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The unequal spirit of the Protestant Reformation: particularism and wealth distribution in early modern Germany

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Abstract
This paper assesses the impact of the Protestant Reformation on wealth distribution and inequality in confessionally divided Germany, between 1400 and 1800. The Reformation expanded social welfare, but provided it in a particularistic way to "deserving" poor and natives only. This gave Protestantism an ambiguous character in terms of redistribution and its impact on inequality. I develop a theoretical framework of this trade-off between welfare expansion and particularistic provision, and test its implications empirically, using a difference-in-differences and an instrumental variable strategy. In line with the theoretical framework, the analysis documents that the Reformation exacerbated inequality overall by making marginal poor people relatively poorer. This increase in inequality was driven by the introduction of new particularistic poor relief policies in Protestant communities. Economic growth was unlikely to be large enough to compensate poor strata for their losses. Protestantism emerges as an underappreciated driver of preindustrial inequality, long before the onset of industrialisation and modern economic growth.

Keywords Wealth · Poverty · Inequality · Political Economy · Protestantism · Welfare · Germany

JEL Classification D31 · H23 · I38 · N33

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"And Jesus said to his disciples, Truly I say to you, it is hard for a man with much money to go into the kingdom of heaven." [...] "Give what property you have in exchange for money, and give the money to the poor"
— New Testament Matthew 19:23, Luke 12:33

"It is not seemly that one man should live in idleness on the labours of his fellows"
— Martin Luther, Appeal to the Ruling Class of German Nationality, 1520

1 Introduction

What is the impact of religious confession on the distribution of wealth and inequality? Since Max Weber's seminal book (1930) "The Protestant Ethic and The Spirit of Capitalism," scholars have debated the socio-economic impact of the Protestant Reformation. While considerable attention has been given to this event's effect on economic growth, its impact on inequality has been studied only marginally see (Becker et al., 2016). This lack of knowledge clashes with the key role recent work attributes to ideology and institutions in explaining how high levels of economic inequality came about and have persisted over the long run of history (Abramitzky, 2008; Piketty, 2020; Alfani, 2021). Protestantism discriminated between "deserving" and "undeserving" poor, and between natives and strangers in the provision of social welfare. It is thus potentially an important variable for understanding preferences towards redistributive policies today (see Alesina & Giuliano, 2010; Enke et al., 2023).[1]

Much discussion about the Reformation's socio-economic impact centres on the expansion of public goods provision, especially in terms of more generous poor relief included in social welfare (Lindert, 2004; Dittmar & Meisenzahl, 2020). This line of argumentation would seem to imply more redistribution of economic resources to poor people, and a more egalitarian distribution of income and wealth under Protestantism. And yet, a key dimension of redistributive policies is how universal or particularistic the provision of social welfare is, that is, whether the expansion of the welfare state comes with certain restrictions. Historical and contemporary societies can choose to redistribute only to people who are socially close—insiders, such as "good deserving Christians" or natives—or also to distant strangers, that is, outsiders such as "bad undeserving Christians" or immigrants (Enke et al., 2023). Such choices generate trade-offs with implications for inequality: if Protestant redistribution did not go as far as marginal poor people, because it excluded "undeserving" individuals and strangers,[2] then it is likely to have increased the gap between poor strata and the rest of society, thus increasing economic inequality. Figure 1 suggests that this might have been the case. It reveals a divergence in the wealth shares of poor strata—defined as the bottom 20 percent of the distribution (Dollar & Kraay, 2002)—in Protestant and Catholic communities in my dataset; the vertical red line represents the beginning of the Reformation period, the grey box the Thirty Years' War.[3]

[1] For example, Reformers heavily emphasised the concept "Who does not work shall not eat" (Laube, 1981: 134; Kahl, 2009: 271), which resembles the ideology underlying social welfare restrictions in many societies imprinted by Protestantism outside Germany, such as workhouses in Victorian England, or SNAP work requirements in the US today (see Jütte, 1994; Gray et al., 2023).

[2] See for example Hartung (1989) and Jütte (1994).

[3] The Thirty Years' War (1618-48) was the most violent and destructive conflict in European history. It started as a conflict over whether Protestantism or Catholicism was the "right" Christian faith. It took place mostly in Germany, where it killed about 40 percent of the population.

In this paper I first develop a theoretical framework of this trade-off. To test the predictions deriving from that framework, I then construct a panel database on local religious confession, wealth distribution and inequality in German communities from 1400 to 1800. It is based on c. 380,000 household wealth observations collected from archival tax records and secondary sources.[4] The data make it possible to observe wealth in a highly disaggregated way across the distribution. They allow me to study inequality—that is, *relative* and not *absolute* wealth distribution—within Protestant and Catholic communities.

Given its religious heterogeneity among communities, Germany is the ideal testing ground with which to shed light on the redistributive effect of the Protestant Reformation.[5] Causal identification is made possible because conversion to Protestantism was superimposed on communities by their local rulers following the Peace of Augsburg (1555). I complement this main analysis with flexible difference-in-differences estimates, which allow me to formally test the parallel trends assumption. To provide additional evidence that the estimates are not driven by self-selection into Reformation adoption, and to address potential violations of the parallel trends assumption, I also employ an instrumental variable strategy: I use the distance to Wittenberg as instrument, as previously employed by Becker and Woessmann (2009), Cantoni (2015) and Becker and Pascali (2019). This instrument exploits the fact that the Reformation was more likely to be adopted the closer a community was to the movement's starting point.

I find that the Reformation increased economic inequality by making poor people poorer relative to the rest of the population. This result is statistically significant and economically meaningful: the bottom fifth of the population lost about 39 percent of its pre-treatment wealth share. The finding is robust to a rich set of controls, including economic growth and warfare, and I do not find evidence of significantly different pre-trends. Changes in other parts of the wealth distribution do not mechanically drive the changes in the bottom tail, and the main result holds when dropping various parts of the dataset, including regions where observations are geographically clustered. The main empirical pattern of poor strata losing significant wealth shares was not short-lived. It endured until the end of the early modern age when industrialisation began. Interestingly, I find no significant evidence that the Reformation had an effect on top wealth shares. This is contrary to what one would expect if the inequality effect of the Reformation were driven by factors like economic growth, capital accumulation or higher upper-tail human capital, as these tend to increase inequality from the top of the distribution. Similarly, I do not find evidence for changes to the wealth shares of middling classes. The instrumental variable estimates are slightly larger than the main difference-in-differences results. However, I document that the instrument was not related to higher inequality before, but only after the beginning of the Reformation. This suggests that, conditional on several covariates, the exclusion restriction most likely holds.

I argue that the findings reflect the Reformation's shift towards a more particularistic provision of poor relief, which outweighed the expansion of social welfare available to some insiders. In Protestant areas strangers and able-bodied but non-working

[4] Since household-level wealth observations have to be aggregated at the community-year level to calculate inequality measures, the final dataset consists of 368 observations. Note that all studies of preindustrial inequality employ relatively small datasets, because of the large amount of household-level data needed to reconstruct one distribution for a given point in time.

[5] The geographical area I study is the inner part of the Holy Roman Empire of the German Nation, which was subject to the Imperial constitution. As a shorthand I refer to the Empire as Germany.

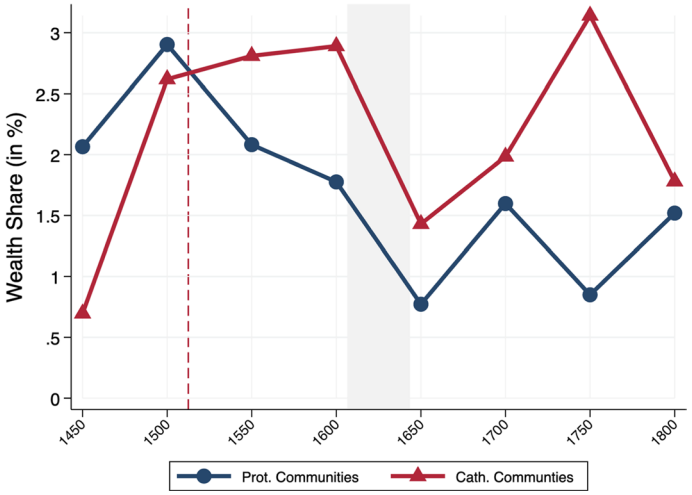

Fig. 1 Wealth Share of the Bottom 20% in Protestant and Catholic Communities, Germany, c. 1400–1800. Notes: Values were collapsed into 50-year intervals and represent half-century averages. To avoid having communities with more observations dominate the trend, every community has the same weight in the average. Because of the uneven number of years and the low number of observations in 1400, values for the years 1400–1450 were collapsed into one data point. The vertical red line represents the beginning of the Reformation period, the grey box the Thirty Years' War

"undeserving" poor were excluded from the local Christian community, and declared as ineligible to receive poor relief; doing so was designed to incentivise them to work. This happened when publicly provided Protestant poor relief substituted the welfare provisions of the Catholic Church. The consequence was a reduction in the supply of poor relief to the excluded groups and an overall decrease of transfers from better-off to marginal poor people. These new low-redistribution policies left behind the bottom of the poor in Protestant society; in Catholic communities the Old Church stuck to its universal approach to charity (as highlighted in the opening quotes) during the Counter-Reformation. Moreover, the particularistic Protestant poor relief system came with a whole set of policies and practices that were also particularistic in nature: the prohibition of begging, the disincentivising of almsgiving, the stigmatisation of the poor in the labour market. These reduced the share of economic resources held by marginal poor people in a way that was analogous to poor relief in the strict sense and exacerbated its effect. As a consequence, the Reformation reshuffled the bottom end of the income and wealth distribution, making some poor *relatively* poorer and increasing inequality. My main data do not allow me to estimate Protestantism's effect on absolute wellbeing of the poor. But using local population size as a rough proxy of economic growth, I find that absolute growth was unlikely to be large enough to compensate Protestant poor strata for their substantial relative losses, suggesting that the poor were worse off in both relative and absolute terms.

I provide several pieces of evidence for the plausibility of the hypothesised mechanism. First, within the poor strata of society it was the bottom decile, the poorest of the poor, that lost the largest share in Protestant areas. This finding is consistent with the notion that Protestant communities excluded people at the very margin of society from poor relief. Second, additional support comes from data collected on the introduction of so-called "church ordinances" in many newly Protestant communities. Among other welfare tasks,

these laws regulated poor relief in a particularistic manner. They legally excluded strangers from social welfare, but also restricted begging and introduced poor badges that stigmatised paupers in the labour market. These particularistic measures redistributed economic resources away from marginal poor people. Church ordinances are found, in fact, to explain a substantial part of the negative effect of the Reformation on poor strata, and the effect is particularly large in communities where the laws explicitly restricted poor peoples' opportunities for begging. Third, the Reformation also reduced poor relief by shutting down monasteries, which for centuries had performed universal redistribution to the poor for the Catholic Church. I show evidence of this effect by drawing on data on the closure of monasteries during the Reformation.

The paper contributes to several strands of literature. First, it improves our understanding of the deep historical causes and persistence of economic inequality and poverty. Recent research has revealed a striking empirical pattern: contrary to a conventional "Kuznetsian view" (see Kuznets, 1955), inequality in Europe did not start to grow only with the beginning of industrialisation in the eighteenth or nineteenth centuries, but increased almost constantly from the sixteenth century onwards. The high levels of inequality observed in the early twentieth century have to a large extent preindustrial roots (Piketty, 2020; Alfani, 2021). The leading explanations for this preindustrial rise in inequality have stressed the role of economic growth (van Zanden, 1995; Puga & Trefler, 2014),[6] warfare and the increasing fiscal capacity of emerging states (Alfani, 2021; Schaff, 2023), political structure (Galor et al., 2009; Schaff, 2024) and demographic expansion (Clark, 2007).[7] Instead, my results emphasise the role of ideological and institutional change (see also Piketty 2020; Alfani 2023), by documenting the impact on inequality of a major, but hitherto overlooked, policy change in the long run of history, namely the Reformation. My findings suggest that the emergence of a new, more particularistic public poor relief system, triggered by Protestantism, influenced redistribution, and consequently increased inequality. In doing so they also speak to a related historical literature that aims at reconstructing the long-term development of poverty. This literature documents growing poverty in several areas of early modern Europe, especially in sixteenth-century Germany (see Alfani, 2021a; Alfani et al., 2024). My findings indicate that the Reformation partially explains that pattern. Additionally, they connect to studies based on contemporary data showing that Protestants have lower preferences for redistribution and experience higher income inequality today (Guiso et al., 2003; Alesina & Giuliano, 2010; Basten & Betz, 2013). My results suggest that today's "Protestant inequality" may have had its historical origins in the sixteenth century and persisted until at least the nineteenth century.

Second, the paper contributes to the classical debate in the social sciences about the economic impact of the Reformation in the long run of history (see Becker and Woessmann, 2009; Cantoni, 2015; Cantoni et al., 2018; Kersting et al., 2020). Much emphasis has been put on how the Reformation led to an expansion of public goods provision, especially in terms of social welfare and poor relief (Lindert, 2004; van Bavel & Rijpma, 2016; Dittmar & Meisenzahl, 2020). This may on the face of things seem to imply more

[6] See Alfani (2021) for a critical view of the idea that economic growth was a relevant driver of growing preindustrial inequality.

[7] This literature is closely related to a larger literature on the drivers of change in inequality in history, and the long-term economic, social and political consequences of inequality (see Persson and Tabellini, 1994; Galor & Moav, 2004; Acemoglu et al., 2005; Piketty, 2014; Scheidel, 2017; Ager et al., 2021; Bartels et al., 2024).

redistribution to the poor and less inequality. Theoretically my paper shifts this focus, by taking into account a second dimension of redistributive policies (see Enke et al. 2023), namely that social welfare was distributed in a more particularistic way when publicly provided Protestant welfare substituted the welfare provision provided by the Catholic Church. My analysis recasts the Reformation as a historical case that exemplifies how a more generous welfare state can increase inequality by discriminating between deserving and undeserving poor, and between natives and strangers, thereby restricting the provision of social welfare to some individuals. The paper therefore speaks to contemporary debates about distributional consequences of anti-immigrant policies and work requirements attached to welfare provision (Alesina et al., 2023; Gray et al., 2023). Relatedly, previous scholarship has shown that an expansion of welfare provided by the state can crowd out welfare provided by religious institutions (Gruber and Hungermann, 2007). I show that such a substitution increased inequality in the context of the Reformation. Religions are often framed as providers of club goods, with inequality-reducing effects within the religious community (Iannaccone, 1992; Abramitzky, 2008; Iyer, 2016). I emphasise the inequality-promoting effects these religious clubs can have in the wider society. Additionally, I show that the closure of monasteries during the Reformation not only redistributed economic resources between the Church and rulers (Cohn, 1987; Cantoni et al., 2018), but also affected the distribution among individuals in an inegalitarian way. I do not criticise work that suggests that Protestantism had positive effects on the economy, for example through education, the provision of public goods or higher incentives to work (Becker & Woessmann, 2009; Spenkuch, 2017; Dittmar & Meisenzahl, 2020). Due to limitations of the main tax data, which register only relative wellbeing, I cannot look systematically at absolute wealth. However, a proxy of absolute wellbeing and the magnitude of poor strata's relative losses suggest that the Reformation probably left a substantial part of the poor population behind, making it worse off in relative and absolute terms, notwithstanding Protestantism's aggregate growth effects.

The next section presents the theoretical framework of the trade-off between generosity and particularistic provision of poor relief under Catholicism and Protestantism, and formulates a hypothesis about the implications of the Reformation for wealth distribution and inequality. Section 3 describes the data in detail. Section 4 presents the empirical strategies used to test the main hypothesis, reports the main results of the paper and discusses limitations. Section 5 attempts to disentangle some of the mechanisms at work, and Sect. 6 concludes.

2 Redistribution under Catholicism and Protestantism: historical evidence and theoretical framework

To structure my analysis of the implications of Protestantism for the distribution of wealth and inequality, I first provide historical evidence of the Reformation's implications for social welfare and the treatment of poor strata in society. Based on that evidence, I then model the Reformation as a shift in the trade-off between per capita redistribution and the social distance towards those people that were eligible to receive support: the Reformation led to an expansion of social welfare, including poor relief, to fellow Christian and community members (Lindert, 2004; Kahl, 2009; Dittmar & Meisenzahl, 2020), but it did so in a particularistic manner to community insiders comprising "deserving" poor and natives

only (see Enke et al. 2023).[8] This made the Reformation highly ambiguous in its implications for redistribution to the poor and inequality.

2.1 The Catholic economy of salvation

In the Catholic economy of salvation, the poor played a central role. They represented Jesus Christ and were glorified as "God's best friends", and the inheritors of the Kingdom of Heaven. Helping the poor was "good work", a moral duty that erased sinful behaviour on behalf of the donor. If at death accumulated good works outweighed sins, the good Christian was saved from purgatory and went to heaven (Bossy, 1985; Kahl, 2009: 270). This ideology created powerful incentives for Catholics and church organisations to make taking care of the poor a priority.

Poor relief practice reflected this appreciation of the poor. It was based on private almsgiving and poor relief by a variety of mostly uncoordinated ecclesiastical organisations, such as monasteries, hospitals (*Spital*), churches, and confraternities. Poor relief was among their principal tasks. It primarily involved cash money, goods such as clothing and food, and free hospital care. Before the Reformation, these forms of poor relief were provided in communities that remained Catholic, such as Cologne, as well as in those that became Protestant, like Nördlingen, Ulm or Augsburg (Isenmann, 2014: 565–575, 585).[9] The Catholic Church was an important redistributor in human history, and possibly the largest one in medieval Europe. It channelled money to its own elites,[10] but also to poor people: between one third and one fourth of church income went to support the poor (Kahl, 2009: 269–271). A poor person could make ends meet, through a combination of payments and offerings from several charitable organisations, private charity, occasional work, and begging. Catholic welfare provision was thus relatively inclusive, embracing a variety of needs indiscriminately and providing relief to the poor universally (Ackels, 1984: 100; Jütte, 1994: 138). The poor continued to have this elevated role in the Catholic worldview after the Reformation began; the Church was critical of what it saw as Protestant stigmatisation of the poor, and during the Counter-Reformation stuck expressly to its universal approach to charity (Jütte, 1994: 125–138; Kahl, 2009: 279–280).

Where the Reformation was introduced, the Catholic Church and its welfare provision literally disappeared. For example, the monasteries through which the Old Church had provided poor relief were simply closed. Confiscated assets were freed from the Catholic Church for secular use, but often went into the coffers of local rulers, for instance to build palaces or wage war (Cohn, 1987; Cantoni et al., 2018).[11] Monasteries and other

[8] For example, evidence from contemporary surveys suggest that communitarian respondents oppose federal welfare and redistributive programmes like universal health care. Universalists, instead, do not mind that federal redistribution is impersonal and is extended to socially distant people. Interestingly, religion has been found to be a key determinant of the degree to which a society tends to be more universal or particularistic in its welfare provision and redistribution (Enke et al., 2023).

[9] Note that poor relief was given to a wide range of occupational groups in the pre-Reformation period. There is evidence of support given to peasants, shepherds, artisans (like weavers, bakers, and carpenters), small retailers, and construction workers, in Catholic and what became Protestant communities (Fischer, 1982: 11–25).

[10] See for example Schilling (1994: 97).

[11] For instance, the Duke of Saxony closed almost all monasteries in his territory, through which he obtained the immense sum of about 150,000 florins (Cantoni et al. 2018: 2059).

ecclesiastical organisations could not fulfil their redistributive function any longer. Poor relief had to be replaced by an entirely new system in Protestant communities.

2.2 The Reformation: poor relief as a public responsibility and the expansion of social welfare

Where the Reformation was introduced, the Christian approach to poor relief changed dramatically. It involved a new trade-off between per capita redistribution and social distance to the recipient. Luther's and other reformers' reinterpretation of Christianity provided a new, coherent vision of how to deal with poverty, organisationally and ideologically. First of all, reformers now envisioned poor relief to be a secular task, performed by communities and their secular authorities instead of ecclesiastical organisations. This followed directly from Luther's "doctrine of the two kingdoms", which postulated the complete separation of the spiritual from the secular realm (Scribner & Dixon, 2003: 36). In 1521 Luther and Karlstadt formulated the first Protestant poor law for the city of Wittenberg, which was the legal basis for a new poor relief system. This first poor law subsequently served as a blueprint that was adopted throughout Protestant Germany when *secular* rulers decreed the introduction of new poor relief systems in the communities of their territories. The centrepiece of the new policy was to create, for the first time, a budget for welfare tasks in Protestant towns and villages, the so-called "poor chest" (*Armenkasten*), to give systematic support to the poor. Note that it was not just cities that provided public poor relief. Villages fulfilled that task in an analogous way and had "poor chests" too (Blickle 2015: 160). It was envisaged the chest would be financed with a mix of endowments of secularised church property, and voluntary contributions from the community. Luther himself was involved in setting up the new poor relief institutions, for example, in the small Saxon community of Leisnig in 1523. Such community-based poor relief systems remained in place until about the late eighteenth or early nineteenth centuries (Jütte, 1994: 106–109; 1996: 392; Kahl, 2009: 272). The introduction of the new welfare system was not a gradual separation between church and state, but outright a *substitution* of the Old Church by secular authorities (Blickle, 2015).[12]

Under this new system, poor relief became for the first time a public responsibility: it became society's duty to be systematic in taking care of fellow Christians, and the poor were entitled to receive a minimum standard of living from the chest. This usually included foodstuffs, fuel, clothing and other goods and services, and up to several florins of cash payment (see Jütte, 1994). It was also common for communities to give more generous alms (*reiche Almosen*) to certain poor groups that had a higher social status within the community.[13] In this sense, the new Protestant poor relief system was a generous expansion of social welfare (Lindert, 2004; Kahl, 2009; Dittmar & Meisenzahl, 2020).

Reformers' central motive for making social welfare a secular task was to reduce corruption. But providing generous targeted transfers to the members of the new religious

[12] See Gruber and Hungermann (2007) for how increased government spending on social welfare crowded out ecclesiastical charitable activity in America in the early twentieth century.

[13] For example, in the merchant-city of Nuremberg, impoverished merchants received more generous alms (Hartung, 1989: 170).

"club" also facilitated convincing the population of Protestantism, a potentially important concern for a new entrant in the hitherto monopolistic market for religious services.[14]

2.3 Particularistic provision of poor relief under Protestantism

Generously expanding social welfare was not the only novelty introduced by Luther and his fellow reformers. Protestantism also provided poor relief in a less universal way. It introduced two mechanisms that placed *part of* the poor population outside the club of "good Christians", excluding them from social welfare. The first mechanism was to exclude all people who were not legally part of the local community (i.e. non-residents, strangers), as it was now the community's responsibility to deliver poor relief. Poor people without citizenship were denied access to communal poor relief and were turned away (Ogilvie, 1997: 45–57; Battenberg, 1991: 51–55).[15] This exclusion was made legally quite explicit. For example, in the chest law introducing the new Protestant poor relief system in Leisnig in 1523—written under the guidance of Luther himself and enforced by secular community authorities—a whole chapter was dedicated to "Rejection of the Burden from Strangers" (my translation) (Sehling, 1902: 601). This particularistic approach meshed well with the material interests of communities. The exclusion of poor strangers from secular poor relief enabled communities to keep low the number of recipients burdening the communal budget (Ogilvie, 1997: 50–51).

The second mechanism by Protestantism used to exclude a sub-group from poor relief was by declaring them "undeserving" or "bad Christians", and therefore non-eligible for social welfare. In this sub-group were the non-working but able-bodied poor, such as those who could not find a job. Their poverty was "not a misfortune to be pitied and relieved, but a moral failing to be condemned" (Tawney, 1926: 230). Only poor individuals who were strictly unable to work, such as invalids, children or old people, were considered "deserving" of community relief under the new Protestant welfare system. "Who does not work shall not eat" was the guiding principle, so able-bodied "fake beggars" were excluded from communal help. Now poor people also had to pay for previously free hospital care (Jütte, 1996: 392; Kahl, 2009: 271; Isenmann, 2014: 575). This particularistic approach had strong support in the reformed Christian ideology. Luther wanted good Christians to work, thus making a contribution to the community that was pleasing to God; instead, idleness and begging were to be disdained.[16] That logic implied sympathy for the "deserving" poor, but placed the able-bodied non-working "undeserving" poor outside the local community of "good Christians". Reformers did not altogether invent discrimination against

[14] I am grateful to Luis Bosshart for this point. See Blickle (1981: 29–40) on reformers' critique of the Old Church's corrupt conduct, Iannaccone (1992), Abramitzky (2008) and Iyer (2016) on religious club goods, and Michalopoulos et al. (2016) on the redistributive transfers that Islam provided in order to establish itself and persist during its initial phase.

[15] Communities in preindustrial times were often hostile to outsiders in general, and did not allow them to participate politically, practice an occupation, or use other public goods. Becoming member was difficult, especially for poor people who did not fulfil the minimum wealth criterion (Ogilvie, 1997: 45–57).

[16] Religious reformers like Luther, Zwingli, Karlstadt Bugenhagen, Hyperius and Bucer differed on many points in their theology, but they were surprisingly united in their negative views on poverty (Jütte, 1996: 392).

certain categories of the poor, but they made it much more systematic, harsher and diffused it geographically.[17]

It is not possible to quantify systematically the number of poor people excluded from public relief in Protestant communities, but historians have long conjectured that their numbers were substantial (Hartung, 1989: 168). Scattered evidence comes from a few cases where community-level estimates of the share of poor relief recipients in relation to the total population are available (see Table 1). The evidence is patchy, making it impossible to adequately control for confounders,[18] but across four centuries after the beginning of the Reformation, the share of public poor relief recipients was lower in almost all Protestant cases compared to Catholic cases. The difference in the average share of recipients suggests a substantial divergence in how exclusionary the two confessions were.

2.4 Beyond poor relief: second order effects of Protestant particularism

The particularistic Protestant approach to poor relief came with a whole set of policies and implications that were particularistic in nature, or the direct consequences of the particularistic poor relief system, and which had similar distributive effects. One of these policies was the restriction and often outright prohibition of begging. Since communities took adequate care of "their" poor, the reasoning went, individuals still begging must have been "undeserving" outsiders. Moreover, it was assumed that beggars could just take up a job if they wanted; they simply needed a strong enough incentive to do so (Kahl, 2009: 274–278). Prohibiting begging was therefore not illogical. Yet, it closed an important income channel for many poor people, reducing their share of economic resources.[19]

Restrictions to begging went hand in hand with the elimination of incentives for donors to engage in private almsgiving. Protestantism denied private almsgiving its theological function of avoiding purgatory and declared it wasteful. Instead, better-off individuals were urged to donate only to the common chest, in order to redistribute money more "efficiently" to "deserving" community members (Jütte, 1996: 396–397; Scribner & Dixon, 2003: 58). In other words, there was a shift in norms about almsgiving that was associated with lower private charity, which closed an income channel for some poor people.

[17] Already some late medieval German and Italian communities were critical of professional and fraudulent begging, and distinguished between "useful" and "useless" citizens, the latter often being poor (Isenmann, 2014: 589; Alfani, 2021a: 25–26). After the beginning of the Reformation, Catholic communities sometimes developed *secular* poor relief institutions as well. But their provisions came on top of those of the Catholic Church, were not introduced everywhere, and they were less exclusionary than in Protestant places, leading to substantial differences in social welfare provision under the two confessions (Grell, 2002: 49; Kahl, 2009: 280).

[18] The most important omitted confounder is probably warfare. For example, Trier was exposed to conflicts during the Thirty Years' War, and Cologne during the French Revolutionary Wars. It is, however, hard to foresee in which direction a potential bias would go. Depending on the type of exposure, wars could lead to an increased demand for poor relief, but also to a cessation of welfare provision because of administrative breakdown, or to the selective death of poor strata because of plagues brought in by soldiers (Alfani et al., 2022; Schaff, 2023).

[19] Poor people who were not allowed to beg anymore due to Reformation-policies had in practice two options. To make a living, they could either steal or work, or do both. For some poor begging was only a means to increase their income from other sources, so they just worked or stole a bit more if they could. It is likely that many of those who had made a living from begging show up with zero wealth in the tax registers (see the discussion of the data below). But it is also likely that some former beggars literally fell below subsistence level, that is, died of hunger, and therefore disappeared from the tax registers (Isenmann, 2014: 589, 599, 732).

Table 1 Population Share of Recipients of Public Poor Relief

Community	Year	Confession	Recipients as % of Population
Trier	1591	Catholic	8.3%
Trier	1600	Catholic	34.6%
Trier	1625	Catholic	27.1%
Trier	1649	Catholic	16.9%
Solothurn (villages)	1768	Catholic	22.5%
Würzburg	1794	Catholic	4.3%
Cologne	1799	Catholic	8.2%
Cologne	1816	Catholic	38.0%
Average Share in Catholic Communities			20.0%
Nuremberg	1531	Protestant	1.2%
Ulm	1531	Protestant	2.8%
Frankenberg	1533-42	Protestant	4.2%
Frankfurt a.M	1539	Protestant	3.6%
Augsburg	1550	Protestant/Mixed	5.5%
Augsburg	1574	Protestant/Mixed	4.3%
Zürich (villages)	1590	Protestant	4.5%
Augsburg	1610	Protestant/Mixed	7.2%
Berlin	1665	Protestant	2.0%
Berlin	1799	Protestant	7.2%
Berlin	1860	Protestant	6.0%
Average Share in Protestant Communities			4.4%

Notes: Data on poor relief recipients for Cologne and Berlin from Fischer (1982: 58, 83) and Jütte (1994: 54), for Trier from Ackels (1984: 94), for Augsburg from Clasen (1984: 89) and Röck (1989: 169), for Nuremberg and Ulm from Hartung (1989: 168, 172), for Würzburg and Frankenberg from Jütte (1996: 388) and for the villages of Solothurn and Zürich, and Frankfurt a.M. from Jütte (1994: 54). For Solothurn and Zürich the data refer to the villages surrounding the towns. I include these Swiss localities in the table because Switzerland was still officially part of the Holy Roman Empire at the time of the Reformation

Ultimately, the particularistic Protestant approach implied a stigmatisation of poverty. In many Protestant communities poor relief recipients had to identify themselves wearing a poor badge, to differentiate between insider and outsider. This put poor people in the same social category of untrustworthy people like prostitutes or lepers (Jütte, 1994: 161–161; see Fig. 2). Stigma deriving from discriminatory symbolic policies can reduce the incentive to take advantage of available support, and it can prevent the poor from entering the labour market and improving their economic situation through work. This redistributes income and wealth away from the poor (Dewan & Wolton, 2022). For example, in Nuremberg and Augsburg the poor badges reportedly discredited the poor with potential employers, while no beggar emblem was necessary in Catholic Trier. It was enough that the priest attested one's need to receive poor relief (Hartung, 1989: 169, 171, 174; Ackels, 1984: 80), thus avoiding discrediting stigmatisation, giving the poor a better chance in the labour market and channelling a larger share of income and wealth to them.

Fig. 2 Poor Badge from Sixteenth-Century Nuremberg. Notes: Poor badge from sixteenth-century Nuremberg in the Germanic National Museum Nuremberg. See Endres (1993)

2.5 Theoretical framework

In Fig. 3 I develop a simple theoretical framework that summarises the historical evidence. I follow loosely the arguments made by Dittmar and Meisenzahl (2020) on welfare expansion due to the Reformation, and by Enke et al. (2023) on the universalism-particularism dimension of redistributive policies. The framework refers to all poor or needy people living in a community, but not all inhabitants had membership, that is, citizenship. The redistributive impact and thus inequality, either under Catholicism or Protestantism, was the result of a trade-off: between first, the generosity of redistribution (y-axis); and second, the social distance between the providers of poor relief (the Church under Catholicism, secular communities under Protestantism) and those needy people that were eligible to receive support, that is, the universalism-particularism dimension (x-axis). Under the assumption that more socially distant people were also poorer, then the more the correlation between these two factors tends towards zero, or even a positive value, the more economic resources are redistributed towards poor people. The result is a higher share of economic resources in the hands of poor people, and lower inequality. Conversely, the more negative the correlation is, the lower is the redistribution to needy people, lowering their share of economic resources and increasing inequality. It is important to recognise that this trade-off refers to the entire poor relief system, coming with one or the other confession, including the provisions from ecclesiastical and secular authorities.

Catholicism provided a medium amount of per capita redistribution through poor relief. Yet it did so in a universal manner, as indicated by the flat slope of the red line: poor people from in- or outside the local Christian community received support. The boundary of the Catholic community was relatively wide and not limited to local community insiders. The total amount of redistribution, indicated by the red and purple areas, was distributed over a large group of needy people.

The advent of the Reformation shifted this trade-off in newly Protestant communities, as indicated by the declining blue line. Per capita redistribution through poor relief may have been more generous for some people under Protestantism than under Catholicism and, as

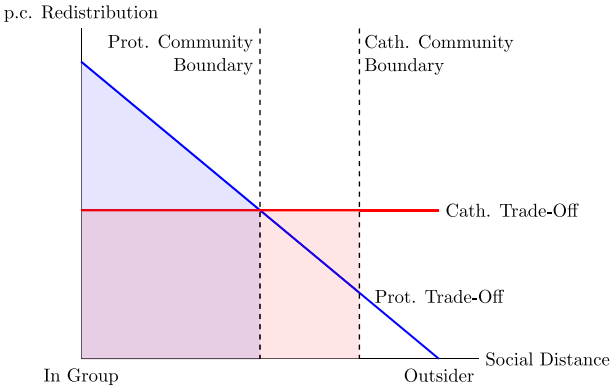

Fig. 3 Framework: Redistribution under Catholicism and Protestantism. Notes: In this framework the redistributive impact and thus inequality, either under Catholicism or Protestantism, was the result of a trade-off: between the generosity of redistribution (y-axis) and the social distance between the providers of poor relief and those needy people eligible to receive support, that is, the universalism-particularism dimension (x-axis)

mentioned, even particularly generous for community members with higher social status.[20] But redistribution was provided in a particularistic manner, as represented by the tighter Protestant community boundary: only members of the local Christian community, to whom the social distance was short, received support. Outsiders, such as strangers or those able-bodied non-working poor who were considered religiously "undeserving bad Christians" did not receive poor relief. This does not mean that outsiders were non-Christians. Outsiders were most likely Christians too, even Protestant. They were just not considered good enough Christians to deserve support, perhaps because they did not work or had immigrated. The total amount of redistribution under Protestantism, indicated by the blue and purple areas, was thus more concentrated compared to Catholicism. It left out a fairly large portion of the poor population.

It is important to recognise that this redistributive effect was not just the result of poor relief in the narrow sense. We must remember, Protestantism also restricted begging, disincentivised private almsgiving and stigmatised poor people, making it harder for them to enter the labour market. All these factors were part of, or were implications of, the particularistic Protestant poor relief system and had analogous distributive implications.

Note that the framework is not making a strong claim about the total amount of resources employed for poor relief either under Protestantism or Catholicism. We lack systematic information about the details of local welfare budgets for the time that could credibly support one or the other claim. In other words, we do not know the size of the areas under the coloured lines. I therefore assume that the total amount of redistribution was approximately equal under both systems. But even if Protestantism redistributed a larger amount of resources, making poor strata richer in *absolute* terms compared to Catholicism, the particularistic character of this redistribution would still reduce poor peoples' *relative* share, thus increasing inequality.[21]

[20] In reality, the Protestant line likely consisted of several downward steps, but for clarity I represent it as linearly declining.

[21] If anything, it would be more reasonable to assume that the total amount of redistribution was higher under Catholicism. First, because the Catholic Church redistributed between one third and one fourth of its income to the poor (Kahl, 2009: 269–271), while the assets that generated this income were usually confiscated by local rulers in Protestant territories, and employed to build palaces or wage war instead (Cantoni et al., 2018). Second, in the conception of reformers, the lack of income-generating assets to finance poor relief was supposed to be compensated with private charity. But the little available evidence suggests that the propensity to engage in private charity in Protestant communities was low. For example, the chest keeper in Protestant Nuremberg received private donations of only about 10–17 florins per month in the six-

2.6 Hypothesis: implications of the Reformation for the distribution of economic resources and inequality

Broadly speaking, economic inequality can increase in two ways: from the top of the income or wealth distribution (i.e. the rich get richer), or from the bottom (i.e. the poor get poorer).[22] I hypothesise that the Reformation increased inequality specifically by reshuffling the bottom end of the income and wealth distribution, making some poor even poorer relative to the rest of society. It did so by shifting the trade-off between generosity of redistribution and the universalism-particularism dimension of who is eligible to receive social welfare. Protestantism reduced the supply of poor relief to the excluded groups, and the transfers from better-off to poor strata. The new low-redistribution policy came with a whole set of policies and practices that were also particularistic in nature and left the bottom of the poor behind in Protestant society. The inequality data employed in the empirical analysis come from property taxes,[23] which implies that any income above subsistence is covered. Given these data, I would expect to observe a reduction in the wealth shares of poor strata, particularly among the poorest of the poor in Protestant communities. This reshaping of the bottom end of the wealth distribution increased the overall gap between the poor and the rest of the population, thus increasing inequality. In contrast, if the inequality effect of the Reformation were driven by factors like economic growth, capital accumulation or higher upper-tail human capital—factors that tend to increase inequality from the top of the distribution[24]—I would expect to observe an increase in the wealth shares of top and middling strata.

3 Data

Figure 4 provides an overview of the 18 Catholic and 25 (what became) Protestant communities included in the analysis, and the major Protestant areas in the mid-sixteenth century. As can be seen by examining the geographical distribution of communities, there was a concentration of Protestant places closer to the town of Wittenberg in the North-east and centre of Germany, while Catholic communities tended to lie in the south. There were Catholic communities in the North and North-west, such as Cologne or Münster, but they are less frequent, and this dataset includes no Catholic communities North of Königshofen. I will show that the clustering of some of the communities does not drive the results (see the Appendix for results that take concerns about spatial dependence into account).

Footnote 21 (continued)
teenth century. This was a very small amount for such a large and rich merchant city (Hartung, 1989: 170), and taking into account that social historians usually consider a single household as poor if it had less than 100 florins of total property (Fischer, 1982: 17).

[22] See Piketty (2014), Alfani (2023), Schaff (2024) and Alfani et al. (2024).

[23] The tax base usually included real estate, crops, animals, cash money, loans, household goods and other property. Property is a stock, but it also gives information about income flows in so far as not all income has been used for subsistence.

[24] See Kuznets (1955), van Zanden (1995) and Puga and Trefler (2014).

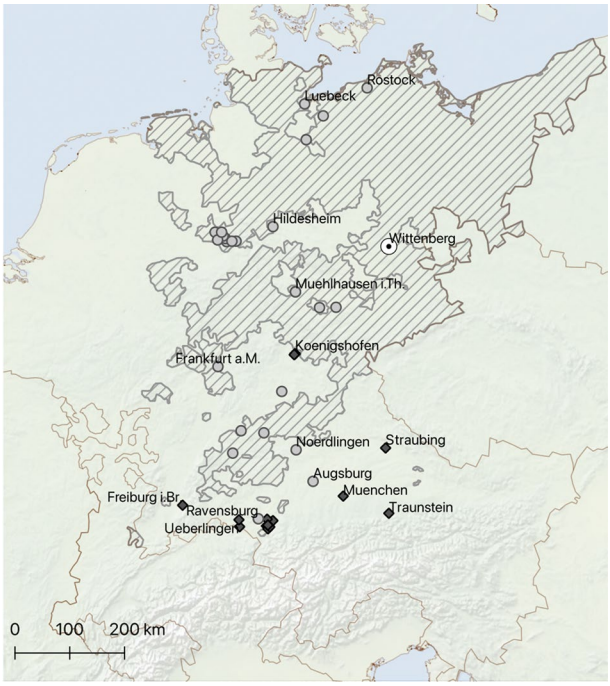

Fig. 4 Protestant and Catholic Communities in the German Inequality Dataset, c. 1400–1800. Notes: Dots (light grey) correspond to Protestant communities and squares (dark grey) to Catholic communities, by 1600. Wittenberg is not part of the dataset. Borders of the Holy Roman Empire around 1545 and Protestant areas within the Empire (shaded in grey; Catholic areas unshaded) around 1559 from Alfani et al. (2022). Selected cities labelled. Not all communities are visible because of visual overlap on the map, and not all, sometimes tiny, Protestant areas are visible because of the scale of the map

I have constructed data on wealth distribution and inequality at the community-year level in steps of 25 years between 1400 and 1800.[25] The estimates are based on information from local property tax registers that list all tax-paying households (citizens and non-citizens) in a community in a given year, and every household's property tax payment, expressed in a local currency. These tax payments have been used to construct 368 community-year wealth distributions, each corresponding to one observation in the analysis. In total, the distributions are based on information about more than 380,000 households.[26] The information comes from archival tax documents as well as secondary sources where the data for every community-year has usually been reported in the form of summary tables divided into detailed wealth brackets.[27] The Appendix provides a comprehensive discussion of the dataset and how it has been constructed from the original sources. Different

[25] The dataset is a substantially extended version of the one built by Alfani et al. (2022). It also differs from Schaff (2023) in that the main outcome variable—the wealth share of the bottom 20 percent—has been newly constructed, but also other outcomes such as the top 1 percent, the middling 40 percent and the top 90 percent wealth shares.

[26] Unfortunately, it is not possible to use the household-level data to construct a large individual-level panel. The main problem is that we cannot convert wealth estimates across time and communities into a common currency. The lack of convertibility is a consequence of: first, preindustrial Germany's political fragmentation led to a plethora of local currencies; second, payments in the tax registers were often recorded in an account currency. These account currencies did not exist physically. They were just a unit of account and so we cannot usually determine their precious metal content to calculate the real value. Even the most comprehensive accounts of currencies and conversion rates do not even come close to making it possible to compare wealth estimates across communities and time (Alfani et al., 2022) This is not a problem for calculating the distribution of wealth, but it makes a comparison of wealth levels impossible.

[27] See for example Hartung (1898: 188–189).

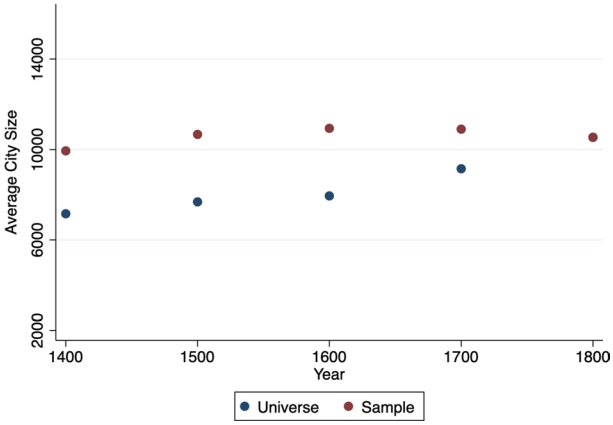

Fig. 5 Population in German towns in "Bairoch dataset": Sample vs. Universe, c. 1400–1800. Notes: Century-averages of the population in towns in an extended version of the "Bairoch-dataset" over the period of analysis (see Alfani et al., 2024). The "Universe" is all towns included in the extended Bairoch-dataset. The "Sample" includes only those towns that are included in my dataset. For details of the calculations see the Appendix

measures of economic inequality have been calculated from the distributions: the wealth percentiles of upper, middle and lower segments of the population and Gini coefficients. For the 43 rural and urban communities within the borders of the inner part of the Holy Roman Empire that are covered, at least one observation before and one after the beginning of the Reformation are available, resulting in an unbalanced panel. The selection of a community into the dataset primarily depended on whether or not the relevant archival documents stood the test of time since their creation and are still available today. The discussion of the two research designs below will explain to what extent my difference-in-differences and instrumental-variable approaches can account for selection bias.

Unfortunately, for the pre-census age there exist only very few statistics of the universe of German towns to which I could compare my sample; to the best of my best knowledge there are none for the universe of villages. Figure 5 compares the average population size of the urban part of my sample to all cities and towns included in an upgraded version of the "Bairoch-dataset" (see Alfani et al. 2024). The towns in my dataset are slightly larger on average, but this difference gradually disappears towards 1800. Moreover, the share of Protestant communities in my dataset (58.1 percent) is only slightly below the average recorded in the *Deutsches Städtebuch* (68.4 percent). To address potential concerns about the small sample size causing uncertainty of statistical inference, the Appendix reports p-values and confidence intervals obtained with Wild Cluster Bootstrapping.

Tax registers from preindustrial times give a fairly accurate picture of the distribution of property among households in communities, subject to some limitations discussed below. The tax base was the totality of mobile and immobile assets, such as real estate, crops, animals, cash money, loans, household goods and other property. The variety of taxed items ensure that all social classes are represented in the registers. Since premodern tax systems did not systematically distinguish between wealth and income, but simply aimed at capturing the overall economic capacity of a taxpayer, elements of income (above subsistence) were effectively also taxed. Yet real estate was the most important asset class everywhere. Premodern tax systems did not distinguish between personal and business wealth, and subsumed all assets at the household-level. The use of these tax sources to study the distribution of wealth over the long run and in comparative perspective is an established tradition in German historiography. Analogous sources have been used in studies of other regions in

preindustrial Europe.[28] The panel-regression setup makes it possible to limit the analysis to within-community variation, and account as well as possible for the possibility that differences in taxation practices between localities could systematically influence the measured wealth distribution.

The data mostly refer to the distribution of wealth (or capitalised income from wealth). Studying the distribution of wealth is interesting in itself, even in the industrial period.[29] Yet wealth distribution is also the best, and usually the only proxy for trends in income distribution in preindustrial, predominantly agricultural economies, like Germany, where income derived mainly from land (Alfani, 2021). The use of wealth data implies that interventions affecting income specifically, such as taxation or redistribution through poor relief, likely took time until they affected the wealth distribution significantly. The wealth distributions have the potential to produce a bias towards the middle; some privileged individuals could obtain tax exemptions, in a way not dissimilar to today. These were, for example, clergymen, officials or members of the nobility, if they resided in urban or rural communities. It is not possible to measure the prevalence of these groups systematically. In a pre-census age, one can only approximate the groups' size. Between 0.5 and 1.5 percent of the population were part of the nobility or clergy in preindustrial Germany (Saalfeld, 1980: 480). It is likely that most tax-exempt households belonged to these groups. But not all noblemen or clergymen were exempt; for instance, lower-level clerics were usually included in the tax registers. Moreover, almost all observations in the dataset include propertyless households (see the Appendix for further discussion).

These minor possible omissions could lead to an underestimation of wealth inequality. However, the potential omission of small groups should not conceal that practically the entirety of civilian households, and therefore the economically most interesting categories like craftsmen, peasants, and merchants, is covered by the wealth distributions. Note that German tax registers have been found to cover poor households very well (Alfani et al., 2022). Potentially missing parts of the distribution are likely to bias my estimates of the impact of the Reformation downwards. The Appendix shows that the *potential* exclusion of parts of the poor from the wealth distributions does not change the trend of poor peoples' wealth shares, which is reassuring given that my regressions include unit- and time-fixed effects.

A potential concern could be the presence of "hidden wealth", perhaps differentially among confessional groups. Authorities implemented several measures to fight tax evasion, such as obliging individuals to swear an oath on the correctness of their tax payment, checks of tax estimates and payments, and severe penalties for evaders, such as confiscation of one's property and public announcement of evaders' names. These measures were likely imperfect, again very similar to today, but it is reasonable to assume that they increased an individual's cost of evading taxes substantially (Isenmann, 2014: 539–541). To the best of my knowledge, there exists no study providing evidence of differentially hidden wealth among confessional groups, and a potential bias would most likely work against the result I find.[30]

[28] See for example van Zanden (1995), Alfani (2021), Alfani et al. (2022).

[29] See for example Piketty (2014).

[30] If anything, one might conjecture that top wealth holders in Catholic communities were more inclined to hide wealth, because richness was morally sanctioned by the Old Church, while it was implicitly encouraged by Protestantism (Weber, 1930). This could bias estimates of wealth concentration in Catholic communities negatively. However, the results reported below provide no evidence that Catholics had significantly lower wealth concentration.

One might also be concerned about Protestants applying different taxation principles, thus influencing the recorded distribution of wealth. For instance, Cantoni et al. (2018) suggest that Protestant communities might have had higher bureaucratic capacity. This could influence my inequality estimates if, for example, poor strata were recorded more thoroughly. To address this concern, in the Appendix I check whether there are any discontinuities in the number of taxpayers during the early phase of the Reformation. If local bureaucracies in Protestant communities recorded poor people more rigorously, one would expect a higher number of taxpayers in these places. I find, however, an insignificant and slightly *lower* number of taxpayers in Protestant communities. This test does not entirely rule out the possibility that Protestant bureaucracies recorded specifically poor people more thoroughly, but it makes it unlikely. The reason for the absence of any significant discontinuities is most likely that taxation in the localities of the Holy Roman Empire had a common legal basis, which contained the possibility of local variations. Again, no study demonstrating different taxation record keeping among confessional groups in Germany exists, to the best of my knowledge. In the Appendix I provide examples of archival tax registers from Catholic and Protestant communities, which visually exhibit a high degree of homogeneity.

Information about the Reformation being introduced in a community has been obtained from standard secondary sources, mainly from the *Deutsches Städtebuch* and the *Historisches Lexikon der deutschen Länder*.[31] Few communities in the dataset reverted to Catholicism after introducing the Reformation. I have coded those few communities depending on whether the Reformation was partially or completely reversed.[32] I will show that the results do not depend on these switching cases.

What were the characteristics of those communities that eventually became Protestant? As shown in Table 2, there were some differences (estimated with bivariate regressions) between them and Catholic communities in the pre-Reformation period. Column 1 shows by how much places that became Protestant after 1517 differed from the mean values of all communities (Column 3). Column 2 shows the standard errors. All differences, in terms of wealth percentiles (bottom 50 percent, bottom 20 percent, middling 40 percent, top 10 percent), overall inequality (Gini coefficient), economic and demographic characteristics (population size, occurrence of epidemics) and time-invariant community characteristics (city-status, soil quality) were not statistically significant in my sample. The only significant differences are geographic. Protestant communities were more likely to be in the North, and closer to the Reformation's starting point of Wittenberg, a fact that I will exploit in the instrumental variable analysis (see also Fig. 4). However, in the robustness checks I will show that neither Northern communities, nor the changing composition of the unbalanced panel drive the impact on inequality.

How much property the poor actually owned is an important question. Table 2 indicates that the bottom fifth of the population owned on average 2.18 percent of total wealth in my sample before the Reformation. But how much is this really worth? We do not have information about poor peoples' wealth at the macro-level at the time, but we can combine

[31] See Cantoni (2012, 2015) and Dittmar and Meisenzahl (2020) for a similar approach; see the Appendix for details about the coding of variables.

[32] To exemplify my coding approach, consider the cases of Augsburg and Konstanz. In Augsburg Catholicism co-existed with Protestantism after the Schmalkaldic War (1546-48), but Reformation legislation was not genuinely taken back. Konstanz, instead, was entirely re-catholicised and Reformation legislation was reversed. Consequently, Augsburg was coded as Protestant and Konstanz as Catholic.

Table 2 Community Characteristics before the Reformation in Germany

	(1) β Protestant	(2) SE	(3) Mean
Bottom 50% Wealth Share pre Reformation	−0.91	(1.84)	12.55
Bottom 20% Wealth Share pre Reformation	0.37	(0.48)	2.18
Middling 40% Wealth Share pre Reformation	−0.11	(2.33)	21.76
Top 10% Wealth Share pre Reformation	−3.24	(3.78)	45.92
Gini Coefficient pre Reformation	−0.01	(0.04)	0.59
Population Size (Log) pre Reformation	0.31	(0.36)	7.51
Occurrence of Epidemics pre Reformation	−0.07	(0.10)	0.38
Urban Community	−0.07	(0.11)	0.61
Soil Quality	0.00	(0.03)	0.72
Longitude	−0.38	(0.25)	10.04
Latitude	3.20***	(0.34)	49.50
Distance to Wittenberg	−185.74***	(18.86)	346.45

Notes: Column 1 shows the estimates on an indicator for a community being Protestant before the Reformation began in bivariate regressions. Column 2 displays standard errors in parentheses. Column 3 provides the mean of the dependent variable in the whole sample. The sample size for the pre-Reformation period is 99 observations. ***$p<0.01$, **$p<0.05$, *$p<0.1$

information about taxable wealth, the number of households, local currencies and real wages in an individual community to get a rough estimate. For instance, in Augsburg, just before the onset of the Reformation, 2.18 percent of total wealth would have implied that a household in the poorest fifth of the population owned property corresponding approximately to 17.14 daily wages of an unskilled worker (see the Appendix for details of the calculation).

One might also wonder what this property was composed of, and who the poor actually were. These questions are even harder to answer systematically, if not impossible, because tax registers do not usually record the different types of household property, but indicate only a total sum. Information about occupation and other individual characteristics, too, were rarely recorded systematically. The available evidence suggests, however, that poor people owned a variety of assets. For example, they typically possessed household goods, such as textiles and furniture, agricultural produce, such as foodstuffs, small sums of cash, and sometimes small amounts of savings and real estate. Their individual characteristics were diverse too. Among the poor, we find small peasants, shepherds, craftsmen (for example, bakers, shoemakers, carpenters or weavers), small retailers, journeymen, day labourers, construction workers, apprentices, servants, and also the so-called “dishonest occupations", such as hangmen. Many poor people were also just old, sick, or female, especially after their breadwinning husband had died (Jütte, 1994: 71-72).

4 Empirical analysis

4.1 Econometric methodology

In order to identify the effect of the Protestant Reformation on economic inequality, I employ the difference-in-differences (henceforth DD) setup in Eq. 1:

$$I_{i,t} = \alpha_i + \pi_t + \theta Prot_i \times PostReform_t + \boldsymbol{\gamma'} \boldsymbol{X_{i,t}} + \epsilon_{i,t} \quad (1)$$

$I_{i,t}$ is some measure of wealth inequality in locality i in year t (t = 1400, 1425,... until 1800).[33] I am mostly interested in wealth percentiles of poor strata, but also consider other inequality measures, such as the Gini coefficient. The DD estimate is given by the interaction of post-treatment indicator ($PostReform_t$) and treatment status ($Prot_i$), a standard approach in the literature.[34] The post-indicator is coded as "one" after 1517.[35] The reason for this coding is that, although there was variation in the official legal adoption of the Reformation (see the Appendix for the historical background), many communities *de facto* implemented reformist ideas before the legal introduction. They did so, for example, through the substitution of the Catholic priest with a Protestant preacher. In other words, the legal introduction might not give an accurate picture of when a community started to live as Protestant. It therefore seems prudent to place the beginning of treatment when the Reformation movement began and Lutheran ideas started to spread throughout Germany. In the Appendix I repeat the baseline specification using the official legal introduction date, which leads to almost identical results. I assigned communities treatment status based on whether they had become Protestant by 1600.[36] While the year 1600 is arguably arbitrary, it is historically a reasonable choice. The Peace of Augsburg in 1555 established the right of authorities to convert to Protestantism and to impose the new religion on their subjects for the first time. Several polities did officially introduce the Reformation in the following years, but it is sensible to assume that the conversion process did not reach a steady state until about 1600. This coding, too, is a standard approach in the published literature, and alternative coding of the treatment variable does not alter the results (see Appendix). Theta (θ) is the main coefficient of interest, providing an estimate of how the introduction of the Reformation affected economic inequality.

In order to address concerns about endogeneity, I use several strategies to account for potential omitted variable bias and reverse causality. The modelling approach controls for unobserved factors that might confound the relationship between the dependent and the independent variable of interest. Locality fixed effects (α_i) account for characteristics that are time-invariant and locality-specific, such as local geographic or regional factors. They further account for certain constitutional characteristics, for instance, whether a locality was a city, which might have had higher inequality but might also have been more likely to adopt the Reformation, was it a member of the Hanse, or did it belong to a bishopric. Time

[33] Inequality measures have been clustered around their closest reference year.

[34] My coding follows common practice in the published literature on the Reformation. See Rubin (2014); Cantoni (2015), Cantoni et al. (2018), Spenkuch (2017), Becker and Pascali (2019) and Dittmar and Meisenzahl (2020). The treatment indicator does not differentiate between various forms of Protestantism, for two reasons: first, differences existed between the branches of the reformed faith and within them. However, taken together the different Protestant confessions as inspired by Martin Luther, Huldrich Zwingli, Johannes Calvin and others were more similar to each other than to the theology and religious practices of the Old Church (see Blickle, 2015: 71–74). Second, Lutheranism, by far the most dominant branch of Protestantism in Germany, is the only reformed faith in the dataset. It was probably less "Weberian" than Calvinism.

[35] This coding implies that treatment is not staggered, so recent critiques of DD research designs with staggered treatment are not a major issue (see for example Goodman-Bacon, 2021).

[36] Another historically sensible cut-off year would be 1624, the reference date established by the Peace of Westphalia. Only few territories changed their religious denomination between 1600 and 1624, and none of the communities in the dataset did so.

fixed effects (π_t) account for shocks that might have had an impact on inequality in all localities, such as macroeconomic trends.

To further mitigate the possibility of the main variable of interest being correlated with the error term, I account for several locality-level *time-variant* observable demographic, economic and institutional characteristics included in vector $\boldsymbol{X_{i,t}}$. These controls are included in most but not all specifications, since they could be "bad controls". I include the population size of a locality because demographic expansion could have played a role in determining the preindustrial wealth distribution (Clark, 2007). As population size is a sensible marker of productivity growth, it is also a frequently used rough proxy for economic development, a potential driver of inequality (Kuznets, 1955; van Zanden, 1995: 649, 656–658; Deaton, 2015: 1–5). But growth could also have driven the introduction of the Reformation: in more entrepreneurial environments, with vibrant markets, rich merchants and high overall prosperity, Protestantism was particularly appealing because it had a less hostile view of profit-seeking (Ekelund et al., 2002). I also include the local occurrence of epidemics, which could have impacted inequality but also the probability of the adoption of the Reformation (Alfani et al., 2022; Dittmar & Meisenzahl, 2020). One might be concerned that wars, in particular the German Peasants' War (1524-25), could have been an alternative treatment impacting Protestant and Catholic communities differentially. This war happened a few years after the Reformation began and might have impoverished peasants in the affected areas, thus influencing inequality. To account for such a possibility, I control for the occurrence of battle action nearby. Last, I include a variable indicating the distance of a community to its nearest university. Universities might have had an impact on inequality (van Zanden, 1995: 658–661), but their role in the distribution of ideas and provision of trained theologians could have influenced the introduction of reformist ideas as well (Kim & Pfaff, 2012). The Appendix provides further details about the coding of variables, and I test the robustness of my results to the inclusion of several time-invariant controls interacted with time-dummies. I consider variables that could have had an impact on inequality and Reformation adoption: agricultural potential, seaside location, whether a locality was an urban community, an Imperial city, a Hanse city or belonged to a bishopric.

Unobserved factors are captured with the random error term $\epsilon_{i,t}$. The standard errors are robust and clustered at the locality level to account for the possibility of serial correlation in the error term. The Appendix reports the baseline results with spatial autocorrelation-adjusted standard errors, and Morans' I test for spatial dependence. They indicate that spatial dependence is a negligible issue for this study. I also report results with standard errors clustered at the territorial level, which does not change the results substantially either.

4.2 Difference-in-differences estimates

4.2.1 Motivation

If Protestantism and inequality were both caused by the same unobserved factor, then selection bias would plague the regression coefficients. This leads to an important question: how did the Reformation come about? Some historians argue that the Reformation was above all a response to widespread dissatisfaction with theological and other matters related to the Church at the time. People were frustrated about the growing contradictions between the preached ideals and lived reality of clerics, corruption, and the sale of indulgences. This, it is claimed, fuelled anti-clericalism, and the Reformation picked up that sentiment (Blickle, 2015: 29–40). But for the overwhelming majority of people the decision to adopt

the Reformation was actually taken by their territorial lords, namely the competence conferred on them by the Peace of Augsburg of 1555. The religious confession was practically *imposed* on the population living in the communities of the sixteenth century, not to speak of the generations born into a confessionally settled environment in later centuries. Only about 10 percent of the population in sixteenth-century Germany ever showed an active interest in the ideas of the Reformation, but up to about 80 percent of the population was Protestant during that time. The difference must be attributable to the confessional choices of magistrates and princes (Scribner & Dixon, 2003: 34).

There exists also a rich literature in the social sciences on the causes of the Reformation, especially asking why rulers decided to introduce Protestantism, and an obvious concern when studying its socio-economic effects is the potentially endogenous choice of religious confession by political elites. For example, Ekelund et al. (2002) discuss the possibility that factors potentially driving inequality, such as trade and growth, were also related to the adoption of the Reformation, although they explicitly aim to explain the diffusion of the Reformation at the country- and not the community-level. Other potential causes were the diffusion of printing, ideological influence by spatial diffusion or political risk (Rubin, 2014; Becker et al., 2020; Cantoni, 2012).[37]

It is possible that some of these factors also influenced local economic outcomes and inequality. The main motivation for the DD analysis derives, therefore, from Fig. 1, which plots the raw data. It shows a divergence in the wealth shares of poor strata in newly Protestant places, but similar trends over two pre-Reformation periods compared to Catholic communities.[38] More data for the pre-Reformation period would clearly be desirable to document common trends, but are unfortunately not available. Yet, Table 2 shows that there were no statistically significant differences in my sample between Protestant and Catholic communities before the Reformation, in terms of poor peoples' wealth shares, overall inequality and several other covariates. Moreover, flexible DD estimates will provide further evidence for the existence of common trends before the advent of Protestantism, making it unlikely that treatment and outcomes were both driven by unobservables and suggesting that differences in outcomes are indeed attributable to the Reformation. I will also show that the main results are confirmed using an instrumental variable strategy, which exploits exogenous variation in treatment allocation and accounts for the possibility that the Reformation was adopted, for example, because of local economic factors.

4.2.2 Baseline results

Following the theoretical framework (Sect. 2) one would expect to observe a reduction in the wealth shares of poor strata in Protestant communities, particularly among the poorest of the poor. Table 3 reports DD results for the effect of the Reformation on the distribution of wealth in communities. The coefficients represent the average post-treatment difference in wealth shares or inequality. To evaluate the hypothesis derived from the theoretical framework, I consider a broad definition of the poor, that is, the wealth shares of the bottom 50 percent, but also narrower definitions: the wealth shares of the bottom 20 percent and of the bottom 10 percent.[39] The effect on the bottom 50 percent is insignificant

[37] For a review, see Becker et al. (2016).

[38] For a similar approach to identification, see for example Cantoni (2015), Cantoni et al. (2018), Becker and Pascali (2019), Dittmar and Meisenzahl (2020).

[39] On the named measures, see Dollar and Kraay (2002) and Piketty (2020).

Table 3 Difference-in-Differences Estimates: Wealth Share Changes of Poor Strata in Protestant Communities, Germany, c. 1400–1800

	(1) Bot. 50%	(2) Bot. 20%	(3) Bot. 10%	(4) Bot. 50%	(5) Bot. 20%	(6) Bot. 10%	(7) 2. Decile	(8) Gini	(9) Bot. 10%/Top 90%
Protestant×Post-Reform	−1.094	−1.004**	−0.431***	−1.330	−1.023***	−0.428***	−0.595**	0.031	−0.004***
	(1.369)	(0.383)	(0.144)	(1.292)	(0.360)	(0.137)	(0.247)	(0.023)	(0.001)
Controls	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Locality and Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	368	368	368	368	368	368	368	368	368
Communities	43	43	43	43	43	43	43	43	43
Mean dep. var	12.55	2.181	0.676	12.55	2.181	0.676	1.505	0.589	0.00688
R^2	0.255	0.165	0.147	0.306	0.228	0.235	0.194	0.318	0.235

Notes: Estimation method is OLS. Standard errors clustered at locality level in parentheses. ***$p<0.01$, **$p<0.05$, *$p<0.1$

(Column 1), but the other two estimates are negative and highly significant (Columns 2 and 3). They are also economically sizeable considering that lower deciles of the population owned minuscule shares of overall wealth: the bottom 20 percent in Protestant communities lost about one wealth share percentage point, which corresponds to 39.4 percent of their pre-treatment wealth share of about 2.55 percentage points (see Table 2). This suggests that the Reformation had a sizeable impact on inequality measured as the wealth percentiles of lower classes. It did not have a significant impact on the bottom half but specifically made people in the poorest fifth of society relatively poorer.

Columns 4–9 introduce all demographic, economic, and institutional time-variant controls, to make the comparison between Protestant and Catholic communities as close to *ceteris paribus* as possible. The results do not change. The controls contain a proxy for economic development, a community's population size, implying that the *relative* losses of poor strata hold even if changes in *absolute* prosperity are accounted for. Of course, the population size is an imperfect proxy of development, and controlling for it does not imply that growth was constant. In the Appendix I test the robustness of my results to the inclusion of several time-invariant controls interacted with time-dummies, which does not change the main result either.

The results also hold for the second decile of the distribution (Column 7). Comparing Columns 6 and 7, the coefficients indicate that the bottom 10 percent (first decile of the distribution), the poorest of the poor, lost the largest share among the poor: 44.0 percent, compared to the 37.8 percent loss of the second decile (see summary statistics in the Appendix). This is indicative of Protestantism hurting economically the people at the margins of society most severely, as the theoretical framework predicts. I also consider indicators of wealth inequality in the whole population. The Gini coefficient (Column 8) points towards an inequality increase, but it is not significantly different from zero. This does not mean that there were no changes in overall inequality in Protestant communities. It only means that the Gini coefficient does not capture the changes, possibly because the indicator is more sensitive to changes in the middle of a distribution rather than at its extremes. The share of the bottom 10 percent in relation to the rest of the population (Column 9), another indicator of wealth inequality, suggests a highly statistically significant increase in overall inequality.

One might wonder whether the wealth share reductions of poor strata are simply the mechanical consequence of a higher wealth concentration at the top or in the middle of the wealth distribution, which would be plausible if inequality were driven by things like economic growth, capital accumulation or higher upper-tail human capital.[40] To address this concern, I estimate the Reformation's effect on top and middling wealth shares in Table 4. The coefficient in Column 1 corresponds to 6.8 percent of the top 10 percent wealth share, and the coefficient in Column 2 to 1.1 percent of the top 1 percent wealth share, in the pre-treatment period in what were to become Protestant communities (see summary statistics in the Appendix for pre-treatment wealth shares). None of the estimates are significantly different from zero, and the magnitudes are small compared to the losses of poor strata. In other words, these estimates provide no evidence for significant wealth concentration in the upper strata of society in Protestant communities.[41] To check whether the Reformation had any impact on the wealth shares of the "middle class", Column 3 reports the

[40] See Weber (1930), Becker and Woessmann (2009) and Dittmar and Meisenzahl (2020).

[41] This result is in line with Kersting et al. (2020) who do not find evidence for Protestant capital accumulation in modern Prussia.

Table 4 Difference-in-Differences Estimates: Wealth Share Changes of Top and Middling Strata in Protestant Communities, Germany, c. 1400–1800

	(1) Top 10%	(2) Top 1%	(3) Mid. 40%	(4) Top 10%	(5) Top 1%	(6) Mid. 40%
Protestant×Post-Reform	3.072	0.123	−0.161	3.493	0.340	−0.514
	(2.334)	(1.829)	(1.608)	(2.504)	(1.849)	(1.580)
Controls	No	No	No	Yes	Yes	Yes
Locality and Time FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	368	368	368	368	368	368
Communities	43	43	43	43	43	43
Mean dep. var	45.92	12.05	21.76	45.92	12.05	21.76
R^2	0.196	0.071	0.286	0.237	0.109	0.304

Notes Estimation method is OLS. Standard errors clustered at locality level in parentheses. ***$p<0.01$, **$p<0.05$, *$p<0.1$

Reformation's effect on the arithmetic middle (deciles four to seven) of the population. This coefficient, too, is statistically not distinguishable from zero. Columns 4–6 indicate that all these results hold when controls are included.

Wealth shares have to add up to 100 percent, which implies that there is some degree of mechanical relationship between different parts of a distribution. One might wonder how it is arithmetically possible that the lower strata of the population lost wealth shares, while the middle and upper parts did not gain. Note that the differences in the wealth shares of the middle and upper classes indicated in Table 4 are just not statistically significant, but not precisely zero, which does not rule out that there was any redistribution. Importantly, however, the possible limited gains of these other parts of the wealth distribution do not *drive* the loss of the poor strata, as additional results reported in the Appendix show. There I use the top 10 percent and middling 40 percent wealth shares as controls, and the bottom 20 percent share as outcome. If the losses of the poor were just mechanically driven by these other strata's gains, the coefficient of interest should be close to zero. But it is not, suggesting that Protestantism led to a highly significant and sizeable reduction of poor peoples' shares, mostly independently of the wealth shares of these other parts of the population.

There are two slightly different interpretations of the above result that poor strata significantly lost wealth shares, but top and middling parts did not significantly gain. One is that the relatively small dataset has not enough statistical power to capture the changes to top and middling parts. A second interpretation is that the wealth share lost in a concentrated fashion at the bottom, was distributed in a dispersed way, so that no other part of the population gained significantly. The data cannot fully substantiate any of the two possibilities. However, Table 3 suggests that the dataset is not too small to capture significant distributional changes to the lower strata of the population caused by the Reformation.

This can also be seen in Fig. 6, where I estimate the saturated specification and plot the coefficients of the effect of Protestantism on the wealth shares of all quintiles of the wealth distribution (Panel A) and on the log-wealth shares of all quintiles (Panel B) to highlight the

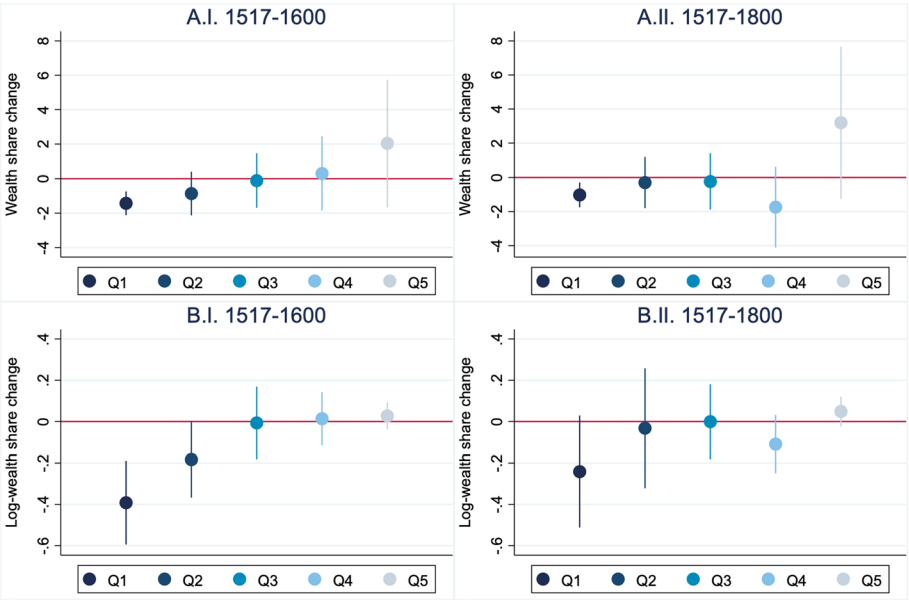

Fig. 6 Difference-in-Differences Estimates: Changes of Quintiles of the Wealth Distribution in Protestant Communities, Germany, c. 1400–1800. Notes: Regression estimates of the wealth share change (Panel A) and log-wealth share change (Panel B) of all quintiles of the wealth distribution in Protestant communities, with respect to Catholic communities (horizontal red line). The treatment is Protestant × Post-Reformation. The pre-treatment period is 1400–1500. Estimation method is OLS. All regressions include a full set of locality and time fixed effects, and all controls. Standard errors clustered at locality level. Confidence intervals indicate significance at the 95-percent level

relative size of the change.[42] The left frame covers the Reformation period until just before the Thirty Years' War, the right frame the whole period of analysis. Only the fifth quintile, that is the bottom 20 percent of the distribution, is negative and significant in both periods, in absolute as well as in relative terms (p-value 0.79 in Panel B Frame II.). All other parts of the distribution experienced mostly insignificant and much smaller relative changes.

Another concern might be whether the Reformation led to migration between Protestant and Catholic communities, which could imply geographical spillover effects having an impact on the results. This type of externality would amount to a violation of the stable unit treatment value assumption (SUTVA). While theoretically possible,[43] it is historically unlikely to be a major issue. The Holy Roman Empire was the most fragmented political entity in early modern Europe, consisting of more than 300 polities; no general right to migrate between the territories existed. Quite the contrary, subjects had to ask permission to migrate from their authorities, they had to be free from feudal bonds, and often had to pay high fees for the right to leave, and needed to obtain a passport for moving around. Added to this, host communities could simply refuse to take in immigrants they

[42] I have added the value one to all wealth quintiles before the log-transformation, in order to keep observations with the value zero.

[43] In theory, people could leave their territories for religious reasons after 1555. In practice, the legal and economic hurdles made emigration at the very least a ruinous endeavour, thwarting the material incentives for migration (Blickle, 2015: 189–190).

Table 5 Difference-in-Differences Estimates: Population Size in Protestant Communities, Germany, c. 1400–1800

	(1) Ln-Pop	(2) Ln-Pop
Protestant×Post-Reform	0.022	0.041
	(0.112)	(0.111)
Controls	No	Yes
Locality and Time FE	Yes	Yes
Observations	368	368
Communities	43	43
Mean dep. var	7.509	7.509
R^2	0.248	0.262

Notes: Estimation method is OLS. In Column 2 all standard controls are included, but not the population size, which is employed as outcome. Standard errors clustered at locality level in parentheses. ***p<0.01, **p<0.05, *p<0.1

did not want, such as poor people. These economic and institutional barriers considerably restricted mobility, given that migrants had to cross many different jurisdictions, even when relocating over short distances. These barriers forced undesired poor people in particular to stay put, because police ordinances outright criminalised their migration, and because they were probably unable to afford the high costs of leaving (Gerteis, 1998; Blickle, 2015: 189–190). Additionally, because the religious divide was such an incisive cultural dividing line at the time, individuals from the other confession were usually met with hostility and, for example, excluded from receiving welfare benefits such as poor relief from hosting communities (Battenberg, 1991: 60). Ultimately, spillover effects would bias my estimates against finding a significant effect of Protestantism. If Protestantism made poor people worse off, then one would expect the poor to attempt to leave these places, thus reducing their number and measured inequality in their communities of origin. Then the actual effect of Protestantism on poor strata's wealth shares would be even larger compared to my estimates.

4.2.3 A rough approximation of relative vs. absolute change

A natural question to ask is whether Protestantism's growth effects were possibly large enough to outweigh the poor strata's *relative* losses, making them better off in *absolute* terms.[44] As I have mentioned, I cannot address this question systematically with my data on wealth distribution. But it is possible to obtain a rough approximation of the absolute growth generated by Protestantism, by using information about population growth in the communities of my sample.[45] In Table 5, I estimate the effect of the Reformation's introduction on the log-population size. The baseline estimate in Column 1 of 0.022 log points is insignificant, and identical to the baseline estimate of Cantoni (2015: 576), obtained in a similar setup but based on a larger sample of preindustrial German cities. The point

[44] On the growth effects of the Protestant Reformation in Germany, see Becker and Woessmann (2009), Cantoni (2015) and Cantoni et al. (2018).

[45] See Cantoni (2015) and Dittmar and Meisenzahl (2020) for a similar approach.

estimate slightly increases when I add controls in Column 2. If we read the change in log points as a lower bound estimate of the percentage change, and leave aside the question of significance, then the Protestant communities in my dataset grew between 2.2 and 4.1 percent over the period of analysis. This estimate can be used for a back-of-the-envelope calculation of absolute versus relative wealth change of poor strata.

The bottom 20 percent of the population owned 2.55 percent of total wealth before the Reformation in what were to become Protestant communities (see Table 2). Let's assume for simplicity that poor strata in Catholic places owned the same share, that both types of communities had an absolute wealth of 100 florins, and that they had the same size. Taking the larger of the two estimates in Table 5, the average Protestant economy would have grown to 104.1 florins, while the Catholic economy would have remained at 100. According to the baseline estimate in Column 3 in Table 3, the Protestant poor lost 1.004 wealth percentage points due to the Reformation, eventually owning about 1.61 florins, and the Catholic poor 2.55 florins. This means that the Protestant poor owned about 37 percent less in absolute terms compared to their Catholic counterpart. To make the Protestant poor equally well-off in absolute terms compared to Catholics, absolute wealth would have had to be about 65 percent higher under Protestantism. This seems very unrealistic: the difference corresponds to sixteen times the point estimate in Column 2. In contemporary societies a per capita wealth difference of 65 percent can be found between Germany on the one hand, and countries like the Czech Republic or Uruguay on the other (Davies et al., 2023). This is not meant to criticise work that has found positive effects of Protestantism on economic growth. The calculations suggests only that absolute wealth growth under Protestantism was most likely not large enough to compensate for the substantial relative losses of poor strata. This is simply the arithmetic consequence of poor strata owning only a very small slice of a "growing pie". The Reformation emerges as an example of a policy that led to average prosperity gains, while leaving a substantial part of the population behind without the possibility of enjoying any of these gains.

4.2.4 Robustness: wealth share distribution of poor strata and alternative samples

Given the limited nature of the dataset, one might be wondering whether the results are driven by idiosyncratic characteristics of groups of communities in the dataset, that is, outliers. In Fig. 7 I plot the raw distributions of wealth shares of the bottom 20 percent in Catholic and Protestant communities, after the beginning of the Reformation. The distributions do not show a concentration of unusual values, which would be indicative of outliers. But comparing the two distributions reveals another interesting fact: the right tale of the distribution, with wealth shares above five percentage points, is almost entirely missing in the sample of Protestant communities. Instead, zero-wealth shares are more common with respect to Catholic communities. In other words, the Protestant distribution of wealth shares is more skewed towards the bottom.

Table 6 shows that the main results hold when certain communities are dropped from the analysis. A first concern could be that Northern communities were peripheral and not well integrated in the governance structures of the Holy Roman Empire. They may have differed from other communities in the centre and south of Germany and it could be that the Reformation variable just picks up this otherness. In Column 1 the four communities high in the North (see Fig. 4) are dropped, which does not change the results. I also drop the five largest cities in the dataset in 1500 (Lübeck, Augsburg, Erfurt, Munich and Frankfurt a.M.), to check whether these exceptionally large and economically dynamic places

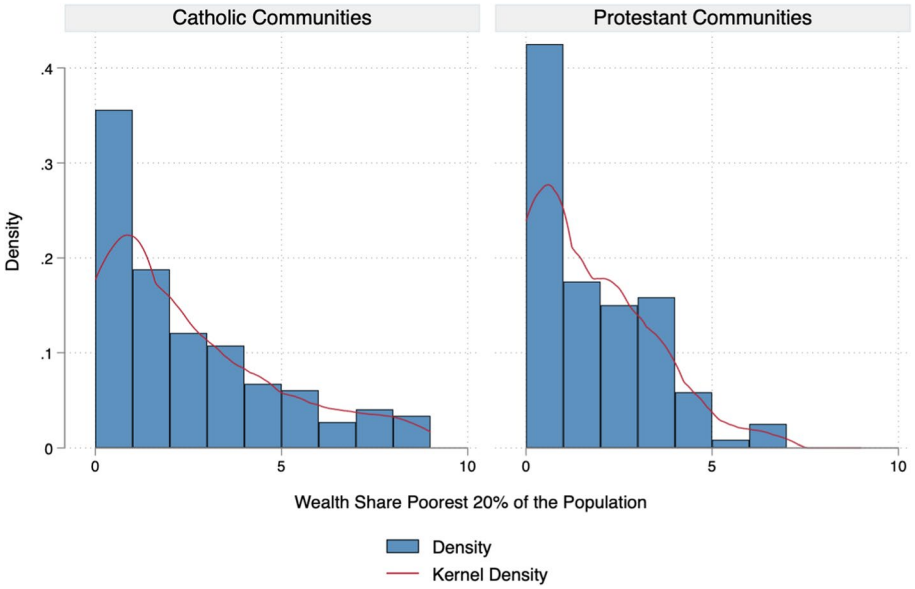

Fig. 7 Robustness: Distribution of Wealth Shares of the Bottom 20 percent in Protestant and Catholic Communities after 1517. Notes: Distribution of wealth shares of the Bottom 20 percent of the population in Protestant and Catholic communities after the beginning of the Reformation (1525–1800). The red line is the kernel density estimate. The sample size is 269 observations

drive the results. Column 2 indicates that this is not the case. Another concern could be that the geographical clustering of communities, evident in Fig. 4, around Wangen (10 communities) in the south and Lippe (8 communities) in the centre-west, might drive the results. Columns 3 and 4 show that the main result qualitatively holds, although losing this relatively large number of communities considerably reduces the power of the dataset.

A fifth concern could be that communities that switch their confession more than once drive the results. Column 5 shows that the results hold when communities are dropped that partially or completely reverted to Catholicism after having introduced the Reformation. Sixth, one might wonder whether communities belonging to a bishopric drive the results. Column 6 suggests that the results hold when these places are dropped. Seventh, one might also wonder whether the results are driven by differences in the strength of serfdom, that is, labour coercion in rural areas. The intensity of labour coercion is very difficult to measure precisely, but the areas east of the river Elbe are often seen as the part of Germany with the strongest form of labour coercion, the so-called “Second Serfdom" (Ogilvie, 2014). But these areas do not seem to drive the results, as Column 7 suggests.

Ultimately, one might be concerned about the unbalanced structure of the panel influencing the results. This data structure is, at the current state of research, almost inevitable because data for household-level wealth inequality since the late Middle Ages are very hard to find. Column 8 reports results for a balanced sub-sample, from 1475 until 1600.[46] Unsurprisingly, the coefficient is even larger compared to the coefficient obtained based on

[46] The Thirty Years’ War began only a few years after 1600. That war was an important shock to welfare provision and inequality (Fig. 8).

Table 6 Robustness: Alternative Samples, Germany, c. 1400–1800

	(1) Bot. 20%	(2) Bot. 20%	(3) Bot. 20%	(4) Bot. 20%	(5) Bot. 20%	(6) Bot. 20%	(7) Bot. 20%	(8) Bot. 20%
Protestant×Post-Reform	−0.995**	−1.137***	−0.604*	−0.825**	−1.130***	−0.979**	−1.045***	−1.581***
	(0.392)	(0.410)	(0.339)	(0.380)	(0.398)	(0.384)	(0.376)	(0.434)
Northern localities excl	Yes	No	No	No	No	No	No	No
5 largest cities in 1500 excl	No	Yes	No	No	No	No	No	No
Lippe localities excl	No	No	Yes	No	No	No	No	No
Wangen localities excl	No	No	No	Yes	No	No	No	No
Confessional reversal localities excl	No	No	No	No	Yes	No	No	No
Bishopric localities excl	No	No	No	No	No	Yes	No	No
Second serfdom localities excl	No	No	No	No	No	No	Yes	No
Balanced Panel 1475-1600	No	No	No	No	No	No	No	Yes
Observations	340	317	320	285	338	339	356	120
Communities	39	38	35	33	40	39	41	20
Mean dep. var	2.101	2.403	1.959	2.055	2.352	2.128	2.075	2.796
R^2	0.253	0.292	0.182	0.239	0.250	0.235	0.229	0.491

Notes: Estimation method is OLS. All regressions include a full set of locality and time fixed effects, and all controls. Standard errors clustered at locality level in parentheses. ***$p<0.01$, **$p<0.05$, *$p<0.1$

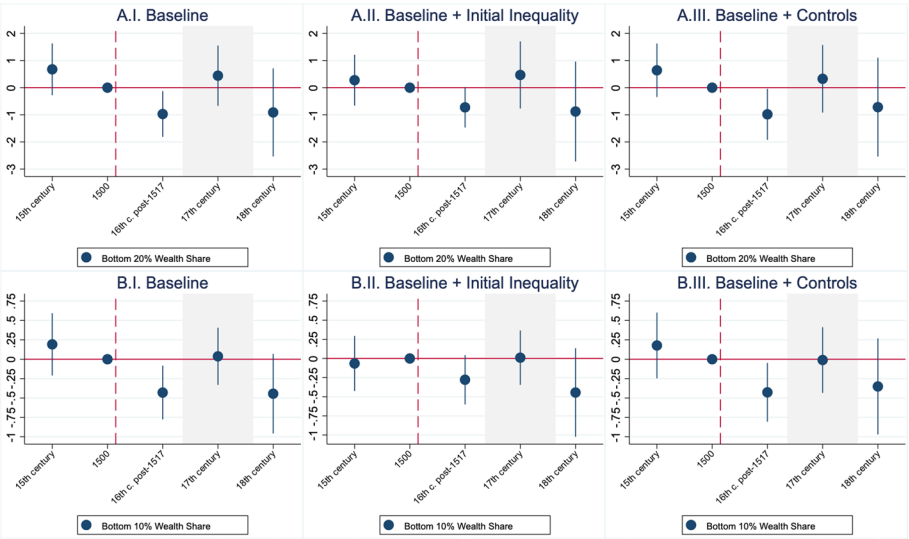

Fig. 8 Flexible Difference-in-Differences Estimates: Wealth Share Change of Poor Strata in Protestant Communities, Germany, c. 1400–1800. Notes: Regression estimates of the wealth share of the bottom 20 percent (Panel A) and the bottom 10 percent of the population (Panel B) in eventually Protestant communities before and after the Reformation (vertical red line), with respect to Catholic communities (horizontal red line). The omitted reference year is 1500. The estimation method is OLS. All specifications have a full set of community fixed effects and time fixed effects. Standard errors clustered at locality level. Confidence intervals indicate significance at the 95-percent level. The vertical red line represents the beginning of the Reformation period, the grey box the Thirty Years' War

the full sample, and highly statistically significant. This suggests that the changing composition of the sample does not drive the results. These checks reassure us that the main results are robust to the composition of the sample and are not driven by outliers.

In the Appendix I report further heterogeneity tests. I look at urban versus rural, Northern versus southern, and western versus eastern communities. None of these checks changes the treatment coefficient of interest substantially, but it seems that Protestant poor strata lost significantly fewer wealth shares in cities and eastern communities. I also check for discontinuities in the number of taxpayers during the early phase of the Reformation, which would be indicative of systematic changes in Protestant tax systems, such as differences in the reporting of poor people. I do not find evidence for discontinuities in the number of taxpayers.

4.2.5 Protestantism's effect on inequality over time: flexible difference-in-differences estimates

In Fig. 8 I plot the estimation results of a flexible DD model, taking the wealth share of the bottom 20 and 10 percent as dependent variables. This setup allows me to evaluate, first, whether the relationship between Protestantism and the wealth share of the lower classes of society changed over time. Second, it allows for another test of the presence of differential pre-Reformation trends, and to control for such trends to some extent. The specification is almost identical to Eq. 1:

$$I_{i,t} = \alpha_i + \pi_t + \sum_{t=1}^{4} \beta_t (Prot_i \times Century_t) + \boldsymbol{\gamma' X_{i,t}} + \epsilon_{i,t} \quad (2)$$

The main difference is the inclusion of an interaction term between the treatment status indicator ($Prot_i$) and a set of four century dummies ($Century_t$) covering the pre- and post-treatment periods. The beta (β) coefficients are the main coefficients of interest. Unfortunately, the small dataset does not have enough power to estimate a fully flexible model at 25-year intervals. I therefore follow the example of Cantoni et al. (2018) and cluster observations into larger intervals, to increase the number of observations for each interval. I take the year 1500 as reference category and divide the remaining period of observation into four intervals corresponding to centuries: from 1400 until about 1475; from 1525 just after the Reformation began until 1600, from 1625 until 1700; and from 1725 until the end of the period of observation in 1800. Note that this is still a demanding specification, considering the size of the dataset, especially towards the end of the period of study when the coverage of the dataset is less dense. The results are admittedly noisy, but still informative. Unfortunately, there is only one pre-Reformation period (15th century), because of a lack of sources for earlier periods. The insignificance of the 15th-century dummy would suggest the absence of a pre-trend.

In Panel A, I take the wealth share of the bottom 20 percent and in Panel B of the bottom 10 percent as dependent variable. Both patterns are almost identical. In Frame I the pre-Reformation period coefficients indicate that Protestant communities may not have been significantly different from Catholic communities. This supports the common-trend assumption, which will be further supported by the instrumental variable analysis. Yet the indicators of the first part of the treatment period (1525–1600) point to a significant widening in outcomes between Protestant and Catholic communities once the Reformation began. Poor strata were relatively worse off in Protestant communities, similar to the simple DD estimates in Table 3.

The coefficients for the period 1625–1700 suggest that the effect disappears during the crisis-ridden seventeenth century, the century of the Thirty Years' War (1618–1648; approximately indicated by the grey box). Poor strata suffered the most economically during that war (Scheidel, 2017: 339; see also Fig. 1). This result might seem puzzling, but it is what one would expect if poor relief policies were one of the mechanisms causing lower wealth shares of Protestant poor strata. The war was exceptionally destructive, incomparably more than epidemics. About 40 percent of the German population died, and the prolonged macroeconomic recession that followed had long lasting negative budgetary effects, including for poor relief. This was particularly relevant in Catholic communities, as they had more generous poor relief provision (Alfani, 2022; Jütte, 1994: 131). For example, in Catholic Trier the war led to an almost complete cessation of poor relief for more than a decade. While hundreds of poor households had received support in the sixteenth and early seventeenth centuries, the number of recipients dropped to zero during the war (Ackels, 1984). In other words, this extraordinary war temporarily eliminated the redistributive effect of universal and generous Catholic poor relief, an effect that could operate during small crises instead.

If the war was an exceptional shock to poor relief, it is not surprising that the coefficients for the eighteenth century are clearly negative again, which suggests that Protestant poor-relief policy had a lasting effect. The new institutions remained substantially unchanged until at least the late eighteenth or early nineteenth centuries (Jütte, 1994: 106–109). However, this result is not statistically significant. The large confidence

intervals suggest that this is probably the result of the poorer coverage of the later early modern period in the dataset.[47]

In Frame II, I interact every community's inequality level at the beginning of observation with a full set of year dummies. These interactions absorb a large amount of the pre-Reformation variation in the outcome, that is, the potential pre-trends that one might suspect looking at the point estimates in Frame I. The benefit of this demanding specification is to make communities even more comparable in the post-treatment period. Reassuringly, the patterns of redistribution observed in Frame I are qualitatively preserved in both panels, and the point estimate for the pre-Reformation period is close to zero. In Frame III all controls are added to the baseline specification. In this demanding saturated specification too, the picture of significantly lower wealth shares of Protestant poor strata is preserved in Panel A and B. This is an important result because one could argue that it was population decline leading to higher wages of lower strata, not the cessation of poor relief, which led to the vanishing difference between Catholic and Protestant communities during the seventeenth century. Since population change is controlled for in this specification, it cannot drive the results.

4.3 Endogenous adoption of the Reformation: instrumental variable analysis

Figure 1 and Table 2, and the flexible DD estimates did not provide evidence for significant pre-trends or pre-Reformation differences in inequality. But one might still be sceptical about whether this assumption really holds looking at some of the point estimates in Fig. 8. More generally, one might be worried about selection bias, and ask whether the Reformation was adopted also because of unobserved economic factors, which could in turn be related to inequality after the beginning of the Reformation.[48] To rule out such potential remaining concerns I employ a second identification strategy. I follow an approach that has been employed in several previous studies,[49] and use the distance to the city of Wittenberg—the place where Luther started the Reformation—as an instrumental variable (henceforth IV). Since we cannot ultimately test the assumptions on which the method builds, the instrument *might* be imperfect.[50] Hence, I view the results of the IV analysis as a useful addition to the main DD results.

The IV isolates exogenous variation by exploiting the idea that the Reformation was more likely to be adopted the closer a community was to the movements' starting point, possibly because of geopolitical considerations in the sixteenth century. There were numerous reasons why a prince or magistrate could have been in favour or against the Reformation.[51] One of the reasons was that it was outright dangerous for princes and magistrates to officially introduce the new religious confession.[52] In that situation, having a powerful

[47] For the period from 1725 to 1800 the dataset contains only 50 observations.

[48] For example, one could argue that more entrepreneurial communities were more prone to the Protestant interpretation of Christianity but were also more likely to have higher inequality after 1517. Then the OLS results could overstate the actual effect. Moreover, one might be concerned about measurement error in the treatment variable.

[49] See for example Becker and Woessmann (2009), Cantoni (2012, 2015) and Becker and Pascali (2019).

[50] For a critique of the instrument in the context of Prussia at the beginning of the twentieth century, see Kersting et al. (2020).

[51] For a summary, see Cantoni (2012).

[52] Martin Luther was legally banned and his ideas and writings were prohibited in the Holy Roman Empire before the Peace of Augsburg. A military intervention by the Catholic Emperor and his allies, or other neg-

neighbouring polity made adoption less risky. Wittenberg was an administrative centre of the first state within the Holy Roman Empire to adopt the Reformation, which was also a powerful polity: the Electorate of Saxony (Cantoni, 2012). Additionally, being closer to Wittenberg and Saxony might have made it easier for imitators to observe how the Reformation was implemented in practice (Becker & Woessmann, 2009: 557–558).[53]

In the Appendix, I report first-stage regression results, which indicate that distance to Wittenberg is indeed a strong predictor of Reformation adoption, suggesting that the instrument-relevance condition is met. The exclusion restriction in this setting amounts to assuming that, conditional on locality- and time-fixed effects and several covariates, the distance to Wittenberg affected inequality only through the probability of a community becoming Protestant. One possible threat could be that being closer to Wittenberg was related to better pre-existing economic development, and therefore to higher inequality. Then the instrument would not be independent. However, Wittenberg was not at all an economic hub. It was an economically backward and remote place, or to put it the words of Luther "on the edge of civilisation" (Becker et al., 2020: 861).

Figure 9 provides additional evidence supporting the assumption that the instrument is as good as randomly assigned. Wealth shares and inequality indicators in 1500 are plotted against the distance to Wittenberg. If the instrument actually provides variation that is exogenous to pre-existing determinants of wealth distribution, then one would expect to find no significant correlation between the distance to Wittenberg and distributional outcomes in 1500. This is precisely what the results of this placebo test indicate. The correlations are practically zero, and not statistically significant (see additional results in the Appendix). Moreover, in most of the regressions presented below I control for several observable economic but also demographic and institutional time-variant characteristics of communities, in addition to time-invariant characteristics captured by the fixed effects. If these saturated specifications still produced significant results, one could be relatively confident that the exclusion restriction holds, and that the instrument is as good as randomly assigned, that is, independent of potential outcomes.

My IV setup is similar to Cantoni (2015). Compared to the previous DD setup, the interaction term of interest, including the indicator of the adoption of the Reformation, is now instrumented by an interaction term containing the IV instead. This is conceptually equivalent to a two-stage least squares setup. The first-stage is:

$$Prot_i \times P_t = \alpha_{1i} + \pi_{1t} + \phi DistanceWittenberg_i \times P_t + \epsilon_{1i,t} \tag{3}$$

Equation 4 represents the second-stage:

$$I_{i,t} = \alpha_{2i} + \pi_{2t} + \delta \widehat{Prot_i \times P_t} + \epsilon_{2i,t} \tag{4}$$

Panel A of Table 7 shows the results of the IV estimates (reduced-form estimates are reported in the Appendix, showing the same pattern as the second stage results). The estimates are local average treatment effects (LATE). They report the causal impact of the

Footnote 52 (continued)
ative political consequences were an imminent threat for supporters of Luther. Political allegiances were therefore important when a polity introduced the Reformation (Scribner & Dixon, 2003: 42–43).

[53] Having contact with Luther himself was immensely important for the spreading of his new interpretation of Christianity. He had most frequent and intense contacts—either through writing or personal visits—with places close to Wittenberg (Becker et al., 2020: 868–869).

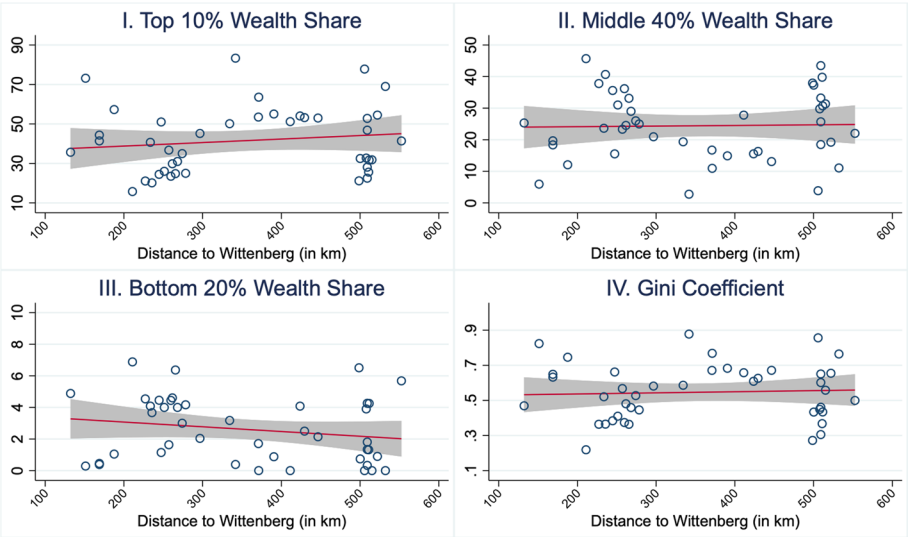

Fig. 9 Instrument Exogeneity: Communities' Distance to Wittenberg and Wealth Distribution in 1500, Germany notes: The graphs show unconditional binned means of the top 10 percent wealth share (Frame I.), the wealth share of the middling 40 percent (Frame II.), the wealth share of the bottom 20 percent (Frame III.) and the Gini coefficient (Frame IV.) in 1500, plotted against the distance to Wittenberg (in km). A thick line of best fit is overlaid, and light grey areas indicate 95 percent confidence intervals

introduction of the Reformation on communities that, for reasons of geographical location, became Protestant.[54] Weakness of the instrument does not seem to be an issue: Kleibergen-Paap F-statistics are well above the conventional cutoff of 10. The picture of distributional differences revealed by the IV estimates is the same compared to Tables 3 and 4. Columns 1–3 show a negative, substantial, and highly significant effect of the Reformation on the wealth share of the lower classes of society. Importantly, this negative relationship also holds when controlling for several community-level covariates, including proxies for economic development. The highly significant estimates in the saturated specifications including covariates (Column 2–6) indicate that the estimates are robust to potential exclusion and independence restriction violations. Column 4 shows that the overall changes in inequality are also captured by the Gini coefficient now. Yet Columns 5 and 6 show that there is again no evidence of a significantly positive effect of the Reformation on top wealth shares, or on the wealth of the arithmetic middle of the population. Overall, the IV results confirm the main DD results. The IV approach de facto randomises treatment, which suggests that the DD results are unlikely to be driven by selection bias.

[54] The coefficients are slightly larger than the OLS estimates (Panel B). The difference most likely reflects proxy measurement error in the Reformation-indicator. The IV might recover a cleaner measure of the intensity of treatment, which is lost in the simple binary treatment variable employed in the OLS regressions. The IV might also remove some of the endogeneity that plagues and thus attenuates the OLS estimates, for example due to unobserved community characteristics. The IV identification relies on compliers, and if these communities are less likely to have characteristics that attenuate the effects of the Reformation, this would lead to larger IV estimates compared to OLS estimates.

Table 7 Instrumental Variable Estimates: Wealth Inequality in Protestant Communities, Germany, c. 1400–1800

	(1) Bot. 20%	(2) Bot. 20%	(3) Bot. 10%	(4) Gini	(5) Top 10%	(6) Mid. 40%
Panel A: IV-Estimates						
Protestant×Post-Reform	−1.995***	−1.896***	−0.744***	0.052*	2.899	−0.391
	(0.483)	(0.502)	(0.211)	(0.028)	(3.097)	(2.034)
Panel B: OLS-Estimates						
Protestant×Post-Reform	−1.004**	−1.023***	−0.428***	0.031	3.493	−0.514
	(0.383)	(0.360)	(0.137)	(0.023)	(2.504)	(1.580)
R^2	0.165	0.228	0.235	0.318	0.237	0.304
F-Stat. IV	75.68	65.35	65.35	65.35	65.35	65.35
Controls	No	Yes	Yes	Yes	Yes	Yes
Locality and Time FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	368	368	368	368	368	368
Communities	43	43	43	43	43	43
Mean dep. var	2.181	2.181	0.676	0.589	45.92	21.76

Notes: Estimation method is TSLS. Standard errors clustered at locality level in parentheses. ***$p<0.01$, **$p<0.05$, *$p<0.1$

4.4 Limitations of the analysis

The analysis is not without limitations, mostly related to the relatively small size of the dataset. For instance, the results in Table 6 show some sensitivity when parts of the dataset are dropped. Although the effect never statistically disappears, one might wonder which characteristics of the dropped communities drive this sensitivity. Unfortunately, beyond the additional results reported in the Appendix, the data limitations make it impossible to fully disentangle the heterogeneity of the effect. There was much variation in how Protestant poor relief systems were set up in cities and territories. For example, in some places begging was forbidden, in others only restricted or not regulated (see below). Unfortunately, at the current state of research, we do not have systematic information about all aspects of local poor relief systems to account for this variation.

Additionally, one might be concerned about the generalizability of the results. Without doubt the 368 observations from 43 communities cover the German area less systematically than other datasets of German towns.[55] However, these larger datasets do not contain any measure of inequality and can, therefore, not inform us about the household-level distribution of wealth in the distant past. My relatively small sample is due to the rarity of inequality data for the preindustrial period, a time for which no censuses or similar large statistical sources exist. The rarity of the sources and the high degree to which the available material has been exhausted for constructing this dataset make it unlikely that a substantially larger dataset registering household-level inequality in preindustrial Germany will become available any time soon.

[55] See for example Cantoni et al. (2018) and Dittmar and Meisenzahl (2020).

5 Mechanisms: particularistic Protestant poor relief policies

So far the analysis has shown that the Reformation made poor people poorer in Protestant communities, in relative terms and with a high probability in absolute terms as well. This increased the gap between the poor and the rest of the population. What are the likely mechanisms behind this relationship? One of them could be that inequality and relative poverty grew in Protestant places due to potential economic expansion, for example fuelled by upper-tail human capital growth. These factors could have been a result of the Reformation and could have led to social differentiation. But on closer examination this conclusion is unlikely to explain the results: first, because I control for proxies of economic development in most regressions; second, because growth and higher human capital would benefit the middling and upper classes of society disproportionately, leading to wealth concentration at the top of the distribution (van Zanden, 1995). But as we have seen, no other part of the population gained significant wealth shares, neither the middling parts nor the percentiles at the very top. Another explanation could be that it was not the Reformation, but rather the German Peasants' War (1524–25), happening around the same time of the beginning of the Reformation, that impoverished poor strata. This is an unlikely explanation too, because I also control for exposure to warfare in most regressions. The theoretical framework in Sect. 2 suggests a different hypothesis to explain the empirical patterns: new low-redistribution policies, such as the exclusion of marginal poor people from social welfare, but also begging prohibitions, the disincentivising of almsgiving and the stigmatisation of the poor in the labour market. The ideal would be to measure low-redistribution policies with data on effective redistribution to poor people. Unfortunately, such data are not available for the pre-statistical age, so I have to rely on indirect evidence. I study first the legal changes brought about by the Reformation in cities and territories, and second monastery closures during the Reformation.

5.1 New poor relief institutions: Protestant church ordinances

Often, some years after the adoption of the Reformation, Protestant city magistrates and territorial rulers introduced laws in their communities that regulated those areas of public life previously regulated by the Catholic Church, namely education, church governance and, importantly, the secular provision of poor relief (Dittmar & Meisenzahl, 2020). These "church ordinances" (*Kirchenordnungen*) were the legal basis for such poor relief institutions as the common chest or the prohibition of begging. They often put the particularistic provision of poor relief into written law, by declaring "undeserving" and non-resident poor as non-eligible for receiving support. Ordinances also conferred on communities the task of managing poor relief locally. The texts of the laws together with their dates of introduction, have been edited in a multi-volume series by Sehling (1902). I employ the introduction of a church ordinance in a community as a proxy variable for the establishment of the new systems of Protestant welfare and poor relief, similar to the study of Dittmar and Meisenzahl (2020).

In addition to the mere presence of a church ordinance, Sehling's volumes make it possible to code a variable indicating whether the content of the laws regulated begging in a community. As mentioned, begging could be a poor person's only income, or could supplement income from work or stealing (Isenmann, 2014: 589, 599, 732). This income would be reflected in the wealth distribution only to the extent to which poor people had some

surplus left above subsistence (see Sect. 3). The regulation of begging took different forms: begging could be limited to certain days of the week, the right to beg could be denied to specific groups (for example, strangers), begging could be restricted to certain areas of the locality or prohibited altogether. The important aspect uniting these forms of regulation is that they restricted the opportunities for begging, thus denying needy people an important source of income and limiting voluntary transfers from better-off to poor individuals.[56] This reduced the poor strata's wealth share.

In order to test the presence of these different patterns more formally, I again estimate a DD setup similar to Eq. 1. Being a Protestant community is held constant in all specifications. The main interaction term of interest now includes the ordinance indicator[57]:

$$I_{i,t} = \alpha_i + \lambda Ordinance_i \times PostIntro_t + \theta Prot_i \times PostReform_t + \boldsymbol{\gamma' X_{i,t}} + \epsilon_{i,t} \quad (5)$$

Columns 1 and 2 of Table 8 document that the introduction of an ordinance led to a sizeable and significant reduction of the wealth share of the bottom 20 percent of the population. The effect of Protestantism loses its statistical and economic significance. This is indicative of church ordinances and the poor relief institutions they introduced having large explanatory power and driving a major part of the observed differences in the wealth shares of poor people in Protestant and Catholic communities.

In Columns 3–6 I augment the interaction term of interest with the begging restriction indicator.[58] The results show that, as expected, regulating begging had a sizeable and negative association with the wealth share of poor strata, resulting from the closure of an important income channel for the poor. As one would expect, the presence of a church ordinance still shows a negative effect, most likely because ordinances restricted poor relief in unmeasured ways other than limiting begging, for instance by excluding able-bodied but non-working people from welfare or by disincentivising almsgiving. Note that the effect on the bottom 10 percent (Column 5) being more than twice as large as the effect on the second decile (Column 6) suggests that poorer households were hit harder by a begging regulation. Intuitively, this is exactly what one would expect because households were more likely to receive money from begging the poorer they were. Other economically relevant effects of begging regulations among the poor were a higher propensity for out-migration (although this was in practice difficult for the poor), higher mortality, and increased incentives to work. However, all these factors would have reduced the number of poor people in a place, reducing inequality, implying that the reported coefficients are lower-bound estimates. In general, one has to keep in mind that the presence of ordinances and begging regulations were likely correlated with other unmeasured characteristics of the poor relief system that limited redistribution to poor people in Protestant communities. One could also interpret the presence of a church ordinance to indicate cities' and territories' compliance with the Protestant reform programme.

[56] It has to be kept in mind that the text of the lengthy ordinances has not always been published entirely in the Sehling volumes (see Dittmar & Meisenzahl, 2020: Appendix). Hence the variable has potential measurement error because it is possible that some communities that were coded as not regulating begging actually did so. The estimates therefore give only a lower bound estimate of the actual effect of begging regulation.

[57] Since the first ordinance dates from 1522, the treatment variable is interacted with a post-treatment indicator that switches on in 1522.

[58] Note that the lower-order interaction Ordinance×Begging is absorbed by the locality fixed effects, and Post-Intro.×Begging would be identical to the triple interaction term since there are no places that had a begging regulation but no ordinance.

Table 8 Mechanisms: Laws Regulating Poor Relief, Germany, c. 1400–1800

	(1) Bot. 20%	(2) Bot. 20%	(3) Bot. 20%	(4) Bot. 20%	(5) Bot. 10%	(6) 2. Decile
Ordinance×Post-Intro	−1.476***	−1.639***	−0.532	−0.843**	−0.478**	−0.365
	(0.383)	(0.286)	(0.441)	(0.412)	(0.212)	(0.277)
Ordinance×Post-Intro.×Begging			−1.443***	−1.181***	−0.594***	−0.587*
			(0.430)	(0.438)	(0.185)	(0.291)
Protestant×Post-Reform	0.375	0.518	0.212	0.349	0.313	0.036
	(0.428)	(0.339)	(0.460)	(0.361)	(0.189)	(0.235)
Controls	No	Yes	No	Yes	Yes	Yes
Locality and Time FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	368	368	368	368	368	368
Communities	43	43	43	43	43	43
Mean dep. var	2.181	2.181	2.181	2.181	0.676	1.505
R^2	0.174	0.239	0.200	0.256	0.283	0.208

Notes: Estimation method is OLS. Standard errors clustered at locality level in parentheses. ***$p<0.01$, **$p<0.05$, *$p<0.1$

Overall, the results are consistent with particularistic Protestant poor relief policies being an important mechanism behind the poor strata becoming worse off in Protestant places relative to the rest of the population. There is evidence for at least two particularistic, low-redistribution policies having an impact: the new exclusionary Protestant poor relief system, and the prohibition of begging. The insignificant coefficients on the Protestantism indicator across all specifications might be interpreted as evidence that institutions mattered more than ideology or culture, but it could also be that strong ideology is correlated with begging restrictions. These things are impossible to disentangle with the available data. In the Appendix, I report again the distribution of the poor strata's wealth shares, which suggest that outliers are not an issue. I also report flexible DD estimates, which show an analogous pattern compared to Fig. 8 and support the conclusions of this section.

5.2 The disappearance of Catholic social welfare: monastery closures

I also proxy for one facet of the disappearance of the universal social welfare system of the Catholic Church during the Reformation: the expropriation and closure of monasteries by local rulers, thus confiscating valuable assets of the Old Church. Monasteries used to redistribute a substantial part of the Church's income—probably between one third and one fourth—to the poor through almsgiving and were an important component of the Catholic poor relief system. Monasteries often also served as hospitals, providing rudimentary healthcare to poor people free of charge. Reformers had envisaged that monasteries' expropriated assets would be reemployed in Protestant communities to provide relief for needy people from the poor chest (Kahl, 2009: 270). In reality, these assets often went into the coffers of local rulers and were not employed for welfare but for waging wars, building roads, hiring bureaucrats, or building palaces. In Catholic territories these assets continued to be employed to benefit the poor (Cohn, 1987; Cantoni et al., 2018). One would expect that this disappearance of Catholic social welfare *ceteris paribus* led to lower strata of

Table 9 Mechanisms: Monastery Closures, Germany, c. 1400–1800

	1400-1600			1400-1800		
	(1)	(2)	(3)	(4)	(5)	(6)
	Bot. 20%	Bot. 20%	Bot. 10%	Bot. 20%	Bot. 20%	Bot. 10%
Monasteries closed×Post-Reform	−0.137**	−0.167**	−0.056**	−0.076	−0.127**	−0.050*
	(0.062)	(0.062)	(0.027)	(0.054)	(0.056)	(0.026)
Controls	No	Yes	Yes	No	Yes	Yes
Locality and Time FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	252	252	252	368	368	368
Communities	43	43	43	43	43	43
Mean dep. var	2.384	2.384	0.781	2.181	2.181	0.676
R^2	0.113	0.211	0.227	0.148	0.218	0.222

Notes: Estimation method is OLS. Standard errors clustered at locality level in parentheses. ***$p<0.01$, **$p<0.05$, *$p<0.1$

society losing wealth shares. I interpret monastery closures as a mechanism, but one could also interpret them as a proxy for the diffusion of the Reformation itself.

I gather information on the location and, if applicable, the closure date, of 3,094 monasteries from Cantoni et al. (2018) and Jürgensmeier and Schwerdtfeger (2005). For each locality in my dataset, I calculate the number of monasteries nearby that were closed during the Reformation period, up until 1600. Since the closure was a one-off reallocation of resources, usually happening when a ruler converted to Protestantism, it is likely that an effect could be observed most clearly in the early phase of the Reformation period. For that reason, I provide estimates covering a shorter period, until about 1600, and estimates for the complete period until 1800 (Table 9).

I estimate regressions analogous to the DD setup in Eq. 1, taking monastery closures as the treatment variable.[59] Column 1 suggests that the closure of monasteries significantly reduced the wealth share of the bottom fifth of the population. For every monastery closed, people at the bottom of the population lost 0.137 percentage points of their wealth share until 1600. Columns 2 and 3 show that this result holds when controls are introduced. Columns 4 to 6 show that, as expected, the effect is qualitatively preserved but smaller and less precisely estimated if we consider the entire period until 1800. One might wonder whether rulers' propensity to close and expropriate monasteries was driven by an increase in the macro-level frequency of warfare in the Reformation period. However, such a macro effect should be captured fairly well by time fixed effects.

The results suggest that the disappearance of the universal Catholic social welfare system, triggered by the Reformation, and the subsequent closure of monasteries did not just redistribute economic resources between rulers and the church (Cantoni et al., 2018). It also affected the distribution among individuals, by making the poor strata relatively poorer and increasing

[59] Note that Pfaff and Corcoran (2012) find that a higher monastery density decreased the odds of a community adopting the Reformation. This implies that poor people might have had lower income and wealth shares before 1517 in what were to become Protestant places. However, such potential differences in *levels* are not a major issue since the DD estimator used here calculates the change in wealth share *trends*.

inequality. This evidence is consistent with the universalism-particularism mechanism suggested by the theoretical framework.

6 Conclusion

This paper has investigated whether religious confession has an impact on the distribution of wealth and inequality, studying the emblematic case of the Protestant Reformation. I presented a theoretical framework of the Reformation's inherent trade-off between, first, the expansion of public goods provision, especially in terms of social welfare, and second, a more particularistic provision of poor relief to in-group members only. The framework suggests that the Reformation was quite ambiguous in its redistributive implications and in its impact on overall inequality. I then argued that the Reformation overall reshuffled the lower part of the wealth distribution to increase the gap between poor strata and all others.

I then tested this hypothesis empirically, employing a DD and IV strategy. I find strong evidence of a negative causal effect of the Reformation on the wealth shares of lower classes of the population in Protestant communities between 1400 and 1800. It seems that the Reformation increased inequality, by making the poor relatively poorer compared to the rest of the population. This effect can be traced back through the early modern period, which suggests that the Reformation had a lasting impact, beginning in the sixteenth century. Yet I do not find evidence of significantly higher wealth shares of rich or middling parts of the population. This result is confirmed by a variety of specifications. The average economic growth that communities experienced as a consequence of introducing the Reformation was unlikely to be large enough to compensate the poor strata for their relative losses, making them worse off also in absolute terms.

The empirical picture is consistent with a historical characterisation of the Reformation as the trigger of new low-redistribution policies in Protestant places, which embodied the particularistic character of the new religious confession towards parts of the poor. Evidence for the plausibility of this hypothesised mechanism comes from information about the introduction of church ordinances, begging prohibitions, and the closure of monasteries. The inequality-promoting character of Protestantism, typically observed in the modern day, seems to have deep historical roots. Protestantism might therefore be an important, hitherto underappreciated driver of rising preindustrial inequality, long before the onset of industrialisation and modern economic growth.

The case of the Reformation exemplifies that a key dimension of redistributive policies is how universal or particularistic societies provide social welfare (Enke et al., 2023), in the sixteenth century as well as today. It shows potentially negative distributional consequences of discriminatory policies against the "undeserving" poor or strangers, to the advantage of "deserving" individuals, natives or other insiders. Ultimately, the Reformation is an example of a policy change that likely left substantial parts of the population behind economically, although it generated economic growth in aggregate.

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