When Debt spells Sin: Does Religiosity guard against Over-Indebtedness?*

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Abstract

Over-indebtedness of individuals is attributed to unemployment, low education, financial illiteracy or age. We emphasize an additional determining factor: attitudes towards debt formed by religious beliefs. For Christians, debt is associated closely with guilt and sin yielding a negative "preconceived opinion" on debt. Yet, contrary to Catholicism, Protestant history and writings indicate also elements of a positive attitude towards debt. We hence test the effect of religious denomination on over-indebtedness using county-level data for Germany. To approach endogeneity, we apply the distance to important churches (Cathedrals, Dome, Münster) and historical events as instruments for a counties' percentage of Catholics and Protestants. We find that more widespread Catholicism in an area indeed leads to a lower share of over-indebted persons. The positive effect of Protestantism on over-indebtedness, however, gets marginally insignificant once endogeneity is taken into account.

Keywords: over-indebtedness, religion, instrumental variable approach, preconceived opinion, enforcement
JEL-Codes: D12, G11, Z12

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1 Introduction

Handling debt in a favorable way, i.e. without ending in insolvency, has been constituting a challenge for mankind since more than two thousand years. Indeed, already in the years the bible was written the question of debt, and arguments about debt, were important aspects of the political and everyday life. Negative experiences were made that left their marks. They explain why in Christian writings and prayers debt is repeatedly associated with guilt and sin. Accordingly, a negative "preconceived opinion" on debt should be common among Christians. Translated in economic terms, this "preconceived opinion" would be reflected in a more pronounced awareness of the risks of debt. Yet, the attitudes towards debt might differ across religious denominations to some degree. In fact, the ban on usury that had a long tradition in the Catholic church, was later on rejected by Protestant reformers. Moreover, historical writings, e.g. of Martin Luther, indicate a more positive "preconceived opinion" on debt and assign importance to a strict enforcement of missed repayments amongst Protestants. Thus, if Protestantism and Catholicism forms specific attitudes towards debt, they should be expected to impact financial behavior and notably the probability of becoming over-indebted among their followers.

The topic is of interest as it highlights the general role of attitudes towards debt for the efficient usage of credit. This is important as wrong usage of credit can lead to over-indebtedness causing adverse macroeconomic impacts. For example Mian & Sufi (2015) show that regions with larger household debt exhibit stronger downturns within the business cycle. Moreover, the paper puts the 'finance demanders' into focus. This highlights a different perspective for the current policy debates about finance and financial stability in which often only the 'finance suppliers', i.e. banks, brokers, are regarded as the central protagonists.

The nexus of religion and financial liabilities has first received attention by Baele et al. (2014). They examine the relation between default rate of loans and religion in Islamic finance. Using microdata for Pakistan they find Islamic loans being less likely to default during Ramadan and in cities where religious-political parties receive high share of votes. Georgarakos & Fürth (2015) explore the effect of social capital on household repayment behavior in Europe in the year 2000. They find that arrears are more common among households living in regions with a low fraction of religious people. They analyze data for European households, whereby German regions are identified by Bundesländer. Unfortunately, for the latter only data for mortgage and rent payments but not for bills and credit were available.

We analyze the effect of religion on adverse outcome of private credit behavior. The latter is obtained by data from a German credit reference agency that depicts the number of over-indebted people per region. These data include in addition to arrears also information from official list of debtors and of debt collection cases. The contribution is thus threefold. It is the first paper that analyzes the link between religion and over-indebtedness. Moreover, the study does so by explicitly distinguishing different denominations, i.e. Catholic and Protestant. Finally, the study is conducted using county data and hence provides a comparison across German counties. The paper thus presents answers to the central research question: Does religious affiliation influence over-indebtedness of individuals?

Germany is an ideal region to give answers to this question. Laws on credit and bankruptcy are uniform across all German regions, and due to the long tradition of credit reference agencies in the country, the data on over-indebtedness is solidly founded and reliable. Moreover, living in the homeland of Protestant Reformation, Protestants and Catholics nowadays are of similar size and at the same time are spread throughout the country. In addition, the countries rich religious history reveals incidents that give further insights into our research question. In fact, we will show that the distribution of important churches can be used to approach endogeneity.

Endogeneity is an issue, as being over-indebted can impact an individuals choice of religious affiliation. For example, a financially struggling individual could develop the will to save church taxes or could become disappointed and loose faith. Both could result in terminating a religious affiliation. To cope with this reverse causality, we apply an instrumental variable approach. We use counties distance to the next important Catholic or Protestant church to capture the part of religiousness that should be independent to over-indebtedness. A church is characterized as important if it is named *Dom* or *Müster* or if it is a *cathedral* or a *bishop sermon church*. We argue that areas for which the distance to such an important church is high should experience a lower share of persons being affiliated to the corresponding persuasion. Moreover, we use a second instrument, one that is already established in the literature. This is religion of a territorial lord in 1624.

Our empirical analysis reveals that religious affiliation indeed impacts the ratio of over-indebted people per county. Interestingly, the effect is opposite for both denominations. Catholics indicate a negative effect as expected. OLS results show that an increase of the share of Catholics by one standard deviation decreases the ratio of persons being over-indebted by up to eight basis points. For Protestants, in turn, a positive effect of six basis points is revealed. However, whereas this effect stays significant for Catholics once endogeneity is taken into account, it is marginally insignificant at the ten percent level for the Protestants (p-value=10.8). The findings take a range of controls into account and also turn out robust if alternative data on indebtedness is employed. We conclude that Catholicism can guard against being over-indebted, whereas Protestantism actually inhibits a tendency promoting over-indebtedness.

So far the impact of Religiousness on finance has been mainly dealt with in terms of investment decisions. Renneboog & Spaenjers (2012*a*) find evidence for the Netherlands that religious households are more inclined to save money than non-religious ones. Catholic households, however, are less likely to invest in stocks and are more risk-averse. Köbrich Leon & Pfeifer (2013) use German household data and show that Christians in comparison to non-religious individuals are more willing to take financial risks. Likewise, individuals with distinct religious backgrounds show distinct behavior concerning their probability to invest in specific assets like savings accounts, building contracts, life insurances or firm assets.

The remainder of the paper is structured as follows. Section 2 elaborates on the link between Christianity and attitudes towards debt. Section 3 provides details of the main variables and a discussion on the control variables. Section 4 presents the results from OLS regressions. The instrument variable set-up and its results are introduced in section 5. In section 6 the robustness is analyzed. Section 7 provides a discussion of the results

in relation to existing literature. Finally, section 8 concludes.

2 Catholics, Protestants and their attitudes towards debt

An astonishing similarity between the language used in religion and the language used in finance exists. In English the word *guilt* and *guilders* - the name of a former currency - is an example. *Redemption* and *redeemer* qualifies as a second example. In the German language there exists a close connection between the words for guilt and debt: the former is *Schuld* whereas the latter is *Schulden*. Yet, the feasible meaning of debt as something negative is also observable in English texts of Religiousness. The prayer Our Father in heaven - that is of central importance in Christian worship - illustrates this in a clear manner. In the traditional version it was prayed "*And forgive us our debts, as we forgive our debtors.*". In the modern version these lines have changed to: "*Forgive us our sins, as we forgive those who sin against us.*".[1]

However, these linkages should not come as a surprise. The negative meaning of debt might well reflect the happenings at the time the bible, the central source of Christian belief, has been written. In this context Wright (2012, p.347) reports that "Debt was quite a major problem in first-century Palestine".[2] Graeber (2011, p.80) states that "[t]he question of debt, and arguments about debt, ran through every aspect of the political life of the time." And indeed, the bible contains passages that deal with situations of indebted people. The parabel of the unforgiving servant in Mt 18, 23-35 or Lk 7,41-42 is a example. Moreover, related to the downside-risks of debt, the issue of usury receives broad attention.[3]

Yet, the crucial point is not primarily that words for debt are synonymous with those for sin or guilt. Indeed, Ingham (2004, as quoted by Graeber (2011)) notes that this is the case for all Indo-European languages. But crucial is, that religious educated people should be expected to be aware of sin and guilt as something that one has to deal with cautiously and as something that does not deserve reward. And through worship they are again and again reminded about the association of debt with sin.

Expecting thus an impact of Religiousness on debt-behavior is not exceptional. Indeed, in its core it seems to have been kind of a common knowledge before. For example, Barro (1999, p.1137) already mentions a causal relationship. Without providing further details or references, he mentions in a parenthetically manner that "religious principles are dedicated, in part, toward curbing lavish expenditures and excessive debt".

Yet, it is a priori ambiguous, whether the direction and the size of the effect should be

[1] The traditional version stems from King James' Bible, the modern version goes back to the English Language Liturgical Consultation (1988).

[2] Josephus (75) in this context give insights. He writes about the wars against the Jews at ca. 66 AD and reports that rebels burn the contracts belonging to their creditors to dissolve their obligations for paying their debts. He states that this was done in order to gain the multitude of those who had been debtors indicating that the group of indebted people had to be large.

[3] This is the case in: Exodus 22:25; Psalms 15:5, 54:12; Jeremiah 9.6; Nehemiah 5:11; Deuteronomy 23:19-20.

similar for different denominations. Indeed, literature provides ample evidence suggesting that in general differences between Catholics and Protestants are prevalent. This differences concern characteristics and behavior, like work ethic, trust, contributions to public goods, attitude toward private ownership and adherence to rules (Benjamin et al. 2010, Traunmüller 2010, Guiso et al. 2003, Arruñada 2010, Renneboog & Spaenjers 2012*a*).[4]

Could differences between Catholics and Protestants be also prevalent with respect to debt-behavior? In fact, Protestant writings and history reveal two positions that might be of influence also nowadays. One concerns strict enforcement of repayment, the other the rejection of the ban on usury.

Central to Martin Luther's conflict with the Catholic church were his critique on selling of indulgences along with his fervent campaigns against the practice of usury. However, after his uprise more radical reformers appeared, arguing that the poor were not morally obliged to repay the interest on usurious loans at all. This caused conflicts. According to Graeber (2011) Luther had to realize that matters were spilling out of control and hence had to react. So, on the one hand he called for strictness concerning repayment. This is illustrated in the sentence. "the world needs a strict, hard, temporal government that will compel and constrain the wicked [...] to return what they borrow, even though a Christian ought not to demand it, or even hope to get it back." (Luther 1524).[5] On the other hand, he declared that "a four to five-percent rate of interest is currently legal under certain circumstances" (Graeber 2011, p.322). According to the same source, these developments became more explicit and Calvin [another well-known protestant reformer] rejected the blanket ban on usury entirely. A position that was afterwards agreed upon by almost all protestant denominations. Thus, a reasonable rate of interest (usually five percent) was regarded as not sinful, if the lenders act in good conscience, do not make lending their exclusive business, and do not exploit the poor (Graeber 2011, p.322).

If Protestants nowadays are still aware of both positions, one would expect two things. First that their "Preconceived opinion" on debt is actually a more positive one compared to Catholics; a fact that would be potentially reflected in a less pronounced aversion on financial risk. Second, a possible stricter reporting and enforcement of missed repayments. Both would result in a higher ratio of over-indebted persons in Protestant areas.

3 Data

Germany is an ideal region for the topic under research. This holds true for at least six reasons. First, the laws on credit and bankruptcy are uniform across all German regions, hence issues that arise in the context of cross-country studies are not of concern. Second, Germany is the homeland of Martin Luther and hence of Protestantism. Third, Germany is a large country covering 80 million inhabitants where freedom of religion is granted

[4] Moreover, Becker & Woessmann (2009) indicate differences in literacy between Catholics and Protestants in Prussia around 1871. However, schooling nowadays is organized by the state, hence the churches role for literacy should be evanescent.

[5] Interestingly, Arruñada et al. (2004) documents that Protestants develop more reliable institutions for legal enforcement and are more willing to spend resources on monitoring and punishing other members of the community.

by constitution. Fourth, Protestants, Catholics and persons that are non affiliated to a religious society are of equal size. Fifth, due to the long tradition of credit reference agencies in Germany, the data on over-indebtedness is solidly founded and reliable.[6] Sixth, due to its rich religious history, Germany is home of many impressing churches, which can be made use of within an instrumental variable approach.

Ideally, we would like to have information on an individuals - externally defined - state of over-indebtedness and her/his religiosity. Yet, such data - if they exist - are not publicly available. The only source that provides data on religiosity on a personal level in Germany and of which we are aware of is SOEP. However, since they have no data on over-indebtedness their data is not used at this stage.[7] Instead we conduct our analysis at the most disaggregated level where both data on over-indebtedness and data on religiosity were available: the 402 German counties. This is in line with previous studies on economic effects of religiosity using either country or state data (Lipford et al. 1993, Grier 1997, Porta et al. 1997, Lipford & Tollison 2003, Acemoglu et al. 2005, Noland 2005, McCleary & Barro 2006, Kanniainen & Pääkkönen 2010) or county data (Hull & Bold 1995, Hull 2000, Boppart et al. 2008, Becker & Woessmann 2009, 2010, Adhikari & Agrawal 2014, Spenkuch & Tillmann 2015).

The following text passage elaborates on the content and shortly also on the background of the data. Descriptive statistics are presented in Table 1. More details on data are provided in Appendix A.1.

Over-Indebtedness The credit reference agency *Creditreform*, collects microdata on over-indebtedness of consumers. Following their definition, over-indebtedness is existent if a debtor is unable to settle the sum of all accounts due for payment in the foreseeable future and no private wealth or credit opportunity is available to cover his living (Verband der Vereine Creditreform e.V. 2014). To capture this definition quantitatively - according to them - at least one of the following three criteria has to be fulfilled to determine whether a person is over-indebted. First, the person has be named on the official list of debtors (amtliches Schuldnerverzeichnis). This list covers individuals that underlie a prison sentence, affirmation in lieu of oath (Eidesstattliche Versicherung) or whom are in private insolvency. Second, the person is indicted within an undisputed private collection case (unstrittiger Inkassofall). Third, sustained delinquencies (nachhaltige Zahlungsstörungen) of private individuals, defined as at least two vain dunning letters (vergebliche Mahnungen) are recorded. The microdata is private, however, within yearly reports the development along the counties is reported. Accordingly, the ratio of over-indebted persons relative to the population above 18 years is available for each county.

Religion Data on religious affiliation is taken from the nation-wide census that took place in 2011. Survey participants were asked: "'Are you member of one of the follow-

[6] The credit reference agency our data stem from was founded in 1871, the yearly publication of over-indebtedness per county go way back to 2006.

[7] We do provide our insights from the SOEP data in relation to private debt in section 7, where possible channels of the effect of religiosity on over-indebtedness are discussed.

ing public-law religious societies?" Among the options were 'Roman Catholic Church', 'Evangelical Church' and being 'No member of a church'.[8] To this end, three variables for measuring religiousness per county accrue: *share of Catholics*, *share of Protestants* and *share of non-religious*. The census was only conducted in 2011, hence no religion data on county-level for other years is available.

Controls:

Economic Situation. It is well-documented that *unemployment* is a major cause of becoming over-indebted. Besides that, we also included *real GDP per capita* to test to what degree economic wealth can explain over-indebtedness. Verband der Vereine Creditreform e.V. (2014) stresses that *divorced* people often run into debt problems, hence their ratio per county is added as a control.

Education. Lusardi & Tufano (2009), Campbell (2006) and Disney & Gathergood (2011) show that individuals that hold available skills attained by education, are better able to handle financial contracts. Accordingly, our regression set-up controls for the ratio of *highly qualified* within a county. To capture the other side of the skills distribution, *employees without an apprenticeship* have also been included.

Income distribution. It could be expected that the income distribution has a positive effect on over-indebtedness. Especially, a high number of *person with a low income* could lead to higher ratio of debt-troubled people per county. Hence the number of persons earning less than 400 Euro per month, the so-called mini-jobbers are included as an explanatory variable. The aforementioned *GDP per capita* and *highly qualified* constitute further variables covering this domain.

Demography: Verband der Vereine Creditreform e.V. (2011) state that the over-indebtedness among people of middle age and elderly people is declining whereas there is a tendency to more over-indebtedness among young people. The occurrence of demographic effects on household finance is also acknowledged by Campbell (2006). Thus we included *average age* as an explanatory variable.

Sex. Studies like Verband der Vereine Creditreform e.V. (2014) report that women have a lower likelihood than men to become over-indebted, therefore *women ratio* is included in the regression.

Economic structure. It is reasonable to argue that the economic structure of a region influences its persons debt behavior. *Self-employed* persons are more inclined to take up a credit, e.g. to finance an investment. Even though the firm constitutes an own entity, and the underlying data only concerns the debt situation of individuals, it might well be that persons whose firms have run into financial problems, are influenced also privately. To take account of the performance of self-employed we hence also added *firm insolvency ratios*.

[8] Since no Muslim public-law religious society was registered at that time, people of Muslim religion are included in the 'No member' category. To minimize the possibility that the 'No member' data is thus measured biased, we used the additional available information that reveals the share of the 'No member' which have an Turkish immigration background. Moreover, from von Wilamowitz-Moellendorff (2001) the ratio of Muslim to Atheists among Turkish immigrants is known. Based on this, we subtracted from the 'No member' data for each county the share of people with Turkish migration background being assumed to having a Muslim religion.

Keeping up with the Jones: As emphasized by Gali (1994) the situation of related persons influences ones own consumption behavior. Therefore peer effects can provoke incentives to consume more or more expansive products to keep up with persons close to oneself. The more urban an area the more consumption possibilities exist. Moreover, the more dense people live, the more opportunities to watch people with differing consumption behavior and living styles are created. The latter in turn can induce a stronger will to consume a wider spectrum or higher quality of products. Our regression model thus incorporates urbanization-dummies identifying whether the area is a *major city*, an *urban county*, a *rural county with agglomerations* or *only sparsely populated*.

Regional politics. Regional politics might be an important factor as well. This might concern economic policies as well as educational policies. Moreover, historical events, like the former division into East and West might have still an effect both on religion and on consumption behavior. Therefore *fixed effects* for all 16 *Bundesländer* are factored in.

Market power of regional credit suppliers. Over-Indebtedness could also be driven by credit supply. As argued by Keeley (1990) strong competition could cause bank charter values to decline triggering an increase in assets and hence credit supply. We hence included a *Lerner-Index* for German counties as computed by Koetter (2013). This index captures banking competition; the lower its number, the weaker is the market power of banks within the county.

Variable	Mean	St.D.	Min.	Max.	N
Over-indebted persons rel. to population (%)	9.02	2.48	3.81	18.06	402
Catholics rel. to population (%)	33.33	24.85	1.92	88.74	402
Protestants rel. to population (%)	31.73	17.51	4.55	75.88	402
Non-Religious rel. to population (%)	30.65	22.5	4.38	85.21	402
Unemployment rate (%)	6.39	3.13	1.2	16.4	402
Real GDP per capita in ten thousand euro	2.25	0.92	1.08	8.14	402
Divorced rel. to population (%)	6.89	1.2	3.8	10.4	402
Self-employed rel. to population (%)	11.78	2.74	3.8	20.1	402
Firm insolvencies rel. to all firms	3.94	2.19	0	13.45	402
High- qualified workers per 1000 inhabitants of work. age	4.71	3.67	0.70	32	402
Mini-jobbers per 1000 inhabitants of work. age	91.14	24.67	43.7	223	402
Workers without apprenticeship per 100 inhabitants of work. age (%)	7.18	3.27	2.3	25.5	402
Bank market power	0.48	0.09	0	0.85	402
Public debt per capita in thousand euro	9.69	4.38	2.2	28.64	402
Average age	41.52	1.69	36.91	46.88	402
Women rel. to population (%)	50.82	0.68	49.2	53.3	402

Table 1: Descriptive statistics of the dependent and explanatory variables.

4 Correlation Analysis

To get first insights whether there is a correlation between religion and over-indebtedness, we run first a simple OLS-regression of shares of religious people in county population on the counties' share of over-indebted people. Afterward its relations are analyzed in an advanced correlation set-up that incorporates the controls described above:

$$\begin{aligned} Over\text{-}Indebtedness_k = c &+ \beta_1 Religiousness_k \\ &+ \beta_2 EconomicControls_k + \beta_3 EducationalControls_k \\ &+ \beta_4 DemographicControls_k + \beta_5 RegionalControls_k + \epsilon_k \end{aligned} \tag{1}$$

Regarding religion we again distinguish the three groups: Catholics, Protestants and Non-Religious. Table 2 shows the results. The simple correlation analysis shows highly significant effects for all three groups.The direction of all three are in line with our deliberations above. The more Catholics within an area the smaller is over-indebtedness. The share of Non-Religious, in turn, impacts over-indebtedness positively. Protestants disclose also a positive effect, which is even higher than the effect of Non-Religious. The incorporation of other explaining factors leads to some changes. Importantly, the directions of the effect for Catholic and Protestants remains the same. Yet, its size reduces to a sixth and a third respectively. Moreover, its significance is now given at the 5%-level. For Non-Religious no statistically significant relation can be detected. The directions of the effects of the controls reflect the considerations before. The more unemployed, divorced, self-employed persons per county, the higher the over-indebtedness. The ratio of high-qualified, the average age and the degree of how rural an area is, in turn, have a minimizing impact. The effect of low-income persons, women ratio, bank market power and public debt, however, turn out insignificant. Concerning goodness-of-fit, the advanced correlations can be regarded as satisfying, as they explain 88% of the cross-county variation of over-indebtedness.

To evaluate the economic significance in more detail, the coefficients concerning religion are analyzed in terms of the variables' standard deviation.[9] For Catholics the following can be stated. If the ratio of Catholics in a county raises by 24.9 %-Points (i.e. one standard deviation) than the ratio of Over-Indebted decreases by 7.5 basis points; this reflects 3 % of the standard deviation of over-indebtedness, which is 2.5 %-Points. For Protestants the numbers are 6.2 basis points and 2.5%, respectively.

[9] Table 6 in Appendix B.1 provides the results for the other coefficients.

	Cath.	Prot.	Non-Rel.	Cath.	Prot.	Non-Rel.
Religion:	-0.042***	0.033***	0.024***	-0.007**	0.009**	-0.014
	(0.004)	(0.006)	(0.004)	(0.004)	(0.004)	(0.010)
Unemployment				0.310***	0.313***	0.310***
				(0.047)	(0.047)	(0.047)
Real GDP p.C.				0.028**	0.029**	0.024*
				(0.014)	(0.014)	(0.014)
Divorced				0.876***	0.913***	0.968***
				(0.091)	(0.086)	(0.101)
Self-employed				0.092**	0.093***	0.084**
				(0.036)	(0.035)	(0.036)
Insolvencies				0.307***	0.305***	0.301***
				(0.053)	(0.053)	(0.054)
High qualified				-0.175***	-0.172***	-0.159***
				(0.033)	(0.032)	(0.033)
Low-income empl.				0.002	0.002	-0.001
				(0.005)	(0.005)	(0.004)
Empl. w/o apprenticeship				0.133***	0.129***	0.131***
				(0.035)	(0.035)	(0.036)
Average age				-0.298***	-0.309***	-0.289***
				(0.064)	(0.064)	(0.064)
Women ratio				-0.132	-0.139	-0.120
				(0.139)	(0.139)	(0.139)
Bank market power				0.236	0.261	0.168
				(0.668)	(0.664)	(0.656)
Public debt p.C.				0.069	0.068	0.071
				(0.071)	(0.071)	(0.071)
Urban county(D)				-0.763***	-0.767***	-0.735***
				(0.235)	(0.234)	(0.235)
Rural c. with aggl.(D)				-0.749***	-0.782***	-0.747***
				(0.266)	(0.265)	(0.261)
Sparsely pop(D)				-0.778***	-0.822***	-0.784***
				(0.281)	(0.280)	(0.274)
Bundesland FE				yes	yes	yes
Constant	10.418***	7.986***	8.326***	16.781***	16.746***	15.918***
	(0.180)	(0.233)	(0.183)	(6.002)	(5.979)	(6.104)
Observations	402	402	402	402	402	402
R^2	0.18	0.05	0.05	0.88	0.88	0.88

*,**,*** indicate significance at the 10%-, 5%- and 1%-level, respectively. Standard errors are based on the Huber-White sandwich estimator.

Table 2: Ordinary Least Square regressions for Catholics, Protestants and Non-Religious.

5 Instrumental Variable Regressions

The above mentioned results have to be dealt with cautiously, as there are threats to internal validity. These are of two kinds. First, there might be a simultaneous causality bias. Accordingly, not only would religiousness influence over-indebtedness - as argued above -, but being over-indebted would impact on an individuals choice of religious affiliation. Reasons for the latter might be a financially struggling individual's will to save church taxes or - in extreme case - his process of turning apostate. As being over-indebted can come along with a situation of many and very severe complex problems causing stress and frustration, the latter can not be excluded.[10] Second, an omitted variable bias might be present. In fact, both the decision not to join a religious affiliation and the situation of being over-indebted might be caused by unability (or unwillingness) to adjust to rules, be they formal or informal. The latter would constitute a factor that should be expected to be correlated with religiousness. However, it is unobserved and difficult to measure.[11]

To account for the endogeneity problem and eliminate the resulting bias, an instrument variable approach is applied. To qualify as valid, the instruments are expected to fulfill two conditions: instrument relevance and instrument exogeneity. Accordingly, we aim to use variables that both have explaining power for the share of religious affiliated persons across German counties in the year 2011 and are not influenced by over-indebtedness of the same year. We use two instruments, one that derives from history and one that makes use of geographical conditions.

The first instrument is *religion of a territorial lord in 1624*. It has been originally introduced by Spenkuch (2011).[12] The background is as following. The start of Reformation by Luther in 1517, led to increasing conflicts between the territorial lords, their inhabitants and amongst both groups. Therefore in 1555 an Imperial Diet in Augsburg was organized that led to the Peace of Augsburg. Concerning religion, two resolutions were crucial: the *ius reformandi* and the *ius emigrandi*. The first one established the principle "Cuius regio, eius religio" stating that the religion of territorial lord is the official religion in his state and hence of all its inhabitants. The second resolution gave each inhabitant who had a diverging religion to his lord, the right to emigrate. As a consequence of this agreement, the unity of religion within individual states was strengthened, while at the same time a religious fragmentation of the German Lands took place (Spenkuch 2011). Yet, the Thirty Years' War (1618-1648) led to area conquests and losses and hence to shifts of borders. To establish stability and a new status quo the Peace of Westphalia was signed in 1648. Concerning religion an agreement was taken that defined Catholic

[10] A further argument for reverse causality can be made from a macroeconomic perspective. According to the theory of secularization, the importance of religion decreases with economic development (i.a. Höhener & Schaltegger 2012). Hence, under the assumption tat economic development is correlated to financial intermediation, areas with higher credit interactions would exhibit looser religious affiliations.

[11] A further, and hence third, threat to internal validity might exist: error-in-measurement. In general the data for religiousness are regarded of good quality, yet they are based on surveys and projections thereof. It might be that religious persons have a diverging probability to be asked, if they stay at home more or less often. it might also be that affiliates of specific persuasions are less keen to answer questions about religiosity. Therefor religious affiliation might be measured with error.

[12] It has also been applied by Spenkuch & Tillmann (2015) .

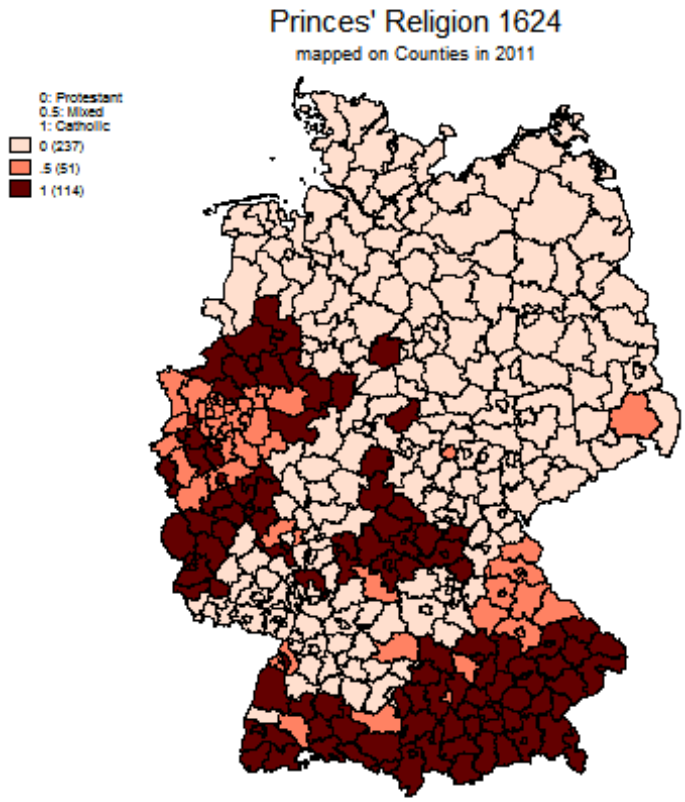


Figure 1: Religion of a territorial lord in 1624

This figure shows the religion of the territorial lord in 1624 mapped on the 402 existing counties in 2011. In 1624 more than a thousand independent territories were in existence. Accordingly, counties that are composed of territories of nonuniform religiousness are classified as mixed. For further details the interested reader is referred to Spenkuch (2011).

and Protestant territorial according to the situation that has prevailed in 1624. A geographical overview of the situation around that time is given in figure 1. It depicts the religion of territorial lord in 1624 mapped on German counties of the year 2011. Counties are either classified as Catholic, Protestant or - if composed of former territories of nonuniform religiousness - as mixed.

According to Cantoni (2014) the decades afterwards experienced no denominational changes for the vast majority of the territories, hence the status of religion of a territorial lord was mainly not prone to further changes. Thus, reflecting the fact that religion is often "inherited" from parents, it is reasonable to expect that religion of a territorial lord in 1624 still influences the current share of Protestants and Catholics across German counties. This would classify the instrument as potentially relevant. Concerning the exogeneity of the instrument, again Cantoni (2014) provides insights. He shows that neither commercial activity nor wealth or strength of a territory - factors that would be candidates for omitted variables - predict whether a territory adopted the Reformation.

However, within our research context the instrument has one potential shortcoming. It has only three parameter values (Catholic, Protestant, mixed) whereas the share of religious people of the different persuasions is a continuous variable ranging from low to very high percentage numbers. Therefore are second instrument is applied, one that has a wider range of parameter values.[13]

This instrument is distance to important churches. Its choice reflects and combines ideas of Becker & Woessmann (2009) and Falck et al. (2011). Becker & Woessmann (2009) used the distance to Wittenberg as an instrument for Protestantism in nineteenth-century Prussia. They argue that the Reformation dispersed concentrically around the place where Luther proclaimed his 95 Theses. As main reasons for a circular dispersion around the religious center they name the costs of traveling and of information diffusion through space. Accordingly, "there is a tendency for the impact to diminish with distance"(Becker & Woessmann 2009, p.557) and "the propensity to come to Wittenberg to listen to Luther and his successors likely declined with distance to Wittenberg" (p.558). Yet, political developments in the following centuries, especially the division of Germany after World War II, led to a hindered accessibility and declined importance of the place Wittenberg for spreading Protestantism.[14] Yet, there are other "religious centers" that play an outstanding role for the dispersion of belief: these are churches. Churches are the place where believing persons meet. It is the place where Priest give their sermons and thus the central place for worshiping. As a matter of fact, each municipality is home to a church. However, their relative importance varies, depending on the historical past of the church, the dimensions of the parish and the quality of its leaders. Thus amongst all churches, there are some that have gained special attention. Attention in terms of attendances in worship service, of size and/or delegated clerical staff. It should be expected that these important churches have played an outstanding, i.e. a crucial and persistent role when it comes to spreading and renewing belief. Indeed, the importance might be valid both spiritually as administratively.

As characters to determine whether a church qualifies as important, we apply four criteria. These criteria are not exclusive, indeed some churches fulfill more than one criteria. To this end a church is characterized as important if it is named *Dom* or *Müster* or if it is a *cathedral* or a *bishop sermon church*. Applying these criteria yields a list of 110 Catholic churches and 89 Protestant churches (see appendix C). Figure 2 maps the municipalities that are home to such an important church.

Following the argumentation of Becker & Woessmann (2009), we argue that there is a tendency for the impact to diminish with geographical distance. Accordingly, areas for which the distance to an important church is high should experience a lower share of persons being affiliated to the corresponding persuasion. Concerning the computation of the distances, I follow Falck et al. (2011), who were interested on each German counties distance to the nearest opera house.[15] Following their procedure, three steps

[13] A further advantage of using a second instrument is that it allows for tests of overidentifying restrictions (Stock & Watson 2012).

[14] This is reflected in the fact, that the county Wittenberg - with a share of Protestants of 19.3 % - took only rank 274 of all 402 German counties in 2011.

[15] Bauer et al. (2015) point out weaknesses in their regression set-up, however, acknowledge geographical distance as a valid instrument.

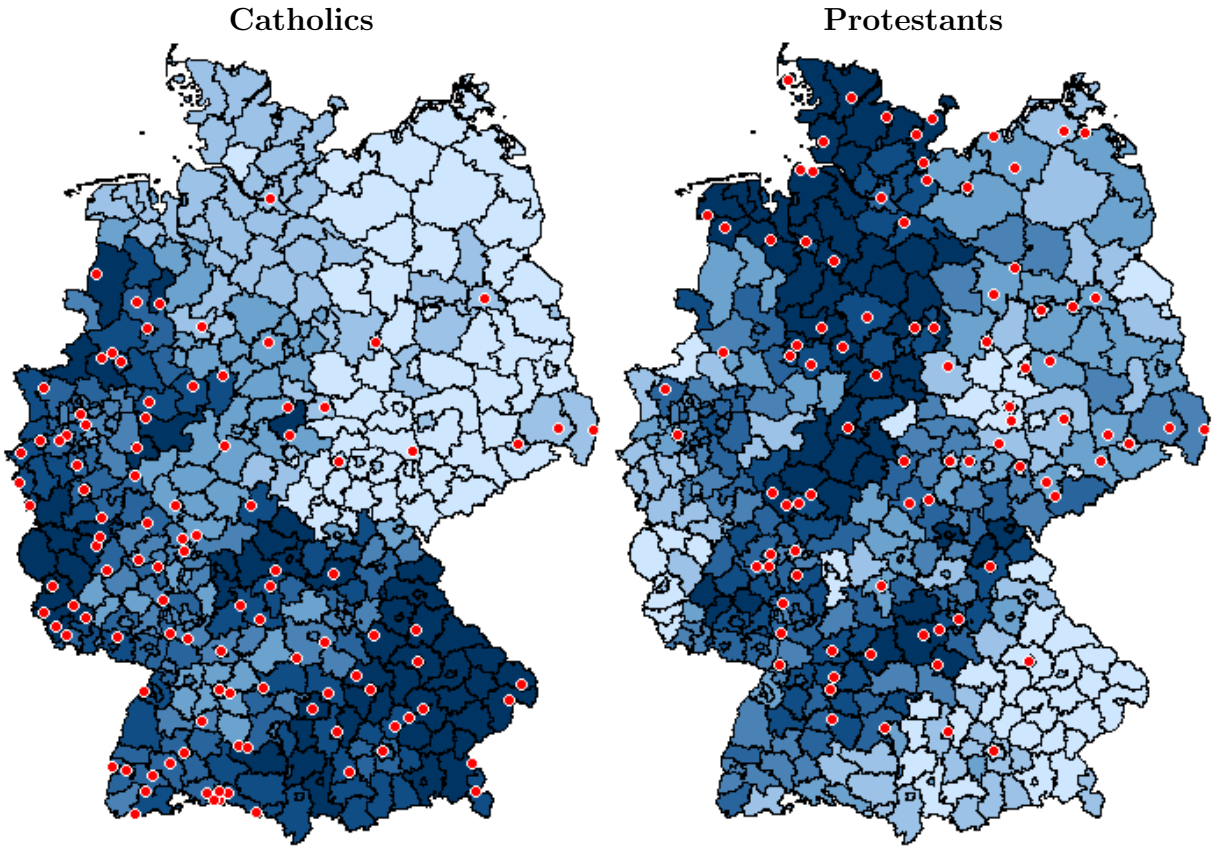
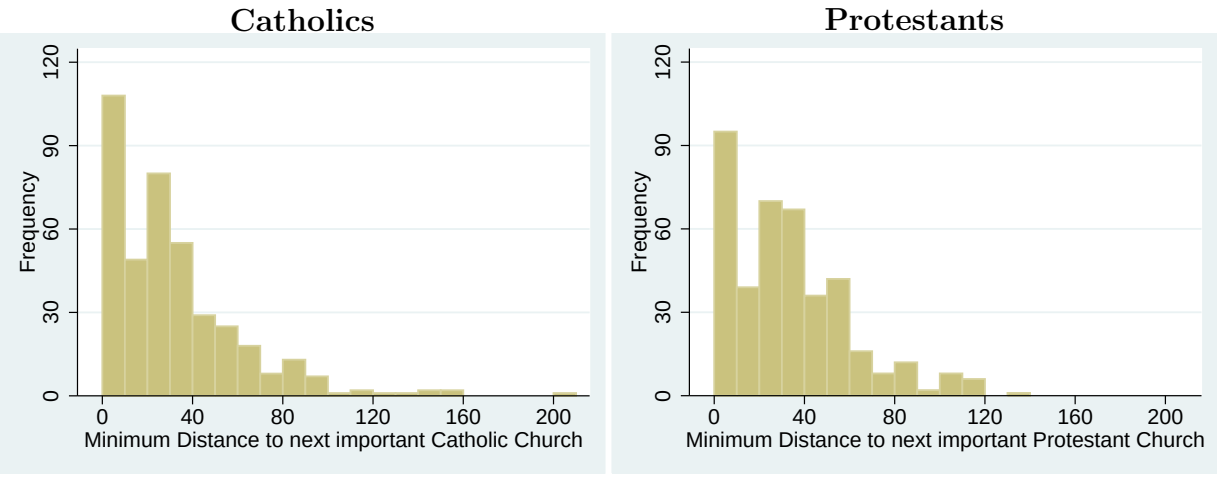


Figure 2: Important Churches

This figure maps the municipalities that are home to an important church within the German counties. For Catholics there are 110 important churches in 105 municipalities in 95 counties. For Protestants 89 important churches in 83 municipalities in 77 counties have been identified. The shading reflects the share of persons belonging to the respective persuasion. The darker the shading, the higher is the population with a Catholic or Protestant affiliation.

are required. First, by using data of latitude and longitude each county's centroid is determined. Afterwards the distance in kilometers to the next important church can be derived. Finally, the distance of counties that are home to an important church is defined as zero. Statistics of the computation are presented in Table 3.



Mean	St.D.	Min.	Max.	N
30.72	29.98	0	202.14	402

Mean	St.D.	Min.	Max.	N
32.85	27.81	0	139.13	402

Table 3: Distance to Important Churches

Applying a measurement procedure for geographical distances similar to Falck et al. (2011), the distance of each of the 402 counties' centroid to the nearest important church (*Dom*, *Müster*, *cathedral*, *bishop sermon church*) is computed.

Summing up, both instruments - the religion of a territorial lord in 1624 and the geographical distance to the next important church - should be expected to generate sufficient exogenous variation that allows the identification of each county's share of people that belong either to the Catholic or the Protestant persuasion. Accordingly, taking account of the endogeneity problem, the following new regression set-up arises:

$$\begin{aligned} Over\text{-}Indebtedness_k = c &+ \beta_1 \widehat{Religiousness}_k \\ &+ \beta_2 EconomicControls_k + \beta_3 EducationalControls_k \\ &+ \beta_4 DemographicControls_k + \beta_5 RegionalControls_k + \epsilon_k \end{aligned} \tag{2}$$

$$\begin{aligned} \widehat{Religiousness}_k = \gamma_1 &Lords'\ religious\ affiliation\ in\ 1624_k \\ &+ \gamma_2 Distance\ to\ important\ church_k \\ &+ \gamma_3 OtherControls_k \end{aligned} \tag{3}$$

The corresponding results are presented in Table 4. It can be seen that the effect of religion on over-indebtedness is present also when endogeneity is taken into account. Concerning the goodness-of-fit the regressions are able to explain 87% of the cross-county variation in over-indebtedness. The instruments turn out relevant and exogenous for both Christian denominations. If current inhabitant's regional lord in 1624 has been Catholic (Protestant) a county's share of Catholics (Protestants) nowadays is 21% (18 %) higher.

And for each kilometer a county's distance to the next important Catholic or Protestant church increases, the share of the corresponding religion's followers drops by 11 and 8 basis points respectively. The F-statistic of the first stage regression is far above ten, affirming that the instruments are not weak.[16] The test of underidentification examines whether the excluded instruments are correlated with the endogenous regressors. As the corresponding p-values are far below the standard significant levels, the Null hypothesis of the equation being underidentified, is rejected. Furthermore, Hansen's J-statistic reports p-values bigger than 0.10, hence the null hypothesis that the instruments are valid, i.e. uncorrelated with the error term, cannot be rejected.

The control variables reveal again the expected sign of directions. Unemployment, being divorced and self-employment raises over-indebtedness. The same holds true for the ratio of employees without an apprenticeship and the ratio of insolvencies among firms in a county. Age, a higher number of high qualified workers and the inverse degree of urbanization, in turn, dampens over-indebtedness. Public debt, regional banking competition, and the ratio of women prove to be insignificant. The share of Catholics has a negative effect on the probability of becoming over-indebted of significance at the 0.06 p-value. The positive effect of Protestantism, in turn, has to be regarded as borderline concerning its statistical significance as its p-value is 0.112.

The search for instruments was targeted on the counties' share of people being affiliated religiously. However, it could be deliberated whether counties' share of non-religious persons might also be instrumented with the presented candidates. For example, it might be thought of that counties with a higher distance to an important church have a higher number of non-religious persons. Yet, the regression results show that this is not the case: the instruments are of no statistical significance. In this context, it probably has to be taken into account, that among non-religious there are not only persons that were raised nonreligious but also those that took an active decision to leave church. The decisions might have been triggered by a strong religious education or by negative experiences. Hence , the effect might go in both directions and cancel each other out. Therefore, the subdued explaining power of distance might also experience a rationale from a theoretical perspective.

[16] cfr. Stock & Watson (2012, p.481)

2nd stage	Cath.	Prot.	Non-Rel.
Religion:	-0.011*	0.010	0.019
	(0.006)	(0.006)	(0.082)
Unemployment	0.310***	0.313***	0.306***
	(0.045)	(0.045)	(0.047)
Real GDP p.C.	0.029**	0.029**	0.024*
	(0.013)	(0.014)	(0.013)
Divorced	0.861***	0.914***	0.821**
	(0.090)	(0.083)	(0.369)
Self-employed	0.096***	0.095***	0.083**
	(0.035)	(0.035)	(0.034)
Insolvencies	0.307***	0.304***	0.317***
	(0.050)	(0.050)	(0.070)
High qualified	-0.179***	-0.172***	-0.181***
	(0.032)	(0.031)	(0.066)
Low-income empl.	0.004	0.002	0.002
	(0.005)	(0.005)	(0.008)
Empl. w/o apprenticeship	0.130***	0.128***	0.150***
	(0.034)	(0.034)	(0.058)
Average age	-0.306***	-0.313***	-0.272***
	(0.064)	(0.064)	(0.073)
Women ratio	-0.139	-0.142	-0.110
	(0.132)	(0.133)	(0.105)
Bank market power	0.284	0.280	0.070
	(0.644)	(0.635)	(0.695)
Public debt p.C.	0.068	0.067	0.071
	(0.068)	(0.068)	(0.068)
Urban county(D)	-0.769***	-0.770***	-0.768***
	(0.228)	(0.227)	(0.250)
Rural c. with aggl.(D)	-0.755***	-0.789***	-0.718***
	(0.258)	(0.260)	(0.255)
Sparsely pop(D)	-0.787***	-0.833***	-0.711**
	(0.273)	(0.277)	(0.302)
Bundesland FE	yes	yes	yes
Observations	402	402	402
R^2	0.87	0.87	0.87
F-stat (1st stage)	123.70	49.39	454.12
Hansen J-Stat p-val.	0.423	0.819	0.206
Underindent. p-val.	0.000	0.000	0.032
Religion 1624 Cath.	20.988***		
Religion 1624 Prot.		17.873***	0.765
Min. Distance Cath.	-0.105***		-0.018
Min. Distance Prot.		-0.084***	-0.017

Table 4: Instrumental Variable regressions for Catholics, Protestants and Non-Religious.

6 Robustness

This section analyzes the robustness of the above mentioned results. To do so, we provide another dependent variable. More precisely, we use a measure established by a competitor of the credit reference agency our original data stem from. The credit reference agency *Schufa* provides a private indebtedness index (PVI, SCHUFA Holding 2013).[17] The PVI distinguishes itself from the data of the share of over-indebted along the following lines. First, it explicitly includes information on both indebtedness and over-indebtedness. Second, according to its description, a - not further specified - weighting procedure on the information per person they hold available is applied. Third, the index is defined in points, which in the year 2011 have ranged from 528 to 2187. However, even though both measures differ in some aspects, the data sources and the topic covered are similar. This is reflected in the observed correlation of 0.89. Based on these facts, it can be concluded that PVI qualifies as a further dependent variable to give insights in our research question.

Table 5 presents the corresponding Instrumental Variable regressions. The results are similar to those presented for the share of over-indebted. Catholicism has a statistically significant negative effect on the PVI (p-value: 0.04). The effect of Protestantism, however, is again positive and also again statistically marginally insignificant at the 10%-level (p-value: 0.12). The main differences to the regressions before is the now given significance of the negative effect of women and the now given insignificance of the dummy whether a county is sparsely populated and the variable on self-employment.

The first might be explained by the unknown underlying weighting scheme applied by the credit reference agency. Women are known to run into problem of debt less often, hence the agency's model might consider the women ratio per county in a more explicit manner. The second and third so far lacks further explanations.

Noticeable are furthermore the test statistics of the instrumental variables procedure. In general, they are of strong similarity to the regressions before. However, the p-value of the Hansen J-statistic is now 0.064 and hence below at least the 10% significance level, bringing the instruments closer to a 'weak instrument'-range. Moreover, the distance to the next protestant church is now of significance at the 10% significance level.

[17] The index has been developed in the year 2006 and is since then published on a yearly basis.

	Cath.	Prot.	Non-Rel.
Religion:	-1.54**	1.19	-4.77
	(0.74)	(0.77)	(8.34)
Unemployment	30.42***	30.81***	30.78***
	(4.93)	(4.89)	(4.83)
Real GDP p.C.	1.24	1.15	0.65
	(1.50)	(1.53)	(1.44)
Divorced	77.61***	84.88***	104.98***
	(10.95)	(10.03)	(36.56)
Self-employed	1.23	0.98	0.37
	(4.27)	(4.25)	(4.22)
Insolvencies	48.18***	47.93***	45.98***
	(6.49)	(6.42)	(7.64)
High qualified	-26.83***	-25.76***	-21.98***
	(4.22)	(4.09)	(7.18)
Low-income empl.	1.02*	0.79	0.17
	(0.59)	(0.52)	(0.79)
Empl. w/o apprenticeship	23.31***	23.37***	22.19***
	(4.33)	(4.31)	(6.11)
Average age	-17.22**	-17.49**	-16.05**
	(6.82)	(6.88)	(7.02)
Women ratio	-45.24***	-45.18***	-43.62***
	(11.61)	(11.48)	(10.74)
Bank market power	35.72	31.79	26.00
	(84.63)	(82.62)	(81.59)
Public debt p.C.	6.59	6.53	6.82
	(6.30)	(6.22)	(6.10)
Urban county(D)	-77.60***	-77.22***	-70.48***
	(24.54)	(24.11)	(24.47)
Rural c. with aggl.(D)	-58.59**	-62.24**	-60.78**
	(29.27)	(28.78)	(29.22)
Sparsely pop(D)	-29.87	-34.71	-36.31
	(30.54)	(30.43)	(34.94)
Bundesland FE	yes	yes	yes
Observations	402	402	402
R^2	0.85	0.86	0.86
F-stat	122.98	49.42	454.12
Hansen J-Stat p-val.	0.064	0.657	0.045
Underindent. p-val.	0.000	0.000	0.026
Religion 1624 Cath.	21.052***		
Religion 1624 Prot.		17.950***	0.772
Min. Distance Cath.	-0.107***		-0.018
Min. Distance Prot.		-0.084***	-0.017*

*,**,*** indicate significance at the 10%-, 5%- and 1%-level, respectively.

Table 5: Instrumental Variable regressions with the *Schufa*-Private Indebtedness Index.

7 Discussion

In this section we look a the topic again under two different perspectives. First, we have a closer look at potential 'religious subchannels' that influence debt behavior and which might give explanations for the divergent effect of Catholics and Protestants. Second, we examine how our argumentation, that stresses the importance of attitudes towards debt, is in line with existing literature on economic effects of religion.

Subchannels of debt behavior A closer look at the 'subchannels' of debt behavior might be able to yield further insights on the divergent effects for Catholics and Protestants. As presented in Figure 3 four 'subchannels' can be thought of, which might determine the effect of attitudes towards debt on the final outcome of over-indebtedness. First of all it could be expected that persons who have a higher awareness of the risks of

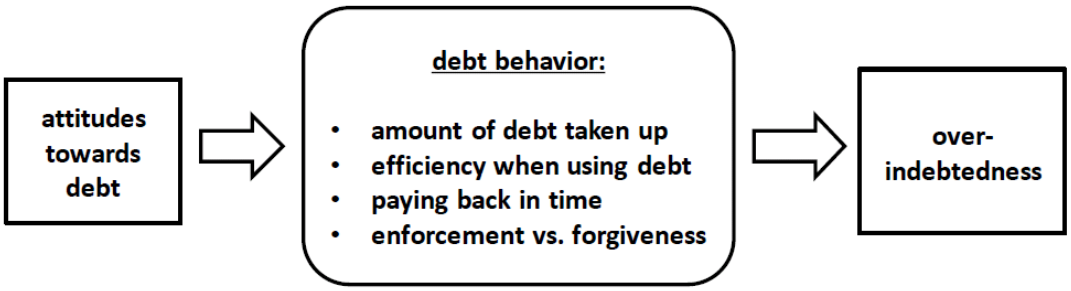


Figure 3: 'Subchannels' of the effect of attitudes towards debt on over-indebtedness

debt *take up less debt* a priori. Interestingly, this is a question that can be examined more detailed using microdata. In a similar time period to the one we examined, the German Socio-Economic Panel study (SOEP) in 2012 includes a a question on the size of personal debt.[18] They ask: "Disregarding mortgages and building loans: Do you currently have debt from credits you took up personally at a bank or from a private person and for which you are liable as a principal? i) Yes/No ii) If yes, what is the size of the residual debt?". Since in the SOEP of 2011 there is a question on "Do you belong to a church or religious group? If yes which one . . . ?", we can filter persons who answered both questions. This allows out to examine whether Protestants, based on their presumed more positive attitude towards debt take up more debt than Catholics or non-Religious.

A first analysis, based on 15000 observations, shows that this is not the case: Whereas among non-religious 20.3% have residual debts, for Protestants the number is in fact less, namely 14.7%, but this is only slightly above Catholics for whom the ratio is 13.4%. A similar picture emerges concerning the amount of debt outstanding. Non-Religious rank first, as they exhibit residual debt of average 16986 euro. Yet, for Protestants the number is 13252 euro and hence actually less than the average 16185 euro among Catholics.

Yet, not necessarily a close relation between the amount of debt taken up and the situation of being over-indebted exist. The important point is whether the credit is used

[18] For more information on the SOEP see i.a. Wagner et al. (2007).

in a favorable way, i.e. without ending in insolvency. It might well be that a higher awareness of the risks of debt does not primarily influence the decision to take up debt, but, more important, for which projects the credit is used for. Accordingly, it might be possible that the *efficiency when using debt* varies across religious persuasion.

The last 'subchannels' concern the importance attached to *pay back in time* at the debtor's side and, related to it, the *rigidity of enforcement* on the creditor's side. As stated in section 2, Martin Luther called for strictness concerning repayment, declaring that "the world needs a strict, hard, temporal government that will compel and constrain the wicked [...] to return what they borrow, even though a Christian ought not to demand it, or even hope to get it back." (Luther 1524). Arruñada et al. (2004) add to this in an important way. They argue that Protestantism favors values and types of moral and legal enforcement [...] while Catholic theology and practice facilitate personal transactions. Applying survey data, he is able to show that Protestants indeed develop more reliable institutions for legal enforcement and are more willing to spend resources on monitoring and punishing other members of the community. A similar argument is made by Blum & Dudley (2001). They emphasize that historically the cost of defection in any contractual relationship for Catholics remained low, since pardon could always be obtained with the intervention of a priest. For Protestant, however, the hedonic cost of defection was high.[19]

Summing up on the 'subchannels' of debt behavior's influence on over-indebtedness, it could be seen that further evidence exists that is able to rationalize a role of debt preferences induced by religious beliefs. It was further seen that the size of the debt taken up is of minor importance when it comes to explaining the differences of over-indebtedness among Catholics and Protestants.

Attitudes towards debt in relation to existing literature How are the deliberations and results presented in section 2 related to existing literature on the impact of religion on behavior? More precisely, can our our argument of a *'preconceived opinion' on debt* shaping specific *attitudes towards debt* be brought in line with existing explanations of the effect of religion in economics?

Guiso et al. (2003) stress the importance of *moral constraints* that are caused by religion. In this context *attitudes towards debt* can easily be understood as being exactly such a moral constraint. One that is binding especially for Catholicism. However, it must be regarded as an open question whether Protestants have a relaxed moral constraint concerning their handling of debt, or whether the effect goes rather by being morally constrained in terms enforcing a regular repayment. Both would provide a rationale for more over-indebted individuals in areas that are home to more Protestants.

Guiso et al. (2013) emphasize *peer-group effects* in the context of a decision whether to default on a mortgage or not. They find evidence that the social stigma associated with an action considered immoral decreases with the number of people doing it. Such an effect

[19] Without providing further details, Kanniainen & Pääkkönen (2010), examining tax morale, stress that "in the southern catholic countries, religion has a built-in forgiveness tradition." This refelcts the common knowledge character of forgiveness versus enforcement culture comparing Catholics and Protestants.

might well be prevalent in our data. If debt is a sin for Catholics it would be expected that the more Catholics live in an area, the higher is the social stigma of a personal confession to not being able to repay. Hence we would expect less people being over-indebted in 'strong catholic' areas and this is exactly what has been revealed in the regressions above. For the Protestants in turn the stigma might be towards promoting strict repayments. Such a group effect would call for a stronger reporting of people missing payments and hence a higher share of over-indebted persons in 'strong Protestant' areas. The partially significance in the results above indicates that such processes might be indeed prevalent to some degree.

Risk-aversion is named as the factor translating religion in economic behavior i.a. by Barsky et al. (1997) and Leon & Pfeifer (2013). It can easily be thought of that *attitudes towards debt* caused by religious convictions are also captured in a broader context by degree of risk-aversion. Hence an argumentation along risk-aversion can be in line with our argumentation.

The research by Renneboog & Spaenjers (2012*b*) indicates that both Catholic and Protestant households have about three percentage point higher probabilities to have saved than nonreligious ones. A clear-cut relation between a *higher propensity to save* and a lower probability to be over-indebted, then, would raise the expectation that both Catholics and Protestants are less over-indebted that non-religious. Our results, however, do not prove this. Yet, whether this findings are hence driven by different country data - Netherlands versus Germany - or simply a clear-cut relation has not to be expected a priori will have to be examined in future research.

Moreover, there is evidence that emphasize the effect of religion onto *risk-aversion of the 'suppliers'*. In this context Grullon et al. (2009) look at the behavior of firms in religious areas. They find that these firms are less likely to practice aggressive earnings management and the size of its managers' compensation packages to be smaller. In addition, Adhikari & Agrawal (2014) disclose that banks headquartered in more religious areas take less risk and remain less vulnerable to financial crises. Indeed, our regression results show that banking competition in a county has no effect on over-indebtedness. Yet, it might still be that credit suppliers in religious areas behave in a way that influences the probability of local over-indebtedness. In our context, such an effect might in theory again be motivated by varying *'preconceived opinion' on debt* among Catholic or Protestant 'dominated' credit suppliers.

8 Conclusion

Over-indebtedness of individuals has so far been attributed to factors like unemployment, low education, financial illiteracy or age. In this paper we have accentuated an additional determining factor: attitudes towards debt formed by religious beliefs. Written records in Christian theology make aware of the important status that debt already had two thousand years ago. Indeed, not different to nowadays, arguments between creditors and debtors occurred regularly. The question of debt was on the agenda of the political and everyday life. Thus not surprisingly, a closer look at the written records reveals a close association of debt with guilt and sin in Christianity. Since religious educated people are aware of sin and guilt as something that one has to deal with cautiously and

as something that does not deserve reward, a negative "'preconceived opinion" on debt should be expected among Christians.

However, religious history since the year year zero has also experienced different paths and opinions. The Reformation brought the evolution of Protestantism. There is also evidence that opinions on finance varied between Catholics and Protestants. Martin Luther called for strictness concerning repayment. Also the blanket ban on usury was rejected by later reformers whereas it experienced a long tradition in the Catholic church. Two things follow. First Protestants "preconceived opinion" on debt might actually be a more positive one compared to Catholics. Second, a possible stricter reporting and enforcement of missed repayments among Protestants might be prevalent. Both would result in a higher ratio of over-indebted persons in Protestant compared to Catholic areas.

This paper hence has examined the effect of religious denomination on over- indebtedness. To do so, county-level data for Germany from credit reference agencies is applied. To approach endogeneity, we pursue an instrumental variable approach: The distance to important churches (Cathedrals, Dome, Münster) and historical events are used as instruments for a counties' percentage of Catholics and Protestants.

We find that more widespread Catholicism in an area leads to a lower share of over-indebted persons. The positive effect of Protestantism on over-indebtedness, however, gets marginally insignificant once endogeneity is taken into account. These results stay robust in further regressions in which data from another credit reference agency is made use of. In our paper we have explained how this results are in line with both religious writings and literature on attitudes of Catholics and Protestants. Furthermore, the discussion highlights 'subchannels' of the debt behavior that give further insights how attitudes on debt formed by religious beliefs might influence the probability of becoming over-indebted.

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A Data

A.1 Data Description

Religiousness concerns the affiliation to one of the following religious groups in Germany: Protestants, Catholics, other or no affiliation. Data comes from *Zensus 2011*, it allows the computation of shares (i.e. relative to population) for each German county.

Unemployment is represented by the rate of unemployed persons relative to 100 inhabitants of working age. The data is taken from *DeStatis*.

Real GDP per capita is from *DeStatis*.

High- qualified workers ratio is defined as Graduates from universities and applied universities per 1000 employees who are subject to mandatory social insurance contribution. The source is *Beschäftigtenstatistik der Bundesagentur für Arbeit*.

Mini-jobbers ratio is defined as persons earning less than 400 Euro per month per 1000 inhabitants of working age. Work that is done while making an apprenticeship is thereby excluded. The source is *Beschäftigtenstatistik der Bundesagentur für Arbeit.*

Workers without apprenticeship. This variable is provided as relative to 100 employees who are subject to mandatory social insurance contribution by *Beschäftigtenstatistik der Bundesagentur für Arbeit.*

Self-employed is defined as self-employed persons per 100 inhabitants of working age. Source is *Arbeitskreis Erwerbstätigenrechnung des Bundes und der Länder, Eurostat Regio Datenbank.*

Bank market power is measured with a Lerner-Index. The index ranges from a high of 1 to a low of 0, with higher numbers implying greater market power. Source is Koetter (2013)

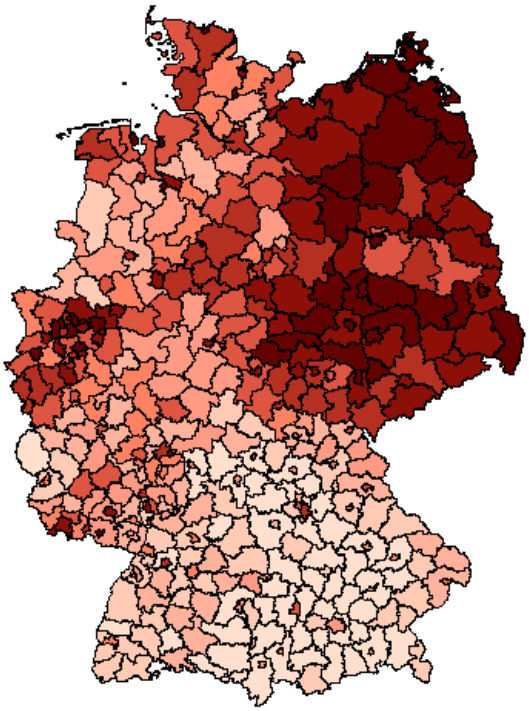
Public debt per capita is the sum of tho kinds of debt (per capita): Municipal, i.e. the mean across all municipalities within the county, and of the Bundesland. Source is *Statistik über Schulden des Bundes und der Länder* and *DeStatis.*

Average age is computed by multiplying the ratio of inhabitants that belong to the available age groups 18-25, 25-30, 30-50, 50-65, older than 65 with the respective mean of these age groups. Source is *Fortschreibung des Bevölkerungsstandes des Bundes und der Länder.*

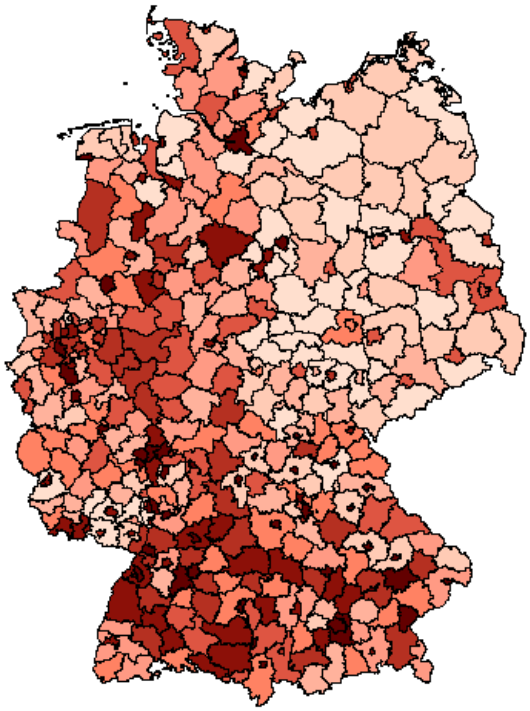
Women ratio is the share of women at the population. Source is *DeStatis* .

For details on the methods and procedures of the Zensus 2011 the interested reader is referred to Statistisches Bundesamt (2015). In 2011 a district reform took place in the Bundesland Mecklenburg-Vorpommern, reducing its numbers of counties from 18 to 8. For some of the above mentioned variables, data was only available for the former counties. Where this was the case, we computed the sum or population-weighted mean to get the data for the new counties.

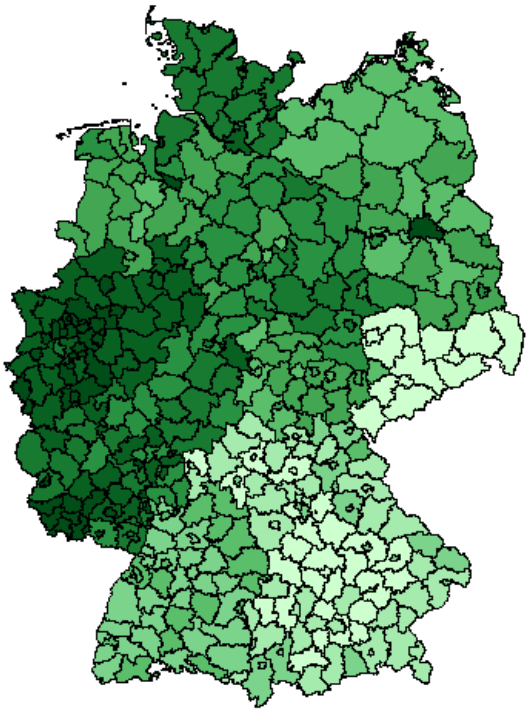
A.2 Maps of selected Control-Variables



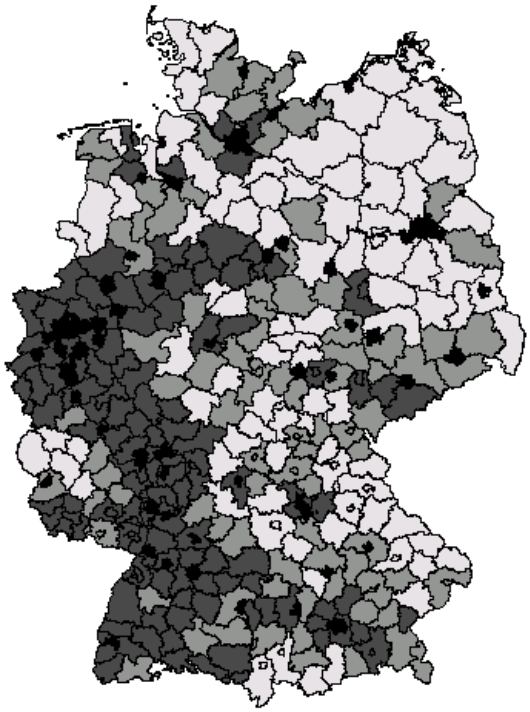
Unemployment Rate



Real GDP per capita



Public debt per capita



Urbanization

B Regression Results

B.1 Beta Coefficients

	Cath.	Prot.	Non-Rel.
Religion:	-0.075**	0.062**	-0.129
Unemployment	0.391***	0.395***	0.392***
Real GDP p.C.	0.102**	0.106**	0.090*
Divorced	0.426***	0.444***	0.470***
Self-employed	0.101**	0.103***	0.093**
Insolvencies	0.272***	0.270***	0.266***
High qualified	-0.260***	-0.254***	-0.235***
Low-income empl.	0.025	0.019	-0.009
Empl. w/o apprenticeship	0.175***	0.171***	0.173***
Average age	-0.203***	-0.210***	-0.197***
Women ratio	-0.035	-0.037	-0.032
Bank market power	0.009	0.009	0.006
Public debt p.C.	0.122	0.120	0.125

Table 6: Standardized coefficients for Ordinary Least Square regressions for Catholics, Protestants and Non-Religious.

C List of Important Churches

C.1 Data Sources & Preparation

A church is defined as an important church if at least one of the following four criteria is fulfilled: i) church is a *Dom* ii) church is a *Münster* iii) church is a Catholic bishop seat and hence a *Kathedrale* or *Konkathedrale* iv) Church is a *sermon place of a Protestant Bishop*. Data for *Dome*, *Münster* and *Kathedralen* are from Wikipedia (2015*a*) and Wikipedia (2015*b*) and have been as far as possible cross-checked by other sources like Imhof & Kunz (2008). The origin of *sermon places of a Protestant Bishop* is Hoheisel (2015). Only sermon churches that have beared this name after 1950 have been included. Concerning *Dome*, only those churches have been included that have still been actively used as church in the years after 1950. Concerning *Münster*, churches that where pure monastery churches have not been considered.

C.2 Catholics

For Catholics 110 important churches in 105 municipalities in 95 counties could be identified.

Countynumber	*Municipalityname*	*Churchname*	*Type*

2000	Hamburg	Neuer Mariendom	Dom u. Kathedrale
3152	Duderstadt	Eichsfelder Dom	Dom
3254	Hildesheim	Hildesheimer Dom	Dom u. Kathedrale
3404	Osnabrück	Dom St. Peter	Dom u. Kathedrale
3454	Haren (Ems)	Emsland-Dom	Dom
3459	Ankum	Artländer Dom St. Nikolaus	Dom
3460	Damme	Dammer Dom	Dom
5111	Düsseldorf	Rather Dom	Dom
5113	Essen	Essener Münster	Münster u. Kathedrale
5116	Mönchengladbach	Münster St. Vitus	Münster
5158	Velbert-Neviges	Nevigeser Wallfahrtsdom	Dom
5162	Neuss	Quirinusmünster Neuss	Münster
5170	Xanten	St. Viktor	Dom
5314	Bonn	Bonner Münster	Münster
5315	Köln	Kölner Dom	Dom u. Kathedrale
5334	Aachen	Aachener Kaiserdom	Dom u. Kathedrale
5334	Kalterherberg	Eifeldom, "Kaffeedom"	Dom
5370	Heinsberg	Selfkantdom	Dom
5515	Münster (Westfalen)	St.-Paulus-Dom	Dom u. Kathedrale
5558	Billerbeck	Ludgerus-Dom	Dom
5566	Altenberg (Bergisches Land)	Altenberger Dom, Bergischer Dom	Dom
5762	Marienmünster in Westfalen	Abtei Marienmünster	Münster
5770	Minden	Mindener Dom	Dom
5774	Paderborn	Dom St. Liborius	Dom u. Kathedrale
5958	Neheim	Sauerländer Dom (Neheim)	Dom
5966	Attendorn	Sauerländer Dom	Dom
5974	Soest	St.-Patrokli-Dom	Dom
6412	Frankfurt	Kaiserdom St. Bartholomäus	Dom
6434	Bad Homburg-Kirdorf	„Taunusdom“	Dom
6439	Geisenheim (Hessen)	„Rheingauer Dom“	Dom
6440	Ilbenstadt	„Dom der Wetterau“: Basilika Maria St. Petrus u. Paulus	Dom
6532	Wetzlar	Wetzlarer Dom	Dom
6533	Limburg an der Lahn	Limburger Dom	Dom u. Kathedrale
6631	Fulda	Fuldaer Dom	Dom u. Kathedrale
6634	Fritzlar	Fritzlarer Dom	Dom
7132	Niederfischbach	Siegerländer Dom	Dom
7135	Karden	"Moseldom"	Dom
7137	Andernach	Mariendom: Maria Himmelfahrt	Dom

7137	Münstermaifeld	Münster St. Martin und Severus	Münster
7140	Ravengiersburg	Hunsrückdom	Dom
7211	Trier	Trierer Dom	Dom u. Kathedrale
7315	Mainz	Mainzer Dom	Dom u. Kathedrale
7315	Mainz-Gonsenheim	Rheinhessendom	Dom
7318	Speyer	Speyerer Kaiserdom	Dom u. Kathedrale
7319	Worms	Wormser Kaiserdom	Dom
7340	Waldfischbach	„Westpfälzerdom“ St. Joseph	Dom
8111	Stuttgart	Domkirche St. Eberhard	Dom u. Konkathedrale
8116	Esslingen am Neckar	Münster St. Paul	Münster
8121	Heilbronn	Deutschordensmünster St. Peter und Paul	Münster
8128	Bad Mergentheim	Münster St. Johannes Baptist	Münster
8136	Schwäbisch Gmünd	Heilig-Kreuz-Münster	Münster
8216	Münster Schwarzach		Münster
8225	Hardheim	„Erftaldom“: römisch-katholische Pfarrkirche St. Alban	Dom
8226	Rauenberg	„Dom des Angelbachtals“	Dom
8311	Freiburg im Breisgau	Freiburger Münster	Münster u. Kathedrale
8315	Breisach	Münster St. Stephan	Münster
8315	Neustadt im Schwarzwald	Neustädter Münster	Münster
8325	Rottweil	Heiligkreuz-Münster	Münster
8326	Villingen	Liebfrauenmünster	Münster
8335	Insel Reichenau (Bodensee)	Marienmünster	Münster
8335	Konstanz	Konstanzer Münster „Unserer Lieben Frau“	Münster
8335	Radolfzell am Bodensee	Münster Unserer Lieben Frau	Münster
8337	Bad Säckingen	Münster St. Fridolin Fridolinsmünster	Münster
8337	St. Blasien	„Schwarzwälder Dom“	Dom
8415	Zwiefalten	Münster Unserer Lieben Frau	Münster
8416	Rottenburg am Neckar	Rottenburger Dom St. Martin	Dom u. Kathedrale
8425	Obermarchtal	Münster St. Peter und Paul	Münster
8435	Salem (Baden)	Salemer Münster	Münster
8435	Überlingen	Überlinger Münster	Münster
9161	Ingolstadt	Münster Zur Schönen Unserer Lieben Frau	Münster

9162	München	Dom zu Unserer Lieben Frau	Dom u. Kathedrale
9172	Bad Reichenhall	Münster St. Zeno	Münster
9176	Eichstätt	Dom St. Salvator und St. Willibald	Dom u. Kathedrale
9178	Freising	Freisinger Dom	Dom u. Konkathedrale
9178	Freising	St. Andrä	Münster
9178	Moosburg an der Isar	Kastulusmünster	Münster
9181	Dießen am Ammersee	Marienmünster Dießen	Münster
9189	Fridolfing	"Dom vom Salzachtal": Pfarrkirche Mariä Himmelfahrt	Dom
9261	Landshut	Münster St. Martin	Münster
9262	Passau	Passauer Dom	Dom u. Kathedrale
9272	Waldkirchen	"Bayerwalddom" oder "Dom des Bayerischen Waldes": St. Peter und Paul	Dom
9362	Regensburg	Niedermünster Regensburg	Münster
9362	Regensburg	Regensburger Dom	Dom u. Kathedrale
9373	Neumarkt in der Oberpfalz	Münster St. Johannes der Täufer	Münster
9376	Schwandorf	Marienmünster auf dem Kreuzberg	Münster
9461	Bamberg	Bamberger Dom (Kaiserdom)	Dom u. Kathedrale
9571	Dinkelsbühl	Münster St. Georg	Münster
9571	Wolframs-Eschenbach	Liebfrauenmünster	Münster
9663	Würzburg	Neumünster St. Johannes Evangelist	Münster
9663	Würzburg	Würzburger Dom	Dom u. Kathedrale
9679	Hausen bei Würzburg	Münster Fährbrück	Münster
9761	Augsburg	Augsburger Dom	Dom u. Kathedrale
9773	Dillingen an der Donau	St. Peter	Konkathedrale
9776	Lindau (Bodensee)	Münster Unserer Lieben Frau	Münster
9779	Donauwörth	Liebfrauenmünster	Münster
10041	Püttlingen	Köllertaldom	Dom
10042	Mettlach	Liutwinusdom	Dom
10044	Dillingen	Saardom	Dom
10046	Bliesen	Bliestaldom: St. Remigiuskirche	Dom
10046	Nonnweiler	Hochwalddom	Dom
10046	St. Wendel	Wendelsdom	Dom
11000	Berlin (D)	St. Hedwigs-Kathedrale	Kathedrale
14612	Dresden	Kathedrale St. Trinitatis (Katholische Hofkirche)	Kathedrale

14625	Bautzen	Dom St. Petri	Dom u. Konkathedrale
14626	Görlitz	Kathedrale St. Jakobus	Kathedrale
15003	Magdeburg	Sankt-Sebastian-Kirche	Kathedrale
15084	Zeitz	Zeitzer Dom	Dom
16051	Erfurt	Erfurter Dom	Dom u. Kathedrale
16061	Effelder	Eichsfelder Dom	Dom
16062	Nordhausen	Nordhäuser Dom	Dom

C.3 Protestants

For Protestants 89 important churches in 83 municipalities in 77 counties could be identified.

Countynumber	*Municipalityname*	*Churchname*	*Type*
1002	Kiel	Nikolaikirche, „Nikolaidom“	Dom u. Bishop sermon place
1003	Lübeck	Lübecker Dom	Dom u. Bishop sermon place
1051	Meldorf	Meldorfer Dom	Dom
1053	Ratzeburg	Ratzeburger Dom	Dom
1054	Insel Föhr	Friesendom: Pfarrkirche St. Johannis in Nieblum	Dom
1055	Eutin	Ehem. Kollegiatsstiftskirche St. Michaelis	Bishop sermon place
1055	Oldenburg in Holstein	St.-Johannis-Kirche, Oldenburger Dom	Dom
1059	Schleswig	Schleswiger Dom	Dom u. Bishop sermon place
2000	Hamburg	Hauptkirche St. Michaelis	Bishop sermon place
3101	Braunschweig	Dom, ehem. Kollegiatsstiftskirche SS. Blasius, Johannes der Täufer und Thomas Becket	Dom u. Bishop sermon place
3154	Königslutter	Kaiserdom	Dom
3155	Einbeck	Münsterkirche St. Alexandri	Münster
3241	Hannover	Marktkirche SS. Jakobi und Georgii	Bishop sermon place
3252	Hameln	Münster St. Bonifatius	Münster
3257	Bückeburg	Stadtkirche	Bishop sermon place
3352	Cuxhaven	Altenbruch: Bauerndom St. Nicolai	Dom

3352	Cuxhaven	Lüdingworth: Bauerndom St. Jacobi	Dom
3352	Otterndorf	Bauerndom St. Severi	Dom
3355	Bardowick bei Lüneburg	Dom zu Bardowick St. Peter und Paul	Dom
3361	Verden	Verdener Dom	Dom
3402	Emden	Große Kirche SS. Cosmas und Damian	Bishop sermon place
3403	Oldenburg	St. Lambertikirche	Bishop sermon place
3457	Leer	Große Kirche	Bishop sermon place
4011	Bremen	Dom, ehem. Kathedrale St. Petri	Dom u. Bishop sermon place
5111	Düsseldorf	Johanneskirche	Bishop sermon place
5170	Wesel	Willibrordi-Dom	Dom
5566	Altenberg (Bergisches Land)	Altenberger Dom, Bergischer Dom	Dom
5711	Bielefeld	Neustädter Marienkirche, „Ravensberger Dom“	Dom u. Bishop sermon place
5758	Herford	Herforder Münster	Münster
5766	Detmold	Erlöserkirche (bis 1947 St. Vitus geweiht)	Bishop sermon place
6411	Darmstadt	Pauluskirche	Bishop sermon place
6411	Darmstadt	Stadtkirche St. Maria	Bishop sermon place
6412	Frankfurt Am Main	St. Katharinenkirche	Bishop sermon place
6414	Wiesbaden	Marktkirche (ehem. St. Mauritius), „Nassauischer Landesdom“	Dom u. Bishop sermon place
6431	Lampertheim (Hessen)	„Dom des Rieds“	Dom
6531	Giessen	Johanneskirche	Bishop sermon place
6531	Londorf (Hessen)	„Dom der Rabenau“	Dom
6532	Herborn	Stadtkirche	Bishop sermon place
6532	Wetzlar	Wetzlarer Dom	Dom
6611	Kassel	Ehem. Stiftskirche SS. Martin und Elisabeth, „Martinsdom“	Dom u. Bishop sermon place
7315	Mainz	Altmünster	Münster
7315	Mainz	Christuskirche, „Evangelischer Dom“	Dom u. Bishop sermon place
7318	Speyer	Protestations-Gedächtniskirche	Bishop sermon place
7339	Ingelheim	”Selztaldom ”: evangelische Pfarrkirche im Stadtteil Großwinternheim	Dom
8111	Stuttgart	Ehem. Stiftskirche Hl. Kreuz	Bishop sermon place
8118	Ludwigsburg	Stadtkirche	Bishop sermon place

8121	Heilbronn	Kilianskirche	Bishop sermon place
8127	Schwäbisch Hall	Stadtpfarrkirche St. Michael, „Münster“	Münster u. Bishop sermon place
8212	Karlsruhe	Stadtkirche, „Cathedrale des Landes Baden“	Bishop sermon place
8415	Reutlingen	Marienkirche	Bishop sermon place
8421	Ulm	Münster (ehem. Unserer Lieben Frau)	Münster u. Bishop sermon place
9162	München	St. Matthäuskirche	Bishop sermon place
9362	Regensburg	Dreieinigkeitskirche	Bishop sermon place
9462	Bayreuth	Stadtkirche Hll. Dreifaltigkeit	Bishop sermon place
9561	Ansbach	St. Gumbertuskirche	Bishop sermon place
9564	Nürnberg	St. Lorenzkirche	Bishop sermon place
9571	Heilsbronn	Münster Heilsbronn	Münster
9577	Heidenheim (Mittelfranken)	Münster St. Wunibald	Münster
9663	Würzburg	St. Johanniskirche	Bishop sermon place
9761	Augsburg	St. Ulrichskirche	Bishop sermon place
11000	Berlin	Kaiser-Wilhelm-Gedächtniskirche	Bishop sermon place
11000	Berlin	St. Marienkirche	Bishop sermon place
11000	Berlin (D)	Oberpfarr- und Domkirche zu Berlin (Berliner Dom)	Dom
12051	Brandenburg	Dom St. Peter und Paul	Dom
13004	Schwerin	Dom, ehem. Kathedrale SS. Maria und Johannes Evangelist	Dom u. Bishop sermon place
13072	Bad Doberan	Doberaner Münster	Münster
13072	Güstrow	Güstrower Dom	Dom
13073	Grimmen	Marienkirche	Bishop sermon place
13075	Greifswald	Dom, ehem. Kollegiatsstiftskirche St. Nikolai	Dom u. Bishop sermon place
14521	Schneeberg	Bergmannsdom: St.-Wolfgangs-Kirche	Dom
14522	Freiberg	Freiberger Dom Sankt Marien	Dom
14524	Zwickau	Marienkirche	Dom
14612	Dresden	Kreuzkirche	Bishop sermon place
14625	Bautzen	Dom St. Petri	Dom
14626	Görlitz	Hauptstadtpfarrkirche SS. Peter und Paul	Bishop sermon place
14627	Meißen	Meißner Dom auf der Albrechtsburg	Dom u. Bishop sermon place
14729	Wurzen	Stiftskirche (Dom) St. Marien	Dom
15001	Dessau	St. Johanniskirche	Bishop sermon place

15001	Dessau	Stadtkirche St. Marien	Bishop sermon place
15002	Halle (Saale)	Hallescher Dom	Dom
15003	Magdeburg	Dom St. Mauritius und Katharina	Dom u. Bishop sermon place
15084	Naumburg	Naumburger Dom	Dom
15085	Halberstadt	Dom zu Halberstadt	Dom
15088	Merseburg	Merseburger Dom	Dom
15090	Havelberg	Havelberger Dom	Dom
15090	Stendal	Dom St. Nikolaus	Dom
16052	Gera	Johanniskirche	Bishop sermon place
16055	Weimar	Stadtkirche SS. Peter und Paul, „Herderkirche“	Bishop sermon place
16056	Eisenach	Georgenkirche	Bishop sermon place

D Counties' nearest Important Church

D.1 List of Counties & their nearest Important Church(Online Appendix)