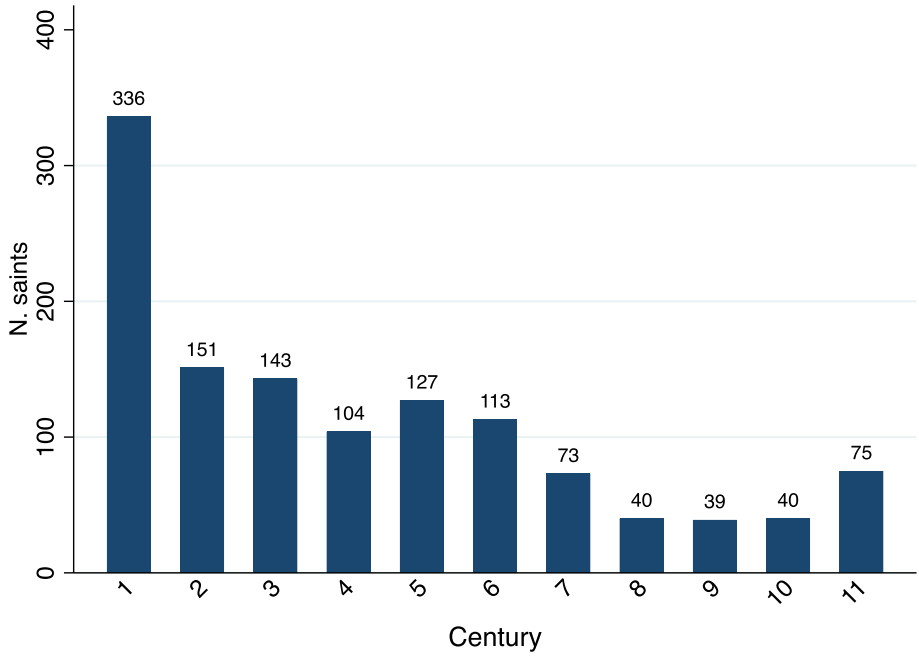
Fig. 7 Saint veneration across centuries *Source*: *Martyrologium Romanum*
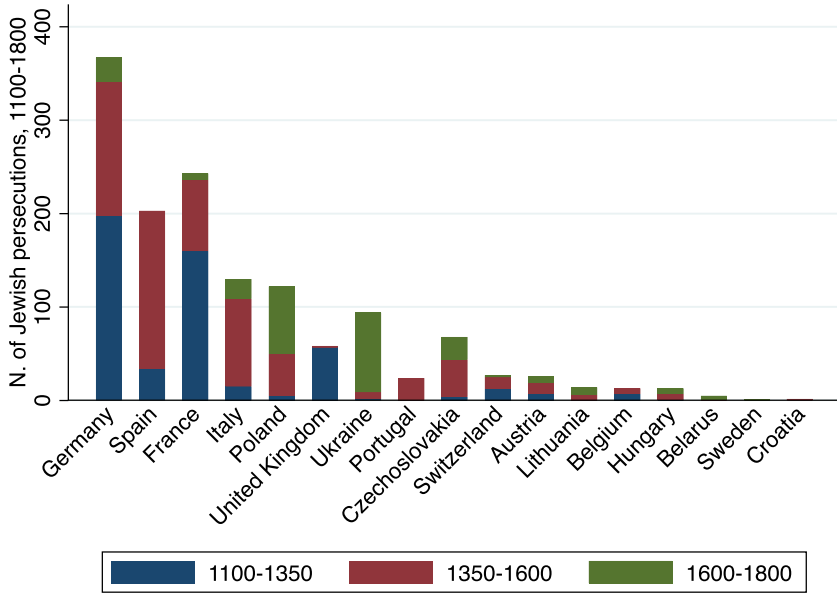
(a) Jewish persecutions, 1100-1800
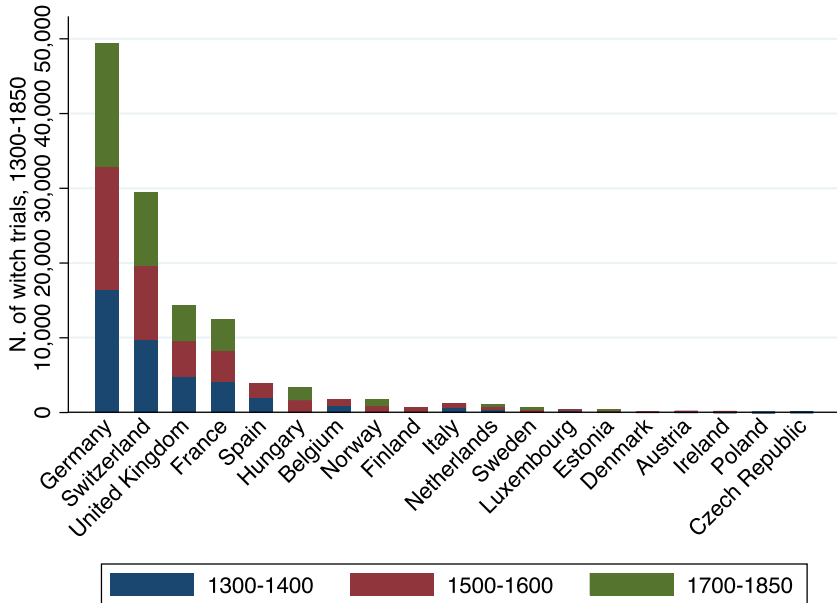
(b) Witch trials, 1300-1850

Fig. 8 Number of persecutions by country *Sources*: Jewish persecutions: Anderson et al. (2017); Witch trials: Leeson and Russ (2018)
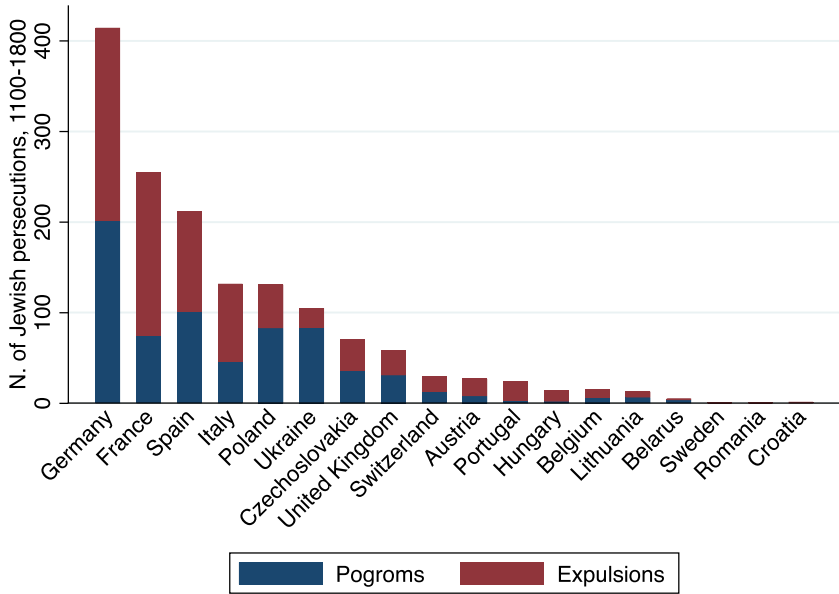
(a) Breakdown of Jewish Persecutions
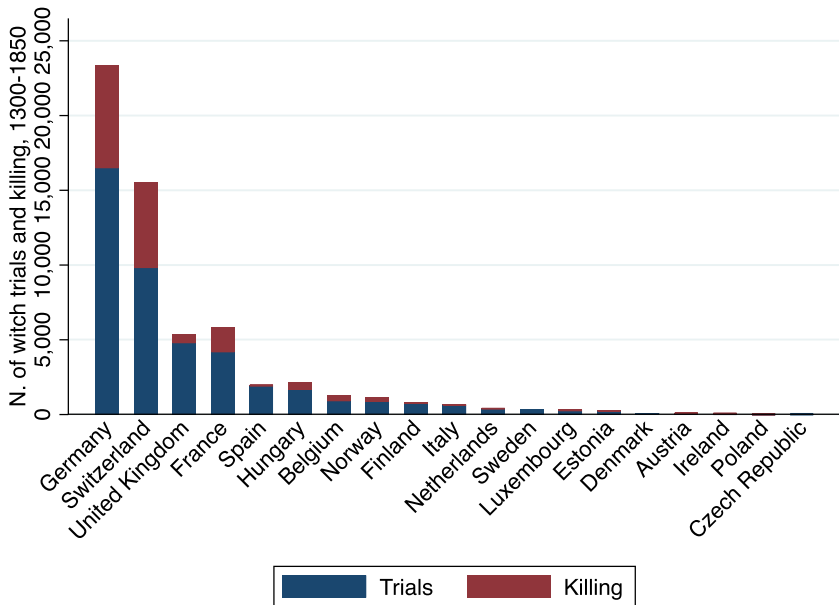
(b) Breakdown of Witch trials

Fig. 9 Persecutions by type *Sources:* Jewish persecutions: Anderson et al. (2017); Witch trials: Leeson and Russ (2018)
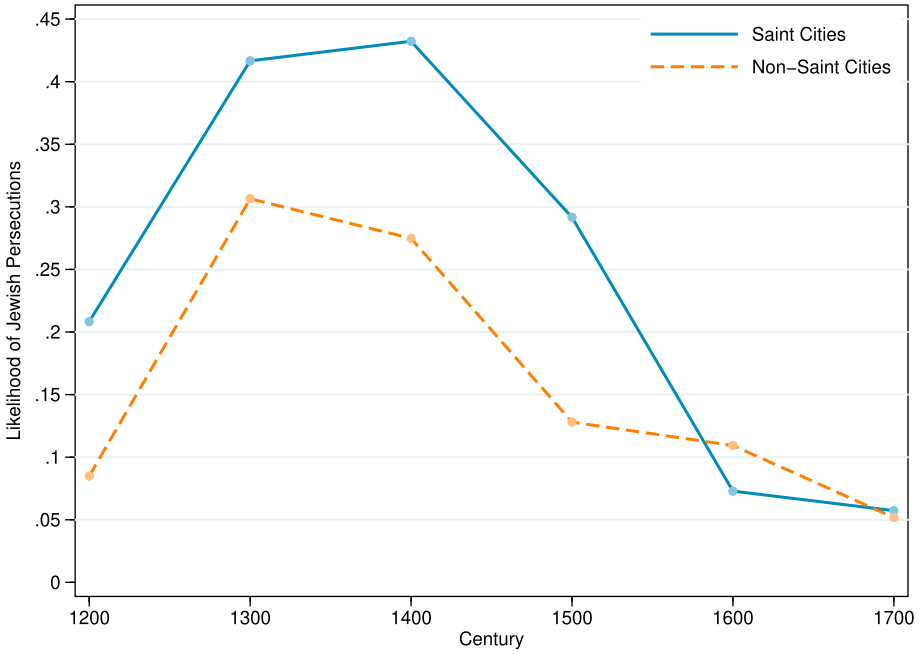
(a) Jewish persecutions, 1100-1800 by Saint and Non-Saint Cities
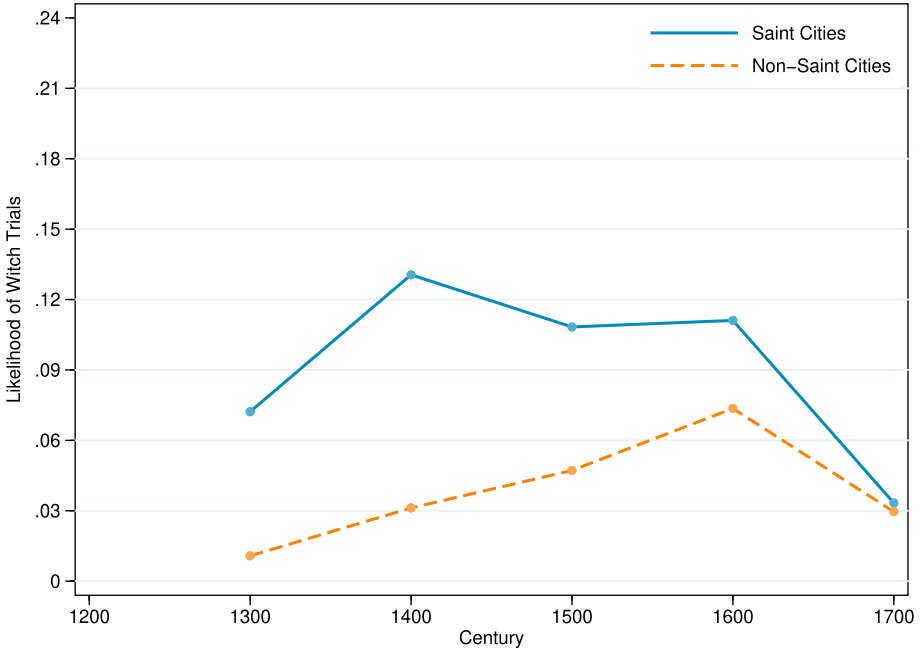
(b) Witch trials, 1300-1850 by Saint and Non-Saint Cities

◀ **Fig. 10** Persecutions across centuries. *Note* This figure plots the proportion of cities that record any perse-cution episode conditional on the existence of a pre-1100 saint cult, across centuries. We see a narrowing of the gap through a rise of persecutions in non-saint cities around and after the Reformation
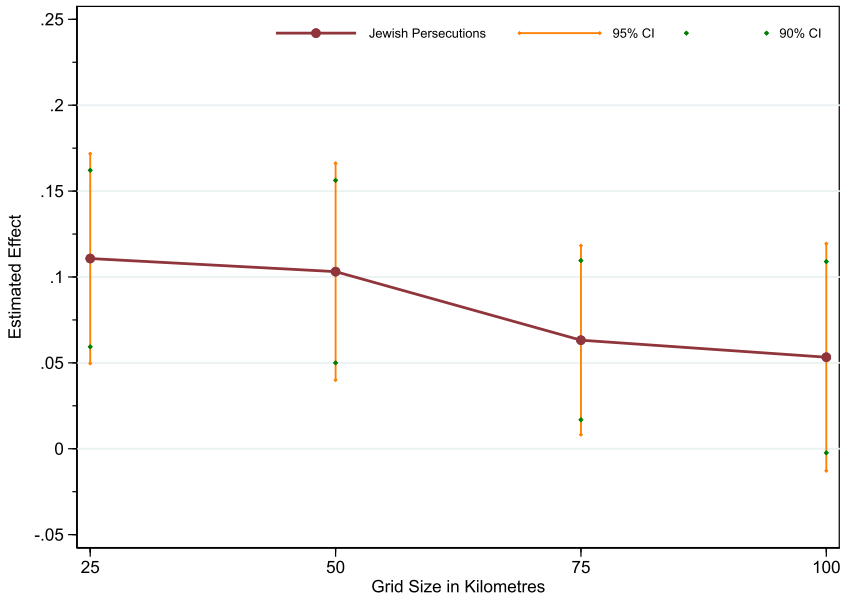
(a) Jewish persecutions by Grid Size
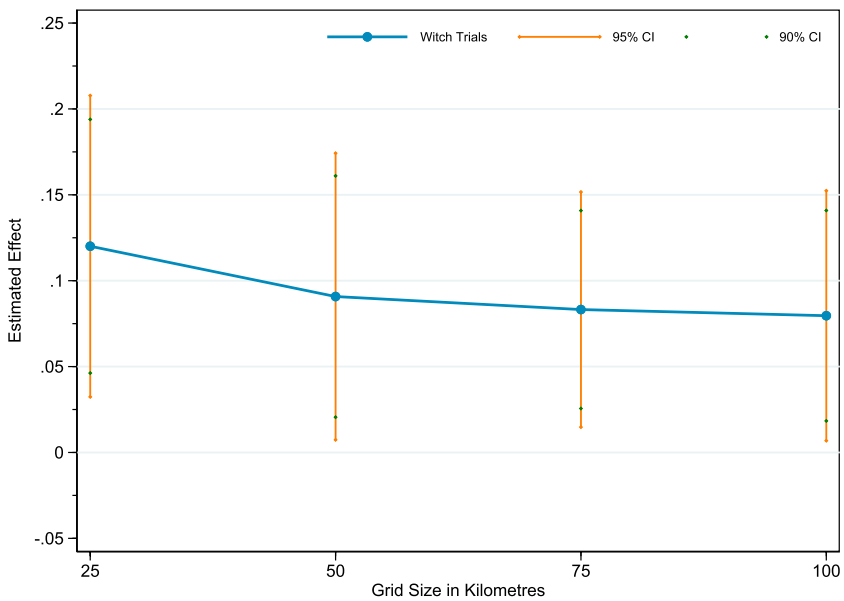
(b) Witch trials by Grid Size

Fig. 11 Robustness by larger grid sizes. *Note* This figure illustrates the coefficient and confidence intervals of saints' presence when aggregating to G × G km grids. We employ the specification from column (6) in Table 1
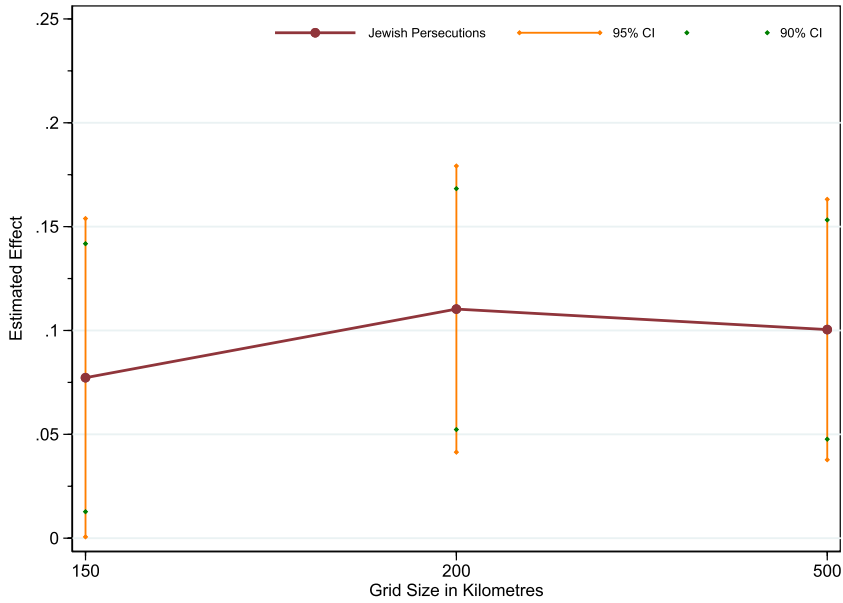
(a) Jewish persecutions at City-Level with Grid FE
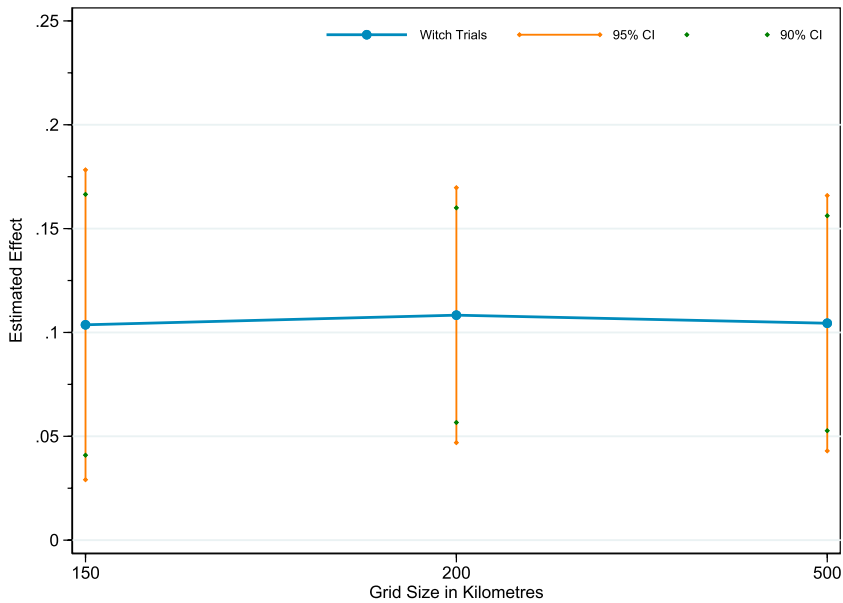
(b) Witch trials at City-Level with Grid FE

Fig. 12 Robustness by grid fixed effects. *Note* This figure illustrates the coefficient and confidence intervals of saints' presence when employing our city-level specification with grid fixed effects as opposed to the historical polity fixed effect in the main text. We employ the specification from column (6) in Table 1

(a) Coefficient for Saints Indicator

(b) Coefficient for Female Saint indicator
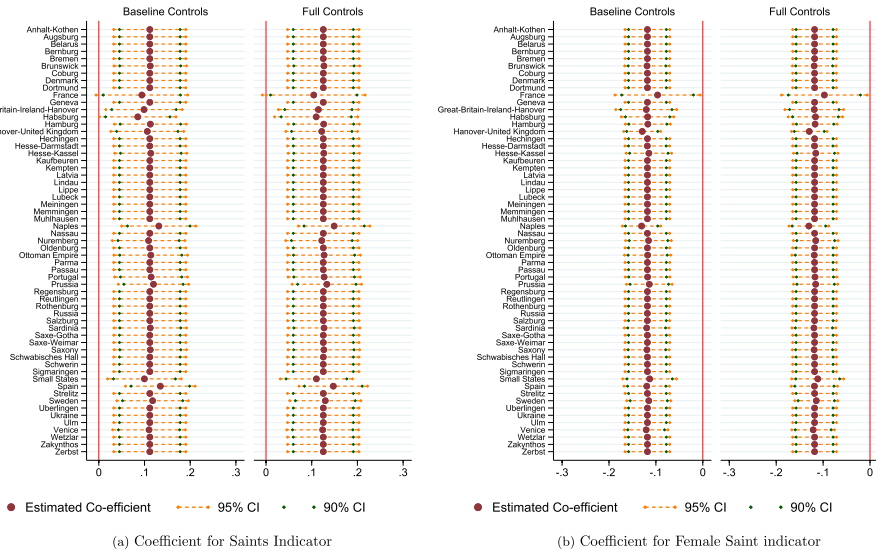
Fig. 13 With trials—robustness to dropping regions one by one. *Note* This figure illustrates the coefficients and confidence intervals of saints' presence when dropping a specific region with the y-axis representing the dropped country. The baseline controls specification corresponds to column (2) in Table 1 while the full controls one corresponds to column (6)

Table 8 Descriptive statistics—full sample and by Saint veneration

	Jewish persecution sample			Witch trials sample		
	(1)	(2)	(3)	(4)	(5)	(6)
	Full	Saint	No Saint	Full	Saint	No Saint
Saint presence	0.215	1	0	0.127	1	0
	(0.411)	–	–	(0.333)	–	–
Female Saint Presence	0.086	0.398	0	0.047	0.368	0
	(0.280)	(0.491)	–	(0.211)	(0.483)	–
Jewish persecution Likelihood	0.733	0.914	0683	0.299	0.632	0.250
	(0.443)	(0.281)	(0.466)	(0.458)	(0.483)	(0.433)
Jewish pogroms Likelihood	0.438	0.511	0.417	0.178	0.353	0.153
	(0.496)	(0.501)	(0.493)	(0.383)	(0.479)	(0.360)
Jewish expulsion Likelihood	0.650	0.876	0.588	0.265	0.606	0.216
	(0.477)	(0.330)	(0.492)	(0.442)	(0.490)	(0.411)
Witch trials Likelihood	0.135	0.344	0.078	0.092	0.297	0.063
	(0.342)	(0.476)	(0.269)	(0.290)	(0.458)	(0.242)
Urban population Density	0.762	17.28	7.699	7.585	16.95	6.222
	(0.47)	(26.31)	(4.723)	(11.63)	(29.00)	(4.275)
Latitude	0.75	45.51	48.36	46.65	45.75	46.78
	(0.357)	(4.342)	(4.158)	(5.344)	(4.432)	(5.452)
Longitude	0.207	5.798	10.14	7.664	5.953	7.913
	(0.916)	(6.768)	(9.207)	(8.913)	(7.158)	(9.115)
Archbishopric City	0.214	0.699	0.081	0.136	0.599	0.069
	(0.410)	(0.460)	(0.273)	(0.343)	(0.491)	(0.254)
University presence	0.082	0.263	0.032	0.040	0.193	0.017
	(0.275)	(0.442)	(0.177)	(0.195)	(0.396)	(0.130)

Table 8 (continued)

	Jewish persecution sample			Witch trials sample		
	(1)	(2)	(3)	(4)	(5)	(6)
	Full	Saint	No Saint	Full	Saint	No Saint
Parliament presence	0.262	0.602	0.168	0.244	0.558	0.199
	(0.440)	(0.491)	(0.374)	(0.430)	(0.498)	(0.399)
Distance to rome	1037	888.1	1077	1044	903.0	1065
(in km)	(425.7)	(450.3)	(409.8)	(460.4)	(467.8)	(455.8)
Distance to Sea	172.3	107.2	190.2	125.0	95.84	129.3
(in km)	(120.8)	(94.33)	(121.2)	(120.3)	(90.09)	(123.6)
Wheat Suitability	3957	3426	4103	3905	3526	3960
Index	(1907)	(1588)	(1961)	(1874)	(1652)	(1898)
Number of Observations	864	186	678	2119	269	1850

Sample size corresponds to Column (6) of baseline Table 1. Population density covers the period between 1100 and 1800 CE for Jewish persecution sample and 1300–1850 CE for the witch trial sample

Table 9 Saints and Jewish expulsions and pogroms

	(1)	(2)	(3)	(4)	(5)	(6)
Dep. var.: *Jewish expulsions-city level*						
Saints	0.380***	0.121**	0.103**	0.100***	0.112**	0.112***
Presence	(0.072)	(0.051)	(0.039)	(0.037)	(0.042)	(0.039)
N	1043	920	864	864	864	864
Adj. R^2	0.085	0.328	0.316	0.316	0.318	0.322
Dep. var.: *Jewish pogroms-city level*						
Saints	0.107**	0.084**	0.073*	0.076*	0.073*	0.093**
presence	(0.043)	(0.033)	(0.037)	(0.038)	(0.039)	(0.037)
N	1043	920	864	864	864	864
Adj. R^2	0.006	0.088	0.093	0.093	0.092	0.103
Dep. var.: *Jewish expulsions-grid level*						
Saints	0.303***	0.130**	0.107***	0.109**	0.115**	0.124***
Presence	(0.063)	(0.050)	(0.039)	(0.042)	(0.047)	(0.045)
N	783	750	741	741	741	741
Adj. R^2	0.074	0.293	0.324	0.323	0.323	0.330
Dep. var.: *Jewish pogroms-grid level*						
Saints	0.101***	0.044	0.036	0.040	0.035	0.061*
presence	(0.031)	(0.027)	(0.030)	(0.031)	(0.031)	(0.031)
N	783	750	741	741	741	741
Adj. R^2	0.006	0.089	0.091	0.092	0.091	0.104
Polity FE	N	Y	Y	Y	Y	Y
Baseline controls	N	Y	Y	Y	Y	Y
Saints types	N	Y	Y	Y	Y	Y
Dist. from Rome	N	N	Y	Y	Y	Y
Institutions	N	N	Y	Y	Y	Y
Wheat suitability	N	N	N	Y	Y	Y
Capital city	N	N	N	N	Y	Y
Dist. from sea	N	N	N	N	N	Y

Fixed effects OLS regressions. Robust standard errors, clustered by sovereign political entities in 1800 (39 clusters). Stars indicate level of significance: ***(1%); **(5%); and *(10%). The baseline controls include: population density, latitude and longitude, (arch)bishopric dummy. Saints types refer to the number of saints in the following high rank occupations: pope, king, queen, abbot/abbess, bishop. Institutions include a dummy for university presence and parliamentary activity

Table 10 Saints and witch killings

	(1)	(2)	(3)	(4)	(5)	(6)
Dep. var.: *Witch killings-city level*						
Saints	0.073***	0.068**	0.055*	0.054*	0.052*	0.056*
Presence	(0.016)	(0.029)	(0.030)	(0.030)	(0.031)	(0.030)
N	2954	2175	2119	2119	2119	2119
Adj. R^2	0.005	0.173	0.183	0.185	0.185	0.186
Dep. var.: *Witch killings-grid level*						
Saints	0.041	0.082**	0.066**	0.066*	0.063*	0.068**
Presence	(0.072)	(0.033)	(0.032)	(0.033)	(0.034)	(0.034)
N	2288	1802	1750	1750	1750	1750
Adj. R^2	0.001	0.376	0.202	0.202	0.202	0.205
Polity FE	N	Y	Y	Y	Y	Y
Baseline controls	N	Y	Y	Y	Y	Y
Saints types	N	Y	Y	Y	Y	Y
Dist. from Rome	N	N	Y	Y	Y	Y
Institutions	N	N	Y	Y	Y	Y
Wheat suitability	N	N	N	Y	Y	Y
Capital city	N	N	N	N	Y	Y
Dist. from sea	N	N	N	N	N	Y

Fixed effects OLS regressions. Robust standard errors, clustered by sovereign political entities in 1800 (52 clusters at the city level). Stars indicate level of significance: ***(1%); **(5%); and *(10%). The baseline controls include: population density, latitude and longitude, (arch)bishopric dummy. Saints types refer to the number of saints in the following high rank occupations: pope, king, queen, abbot/abbess, bishop. Institutions include a dummy for university presence and parliamentary activity

Table 11 Controlling for religiosity in France

	Share refractory clergy			cJewish persecutions			Witch trials		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Saint	−0.015	−0.015	−0.027	0.224**	0.240**	0.241**	0.206**	0.198**	0.164*
Presence	(0.024)	(0.023)	(0.022)	(0.094)	(0.102)	(0.096)	(0.086)	(0.086)	(0.087)
Share refractory				−0.022	−0.032	−0.199	−0.232	−0.261	−0.404**
Clergy				(0.222)	(0.216)	(0.222)	(0.180)	(0.183)	(0.192)
N	296	296	282	296	296	282	296	296	282
Adj. R^2	0.753	0.751	0.794	0.333	0.351	0.395	0.243	0.255	0.281
Baseline									
Controls	Y	Y	Y	Y	Y	Y	Y	Y	Y
Full									
Controls	N	Y	Y	N	Y	Y	N	Y	Y
Squicciarini									
Controls	N	N	Y	N	N	Y	N	N	Y
Historical admin									
Region FE	Y	Y	Y	Y	Y	Y	Y	Y	Y

All regressions are at the city level. Fixed effects OLS regressions. Robust standard errors, clustered by historical administrative region (55 clusters). Stars indicate level of significance: ***(1%); **(5%); and *(10%). The data for the share refractory clergy are at the dèpartment level. They refer to the share of French clergy that did not swear the oath of allegiance to the Civil Constitution promoted by the revolutionary government, but instead confirmed their loyalty to the Catholic Church Squicciarini (2020). The baseline controls include: population density, latitude and longitude, bishopric city. Full controls include saint types (the number of saints in the following high rank occupations: pope, king, queen, abbot/abbess, bishop) and all controls specified in col. 6 of Table 1. Squicciarini controls include the full set of controls added in Squicciarini (2020)'s replicating Table 3, col. 5: log total department population in 1891; temperature; precipitation; wheat soil suitability; an index of pre-industrial activities in France before 1500; log distance from Paris (in km); a dummy for departments where the king, before 1789, exerted particularly strong power; log number of subscribers to the Encyclopedie in 1777–1780; the ratio of students to school-age population (5–15 years)

Table 12 Saints, witch trials and Jewish persecutions: controlling for historical region FE

	Jewish persecutions			Witch trials		
	(1)	(2)	(3)	(4)	(5)	(6)
Saints	0.138***	0.105***	0.088**	0.194***	0.145***	0.179***
Presence	(0.039)	(0.039)	(0.044)	(0.037)	(0.036)	(0.040)
Female			0.062			−0.117**
Saints presence			(0.054)			(0.053)
N	858	858	858	2111	2111	2111
Adj. R^2	0.219	0.229	0.228	0.402	0.419	0.423
Baseline						
Controls	Y	Y	Y	Y	Y	Y
Saints						
Types	N	Y	Y	N	Y	Y
Region FE	Y	Y	Y	Y	Y	Y

Notes: All regressions are at the city level. Fixed effects OLS regressions. Robust standard errors, clustered by historical administrative region (272 clusters for Jewish persecutions, 434 for witch trials). Stars indicate level of significance: ***(1%); **(5%); and *(10%). The baseline controls include: population density, latitude and longitude, bishopric city. Saints types refer to the number of saints in the following high rank occupations: pope, king, queen, abbot/abbess, bishop

Table 13 Saints per capita, persecutions and witch trials

	(1)	(2)	(3)	(4)	(5)	(6)
Panel A	Dep. var.: *Jewish persecutions-city level*					
Saints	0.043***	0.020***	0.018***	0.018***	0.019***	0.019***
Per capita	(0.008)	(0.007)	(0.006)	(0.006)	(0.007)	(0.006)
N	920	920	864	864	864	864
Adj. R^2	0.049	0.210	0.215	0.215	0.214	0.217
Panel B	Dep. var.: *witch trials-city level*					
Saints	0.039***	0.018***	0.015**	0.015**	0.015**	0.015**
Per capita	(0.006)	(0.007)	(0.006)	(0.006)	(0.006)	(0.006)
N	2175	2175	2119	2119	2119	2119
Adj. R^2	0.070	0.201	0.288	0.294	0.327	0.294
Panel C	Dep. var.: *Jewish persecutions-grid level*					
Saints	0.035***	0.019***	0.016***	0.017***	0.018**	0.019***
Per capita	(0.008)	(0.006)	(0.005)	(0.006)	(0.007)	(0.006)
N	750	750	741	741	741	741
Adj. R^2	0.044	0.205	0.225	0.229	0.228	0.234
Panel D	Dep. var.: *Witch Trials-Grid Level*					
Saints	0.044***	0.024***	0.020***	0.020**	0.020***	0.020**
Per capita	(0.008)	(0.008)	(0.007)	(0.007)	(0.007)	(0.008)
N	1750	1750	1750	1750	1750	1750
Adj. R^2	0.076	0.212	0.231	0.230	0.230	0.233
Polity FE	N	Y	Y	Y	Y	Y
Baseline controls	N	Y	Y	Y	Y	Y
Saints types	N	Y	Y	Y	Y	Y
Dist. from Rome	N	N	Y	Y	Y	Y
Institutions	N	N	Y	Y	Y	Y
Wheat suitability	N	N	N	Y	Y	Y
Capital city	N	N	N	N	Y	Y
Dist. from sea	N	N	N	N	N	Y

Fixed effects OLS regressions. Robust standard errors, clustered by sovereign political entities in 1800 (39 clusters). Stars indicate level of significance: ***(1%); **(5%); and *(10%). The baseline controls include: population density, latitude and longitude, (arch)bishopric dummy. Saints types refer to the number of saints in the following high rank occupations: pope, king, queen, abbot/abbess, bishops. Institutions include a dummy for university presence and parliamentary activity

Table 14 Robustness tests

Dep. var	W/o top persecuting cities		W/o cities with most saints		W/o Paris		Post-1100 saints			
	Persecution	Witch trials	Persecution	Witch trials	Persecution	Witch trials	Persecution		Witch trials	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
City level										
Saints Presence	0.107***	0.103***	0.095***	0.083*	0.107***	0.112***	0.103***	0.104***	0.093***	0.142***
	(0.039)	(0.038)	(0.034)	(0.047)	(0.36)	(0.038)	(0.037)	(0.038)	(0.030)	(0.041)
Female saint presence								0.042		−0.129***
								(0.057)		(0.022)
Post-1100 Saint presence							0.021	0.034	0.013	−0.002
							(0.035)	(0.037)	(0.039)	(0.034)
Post-1100 female Saint presence								0.011		0.085*
								(0.014)		(0.046)
N	919	2153	911	2154	919	2174	920	2175	920	2175
Adj. R²	0.209	0.196	0.206	0.181	0.209	0.199	0.209	0.203	0.207	0.212
Grid-level										
Saints Presence	0.103***	0.142***	0.096***	0.116***	0.103***	0.144***	0.102***	0.139***	0.093***	0.153***
	(0.031)	(0.047)	(0.030)	(0.057)	(0.030)	(0.046)	(0.033)	(0.045)	(0.034)	(0.042)
Female saint Presence								0.037		−0.041**
								(0.050)		(0.020)
Post-1100 saint presence							0.009	−0.015	0.005	−0.038
							(0.033)	(0.060)	(0.036)	(0.027)
Post-1100 female Saint presence								0.002		0.088**
								(0.018)		(0.039)
Baseline Controls	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

Table 14 (continued)

Dep. var	W/o top persecuting cities		W/o cities with most saints		W/o Paris		Post-1100 saints			
	Persecution	Witch trials	Persecution	Witch trials	Persecution	Witch trials	Persecution		Witch trials	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
City level										
Saints										
Types	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
N	744	1745	740	1728	749	1801	750	1802	750	1750
Adj. R^2	0.209	0.220	0.198	0.194	0.204	0.215	0.206	0.216	204	0.217

Robust standard errors, clustered by sovereign political entities in 1800 (39 clusters). Stars indicate level of significance: ***(1%); **(5%); and *(10%). The baseline controls include: population density, latitude and longitude, (arch)bishopric dummy. Saints types refer to the number of saints in the following high rank occupations: pope, king, queen, abbot/abbess, bishop. The top 1% persecuting cities [cols. (1)–(2)], cities with the top 1% saints [cols. (3)–(4)], and Paris [cols. (5)–(6)] are removed

Table 15 Accounting for spatial autocorrelation

	(1)	(2)	(3)	(4)	(5)	(6)
Panel A	Dep. var.: *Jewish persecutions-city level*					
Saints	0.043***	0.020***	0.018***	0.018***	0.019***	0.019***
Presence	(0.031)	(0.035)	(0.034)	(0.034)	(0.035)	(0.036)
N	1043	920	864	864	864	864
Panel B	Dep. var.: *witch trials-city level*					
Saints	0.050	0.112***	0.094**	0.093**	0.090**	0.093**
Presence	(0.044)	(0.037)	(0.038)	(0.037)	(0.037)	(0.039)
N	2954	2175	2119	2119	2119	2119
Panel C	Dep. var.: *Jewish persecutions-grid level*					
Saints	0.237***	0.103***	0.091**	0.098**	0.102***	0.110***
Presence	(0.049)	(0.038)	(0.038)	(0.038)	(0.039)	(0.040)
N	783	750	741	741	741	741
Panel D	Dep. var.: *witch trials-grid level*					
Saints	0.116***	0.165***	0.114***	0.114***	0.111***	0.117***
Presence	(0.039)	(0.034)	(0.033)	(0.033)	(0.034)	(0.035)
N	2288	1802	1750	1750	1750	1750
Polity FE	N	Y	Y	Y	Y	Y
Baseline controls	N	Y	Y	Y	Y	Y
Saints types	N	Y	Y	Y	Y	Y
Dist. from Rome	N	N	Y	Y	Y	Y
Institutions	N	N	Y	Y	Y	Y
Wheat suitability	N	N	N	Y	Y	Y
Capital city	N	N	N	N	Y	Y
Dist. from sea	N	N	N	N	N	Y

Fixed effects OLS regressions. The standard errors are the largest Conley (1999) standard errors using 100 km and 200 km thresholds, where distance cutoffs are computed geodesically or with a linear decay. Stars indicate level of significance: ***(1%); **(5%); and *(10%). The baseline controls include: population density, latitude and longitude, (arch)bishopric dummy. Saints types refer to the number of saints in the following high rank occupations: pope, king, queen, abbot/abbess, bishops. Institutions include a dummy for university presence and parliamentary activity

Table 16 Saints and the probability of hosting a Jewish community

	(1)	(2)	(3)	(4)	(5)	(6)
Saints	−0.310***	−0.290***	−0.272***	−0.273***	−0.280***	−0.283***
presence	(0.055)	(0.073)	(0.069)	(0.066)	(0.070)	(0.065)
N	2800	2117	2117	2117	2117	2117
Adj. R^2	0.061	0.216	0.221	0.232	0.234	0.251
Polity FE	N	Y	Y	Y	Y	Y
Baseline controls	N	Y	Y	Y	Y	Y
Saints types	N	Y	Y	Y	Y	Y
Dist. from Rome	N	N	Y	Y	Y	Y
Institutions	N	N	Y	Y	Y	Y
Wheat suitability	N	N	N	Y	Y	Y
Capital city	N	N	N	N	Y	Y
Dist. from sea	N	N	N	N	N	Y

Fixed effects OLS regressions. The dependent variable is a dummy variable equal to 1 if a location never persecuted a Jewish community. Robust standard errors, clustered by sovereign political entities in 1800 (39 clusters). Stars indicate level of significance: ***(1%); **(5%); and *(10%). The baseline controls include: population density, latitude and longitude, (arch)bishopric dummy. Saints types refer to the number of saints in the following high rank occupations: pope, king, queen, abbot/abbess, bishops. Institutions include a dummy for university presence and parliamentary activity

Table 17 Alternative treatment cutoffs

	(1)	(2)	(3)	(4)	(5)	(6)
Cutoff = 1234						
Panel A	Dep. var.: *Jewish persecutions-city level*					
Saints	0.302***	0.129***	0.119***	0.118***	0.126***	0.126***
Presence	(0.047)	(0.043)	(0.037)	(0.037)	(0.042)	(0.037)
N	1043	920	920	920	920	920
Adj. R^2	0.061	0.216	0.222	0.222	0.222	0.221
Panel B	Dep. var.: *witch trials-city level*					
Saints	0.051**	0.109***	0.092**	0.091**	0.089**	0.092**
Presence	(0.023)	(0.040)	(0.037)	(0.036)	(0.035)	(0.037)
N	2957	2177	2177	2177	2177	2177
Adj. R^2	0.001	0.199	0.214	0.216	0.216	0.215
Cutoff = 1634						
Panel C	Dep. var.: *Jewish persecutions-city level*					
Saints	−0.013	0.143**	0.151**	0.150**	0.147**	0.145**
Presence	(0.061)	(0.056)	(0.058)	(0.059)	(0.056)	(0.060)
N	694	571	571	571	571	571
Adj. R^2	0.001	0.041	0.043	0.041	0.040	0.040
Panel D	Dep. var.: *witch trials-city level*					
Saints	0.066***	0.106***	0.089***	0.087***	0.086***	0.088***
Presence	(0.020)	(0.036)	(0.031)	(0.030)	(0.030)	(0.031)
N	2902	2168	2168	2168	2168	2168
Adj. R^2	0.003	0.194	0.208	0.210	0.211	0.210
Polity FE	N	Y	Y	Y	Y	Y
Baseline controls	N	Y	Y	Y	Y	Y
Saints types	N	Y	Y	Y	Y	Y
Dist. from Rome	N	N	Y	Y	Y	Y
Institutions	N	N	Y	Y	Y	Y
Wheat suitability	N	N	N	Y	Y	Y
Capital city	N	N	N	N	Y	Y
Dist. from sea	N	N	N	N	N	Y

Fixed effects OLS regressions. Robust standard errors, clustered by sovereign political entities in 1800 (39 clusters). Stars indicate level of significance: ***(1%); **(5%); and *(10%). The baseline controls include: population density, latitude and longitude, (arch)bishopric dummy. Saints types refer to the number of saints in the following high rank occupations: pope, king, queen, abbot/abbess, bishops. Institutions include a dummy for university presence and parliamentary activity

Table 18 Spillover effects, 300 km radius

	Jewish persecutions				Witch trials			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Saint Presence	0.096**	0.105**	0.103***	0.113**	0.150***	0.142***	0.143***	0.150***
	(0.041)	(0.042)	(0.038)	(0.043)	(0.045)	(0.043)	(0.041)	(0.044)
% Saints within 300 km	0.002			0.001	−0.004*			−0.003**
	(0.003)			(0.004)	(0.002)			(0.001)
% Trials within 300 km		0.003**		0.004***		0.003***		0.003***
		(0.001)		(0.001)		(0.001)		(0.001)
% Persecutions within 300 km			0.006***	0.007**			−0.002***	−0.001
			(0.002)	(0.003)			(0.001)	(0.001)
Baseline								
Controls	Y	Y	Y	Y	Y	Y	Y	Y
Saints Types	Y	Y	Y	Y	Y	Y	Y	Y
Bishopric city	Y	Y	Y	Y	Y	Y	Y	Y
N	915	915	915	915	2170	2170	2170	2170

Fixed effects OLS regressions. Robust standard errors, clustered by sovereign political entities in 1800 (39 clusters). Stars indicate level of significance: ***(1%); **(5%); and *(10%). The baseline controls include: population density, latitude and longitude, (arch)bishopric dummy. Saints types refer to the number of saints in the following high rank occupations: pope, king, queen, abbot/abbess, bishop

Table 19 Saints 900-1100, persecutions and witch trials

	(1)	(2)	(3)	(4)	(5)	(6)
Panel A	Dep. var.: *Jewish persecutions-city level*					
Saints presence	0.290***	0.107***	0.095***	0.095***	0.099***	0.103***
900–1100	(0.046)	(0.038)	(0.031)	(0.031)	(0.036)	(0.031)
N	1043	920	864	864	864	864
Adj. R^2	0.055	0.209	0.215	0.214	0.214	0.217
Panel B	Dep. var.: *witch trials-city level*					
Saints presence	0.053**	0.111***	0.093**	0.091**	0.089**	0.092**
900–1100	(0.026)	(0.040)	(0.036)	(0.036)	(0.035)	(0.037)
N	2954	2175	2119	2119	2119	2119
Adj. R^2	0.001	0.199	0.215	0.216	0.216	0.216
Panel C	Dep. var.: *Jewish persecutions-grid level*					
Saints presence	0.237***	0.104***	0.091***	0.098***	0.100***	0.110***
900–1100	(0.047)	(0.031)	(0.026)	(0.030)	(0.034)	(0.031)
N	783	750	741	741	741	741
Adj. R^2	0.052	0.207	0.225	0.229	0.228	0.235
Panel D	Dep. var.: *witch trials-grid level*					
Saints presence	0.121***	0.141***	0.118***	0.118***	0.117***	0.121***
900–1100	(0.029)	(0.045)	(0.043)	(0.043)	(0.042)	(0.044)
N	2288	1802	1750	1750	1750	1750
Adj. R^2	0.011	0.213	0.231	0.231	0.231	0.234
Polity FE	N	Y	Y	Y	Y	Y
Baseline controls	N	Y	Y	Y	Y	Y
Saints types	N	Y	Y	Y	Y	Y
Dist. from Rome	N	N	Y	Y	Y	Y
Institutions	N	N	Y	Y	Y	Y
Wheat suitability	N	N	N	Y	Y	Y
Capital city	N	N	N	N	Y	Y
Dist. from sea	N	N	N	N	N	Y

Fixed effects OLS regressions. Saints presence 900–1100 is a dummy variable equal to 1 if a location was Christianised by 900 and venerated at least one saint during 900–1100. Robust standard errors, clustered by sovereign political entities in 1800 (39 clusters). Stars indicate level of significance: ***(1%); **(5%); and *(10%). The baseline controls include: population density, latitude and longitude, (arch)bishopric dummy. Saints types refer to the number of saints in the following high rank occupations: pope, king, queen, abbot/abbess, bishops. Institutions include a dummy for university presence and parliamentary activity

Table 20 Saints 900–1100, persecutions (1100–1300) and witch trials (1300–1500)

	(1)	(2)	(3)	(4)	(5)	(6)
Panel A	Dep. var.: *Jewish persecutions, 1100–1300-city level*					
Saints presence	0.140***	0.113***	0.098***	0.101***	0.106***	0.103***
900–1100	(0.022)	(0.030)	(0.030)	(0.031)	(0.032)	(0.030)
N	324	323	323	323	323	323
Adj. R^2	0.021	0.237	0.229	0.234	0.232	0.233
Panel B	Dep. var.: *witch trials, 1300–1500-city level*					
Saints presence	0.133***	0.087**	0.073**	0.070**	0.064**	0.074**
900–1100	(0.024)	(0.033)	(0.033)	(0.032)	(0.031)	(0.033)
N	2954	1198	1198	1198	1198	1198
Adj. R^2	0.032	0.182	0.196	0.203	0.208	0.205
Panel C	Dep. var.: *Jewish persecutions, 1100–1300-grid level*					
Saints presence	0.153***	0.115**	0.107*	0.110**	0.114**	0.112**
900–1100	(0.026)	(0.048)	(0.053)	(0.048)	(0.050)	(0.044)
N	301	300	300	300	300	300
Adj. R^2	0.054	0.218	0.220	0.218	0.217	0.220
Panel D	Dep. var.: *witch trials, 1300–1500-grid Level*					
Saints presence	0.161***	0.127***	0.112**	0.110**	0.103**	0.114**
900–1100	(0.026)	(0.044)	(0.044)	(0.045)	(0.043)	(0.046)
N	2140	1080	1080	1080	1080	1080
Adj. R^2	0.047	0.187	0.204	0.206	0.213	0.209
Polity FE	N	Y	Y	Y	Y	Y
Baseline controls	N	Y	Y	Y	Y	Y
Saints types	N	Y	Y	Y	Y	Y
Dist. from Rome	N	N	Y	Y	Y	Y
Institutions	N	N	Y	Y	Y	Y
Wheat suitability	N	N	N	Y	Y	Y
Capital city	N	N	N	N	Y	Y
Dist. from sea	N	N	N	N	N	Y

Fixed effects OLS regressions. This sample restricts Jewish persecutions to the years 1100–1300 and witch trials to the years 1300–1500. Saints presence 900–1100 is a dummy variable equal to 1 if a location venerated at least one saint during 900–1100. Robust standard errors, clustered by sovereign political entities in 1800 (39 clusters). Stars indicate level of significance: ***(1%); **(5%); and *(10%). The baseline controls include: population density, latitude and longitude, (arch)bishopric dummy. Saints types refer to the number of saints in the following high rank occupations: pope, king, queen, abbot/abbess, bishops. Institutions include a dummy for university presence and parliamentary activity

Further robustness checks

Count models

The main analysis in the text establishes the existence of a positive relationship between saints and persecutions at the extensive margins, here we analyse such a relationship at the intensive margin. We report the results in Table 21, using the continuous measure

Table 21 Count models

Dep. var	Jewish persecutions		Witch trials	
	OLS-log	Poisson	OLS-log	Poisson
	City level			
	(1)	(2)	(3)	(4)
Saints	0.163***	0.246**	0.163	0.832*
	(0.041)	(0.105)	(0.112)	(0.450)
N	864	835	2,119	1,947
	Grid level			
Saints	0.115***	0.132	0.185	0.508
	(0.040)	(0.115)	(0.122)	(0.391)
N	743	714	1,750	1,596
Polity FE	Y	Y	Y	Y

Robust standard errors, clustered by sovereign political entities in 1800. Stars indicate level of significance: ***(1%); **(5%); and *(10%). All regressions include the full set of controls used in Column (6) of Table 1

of persecution episodes. Throughout this table we use the fully controlled specification, including the polity FE, employed in Table 1, column (6).

In columns(1) and (3), we use the log of persecutions and trials, respectively. For observations with zero counts we add 1 to the logarithmic function, which is standard in the literature. The point estimates indicate that saint cities are 16% more likely to engage in Jewish persecutions as well as in witch trials. We find similar point estimates at the grid level as well. In columns (2) and (4), we employ a Poisson model and continue to find positive impacts, albeit larger in magnitude, providing further evidence behind the underlying impact of exposure to saint veneration and minority persecutions.

Placebo estimates from random orderings

Another concern that can plague the analysis in the main text is that we observe only one dimension/proxy of local religiosity. In a deeply religious society, like that of Medieval Europe, there would a wide variety of manifestations of religion and these could substantially vary spatially across cities. For instance, trade in relics of the saints had reached enormous proportions in medieval times Brown (1981) and cities could host a relic without having the actual saint's shrine. Due to the lack of data on relics' trade, in our analysis these cities are not considered treated.

To probe this concern empirically, we perform a placebo analysis by randomly changing treatment assignment of sainthood across cities in our sample. In each iteration we fix the number of treated cities to match our baseline sample of around 270. The motivation behind this is that if some control variables or non-saint cities had other similar features of religiosity which could also impact persecution then we would estimate a strong positive point estimate in some of these experiments as well.

Figure 14 presents the results from this exercise. Our actual point estimates for both witch trials (a) and Jewish persecutions (b) are well to the right of the entire distribution of 1000 placebo point estimates from the random orderings. This provides further evidence that sainthood indeed captures important elements local religion associated with the perpetration of violent persecution of minorities during the Middle Ages and thereafter.
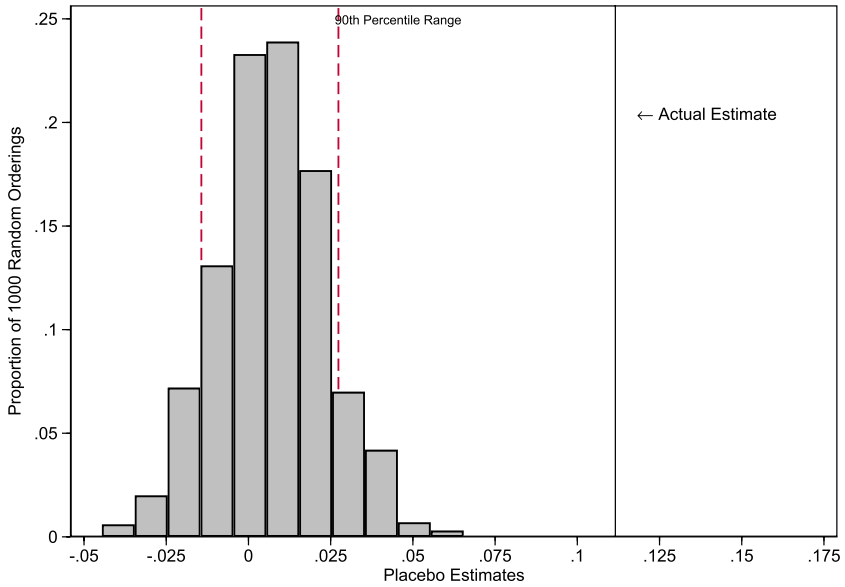
(a) Witch Trials
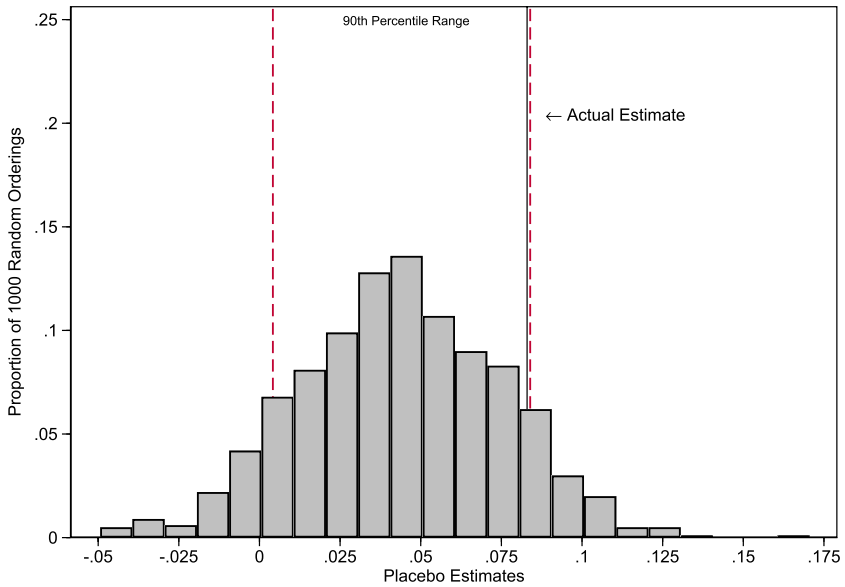
(b) Jewish Persecutions

Fig. 14 Placebo estimates from 1000 random orderings. *Note* The above histograms present results from a placebo exercise. We randomly assign saint status to cities in our sample and estimate the coefficient on this placebo saint indicator. We repeat this process 1000 times and plot the proportion of results in bins of size 0.01

Saints' hagiographies

In this section we provide some examples of saints' lives, based on information predominantly extracted from the *Martyrologium Romanum*.

St. Ambrose
Bishop of Milan, Doctor of the Church
Birth: 339-340 (Trier, Germany)
Feast day: December 7
Death: 397 (Milan, Italy)
Place of veneration: Milan

AMBROGIO di Milano. *Il Vescovo A*. Milano, Basilica di S. Ambrogio, Cappella di S. Vittore (sec. VI). (foto Soprint. Gall. Milano)

Source: Bibliotheca Sanctorum

Descendent of a Roman aristocratic family, probably of Greek origin. He was born in Trier around 339–340 and after his father's death he moved to Rome with his mother and siblings. After studying law, he became the bishop of Milan in 374. Ambrose was the protector and defender of the weak and the oppressed. One of his priorities in his pastoral activities was promoting female virginity and the cult of martyrs, as documented by his own writings: "By the death of martyrs religion has been defended, faith increased, the Church strengthened; the dead have conquered, the persecutors have been overcome. And so we celebrate the death of those of whose lives we are ignorant." (Letter XXII).

He was a strong adversary of the early church heresies of Arianism and Donatism; his fight with Arianism intensified in 381 and would last nearly his entire life.

When he participated to the synod of Aquileia, organised by emperor Graziano, to judge two Arian bishops, Palladio of Raziaria and Secondino of Singidunum, and the presbyter Attalo, he led all the discussions, and subjected the three accused to stringent interrogations. The heretics, persevering in the error they were deposed and excommunicated.

His doctrinal position against pagan gods was uncompromising, a constant theme in his writings and sermons:

> "There is no security for those who do not sincerely worship the true God, that is, the God of Christians, by whom the universe is governed. The pagan gods are but demons. Whoever militates for the true God must dedicate all his zeal and devotions to him."
> *Bibliotheca Sanctorum* , Vol. I, p.981

Its criticism to Judaism was similarly fierce. In 388, in Callinicum (the current al-Raqqa), a crowd of Christians stormed the local synagogue and burned it.

The Roman governor condemned the incident and, to maintain public order, arranged for the synagogue to be rebuilt, a decision endorsed by Emperor Theodosius I. Ambrose opposed the emperor's decision and wrote him a letter (*Epistulae variae, 40*) to persuade him not to rebuild the synagogue. In such *epistola* Ambrose declared himself responsible for the fire:

"I declare that I have set the synagogue on fire, yes, it was I who gave the task, so that there is no longer any place where Christ is denied."

Ambrose further affirmed that that fire was not a crime and that if he had not yet given the order to burn the synagogue in Milan it was only out of laziness and that burning the synagogues was also a glorious act.[79]

St. Agatha
Martyr, vergin; patron saint of Catania
Birth: First half of the 3rd century (Catania, Italy)
Feast day: February 5 and August 17
Death: 5 February 251 (Catania)
Place of veneration: Catania

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[79] For further details on the Callinicum incident, see Todini (1990) and Craughwell (2003).

AGATA, s.m. Maestro del Carmine, tavola processionale. Firenze, Museo dell'Opera del Duomo (sec. XIII).
(foto Alinari)

Source: Bibliotheca Sanctorum, vol.1

Most of the extant knowledge about Saint Agatha comes from *Passio s. Agathae*, the acts of the martyr's life, compiled in the second half of the fifth century. Born in Catania from a rich and noble family, Saint Agatha was martyred during Emperor Decio's persecution on 5 February 251. As a young girl she made the vow of perpetual virginity.

She was arrested for being Christian and she was tortured for not renouncing her faith. After being scourged, her skin was lacerated with iron points, the sores were set on fire and her breasts were amputated. According to legend, during the night she had a vision of St. Peter, who miraculously healed her. She was further tortured, and thrown on shards of pots and burning coals. During the torture, a wing of the prison collapsed and killed her executioners. Agatha died while praying to God. The faithful honoured her body and started venerating her as a martyr.

Agatha performed many miracles after death, including shielding pagans from Etna's eruptions, after which they converted to Christianity, and various miraculous rescues via a sacred veil, which covered her tomb. She was invoked as a protector against volcanic eruptions, fires and bell makers (since bells were used as a warning during a natural calamity). She was also the protector of weavers and of breastfeeding mothers. An angel has engraved on her sepulchral stone: *Mentem sanctam, spontaneam, honorem Deo et patriae liberationem.*[80]

During her feast days, the bust of the saint covered by a large amount of precious jewels, and the casket containing her relics are paraded across the city of Catania. Her devotees carry giant candles (the so called "candelore"), fireworks are part of the celebrations, and poetry competitions, in which songs in honour of the saint are improvised, are performed.

St. Florian

Martyr, holy man, patron saint of Linz, Austria
Birth: 250 (Sankt Pölten, Austria)
Feast day: May 4
Death: 304 (Enns river)
Place of veneration: Linz

Florian was an officer of the Roman army, who occupied a high administrative post in Noricum, and who suffered death for being Christian during Emperor Diocletian's rule. His legendary "Acts" state that he gave himself up at Lorch to the soldiers of Aquilinus, the governor, when they were rounding up the Christians. After confessing his faith, he was twice scourged, half-flayed alive, set on fire, and finally thrown into the river Enns with a stone around his neck. His body, recovered and buried by a pious woman, was eventually moved to an abbey near Linz.

Many miracles of healing are attributed to his intercession and he is invoked as a powerful protector in danger from fire or water. St. Florian is the patron of firefighters, chimney sweeps, and brewers. He is invoked against fires, floods, lightning, and the pains of purgatory. In the southern Catholic parts of present Bavaria and Austria peasants regularly have used the name Florian, as one of the given names for at least one of their male children to secure the saint's patronage against fire. In Austria and Germany, fire services use Florian in radio communications as universal call sign for fire stations and fire trucks.

St. Didier (Desiderius)

Archbishop of Vienne, France
Birth: date unknown (Autumn, France)
Feast day: May 26
Death: 607 (Vienne, France)
Place of veneration: Vienne

Didier's life was characterised by the enforcement of strict clerical discipline and his attacks on simony. He was denounced for paganism by Queen Brunhildis (whose immorality he denounced) to Pope Gregory the Great who exonerated him, but was later banished by a synod controlled by Brunhildis. Desiderius was stoned to death under the order of King Theodoric, whom he had publicly censured. A hagiographical work was written about him by the Visigothic king Sisebuto, during the 7th century.

St. John of Beverly

Bishop of Hexham and of York, England

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[80] Holy mind, spontaneous, the honour of God and the country's liberation.

Birth: (Harpham, England)
Feast day: May 26
Death: 7 May 721 Beverley (England)
Place of veneration: Beverley

Born from noble parents at Harpham, John studied under Adrian at St. Theodore's School in Kent, after which he became a monk at Whitby. He was named bishop of Hexham in 687 and then transferred to York in 705. John was diligent in visitation, considerate towards the poor, and attentive to the training of students whom he maintained under his personal charge. He was known for his holiness and his preference for the contemplative life.

In ill health, John resigned the bishopric of York in 717 and retired to Beverly Abbey, which he had founded, and remained there until his death on May 7. His shrine was for centuries one of the most popular pilgrim centres in England. Many miracles of healing are ascribed to John, and the popularity of his cult was a major factor in the prosperity of Beverley during the Middle Ages. He was canonised by Pope Benedict IX in 1037.

Henry V gave the credit for his victory at the Battle of Agincourt to the miraculous intervention of John. On the day of the battle, blood and oil were seen running from the tomb. Henry made John one of the patrons of the royal household and ordered that his feast was to be celebrated throughout England. Henry and his queen went to Beverley in 1420 to make offerings at the saint's shrine. In 1541, the shrine was destroyed on the orders of Henry VIII as part of the English Reformation.

Declarations

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