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Hofmann, Christian | van Lent, Laurence | Schwaiger, Nina

# Religion and Ownership

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**Christian Hofmann**
LMU Munich
Institute for Accounting and Control
Ludwigstraße 28, 80539 Munich, Germany
[T] +49 89 21802302, [F] +49 89 218013550
hofmann@bwl.lmu.de

**Laurence van Lent**
Frankfurt School of Finance & Management
Adickesallee 32-34, 60322 Frankfurt, Germany
[T] +49 69 154008531, [F] +49 69 1540084531
l.vanlent@fs.de

**Nina Schwaiger***
LMU Munich
Institute for Accounting and Control
Ludwigstraße 28, 80539 Munich, Germany
[T] +49 89 21803888, [F] +49 89 218013550
nina.schwaiger@bwl.lmu.de

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* Corresponding author.

# Religion and Ownership

**ABSTRACT:** This study examines the effect of religion on ownership structures. In particular, we expect that the local strength of Protestantism will reduce ownership concentration and insider ownership. Protestantism is less hierarchical than Catholicism, which suggests that adherents of the Protestant faith will have a strong preference for autonomy. Moreover, they rely strongly on horizontal ties between fellow citizens, which encourages trust and reduces a shareholders' need to monitor a firms' employees. Our identification is based on a panel regression, a geographical regression discontinuity design, a difference design, and an instrumental variable approach. In line with our predictions, we find that the local strength of Protestantism reduces ownership concentration and insider ownership. A subsequent channel analysis suggests that the local strength of Protestantism has a negative direct effect on blockholder ownership and a negative indirect effect on the size of shareholding and insider ownership through developing trust. Overall, our results underline the role of the demographic features of firms' geographic environments in explaining ownership structures.

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## 1. Introduction

A growing body of evidence suggests that geographical variation in a firms' organization may have deep historical roots. For example, the pattern of contemporary female ownership of firms has been attributed to differences in historical agricultural practices associated with the use of the hoe versus the plough (Alesina *et al.* 2013). Similarly, trust shaped by lengthy historical processes (i.e., the slave trade or historical weather patterns) is associated with the current allocation of decision-making power between corporate headquarters and local subsidiaries (Bloom *et al.* 2012). Building on this research, we argue that geographical variations in the dominant religion help explain crucial governance choices made by firms. Specifically, we document that the presence of large shareholders (i.e., blockholders) and the degree of insider or manager ownership is associated with dominance of the Protestants (as compared to Catholics) in a region.

Large shareholders and insider or manager ownership are both a response to the agency problem created by the separation of ownership and management (Berle & Means 1932). Blockholders have a stake in the firm large enough that they are incentivized to monitor management, which they do by exercising their legal right to directly intervene in the strategic decisions of the firm. Insider ownership aligns the interests of managers with those of the shareholders, reducing the conflict of interest at the root of the agency problem.

Religion can influence the evolution of regional governance responses by firms to agency problems. In particular, hierarchical religions (e.g., Catholicism, Islam, Eastern Orthodoxy) impose a structure on society that is characterized by vertical bonds of authority (La Porta *et al.* 1997), while horizontal religions (e.g., Protestantism) promote level networks of association between people. Furthermore, the extent to which religions promote homogenous values and encourage mutual social control in order to enforce moral standards varies significantly (Arruñada 2010). For example, Protestants are encouraged to give charity

universally, as opposed to Catholics, who are encouraged to favor friends and relatives. Furthermore, Catholics rely on the enforcement of moral standards by a priest (through the absolution of sins through confession), while Protestants depend on enforcement by the community.

We propose that in regions where Protestantism dominates Catholicism, management will be more averse to accepting direct intervention by blockholders, raising the costs of holding large stakes in a firm as a way to reduce agency problems. In addition, stronger mutual monitoring reduces the magnitude of the agency problem and the demand for blockholders. In contrast, our expectations for the effect of religion on insider ownership are less straightforward. Because blockholder intervention is more costly, on the one hand, alternative governance mechanisms that align interests between shareholders and managers (such as insider ownership) will become more appealing. However, because it is likely that stronger communal enforcement of behavior in Protestant dominated regions will reduce the size of the agency problem, the need for insider ownership might be lower. Thus, we must empirically gauge which of these effects is most pronounced in the data.

In addition to the direct effect of religion on governance choices, we also propose an indirect effect through the creation of trust. In line with prior studies, we expect that in Protestant regions, trust between people is higher than in Catholic regions. The need for costly monitoring is low when trust is high and thus we expect fewer blockholders and lower levels of insider ownership (Chami & Fullenkamp 2002; Himmelberg et al., 1999).

Examining the effect of deep-seated cultural variables (such as religion) on a firm's governance poses several non-trivial empirical challenges. Endogeneity issues might prevent a causal interpretation of the result that geographic variation in religion is associated with a firm's governance. While reverse causality is unlikely to be an issue in our context given that the dominant regional religion is largely the outcome of historical events (a fact that we explicitly

exploit below), other sources of endogeneity might be a concern. Specifically, unobserved characteristics that are correlated with the region's dominant religion (but omitted from the model) might be the true determinant of both governance and religion. The usual remedy of using panel data to impose a stringent fixed-effects structure is unavailable to us because the variable of interest (the region's dominant religion) is quasi-fixed over time (Himmelberg *et al.* 1999; Zhou *et al.* 2001). We address this challenge by exploiting the unique features of our setting in Germany, where we conduct our test on a sample of private firms. Germany has two dominant religions (Protestantism and Catholicism), which are found in sharply defined regions across the country. These regions are largely determined by historical events from the 1500s, meaning that different faith regions are often adjacent. Thus, we compare firms that are closely located but in different faith regions under the identifying assumption that these firms are largely similar except for their region's dominant religion (i.e., we apply a geographical regression discontinuity design). We complement these analyses by using an instrumental variables (IV) approach in which we exploit the religious adoption of each region and use only the variation in the historically dominant religion to explain current ownership structures.

More specifically, we use a sample of private German firms from 2007 to 2010, which gives us 16,468 firm-year observations. We follow prior studies (e.g., Dyreng *et al.* 2012; Leventis *et al.* 2018) and measure the strength of Protestantism (as compared to Catholicism) by the presence of Protestant adherents at the location of a firm's headquarters. In particular, we divide the number of Protestant adherents by the number of Christian adherents, which gives us the opportunity to directly compare horizontal versus hierarchical religions. We have granular information on the number of Protestant and Catholic adherents at the German municipality level provided by the German Federal Statistical Office. Note that a municipality is the smallest geographical administrative unit in Germany. In particular, as of 2017, Germany was divided into 13,361 municipalities while the number of inhabitants per municipality ranged between 9 and 535,061 with an average of 5,122 inhabitants per municipality (Source: German

Federal Statistical Office). In comparison, as of 2017, the U.S. was divided into 3,142 counties. Given a population of 326 million in 2017, the average population per county was about 103,666 (Source: United States Census Bureau). We then examine two characteristics of ownership structures using data from the Bureau van Dijk's Amadeus database. First, we examine ownership concentration by looking at three different measures of blockholder ownership (i.e., the number of blockholders, the number of blockholders relative to the number of shareholders, and the number of shareholders needed to form a blockholder) and a measure of the size of shareholding (i.e., the largest shareholder). Second, we look at insider ownership by measuring the proportion of shares held by managers.

In order to identify the effect on ownership structures of having Protestantism (as opposed to Catholicism) as the region's dominant religion, we use four different designs. First, we provide evidence of a negative association between the strength of Protestant adherence and ownership concentration based on a panel regression analysis using the full sample. Second, we use a geographical regression discontinuity on a subset of the sample in order to more clearly identify the causal effect of Protestant adherence on ownership structures. The results suggest that Protestant adherence decreases ownership concentration and insider ownership. As the geographical regression discontinuity design relies on a subsample of identified border observations, in a third analysis, we perform a differences design of ownership structures where we compare treated and control firms located in the identified border districts[1] while controlling for other differences between the firms. We find additional evidence that Protestant adherence reduces ownership concentration. Finally, we confirm our results using an instrumental variable regression analysis, which provides another way of addressing endogeneity concerns; specifically, we use regional religious adherence in the year 1555 as an instrumental variable

[1] A district comprises several municipalities and is the second smallest geographical administrative unit in Germany. In 2015, Germany was divided into 294 districts (Source: German Federal Statistical Office).

when estimating the effect of Protestant adherence on ownership structures (see Spenkuch 2017).

Next, we perform a channel analysis to examine whether the effect of the region's dominant religion on ownership is direct or whether it is an antecedent of the earlier documented effect of trust. In particular, we test for both the direct effects and indirect effects of the region's dominant (Protestant) religion created by trust on our measures of ownership structures. In line with our predictions, we find that Protestantism directly reduces blockholder ownership and that it has a negative and indirect effect on the size of shareholding and insider ownership.

Our efforts contribute to several strands of literature. Important prior research has examined the determinants of ownership structures; among the relevant factors, it has highlighted firm characteristics such as firm size and listing status (Demsetz & Lehn 1985; Claessens & Tzioumis 2006). Other work has focused on country-level institutions, such as investor protection laws, and has emphasized the importance of trust and informal relations in explaining ownership structures (Franks *et al.* 2008). We add to this research by documenting the role of a region's dominant religion in explaining ownership structures. In addition, we explore whether religion operates on ownership structures directly or whether it is an antecedent to trust, which has been shown to affect ownership.

We also contribute to an emerging literature on the deep historical roots of organizational practices (Bloom *et al.* 2012). These studies build on a literature in economics that uses fundamental geographical differences in terrain, climate conditions, and natural resources to explain the evolution of time preferences, gender roles, and collaborative practices in communities, shedding light on differences in historical economic development (Alesina *et al.* 2013; Talhelm *et al.* 2014; Galor & Özak 2016). While the interpretation of the evidence requires careful consideration, one advantage of these types of analyses is that cultural

variables, such as the dominant religion in a firm's location, are arguably largely exogenous to the firm itself.

Previous work has also documented that the strength of religious adherence affects corporate decision making (Hilary & Hui 2009; Boone *et al.* 2012), corporate financial reporting quality (Dyreng *et al.* 2012; McGuire *et al.* 2012), and the decisions of auditors and investors (Kumar *et al.* 2011; El Ghoul *et al.* 2012; Leventis *et al.* 2018). These studies offer important preliminary evidence on the role of religions, but do not explore how the differences between religions shape organizational structures.

## 2. Sample, variable measurement, and descriptive statistics

### 2.1 Sample

Our sample is comprised of private German firms from 2007 to 2010 drawn from the Bureau van Dijk's Amadeus database, covering 16,468 firm-year observations. Where prior studies focus primarily on U.S. listed firms, we test our predictions using private German firms. Germany is an advantageous setting for four reasons: 1) it is one of the few European countries with two Churches of similar size, i.e., the Catholic Church and the Protestant Church. Moreover, the borders separating Catholic and Protestant regions have remained nearly unchanged for centuries, allowing for a research design with stronger causal interpretation. 2) Germany taxes church membership (eight to nine percent of income tax), which means that non-religious people are incentivized to withdraw from church to avoid taxation. Thus, high registered church membership should reflect meaningful local adherence to religion. 3) In contrast to prior studies in the U.S., which use county-level information on religious adherence, we have granular data on religious adherence at the municipality level. Since a German municipality is smaller than an U.S. county, our dataset allows us to more precisely infer the geographical variation in religious adherence where the firm is headquartered. Additionally, our sample of private firms largely avoids the complications which come from using large

(publicly-listed) companies; specifically, these firms are likely to have multiple (potentially cross-border) locations of operation as well as employ workers that are likely commuting large distances to work. Federal statistics show that 75 percent of employees at German private firms live within 25 km of work (and about 50 percent live within 10 km) (Bundesamt 2015). Consequently, using local religious adherence where a firm is headquartered as a measure of the dominant religion in the firm's region is likely to have substantially lower measurement error as compared to a sample of publicly-listed firms. 4) As our sample consists of private firms, the majority of our observations are from small- or medium-sized firms (i.e., 68 percent).[2] In 2015, small- and medium-sized firms generated 47 percent of the gross value added, underlining the economic meaning of small- and medium-sized firms in Germany (Bundesamt 2018). The sample selection process is described in Table 1.

[Please insert Table 1 here]

Most of the firms in our sample are pure limited liability companies. The remaining firms are of mixed legal form, combining a limited partnership with a limited liability company. More than half of our sample firms are located in North Rhine-Westphalia (25.95 percent), Bavaria (17.16 percent), and Baden-Württemberg (14.92 percent), collectively, which is representative for private firms in Germany (see Table 2).

[Please insert Table 2 here]

Roughly 40 percent of firms belong to the manufacturing industry. The second (third/fourth) largest group of firms are in the wholesale and retail-trade (construction/professional, scientific, and technical activities) industry (see Table 3).[3]

[2] Following the European Union (EU 2003), a firm is defined as small or medium sized if it employs less than 250 employees and has total assets less than 43 million Euro.

[3] Our sample is representative for Germany because the largest industry groups identified in our sample are four of the six biggest industry groups identified from all private firms in Germany (with known location and industry).

[Please insert Table 3 here]

## 2.2 Data sources and variable measurement

We obtain data on religious adherence for 2007 and 2010 from the Federal Statistical Office[4]; these data contain information on the number of Catholics, Protestants, and non-Christian religious adherents or undenominational citizens at the municipality level.[5] Since the dataset is generated from the income tax statement, it includes information on religious adherence for all German citizens delivering an income tax statement to tax authorities.[6]

In our study, we focus on the difference between the Protestant and Catholic faiths. Our main variable of interest is the dominance of Protestant (relative to Catholic) adherents in a municipality; we measure the local strength of Protestantism as the number of Protestant adherents in the municipality of a firm's headquarters divided by the total number of Christian adherents in the same municipality (*STRENGTH_PROT*).

Following prior studies (e.g., Hilary & Hui 2009; Dyreng *et al.* 2012; McGuire *et al.* 2012), we use the location of a firm's headquarters to measure the firm's exposure to the dominant religion.[7] Since we analyze private firms, which are less internationally diversified than listed firms, headquarters may even be the only location of the firm, underlining the role of the dominant religion at this location. In line with prior research (e.g., Grullon *et al.* 2010), we argue that it is reasonable to use the local measure of the dominant religion to infer the

[4] RDC of the Federal Statistical Office and Statistical Offices of the Länder, Lohn-und Einkommenssteuerstatistik, 1995-2010, own calculations.

[5] Due to privacy reasons, the Federal Statistical Office aggregated non-Christian religious adherents and undenominational citizens. Consequently, we can only examine Christian vs. non-Christian faith or Catholic vs. Protestant faith.

[6] Whether a German citizen is required to deliver an income tax statement to the tax authority depends on his income. This means that our dataset on religious adherence does not include children and low-income earners. In 2010 (as an example), we have information on the religious adherence of about 58 million citizens, representing about 71 percent of the total German population in 2010. Consequently, we argue that our religion data are a relatively good base to measure the degree of religious adherence in a municipality.

[7] The authors of these studies argue that since a firm's headquarters are a focal point of information exchange within a firm and since the core business activities of a firm are often conducted at headquarters, this approach is reasonable (Pirinsky & Qinghai 2006; Davis & Henderson 2008).

religious adherence of the firm's employees. For our research, however, whether or not the employees of a specific firm are religious is immaterial. Instead, we question whether the dominant faith in a region is associated with the firm's governance choices. Note, however, that even if employees are themselves non-religious, they will still be affected by the moral standards of the religious faith prevailing where they live and operate (Kohlberg 1984; Kennedy & Lawton 1998; Cialdini & Goldstein 2004). Since the probability of employees living in or near communities surrounding the firm's headquarters is high (Bundesamt 2015), especially for small, private firms, many employees may share the religious norms prevailing in the firm's local environment.[8] In line with prior studies (e.g., Hilary & Hui 2009), we linearly interpolate the data on religious adherence between 2007 and 2010 in order to get a full dataset ranging from 2007 to 2010.

We analyze the effect of the strength of the region's Protestant faith on firms' ownership structures. In our analysis, we focus on two characteristics of ownership structure: the concentration of ownership and insider ownership. We obtain data on ownership and insiders from the Bureau van Dijk's Amadeus database. To capture ownership concentration, we apply three measures of blockholder ownership: 1) *#BLOCK* captures the number of blockholders (all shareholders holding more than 25 percent of shares[9]) per firm (Claessens & Tzioumis 2006). 2) *BLOCK* captures the number of blockholders relative to the number of shareholders per firm (Pedersen & Thomsen 2003). 3) *SHAREHOLDERS_REQUIRED* is an indicator variable equal to 1 if a firm needs only one shareholder to form a block of 25 percent, 0 otherwise (see Franks *et al.* 2008). Additionally, we capture ownership concentration by the variable

[8] An additional analysis suggests that in 63 percent of cases, the founder lives at firm location, suggesting that in many cases the founder's and the employees' religious social norms coincide. The founder is identified from matches between shareholder and firm names using the dataset from 2010.

[9] For private firms, a blockholder is defined in the Bureau van Dijk's Amadeus database as any owner who holds more than 25 percent of firm shares (Claessens & Tzioumis 2006).

*BIGGEST_SHAREHOLDER*, which is defined as the logarithm of the shares held by the largest shareholder (Franks *et al.* 2006).

Finally, we analyze insider ownership, measured by the variable *INSIDER* capturing the proportion of shares owned by managers per firm (Helwege *et al.* 2007). Note that while our measures of ownership concentration consider any type of shareholders, our measure of insider ownership focuses on shareholders that are managers of the firm.

We control for demographic characteristics at the location of firms' headquarters because they might be correlated with our religion variable (Hilary & Hui 2009). We obtain these data at the district level from the Federal Statistical Office. More specifically, we consider *GENDER* measured as the proportion of female inhabitants in the district where the firm's headquarters are located, *AGE* as the average age of the inhabitants, *MARRIED* as the proportion of married inhabitants, *INCOME* as the logarithm of available income per inhabitant, *MINORITIES* as the proportion of foreigners, and *EDUCATION* as the proportion of inhabitants having a general or subject-linked higher education entrance qualification.

We also include the variable *MUNICIPALITYSIZE* as a control variable to capture population size (Hilary & Hui 2009). We obtain this variable from the religion dataset and calculate it as the logarithm of the sum of Catholics, Protestants, and members of other non-Christian religions or undenominational inhabitants in the municipality where the firm is headquartered.[10] Moreover, we include dialect fixed effects[11] to control for the fact that languages and dialects signal values or beliefs, thus affecting the formation of trust (Doney *et al.* 1998; Chong *et al.* 2010).

[10] As mentioned above, the religion dataset includes only those inhabitants who have to deliver a tax income statement to the tax authority. For consistency, we also use this dataset to measure the municipality size at firm location.

[11] We used a map to assign to each German district its prevailing dialect. The map can be found on the following webpage: http://maps.landkartenindex.de/deutschland/deutschland_dialekte.php.

As regional differences in trade tax rates ("Gewerbesteuersätze") may influence firm location choices, we control for the trade tax rates at firm locations in our regression analyses (captured by the variable *TAX*, measured at the municipality level).

Following the literature on ownership structures, we control for the characteristics of firm size, firm age, risk, leverage, loss, and growth, obtained from the Bureau van Dijk's Amadeus database.[12] *SIZE* is included as a control variable because shareholders of large firms prefer a diffuse ownership structure in order to maximize their wealth or utility (Demsetz & Lehn 1985). *SIZE* is calculated as the logarithm of total assets (Mak & Li 2001). We control for firm age (*FIRMAGE*) measured as the logarithm of firm age in years (see Mak & Li 2001). We include *RISK* as control variable since a noisier firm environment increases shareholders' need to control the firm, resulting in more concentrated ownership structures (Demsetz & Lehn 1985). Following Demsetz and Lehn (1985), we approximate *RISK* by calculating the instability of a firm's profit rate, measured as the difference between the maximum and minimum of the return on equity over the past three years.[13]

Since debt pressure may reduce agency conflicts within firms, and may thus work as a substitute for other control mechanisms (Pedersen & Thomsen 2003), we include *LEV* as a further control variable in our analysis and measure it as the ratio of debt to total assets. *LOSS* is an indicator variable equal to 1 if the firm realized a loss in at least one of the past three years (measured in terms of the return on equity), 0 otherwise (Hilary & Hui 2009).[14] We include this control variable since ownership structures may be adjusted if a firm experiences a loss. *GROWTH* equals the firm's average growth in total assets over the last three years (Mak & Li 2001) and captures firm specific variables which are unrelated or indirectly related to ownership

[12] The web interface from Bureau van Dijk's Amadeus database only contains data for the last ten years. For any previous year, we collected archival data from CDs from Bureau van Dijk.
[13] Due to data availability, we only use the last three returns on equity values, whereas Demsetz and Lehn (1985) use five.
[14] Due to data availability, we use the return on equity to calculate the indicator variable, whereas Hilary and Hui (2009) use the return on assets. Additionally, we use all return-on-equity values over the last three years because it may take time for shareholders to change their monitoring activities in response to firm losses.

structures (Pedersen & Thomsen 2003).[15] All firm characteristics variables (except the loss indicator and firm age) are winsorized at the 1 and 99 percent levels.

Additionally, we include the indicator variable *INTERLOCK* which is equal to 1 if at least one shareholder of a firm is also a shareholder in another firm in the same year, 0 otherwise. We include this indicator variable since the probability of a shareholder being a blockholder in firm A may be lower if he[16] is also a blockholder in firm B, due to the costs of blockholding (Demsetz & Lehn 1985). Finally, we include four types of fixed effects, which may affect ownership structures or be related to religion: 1) the legal form of the firm, 2) the primary industry of the firm (Demsetz & Lehn 1985), and 3) time. For an overview on the variables, see Appendix 1.

We matched ownership data from Amadeus with religion data from the Federal Statistical Office using postcodes and the official municipality keys of firm locations from the dataset of Geodaten-Deutschland.de,[17] which translates postcodes into official municipality keys.

### 2.3 Descriptive statistics

Table 4 provides descriptive statistics on the strength of the Protestant faith on the firm's location, ownership structures, firm characteristics, and demographic characteristics.

[Please insert Table 4 here]

*STRENGTH_PROT* has a mean (median) of 0.52 (0.54) and a relatively high standard deviation of 0.25, suggesting that, on average, the number of Protestants and Catholics is balanced at firm locations. An (untabulated) analysis suggests that the strength of Protestant adherence is nearly constant throughout the sample period. On average, 40 (43) percent of firms

[15] Due to data availability, we calculate average growth over the previous three years, whereas Mak and Li (2001) use four years of data.
[16] Personal pronouns always refer to both genders.
[17] https://www.geodaten-deutschland.de/index.php.

were located in Protestant regions in 2007 (2010). Moreover, there are nearly no temporal changes in the dominance of Protestantism in the firm's location; less than one percent of firms with data for both years change from Protestant (Catholic) in 2007 to Catholic (Protestant) in 2010. Note that where we have data for both 2007 and 2010, none of our sample firms have relocated headquarters during our sample period.

The number of blockholders (*#BLOCK*) ranges between 1 and 3, with an average of 1.34. The average biggest shareholder (*BIGGEST_SHAREHOLDER*) has a shareholding of 56 percent. Moreover, 54 percent of shares are owned by managers of the firm (*INSIDER*). On average, firms have a debt-to-total-assets ratio of 49 percent (*LEV*). In about 20 percent of cases, firms realized at least one loss during the previous three years (*LOSS*). In our sample, firms grew about 10 percent over the previous three years in terms of total assets (*GROWTH*).

Table 5 provides the results of a Pearson correlation analysis. The results indicate a negative and statistically significant relation between the strength of Protestant adherence at the firm location (*STRENGTH_PROT*) and the ownership structure variables *#BLOCK*, *BLOCK*, *SHAREHOLDERS_REQUIRED*, and *BIGGEST_SHAREHOLDER* (p-value < 0.01). The results are not statistically significant for the relation between the strength of Protestantism adherence at firm location and insider ownership (*INSIDER*) for the total sample.

Additionally, we observe that insider ownership (*INSIDER*) is positively and statistically significantly (p-value < 0.01) associated with all blockholder ownership variables (*#BLOCK*, *BLOCK*, and *SHAREHOLDERS_REQUIRED*), and most strongly with the ownership concentration variable *BIGGEST_SHAREHOLDER* ($\rho = 0.35$, p-value < 0.01). This observation confirms prior research suggesting that management and ownership are closely linked in private firms (Claessens & Tzioumis 2006).

[Please insert Table 5 here]

Finally, the correlation results indicate that the strength of Protestant adherence at firm location is significantly correlated with different demographic and firm characteristic control variables (except for risk and leverage), but the correlations are reasonably low.

## 3. The impact of religion on ownership

In this section, we present the tests of our main prediction that the local strength of Protestantism is negatively related with ownership concentration (captured by blockholder ownership and the size of shareholding) and insider ownership. We recognize a trade-off between using the full sample for the analysis, which increases the generalizability of the results, and using a smaller, more homogeneous set of observations, which strengthens identification. Sections 3.1 to 3.4 present different empirical approaches that address this trade-off. In Section 3.1, we run a panel regression using the full dataset. Section 3.2 presents the results of a geographical regression discontinuity design on a subset of the sample. In Section 3.3, we perform a regression analysis examining the differences in ownership structures between religious-border pairs in the same state. Finally, in Section 3.4, we present the results of an instrumental variable approach that addresses endogeneity concerns about our relation of interest.[18]

### 3.1 Panel regressions

We start our analyses by performing panel regressions on the full dataset. In particular, we regress our measures for ownership concentration and insider ownership on the strength of Protestant adherence while controlling for a range of firm and demographic characteristics to address unobserved heterogeneity. We estimate the following model:

$$\mathbf{OWNERSHIP\_STRUCTURE}_{it} = \gamma STRENGTH\_PROT_{it} + \mathbf{X}_{ijt}\boldsymbol{\beta} + \mu_i + \eta_k + \theta_j + \iota_t + \varepsilon_{it} \quad (1)$$

[18] Note that it is not possible to perform a difference-in-difference analysis since religion is nearly constant throughout the sample period (see Section 2.3)

where i is an index across firms, k is an index across industries, j is an index across districts, and t is an index across years. *OWNERSHIP_STRUCTURE* is a vector of the variables *#BLOCK*, *BLOCK*, *SHAREHOLDER_REQUIRED*, *BIGGEST_SHAREHOLDER*, and *INSIDER*. We include a number of control variables. A K×1 vector of control variables, $X_{ijt}$, includes district-level (demographic) characteristics at the firm location (*GENDER, AGE, MARRIED, MUNICIPALITYSIZE, INCOME, MINORITIES, EDUCATION*, and *TAX*), as well as the firm-specific control variables (*SIZE, FIRMAGE*, *RISK*, *LEV, LOSS, GROWTH,* and *INTERLOCK*). $\mu_i$ is legal-form fixed effects, $\eta_k$ is industry fixed effects, $\theta_j$ is dialect fixed effects, and $\iota_t$ denotes year fixed effects. All variables are described in Section 2.2. For an overview of the variables, see Appendix 1. We expect $\gamma$ to be negative in all specifications.

We estimate our model using 16,468 observations in the period from 2007 to 2010; robust standard errors are clustered at the municipality level to reflect that our variable of interest is quasi-fixed at this level (Angrist & Pischke 2008). Moreover, in Appendix 2, we present a correlated random effects model that can be interpreted as controlling for time-invariant, unobservable firm characteristics (Wooldridge 2000). We present our results from the regression analysis in Table 6.

[Please insert Table 6 here]

Model 1 is estimated by Poisson, models 2, 4, and 5 by OLS, and model 3 by Probit. Columns (1a), (2a), (3a), (4a), and (5a) present the results of the regression analysis using only Protestant strength at the firm's location as the independent variable (i.e., without control variables). Columns (1b), (2b), (3b), (4b), and (5b) present the results of the regression analysis when all controls and fixed effects are included. The regression results are consistent with the results of the correlation analysis and we find that the strength of Protestant adherence is statistically negatively related to blockholder ownership. The effect is significant for all dependent variables in the specification without controls as well as in the specification with

controls (one-sided p-value < 0.05). For the variable *BIGGEST_SHAREHOLDER*, we also find a significant effect for the specification without controls and with controls (one-sided p-value < 0.10). In column (5a) and (5b), we present the results of Protestant faith adherence on insider ownership. In line with the results of the correlation analysis, the regression results indicate that based on the full dataset, there is no statistically significant effect of the strength of Protestant adherence on insider ownership.[19]

While these results provide statistical support for an association between the dominant religion and ownership structure, they do not speak to the economic significance of the relation. Given the stickiness in the variable of interest and the outcome variables, identification occurs mostly through cross-sectional variation. Consequently, estimates for the size of the effect are confounded by the potential for cross-sectional heterogeneity. For this reason, we postpone discussion of economic magnitudes to analyses that provide cleaner estimates of the causal relation.

Overall, the results support our hypothesis that the strength of local Protestant adherence is negatively related to blockholder ownership.

### 3.2 Geographical regression discontinuity analysis

The next analysis is based on a subsample of the dataset. This reduces the generalizability of the results, but strengthens the identification strategy by focusing on a more homogeneous set of observations. In particular, we use a geographical regression discontinuity design. Intuitively, we analyze firms located along a narrow geographic border that differ in the independent variable, but do not differ in their basic demographic conditions.[20] The border splits units into treated and control areas in an as-if random fashion (Keele & Titiunik 2014).

[19] The results are qualitatively similar if we control for Christian faith adherence (measured as the proportion of Christian adherents in the municipality where the firm's headquarters are located) as well as political affiliation (measured as the proportion of inhabitants having elected CDU/CSU with their first vote in the municipality where the firm's headquarters are located).

[20] Note that the geographical regression discontinuity design is more general than propensity score matching.

The approach relies on the assumption that the areas around the border do not differ in their geographically-defined institutional characteristics (Keele & Titiunik 2014), eliminating compound treatments.

In order to apply the geographical regression discontinuity design in our setting, we identify a geographic border between Protestant and Catholic districts in Germany based on our religion dataset from the year 2010 (see Figure 1).

[Please insert Figure 1 here]

According to our definition, a district is part of a Protestant (Catholic) border if it is dominated by Protestants (Catholics) and if at least one of the surrounding districts is dominated by Catholics (Protestants). After identifying border districts, we reduce the sample to observations located in Bavaria in order to eliminate compound treatments.[21] We selected Bavaria for our geographical regression discontinuity analysis because Bavaria has the highest overall score for: the number of sample observations, the difference in the strength of Protestant adherence in Protestant and Catholic border areas, and the economic activity (i.e., the share of gross value added). Figure 2 provides a map of Bavaria.

[Please insert Figure 2 here]

The red line highlights the border between the Protestant regions (in yellow) and the Catholic regions (in blue). The circles indicate the location and the number of sample firms located in the border areas. Figure 1 suggests two possible borderlines separating Protestant and Catholic regions that could be used for the analysis; we have selected the lower boundary due to a considerably higher number of available observations.

[21] Germany is divided into 16 states, which are the coarsest administrative classification. A state is comprised of several districts and is the greatest geographical administrative unit in Germany. Since states obviously differ from each other, for example, in terms of demographic characteristics, regulation, or economic activity (Bräuninger & Stiller 2007), our geographic regression discontinuity analysis should focus on observations within one selected state.

Based on the selected observations in Bavaria, we perform a local linear regression. The local linear regression compares units on the left and on the right of the border, which are matched based on their distance to the border (i.e., equal distance around the discontinuity) (Keele & Titiunik 2014).[22] Before running the regression, a bandwidth around the discontinuity is chosen; this bandwidth is the maximum distance from the border a unit should be to be included in the analysis. This bandwidth can be chosen manually (i.e., by conventional inference) or by applying the optimized bandwidths determined by the statistical software (i.e., by robust inference).

Table 7 reports the results of the geographical regression discontinuity design using local linear regression: Panel A reports the results for the measures of ownership concentration; Panel B reports the results for insider ownership. Treatment is defined as being located in a district with more Protestants than Catholics, while control is defined as being located in a district with more Catholics than Protestants. The column estimate contains the point estimate, which is the difference in the ownership concentration/insider ownership of firms located in Protestant border districts (treated units) and firms located in Catholic border districts (control units). We manually chose a bandwidth of 20 kilometers (see columns "conventional inference"), though the robust inference with optimized bandwidths is shown in the last columns of Table 7 (see columns "robust inference"). Local linear regression results are estimated with triangular kernel weights on each observation's distance to the point of estimation while controlling for the firm characteristics *SIZE*, *FIRMAGE*, *RISK*, *LEV*, *LOSS*, and *GROWTH*.

We find negative and statistically significant point estimates for the variables *BLOCK*, *SHAREHOLDERS_REQUIRED*, *BIGGEST_SHAREHOLDER*, and *INSIDER* (one-sided p-value < 0.05 for *BLOCK* and *SHAREHOLDERS_REQUIRED*; one-sided p-value < 0.05 (0.10) for *BIGGEST_SHAREHOLDER* and *INSIDER* using conventional (robust) inference). The

[22] We used Geographic Information Systems (GIS) software to determine the distance of each observation to the boundary (i.e., naïve distance).

point estimate of *#BLOCK* is insignificant for both conventional and robust inference. Overall, we find that in the subset of firms located at the religious border in Bavaria, firms located in Protestant districts have significantly lower blockholder ownership, lower maximum shareholding, and decreased insider ownership.

[Please insert Table 7 here]

In terms of economic significance, we find that firms located in border districts dominated by Protestants (Catholics) have, on average, 1.24 (1.49) blockholders, which results in a blockholder ownership (i.e., *BLOCK*) of 0.69 (0.76) in these regions. While there is a 93 percent likelihood that a firm in a Protestant border district needs just one shareholder to form a block of 25 percent, all firms in Catholic border districts need only one shareholder to form the same block. While the biggest shareholder in a Protestant border district holds 57 percent of firm shares, the biggest shareholder in a Catholic border district holds 65 percent. All differences are statistically significant (maximum one-tailed p-value < 0.10).

### 3.3 Differences analysis

In the geographical regression discontinuity design, we analyze only a small subset of our sample: namely, all firms located in a pre-defined bandwidth along a border in Bavaria. In order to address the concern that the results may only hold for this small subset of observations, we perform an additional analysis using all identified border observations. In particular, we conduct a regression analysis on all pairs of attached border districts throughout Germany that are dominated by Protestants and Catholics, respectively. For each Catholic border district, we identify the Protestant border districts that share a common borderline.[23]

[23] The identification is done with the help of ArcMap by ESRI. Since we have to perform this identification largely by hand, we use the district-level religion data (instead of municipality-level) for this analysis.

Next, we determine the averages for our measures of ownership concentration and insider ownership per district and take the differences between the averages of each border-district pair (i.e., the differences in the variables' averages of firms located in Protestant versus Catholic border districts). Thus, our re-defined measures *#BLOCK_DIFF*, *BLOCK_DIFF*, *SHAREHOLDERS_REQUIRED_DIFF*, *BIGGEST_SHAREHOLDER_DIFF*, and *INSIDER_DIFF* capture the differences in the averages of *#BLOCK*, *BLOCK*, *SHAREHOLDERS_REQUIRED*, *BIGGEST_SHAREHOLDER*, and *INSIDER* for Protestant and the attached Catholic border districts. We consistently use the difference in the average strength of Protestant adherence between Protestant border districts and the surrounding Catholic border districts, and apply the same variable construction for the control variables *SIZE*, *FIRMAGE*, *RISK*, *LEV*, *LOSS*, and *GROWTH*. We also control for state fixed effects.[24] The results of the regression analysis are presented in Table 8.

[Please insert Table 8 here]

For all dependent variables, we find a negative effect of the difference in the strength of Protestant faith on the differences in blockholder ownership, size of shareholding, and insider ownership. The effect is statistically significant for the variables *BLOCK* and *BIGGEST_SHAREHOLDER* (one-sided p-value < 0.10). For the dependent variables *#BLOCK*, *SHAREHOLDERS_REQUIRED*, and *INSIDER*, we find a negative effect, although it is insignificant. Overall, these results are consistent with the results of our prior analyses, though the cost of the approach is losing some statistical power.

In terms of economic significance, the results suggest that if the difference in the strength of Protestant adherence between firms in Protestant vs. Catholic border districts increases by

[24] Note that we drop border district pairs which are located in different states as they are hard to compare.

one standard deviation, the difference in blockholder ownership (i.e., *BLOCK*) decreases by 3 percentage points.

### 3.4 Instrumental variable approach

Finally, we apply an instrumental variable approach in order to further address potential correlated omitted variable issues. We follow Spenkuch (2017) and use religious adherence in Germany in 1555 as an instrument to estimate the causal effect of Protestant dominance in the sample period of 2007 to 2010 on ownership structures. The current distribution of Protestant and Catholic regions in Germany can be traced back to the Peace of Augsburg in 1555, where according to the principle *cuius regio, eius religio* ("whose realm, his religion"), each lord chose the religion for his region and every person within it (Spenkuch 2017). We georeference Spenkuch (2017) map of religious adherence in 1555 and use GIS software to translate it onto the current administrative districts.

We define a district as historically Protestant if the majority of its area was dominated by a Protestant lord in 1555. In particular, we construct an indicator variable that takes 1 if dominated by a Protestant lord in 1555, 0 otherwise. We perform an instrumental variables regression with standard errors clustered at the municipality level and use historical religious adherence as an instrument for our variable of interest *STRENGTH_PROT*. Thus, we only exploit variation in contemporary dominant religion that can be explained by historical choices dating back to 1555. The results of the estimation are presented in Table 9. Note that we only present the instrumental variable regressions for dependent variables with statistically significant results in the panel regressions.

[Please insert Table 9 here]

The results of the instrumental variable regression are consistent with the results of our panel regressions. In the full model, we find a negative and statistically significant effect (one-sided p-value < 0.01 for *#BLOCK* and one-sided p-value < 0.10 for

*SHAREHOLDERS_REQUIRED*) of the strength of Protestant adherence in the firm's location on blockholder ownership.

## 4. Channels of the religion-ownership relation

The analysis in Section 3 shows that the strength of Protestant adherence has a negative impact on blockholder ownership, size of shareholding, and insider ownership. In this section, we analyze the channel through which Protestant dominance in the region may affect ownership structures. As discussed in the introduction, we expect a negative direct effect of Protestant adherence on blockholder ownership because Protestants have a stronger preference for autonomy than do Catholics (Bloom *et al.* 2012).

The existence of a direct effect of Protestant adherence on insider ownership is not a given. On the one hand, a stronger adherence to the Protestant faith arguably reduces the size of the agency problem and thus the need for insider ownership. However, as Protestants are thought to be more adverse to hierarchical intervention (by blockholders), the alternative governance mechanism of insider ownership may become more appealing as a response to agency conflicts. Indeed, prior studies provide initial evidence of a substitution relation between the shares held by outside blockholders and insider ownership (Mehran 1995).

Additionally, we expect an indirect effect of regional Protestant faith on the size of blockholding and insider ownership through the creation of trust. If shareholders increase the size of their shareholding above the minimum needed to qualify as a blockholder, which ensures sufficient decision rights and a means to directly intervene in the firm, this may be explained by a lack of trust in the firm's management. Moreover, we also expect the relation between Protestant adherence and insider ownership to be mediated by trust. Firms located in high-trust areas are characterized by weaker agency conflicts, which reduces the need to control employees through costly equity-based pay (Jensen & Meckling 1976; Hilary & Huang 2015).

To measure trust, we rely on data from Germany's Socio-Economic Panel (SOEP), a longitudinal study of German private households on topics such as occupational biographies, earnings, and satisfaction indicators. We use data from the survey question on whether individuals are willing to risk trusting other people, which is available at the district level for 2009. We assume these data are constant throughout our sample period and match it with our full dataset. Respondents were asked to rate their willingness to trust others on a scale from 0 to 10, where 0 (10) indicates no (strong) willingness.

To measure *TRUST*, we compute the fraction of survey respondents in each district responding on the upper half of the scale, i.e., from 5 to 10. We expect our variable *STRENGTH_PROT* to positively affect *TRUST*, which, in turn, should have a negative impact on our measure of the size of shareholding (*BIGGEST_SHAREHOLDER*) and insider ownership (*INSIDER*). The regressions are estimated by OLS and robust standard errors. We present the results of this analysis in Table 10.

[Please insert Table 10 here]

Column (1) presents the regression results for trust on the strength of Protestant faith in the firm's location, controlling for demographic and firm-specific characteristics in addition to legal-form, dialect, industry, and year fixed effects. All variables are described in Section 2.2 and in Appendix 1. The results suggest that the strength of Protestant adherence has a positive and statistically significant effect (one-sided p-value < 0.01) on trust. Columns (2) to (6) present regression results for our measures of ownership structures on the strength of Protestant faith and trust; columns (2), (3), and (4) show a negative and statistically significant effect on dependent variables *#BLOCK*, *BLOCK*, and *SHAREHOLDER_REQUIRED* (one-sided p-value < 0.01 for *#BLOCK*, *BLOCK*, and *SHAREHOLDERS_REQUIRED*). The results suggest that there is a negative direct effect of Protestant adherence on blockholder ownership.

In columns (5) and (6), we present results for the size of shareholding (*BIGGEST_SHAREHOLDER*) and insider ownership (*INSIDER*). In line with our expectations, we identify trust as a mediator of the effect of Protestant faith on the size of shareholding and insider ownership. In particular, the variable *TRUST* is negative and statistically significant in both regressions (one-sided p-value < 0.01 in column (5) and one-sided p-value < 0.05 in column (6)), suggesting that both the shares held by the biggest shareholder and insider ownership decrease with trust. Since the strength of Protestant adherence is positively related with trust and trust is negatively related with our two measures of shareholding size and insider ownership, we find support for the fact that trust mediates the relation between the dominance of Protestant faith in the firm's region and our two characteristics of ownership structures (i.e., shareholding size and insider ownership).

Overall, we find a negative direct effect of Protestant adherence on our measures of blockholder ownership and a negative indirect effect on shareholding size and insider ownership, which is mediated by trust. Statistics at the end of Table 10 confirm the presence of a direct (indirect) negative, statistically significant effect of Protestant adherence on ownership structures in columns (2) to (4) ((5) and (6)), which is in line with our theoretical arguments. The direct effect of Protestant faith on blockholder ownership may be explained by a higher preference for autonomy due to the horizontal character of Protestantism (La Porta *et al.* 1997; Bloom *et al.* 2012). The mediating role of trust between Protestant adherence in the region and shareholding size/insider ownership is also likely explained by the organization of Protestant congregations, which encourage level ties with fellow members and increased mutual monitoring. Consequently, Protestant dominance in the region should increase general trust, reducing the agency conflict and the shareholders' need to monitor firm management through ownership or equity-based pay.

## 5. Robustness checks

After establishing a link between Protestant adherence and ownership structures, we perform the following tests to evaluate the robustness of our results.

One concern may be that we run a panel regression from 2007 to 2010 even though our variable of interest (i.e., the strength of Protestant adherence) is nearly constant throughout our sample period. This means that using four years of observations could artificially decrease the standard errors in our regression models and increase the likelihood of finding significant effects. In order to address this concern, we perform the regression model in equation (1) (without year fixed effects) on the cross-section of year 2010. In this regression, our sample size reduces to 6,954 firm-shareholders observations. The results (untabulated) are consistent and remain significant (maximum one-sided p-value < 0.10).

Because our variable of interest, *STRENGTH_PROT*, is quasi-fixed over the sample period, we cannot implement a firm fixed effect model. For that reason, the results for our panel regressions might be partially explained by unobserved heterogeneity in the cross-section. While we address these concerns directly in later tests (Sections 3.2 and 3.3), these analyses lose power (because they operate on a smaller sample) and are more accurately interpreted as local average treatment effects. Therefore, we also implement a correlated random effects model that includes the municipality (time-series) averages of time variables as additional regressors; this also allows a time-constant explanatory variable (Wooldridge 2000, p. 332). Intuitively, this approach allows the time-constant variable to be correlated with the municipality-average level of the time-varying variables. Wooldridge (2000) shows that estimating the regression by random effects yields the same estimate on the time-varying variables as does estimating by fixed effects. Using a correlated random effects model allows us to have a time-constant variable of interest, for which we can also obtain an estimate. Results in Appendix 2 show that the correlated random effects estimates of Equation (1) are very similar

to those reported in Table 6, though the statistical significance is stronger in some specifications.

## 6. Conclusion

We present a sequence of tests designed to probe the relation between a firm's ownership structure and the dominant religion in the firm's location. These tests provide empirical evidence on ideas previously put forward about how religion shapes the behaviors and preferences of people, which ultimately influence particular institutional arrangements. Protestantism (as compared with a hierarchical faith such as Catholicism) is thought to be associated with autonomy and strong horizontal relationships, which increase the enforcement of moral standards. This dual effect implies that in Protestant dominated regions, governance structures are less likely to rely on direct intervention; instead, they exploit the enforcement of behavior by mutual control.

Our tests show evidence consistent with these ideas. In particular, we show that Protestant religion is negatively associated with various measures of large shareholdings. In designs less likely to be impacted by correlated omitted variables, we show that large shareholdings are less common for firms located in Protestant regions. We also show that insider ownership is negatively associated with adherence to Protestantism in the region, although the statistical significance of the evidence varies likely due to differences in the power of tests with stronger causal implications.

We hypothesize that the mixed evidence on the direct effect of religion on insider ownership might be partially also explained by the potential channels linking the two variables. In particular, we posit that as religion operates through trust, insider ownership will be affected. If insider ownership is used as a substitute for monitoring by large shareholders, however, it might be difficult to document the association between insider ownership and religion in the

cross-section (as both effects work in opposite directions). Our evidence shows that Protestant dominance in a region increases trust, which then decreases insider ownership.

Together, these findings are consistent with the idea that geographical variation in religion, likely attributable to long-term historical trends, influences the governance choices of contemporary firms.

**Appendix 1**
Variable Definitions.

| Variable name | Variable definitions |
|---|---|
| STRENGTH_PROT | number of Protestant adherents in the municipality where the firm's headquarters are located divided by the number of Christian adherents in this municipality: $$\frac{number\ of\ Protestant\ adherents\ in\ municipality_i}{number\ of\ Christian\ adherents\ in\ municipality_i}$$ $$i\ indicates\ the\ firm$$ |
| #BLOCK | number of blockholders (shareholders who hold more than 25 percent of firm shares) per firm |
| BLOCK | number of blockholders (shareholders who hold more than 25 percent of firm shares) relative to the number of shareholders per firm |
| SHAREHOLDERS_REQUIRED | indicator variable equal to 1 if the firm needs only 1 shareholder to form a block of 25 percent, 0 otherwise |
| BIGGEST_SHAREHOLDER | logarithm of the shares held by the largest shareholder |
| INSIDER | proportion of shares owned by managers per firm |
| GENDER | proportion of female inhabitants in the district where the firm's headquarters are located |
| AGE | average age of the inhabitants in the district where the firm's headquarters are located |
| MARRIED | proportion of married inhabitants in the district where the firm's headquarters are located |
| MUNICIPALITYSIZE | logarithmized sum of Catholics, Protestants, and members of other religions/undenominational inhabitants in the municipality where the firm is headquartered |
| INCOME | logarithmized available income per inhabitant in the district where the firm's headquarters are located |
| MINORITIES | proportion of foreigners in the district where the firm's headquarters are located |
| EDUCATION | proportion of inhabitants having a general or subject-linked higher education entrance qualification in the district where the firm's headquarters are located |
| TAX | trade tax rate ("Gewerbesteuer") in the municipality where the firm's headquarters are located |
| SIZE | logarithm of total assets (in thousand €) winsorized at 99 percent |
| FIRMAGE | logarithm of firm age in years |

| | |
|---|---|
| RISK | difference between the maximum and minimum of return on equity over the past three years winsorized at 99 percent |
| LEV | ratio of debt to assets winsorized at 99 percent |
| LOSS | indicator variable equal to 1 if the firm realized a loss in at least one of the past three years (measured in terms of the return on equity), 0 otherwise |
| GROWTH | average growth in total assets over the last three years winsorized at 99 percent |

**Notes:** This table lists the variables used in the empirical analysis and their description.

**Appendix 2**

Correlated random effects regressions:

$$\mathbf{OWNERSHIP\_STRUCTURE}_{it} = \gamma STRENGTH\_PROT_{it} + \mathbf{X}_{ijt}\boldsymbol{\beta} + \overline{\mathbf{X}}_{ijt}\boldsymbol{\varphi} + \mu_i + \eta_k + \theta_j + \iota_t + \varepsilon_{it} \quad (1')$$

| Estimated effect | VARIABLES | (1) #BLOCK | (2) BLOCK | (3) SHAREHOLDERS_REQUIRED | (4) BIGGEST_SHAREHOLDER | (5) INSIDER |
|---|---|---|---|---|---|---|
| estimated as a standard random-effects model | STRENGTH_PROT | -0.09** | -0.04** | -0.02** | -0.06** | -0.01 |
| | | (0.042) | (0.021) | (0.013) | (0.030) | (0.022) |
| estimated as a standard random-effects model | GENDER | -0.46 | 1.13 | 0.53 | 1.26 | 0.73 |
| | | (1.853) | (0.897) | (0.575) | (1.321) | (0.969) |
| estimated as a standard random-effects model | MARRIED | 0.34 | 0.13 | 0.04 | 0.04 | 0.10 |
| | | (0.433) | (0.212) | (0.132) | (0.312) | (0.222) |
| estimated as a standard random-effects model | MUNICIPALITYSIZE | -0.02** | -0.01 | -0.00 | 0.00 | -0.01 |
| | | (0.010) | (0.005) | (0.003) | (0.007) | (0.005) |
| estimated as a standard random-effects model | MINORITIES | 0.54* | 0.07 | 0.05 | -0.13 | -0.18 |
| | | (0.282) | (0.141) | (0.089) | (0.211) | (0.150) |
| within-cluster | AGE | -0.04 | -0.01 | -0.00 | 0.02* | 0.05* |
| | | (0.025) | (0.011) | (0.005) | (0.012) | (0.029) |
| within-cluster | INCOME | 0.27 | 0.18** | 0.02 | 0.01 | -0.12 |
| | | (0.175) | (0.078) | (0.039) | (0.093) | (0.218) |

**Appendix 2 (continued)**

| | | | | | | |
|---|---|---|---|---|---|---|
| within-cluster | EDUCATION | 0.02 | -0.03 | 0.03** | -0.02 | 0.00 |
| | | (0.067) | (0.031) | (0.016) | (0.030) | (0.094) |
| within-cluster | TAX | 0.05 | 0.01 | -0.00 | -0.04 | -0.01 |
| | | (0.040) | (0.016) | (0.011) | (0.031) | (0.057) |
| within-cluster | SIZE | -0.01 | -0.00 | 0.00 | 0.00 | 0.03 |
| | | (0.020) | (0.008) | (0.004) | (0.007) | (0.021) |
| within-cluster | FIRMAGE | -0.02 | -0.01 | 0.01 | 0.03 | 0.01 |
| | | (0.041) | (0.023) | (0.010) | (0.019) | (0.070) |
| within-cluster | RISK | 0.01 | -0.01 | -0.00 | -0.01 | -0.01 |
| | | (0.008) | (0.004) | (0.002) | (0.004) | (0.010) |
| within-cluster | LEV | -0.01 | 0.01 | -0.01 | 0.01 | -0.03 |
| | | (0.038) | (0.016) | (0.008) | (0.015) | (0.039) |
| within-cluster | LOSS | -0.01 | -0.00 | -0.00 | -0.01* | 0.04*** |
| | | (0.012) | (0.005) | (0.003) | (0.005) | (0.013) |
| within-cluster | GROWTH | -0.03 | -0.01 | 0.00 | 0.01 | 0.01 |
| | | (0.027) | (0.011) | (0.004) | (0.013) | (0.032) |
| within-cluster | INTERLOCK | 0.00 | -0.04*** | 0.00 | -0.01 | 0.00 |
| | | (0.030) | (0.012) | (0.011) | (0.012) | (0.024) |
| between-cluster | LOSS | -0.01 | -0.01 | -0.01 | -0.01 | -0.10*** |
| | | (0.024) | (0.012) | (0.008) | (0.017) | (0.018) |
| difference in between- and within-cluster | AGE | 0.02 | -0.00 | -0.00 | -0.03** | -0.06* |
| | | (0.027) | (0.012) | (0.006) | (0.013) | (0.029) |
| difference in between- and within-cluster | INCOME | -0.30 | -0.24*** | -0.05 | -0.05 | 0.13 |
| | | (0.202) | (0.092) | (0.053) | (0.118) | (0.225) |
| difference in between- and within-cluster | EDUCATION | 0.04 | -0.03 | -0.08* | -0.15 | 0.04 |
| | | (0.146) | (0.072) | (0.045) | (0.102) | (0.117) |

**Appendix 2 (continued)**

| | | | | | | |
|---|---|---|---|---|---|---|
| difference in between- and within-cluster | TAX | -0.04 | -0.02 | -0.01 | 0.01 | 0.02 |
| | | (0.048) | (0.021) | (0.014) | (0.038) | (0.058) |
| difference in between- and within-cluster | SIZE | -0.03 | -0.04*** | -0.02*** | -0.06*** | -0.06*** |
| | | (0.021) | (0.009) | (0.005) | (0.009) | (0.022) |
| difference in between- and within-cluster | FIRMAGE | 0.04 | -0.02 | -0.02 | -0.07*** | -0.04 |
| | | (0.043) | (0.024) | (0.011) | (0.021) | (0.071) |
| difference in between- and within-cluster | RISK | -0.01 | 0.02** | 0.01** | 0.02** | 0.01 |
| | | (0.015) | (0.008) | (0.004) | (0.010) | (0.012) |
| difference in between- and within-cluster | LEV | 0.08 | 0.04 | 0.02 | 0.02 | 0.09** |
| | | (0.052) | (0.023) | (0.013) | (0.030) | (0.043) |
| difference in between- and within-cluster | GROWTH | 0.04 | 0.10*** | 0.00 | 0.09** | 0.01 |
| | | (0.054) | (0.026) | (0.015) | (0.038) | (0.043) |
| difference in between- and within-cluster | INTERLOCK | -0.02 | -0.04*** | -0.03** | -0.13*** | -0.06** |
| | | (0.035) | (0.015) | (0.013) | (0.018) | (0.025) |
| | Constant | 2.53** | 1.69*** | 1.36*** | 4.74*** | 0.51 |
| | | (1.113) | (0.536) | (0.358) | (0.818) | (0.578) |
| | legal form fixed effects | YES | YES | YES | YES | YES |
| | dialect fixed effects | YES | YES | YES | YES | YES |
| | industry and year fixed effects | YES | YES | YES | YES | YES |
| | Number of observations | 16,468 | 16,468 | 16,468 | 16,468 | 16,468 |
| | Number of groups | 8,050 | 8,050 | 8,050 | 8,050 | 8,050 |

## Appendix 2 (continued)

**Notes:** This table reports the regression results. The models are estimated based on a correlated random effects model. *#BLOCK* is the number of blockholders (shareholders who hold more than 25 percent of firm shares) per firm. *BLOCK* is the number of blockholders to the number of shareholders per firm. *SHAREHOLDERS_REQUIRED* is an indicator variable equal to 1 if the firm needs only 1 shareholder to form a block of 25 percent, 0 otherwise. *BIGGEST_SHAREHOLDER* is the logarithm of the shareholding of the largest shareholder. *INSIDER* is the proportion of shares owned by managers per firm. *STRENGTH_PROT* is the number of Protestant adherents in the municipality where the firm's headquarters are located divided by the number of Christian adherents in the same municipality. *GENDER* is the proportion of female inhabitants in the district where the firm's headquarters are located. *AGE* is the average age of the inhabitants in the district where the firm's headquarters are located. *MARRIED* is the proportion of married people in the district where the firm's headquarters are located. *MUNICIPALITYSIZE* is the logarithmized sum of Catholics, Protestants, and members of other religions/undenominational inhabitants in the municipality where the firm is headquartered. *INCOME* is the logarithmized available income per inhabitant in the district where the firm's headquarters are located. *MINORITIES* is the proportion of foreigners in the district where the firm's headquarters are located. *EDUCATION* is the proportion of inhabitants having a general or subject-linked higher education entrance qualification in the district where the firm's headquarters are located. *TAX* captures the trade tax rate ("Gewerbesteuer") in the municipality where the firm's headquarters are located. *SIZE* is the logarithm of total assets winsorized at 99 percent. *FIRMAGE* is the logarithm of firm age in years. *RISK* is the difference between the maximum and minimum of the return on equity over the past three years winsorized at 99 percent. *LEV* is the ratio of debt to assets winsorized at 99 percent. *LOSS* is an indicator variable equal to 1 if the firm realized a loss in at least one of the past three years (measured in terms of return on equity), 0 otherwise. *GROWTH* is the average growth in total assets over the last three years winsorized at 99 percent. *INTERLOCK* is an indicator variable equal to 1 if at least one shareholder of a firm is also shareholder within another firm in the same year, 0 otherwise. Furthermore, we control for legal form, dialect, industry, and year fixed effects. *, **, *** indicate one-tailed significance for the predictions at the 10 percent, 5 percent, and 1 percent levels, respectively; significance is two-tailed otherwise. Robust standard errors are reported in parentheses. For an overview of the variables, see Appendix 1.

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**Table 1**
Sample.

| Sample selection | # observations |
|---|---|
| Potential dataset, Amadeus[a] | 120,436 |
| Drop observations with a missing shareholder identifier | 95,472 |
| Drop observations with a missing shareholder's percentage of ownership | 95,236 |
| Drop observations with inconsistent ownership data | 93,503 |
| Drop firms with a missing official municipality key | 90,185 |
| Drop firms with missing religion information at headquarters' location | 88,006 |
| Drop firms with missing financial or demographic controls | 16,468 |
| Final sample | 16,468 |

**Notes:** This table reports the sample selection process and presents the final sample of analysis.

[a] Firms need to satisfy the following conditions to be included in the sample: they should be located in Germany, have the legal form of a private limited company, have at least one private shareholder located in Germany, and have a known value for the number of employees, return on equity, and leverage in the last available year.

**Table 2**
Firm location.

| State | Percent | |
|---|---|---|
| | Our sample | All private firms in Germany [b] |
| Schleswig Holstein | 2.81 | 2.14 |
| Hamburg | 2.10 | 5.44 |
| Lower Saxony | 8.33 | 8.67 |
| Bremen | 0.50 | 1.22 |
| North Rhine-Westphalia | 25.95 | 24.52 |
| Hesse | 5.75 | 9.59 |
| Rhineland Palatinate | 3.94 | 2.74 |
| Baden-Württemberg | 14.92 | 13.05 |
| Bavaria | 17.16 | 16.55 |
| Saarland | 1.32 | 1.13 |
| Berlin | 2.03 | 7.78 |
| Brandenburg | 1.46 | 1.49 |
| Mecklenburg Western Pomerania | 0.27 | 0.65 |
| Saxony | 7.83 | 3.04 |
| Saxony-Anhalt | 2.95 | 1.19 |
| Thuringia | 2.68 | 0.81 |
| **Total** | 100.00 | 100.00 |

**Notes:** This table reports the locational distribution of firms. The statistics are based on the full sample from 2007 to 2010 with 16,468 observations.

[b] All firms are located in Germany, are a private limited company, and have a known value for location and industry.

**Table 3**
Industry.

| Industry (NACE) | Frequency | Percent |
|---|---|---|
| Accomodation and Food Service Activities (digits 55-56) | 56 | 0.34 |
| Administrative and Support Service Activities (digits 77-82) | 546 | 3.32 |
| Agriculture, Forestry and Fishing (digits 01-03) | 51 | 0.31 |
| Arts, Entertainment and Recreation (digits 90-93) | 18 | 0.11 |
| Construction (digits 41-43) | 2,020 | 12.27 |
| Education (digit 85) | 42 | 0.26 |
| Electricity, Gas, Steam and Air Conditioning Supply (digit 35) | 20 | 0.12 |
| Financial and Insurance Activities (digits 64-66) | 122 | 0.74 |
| Human Health and Social Work Activities (digits 86-88) | 120 | 0.73 |
| Information and Communication (digits 58-63) | 350 | 2.13 |
| Manufacturing (digits 10-33) | 6,004 | 36.46 |
| Mining and Quarrying (digits 05-09) | 75 | 0.46 |
| Other Service Activities (digits 94-96) | 104 | 0.63 |
| Professional, Scientific and Technical Activities (digits 69-75) | 1,047 | 6.36 |
| Public administration and defence; compulsory social security (digit 84) | 1 | 0.01 |
| Real Estate Activities (digit 68) | 300 | 1.82 |
| Transportation and Storage (digits 49-53) | 593 | 3.60 |
| Water Supply, Sewerage, Waste Management and Remediation Activities (digits 36-39) | 128 | 0.78 |
| Wholesale and Retail Trade, Repair of Motor Vehicles and Motorcycles (digits 45-47) | 4,871 | 29.58 |
| **Total** | 16,468 | 100.00 |

**Notes:** This table reports the industry distribution of firms.
The statistics are based on the full sample from 2007 to 2010 with 16,468 observations.

**Table 4**
Descriptive statistics.

| Variable | Obs | Mean | Min | Median | Max | Std. dev. |
|---|---|---|---|---|---|---|
| Independent variable | | | | | | |
| STRENGTH_PROT | 16,468 | 0.52 | 0.02 | 0.54 | 0.99 | 0.25 |
| Dependent variables | | | | | | |
| #BLOCK | 16,468 | 1.34 | 0.00 | 1.00 | 3.00 | 0.70 |
| BLOCK | 16,468 | 0.70 | 0.00 | 1.00 | 1.00 | 0.36 |
| SHAREHOLDERS_REQUIRED | 16,468 | 0.94 | 0 | 1 | 1 | 0.23 |
| BIGGEST_SHAREHOLDER | 16,468 | 4.03 | 0.36 | 3.97 | 4.61 | 0.53 |
| INSIDER | 16,468 | 0.54 | 0.00 | 0.55 | 1.00 | 0.41 |
| Demographic controls | | | | | | |
| GENDER | 16,468 | 0.51 | 0.49 | 0.51 | 0.54 | 0.01 |
| AGE | 16,468 | 42.78 | 38.23 | 42.52 | 48.12 | 1.50 |
| MARRIED | 16,468 | 0.46 | 0.35 | 0.48 | 0.52 | 0.04 |
| MUNICIPALITYSIZE | 16,468 | 10.26 | 4.41 | 10.00 | 14.63 | 1.84 |
| INCOME | 16,468 | 9.85 | 9.54 | 9.85 | 10.54 | 0.12 |
| MINORITIES | 16,468 | 0.09 | 0.01 | 0.08 | 0.26 | 0.05 |
| EDUCATION | 16,468 | 0.31 | 0.00 | 0.31 | 0.64 | 0.09 |
| TAX | 16,468 | 3.87 | 2.00 | 3.90 | 4.90 | 0.52 |
| Financial controls | | | | | | |
| SIZE | 16,468 | 8.86 | 5.00 | 8.96 | 12.14 | 1.32 |
| FIRMAGE | 16,468 | 2.96 | 0.00 | 3.00 | 5.19 | 0.66 |
| RISK | 16,468 | 0.37 | 0.01 | 0.18 | 4.07 | 0.61 |
| LEV | 16,468 | 0.49 | 0.02 | 0.50 | 0.90 | 0.24 |
| LOSS | 16,468 | 0.20 | 0.00 | 0 | 1 | 0.40 |
| GROWTH | 16,468 | 0.10 | -0.16 | 0.07 | 0.97 | 0.17 |

**Notes:** This table presents descriptive statistics on the independent, dependent, and control variables. *STRENGTH_PROT* is the number of Protestant adherents in the municipality where the firm's headquarters are located divided by the number of Christian adherents in this municipality. *#BLOCK* is the number of blockholders (shareholders who hold more than 25 percent of firm shares) per firm. *BLOCK* is the number of blockholders to the number of shareholders per firm. *SHAREHOLDERS_REQUIRED* is an indicator variable equal to 1 if the firm needs only 1 shareholder to form a block of 25 percent, 0 otherwise. *BIGGEST_SHAREHOLDER* is the logarithm of the shares held by the largest shareholder. *INSIDER* is the proportion of shares owned by managers per firm. *GENDER* is the proportion of female inhabitants in the district where the firm's headquarters are located. *AGE* is the average age of the inhabitants in the district where the firm's headquarters are located. *MARRIED* is the proportion of married inhabitants in the district where the firm's headquarters are located. *MUNICIPALITYSIZE* is the logarithmized sum of Catholics, Protestants, and members of other religions/undenominational inhabitants in the municipality where the firm is headquartered. *INCOME* is the logarithmized available income per inhabitant in the district where the firm's headquarters are located. *MINORITIES* is the proportion of foreigners in the district where the firm's headquarters are located. *EDUCATION* is the proportion of inhabitants having a general or subject-linked higher education entrance qualification in the district where the firm's headquarters are located. *TAX* captures the trade tax rate ("Gewerbesteuer") in the municipality where the firm's headquarters are located. *SIZE* is the logarithm of total assets (in thousand €) winsorized at 99 percent. *FIRMAGE* is the logarithm of firm age in years. *RISK* is the difference between the maximum and minimum for the return on equity over the past three years winsorized at 99 percent. *LEV* is the ratio of debt to assets winsorized at 99 percent. *LOSS* is an indicator variable equal to 1 if the firm realized a loss in at least one of the past three years (measured in terms of return on equity), 0 otherwise. *GROWTH* is the average growth in total assets over the last three years winsorized at 99 percent. The descriptive statistics are based on the full sample from 2007 to 2010 with 16,468 observations. For an overview of the variables, see Appendix 1.

**Table 5**
Correlations.

| Variable | STRENGTH_PROT | #BLOCK | BLOCK | SHAREHOLDERS_REQUIRED | BIGGEST_SHAREHOLDER | INSIDER | GENDER | AGE | MARRIED | MUNICIPALITY SIZE | INCOME | MINORITIES | EDUCATION | TAX | SIZE | FIRMAGE | RISK | LEV | LOSS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| #BLOCK | -0.02*** | | | | | | | | | | | | | | | | | | |
| BLOCK | -0.02*** | 0.51*** | | | | | | | | | | | | | | | | | |
| SHAREHOLDERS_REQUIRED | -0.03*** | 0.46*** | 0.48*** | | | | | | | | | | | | | | | | |
| BIGGEST_SHAREHOLDER | -0.03*** | -0.01 | 0.54*** | 0.59*** | | | | | | | | | | | | | | | |
| INSIDER | -0.00 | 0.11*** | 0.30*** | 0.23*** | 0.35*** | | | | | | | | | | | | | | |
| GENDER | 0.08*** | -0.04*** | -0.03*** | -0.02*** | -0.02* | -0.01 | | | | | | | | | | | | | |
| AGE | 0.49*** | -0.02** | -0.00 | -0.02*** | -0.01* | 0.02** | 0.18*** | | | | | | | | | | | | |
| MARRIED | -0.11*** | 0.03*** | 0.02*** | 0.03*** | 0.03*** | 0.01 | -0.44*** | 0.21*** | | | | | | | | | | | |
| MUNICIPALITY SIZE | 0.05*** | -0.04*** | -0.04*** | -0.03*** | -0.04*** | -0.03*** | 0.44*** | -0.18*** | -0.75*** | | | | | | | | | | |
| INCOME | -0.32*** | -0.00 | -0.02** | 0.00 | 0.01 | -0.02** | 0.13*** | -0.39*** | 0.06*** | 0.02*** | | | | | | | | | |
| MINORITIES | -0.23*** | -0.02** | -0.05*** | -0.02** | -0.03*** | -0.04*** | 0.28*** | -0.45*** | -0.46*** | 0.60*** | 0.48*** | | | | | | | | |
| EDUCATION | 0.28*** | -0.02*** | -0.03*** | -0.04*** | -0.04*** | -0.00 | 0.43*** | 0.19*** | -0.57*** | 0.54*** | -0.09*** | 0.20*** | | | | | | | |
| TAX | 0.04*** | -0.03*** | -0.04*** | -0.03*** | -0.04*** | -0.02*** | 0.47*** | -0.04*** | -0.52*** | 0.75*** | -0.08*** | 0.42*** | 0.50*** | | | | | | |
| SIZE | -0.11*** | -0.06*** | -0.18*** | -0.11*** | -0.14*** | -0.13*** | -0.02** | -0.14*** | 0.03*** | -0.02** | 0.15*** | 0.12*** | -0.08*** | -0.07*** | | | | | |
| FIRMAGE | -0.10*** | 0.01 | -0.12*** | -0.03*** | -0.09*** | -0.07*** | 0.01 | -0.13*** | 0.04*** | 0.01 | 0.15*** | 0.13*** | -0.06*** | -0.01 | 0.26*** | | | | |
| RISK | 0.01 | 0.00 | 0.03*** | 0.03*** | 0.04*** | -0.01 | 0.02*** | -0.01 | -0.02** | 0.04*** | 0.02** | 0.03*** | 0.01 | 0.03*** | -0.10*** | -0.05*** | | | |
| LEV | -0.00 | 0.02*** | 0.02*** | 0.02*** | 0.02*** | -0.00 | -0.02*** | -0.02** | 0.00 | -0.01 | -0.01 | -0.02** | -0.01* | -0.01 | 0.04*** | -0.03*** | 0.22*** | | |
| LOSS | 0.02** | -0.01 | -0.00 | -0.01 | -0.01 | -0.04*** | -0.00 | 0.04*** | 0.01* | -0.00 | 0.01 | -0.00 | 0.00 | 0.00 | -0.07*** | 0.00 | 0.28*** | 0.15*** | |
| GROWTH | 0.02** | -0.01 | 0.07*** | 0.02** | 0.05*** | 0.05*** | -0.00 | 0.02*** | -0.01 | -0.00 | -0.05*** | -0.02*** | -0.00 | 0.00 | -0.05*** | -0.23*** | 0.03*** | 0.01 | -0.13*** |

## Table 5 (continued)

**Notes:** This table reports the Pearson correlations between the variables using 16,468 observations from 2007 to 2010. *STRENGTH_PROT* is the number of Protestant adherents in the municipality where the firm's headquarters are located divided by the number of Christian adherents in the same municipality. *#BLOCK* is the number of blockholders (shareholders who hold more than 25 percent of firm shares) per firm. *BLOCK* is the number of blockholders to the number of shareholders per firm. *SHAREHOLDERS_REQUIRED* is an indicator variable equal to 1 if the firm needs only 1 shareholder to form a block of 25 percent. *BIGGEST_SHAREHOLDER* is the logarithm of the shares held by the largest shareholder. *INSIDER* is the proportion of shares owned by managers per firm. *GENDER* is the proportion of female inhabitants in the district where the firm's headquarters are located. *AGE* is the average age of the inhabitants in the district where the firm's headquarters are located. *MARRIED* is the proportion of married inhabitants in the district where the firm's headquarters are located. *MUNICIPALITYSIZE* is the logarithmized sum of Catholics, Protestants, and members of other religions/undenominational inhabitants in the municipality where the firm is headquartered. *INCOME* is the logarithmized available income per inhabitant in the district where the firm's headquarters are located. *MINORITIES* is the proportion of foreigners in the district where the firm's headquarters are located. *EDUCATION* is the proportion of inhabitants having a general or subject-linked higher education entrance qualification in the district where the firm's headquarters are located. *TAX* captures the trade tax rate ("Gewerbesteuer") in the municipality where the firm's headquarters are located. *SIZE* is the logarithm of total assets winsorized at 99 percent. *FIRMAGE* is the logarithm of firm age in years. *RISK* is the standard deviation of the return on equity over the past three years winsorized at 99 percent. *LEV* is the ratio of debt to assets winsorized at 99 percent. *LOSS* is an indicator variable equal to 1 if the firm realized a loss in at least one of the past three years (measured in terms of return on equity), 0 otherwise. *GROWTH* is the average growth in total assets over the last three years winsorized at 99 percent. *, **, *** indicate the two-tailed statistical significance at the 10 percent, 5 percent, and 1 percent levels, respectively. For an overview of the variables, see Appendix 1.

**Table 6**
Regression Analysis.

| VARIABLES | (1a) #BLOCK | (1b) #BLOCK | (2a) BLOCK | (2b) BLOCK | (3a) SHAREHOLDERS_REQUIRED | (3b) SHAREHOLDERS_REQUIRED | (4a) BIGGEST_SHAREHOLDER | (4b) BIGGEST_SHAREHOLDER | (5a) INSIDER | (5b) INSIDER |
|---|---|---|---|---|---|---|---|---|---|---|
| STRENGTH_PROT | -0.05** | -0.07** | -0.03** | -0.04** | -0.26*** | -0.35** | -0.07*** | -0.05* | -0.00 | -0.01 |
| | (0.024) | (0.035) | (0.018) | (0.024) | (0.101) | (0.150) | (0.028) | (0.035) | (0.017) | (0.023) |
| GENDER | | 0.00 | | 1.47 | | 4.99 | | 2.62* | | 0.54 |
| | | (1.539) | | (0.978) | | (5.767) | | (1.543) | | (0.954) |
| AGE | | -0.01** | | -0.01** | | -0.04 | | -0.01 | | -0.00 |
| | | (0.007) | | (0.005) | | (0.032) | | (0.008) | | (0.005) |
| MARRIED | | 0.31 | | 0.07 | | 0.31 | | 0.08 | | -0.01 |
| | | (0.330) | | (0.230) | | (1.281) | | (0.353) | | (0.225) |
| MUNICIPALITYSIZE | | -0.01* | | -0.00 | | -0.00 | | -0.00 | | -0.00 |
| | | (0.008) | | (0.005) | | (0.032) | | (0.008) | | (0.005) |
| INCOME | | 0.04 | | -0.01 | | -0.12 | | -0.02 | | 0.04 |
| | | (0.073) | | (0.052) | | (0.310) | | (0.083) | | (0.054) |
| MINORITIES | | 0.38* | | -0.06 | | 0.79 | | -0.07 | | -0.32** |
| | | (0.218) | | (0.172) | | (0.929) | | (0.223) | | (0.162) |
| EDUCATION | | 0.01 | | -0.09 | | -0.39 | | -0.15* | | 0.03 |
| | | (0.088) | | (0.061) | | (0.332) | | (0.091) | | (0.063) |
| TAX | | -0.00 | | -0.02 | | -0.17* | | -0.04* | | 0.01 |
| | | (0.021) | | (0.014) | | (0.088) | | (0.021) | | (0.015) |

**Table 6 (continued)**

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| SIZE | | -0.03*** | | -0.04*** | | -0.17*** | | -0.05*** | | -0.03*** |
| | | (0.006) | | (0.004) | | (0.024) | | (0.006) | | (0.003) |
| FIRMAGE | | 0.02* | | -0.04*** | | -0.09** | | -0.05*** | | -0.03*** |
| | | (0.010) | | (0.007) | | (0.043) | | (0.011) | | (0.007) |
| RISK | | -0.00 | | 0.01* | | 0.07 | | 0.02** | | 0.01 |
| | | (0.009) | | (0.006) | | (0.043) | | (0.009) | | (0.007) |
| LEV | | 0.05* | | 0.04** | | 0.14 | | 0.03 | | 0.05*** |
| | | (0.026) | | (0.018) | | (0.113) | | (0.029) | | (0.017) |
| LOSS | | -0.02 | | -0.01 | | -0.10* | | -0.02 | | -0.04*** |
| | | (0.014) | | (0.010) | | (0.055) | | (0.014) | | (0.010) |
| GROWTH | | -0.02 | | 0.07*** | | 0.08 | | 0.09*** | | 0.02 |
| | | (0.028) | | (0.023) | | (0.137) | | (0.032) | | (0.023) |
| INTERLOCK | | -0.02 | | -0.08*** | | -0.29*** | | -0.13*** | | -0.06*** |
| | | (0.015) | | (0.010) | | (0.054) | | (0.016) | | (0.010) |
| Constant | 0.32*** | 0.61 | 0.72*** | 1.12** | 1.74*** | 4.34 | 4.07*** | 4.06*** | 0.54*** | 0.28 |
| | (0.014) | (0.904) | (0.010) | (0.567) | (0.060) | (3.760) | (0.015) | (0.855) | (0.010) | (0.610) |
| legal form fixed effects | | YES | | YES | | YES | | YES | | YES |
| dialect fixed effects | | YES | | YES | | YES | | YES | | YES |
| industry fixed effects | | YES | | YES | | YES | | YES | | YES |
| year fixed effects | | YES | | YES | | YES | | YES | | YES |
| Number of observations | 16,468 | 16,468 | 16,468 | 16,468 | 16,468 | 16,468 | 16,468 | 16,468 | 16,468 | 16,468 |

**Table 6 (continued)**

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Wald Chi$^2$-statistic | 3.88** | 125.95*** | | | 6.78*** | 277.43*** | | | | |
| F-statistic | | | 2.88* | 17.93*** | | | 6.58** | 9.93*** | 0.00 | 22.07*** |
| Pseudo R-squared | | | | | 0.002 | 0.080 | | | | |
| Adjusted R-squared | | | 0.000 | 0.070 | | | 0.001 | 0.056 | 0.000 | 0.052 |

**Notes:** This table reports the regression results. Model 1 is estimated by Poisson, models 2, 4, and 5 by OLS, and model 3 by Probit. Models (1a), (2a), (3a), (4a), and (5a) are estimated without controls. Models (1b), (2b), (3b), (4b), and (5b) are estimated with controls. *#BLOCK* is the number of blockholders (shareholders who hold more than 25 percent of firm shares) per firm. *BLOCK* is the number of blockholders to the number of shareholders per firm. *SHAREHOLDERS_REQUIRED* is an indicator variable equal to 1 if the firm needs only 1 shareholder to form a block of 25 percent. *BIGGEST_SHAREHOLDER* is the logarithm of the shares held by the largest shareholder. *INSIDER* is the proportion of shares owned by managers per firm. *STRENGTH_PROT* is the number of Protestant adherents in the municipality where the firm's headquarters are located divided by the number of Christian adherents in the same municipality. *GENDER* is the proportion of female inhabitants in the district where the firm's headquarters are located. *AGE* is the average age of the inhabitants in the district where the firm's headquarters are located. *MARRIED* is the proportion of married people in the district where the firm's headquarters are located. *MUNICIPALITYSIZE* is the logarithmized sum of Catholics, Protestants, and members of other religions/undenominational inhabitants in the municipality where the firm is headquartered. *INCOME* is the logarithmized available income per inhabitant in the district where the firm's headquarters are located. *MINORITIES* is the proportion of foreigners in the district where the firm's headquarters are located. *EDUCATION* is the proportion of inhabitants having a general or subject-linked higher education entrance qualification in the district where the firm's headquarters are located. *TAX* captures the trade tax rate ("Gewerbesteuer") in the municipality where the firm's headquarters are located. *SIZE* is the logarithm of total assets winsorized at 99 percent. *FIRMAGE* is the logarithm of firm age in years. *RISK* is the difference between the maximum and minimum of the return on equity over the past three years winsorized at 99 percent. *LEV* is the ratio of debt to assets winsorized at 99 percent. *LOSS* is an indicator variable equal to 1 if the firm realized a loss in at least one of the past three years (measured in terms of return on equity), 0 otherwise. *GROWTH* is the average growth in total assets over the last three years winsorized at 99 percent. *INTERLOCK* is an indicator variable equal to 1 if at least one shareholder of a firm is also shareholder within another firm in the same year, 0 otherwise. Furthermore, we control for legal form, dialect, industry, and year fixed effects. *, **, *** indicate one-tailed significance for the predictions at the 10 percent, 5 percent, and 1 percent levels, respectively; significance is two-tailed otherwise. Robust standard errors clustered at the municipality level are reported in parentheses. For an overview of the variables, see Appendix 1.

**Table 7**
Geographical Regression Discontinuity Design.

*Panel A: Ownership Concentration*

| Dependent variable: #BLOCK | Conventional Inference | | | | Robust Inference | | | |
|---|---|---|---|---|---|---|---|---|
| | Estimate | h | NTr | NCo | Estimate | h | NTr | NCo |
| STRENGTH_PROT | -0.23<br>(0.183) | 20 | 134 | 63 | -0.08<br>(0.234) | 15.23 | 113 | 55 |

| Dependent variable: BLOCK | Conventional Inference | | | | Robust Inference | | | |
|---|---|---|---|---|---|---|---|---|
| | Estimate | h | NTr | NCo | Estimate | h | NTr | NCo |
| STRENGTH_PROT | -0.23**<br>(0.109) | 20 | 134 | 63 | -0.28**<br>(0.155) | 12.17 | 97 | 45 |

| Dependent variable: SHARHOLDERS_REQUIRED | Conventional Inference | | | | Robust Inference | | | |
|---|---|---|---|---|---|---|---|---|
| | Estimate | h | NTr | NCo | Estimate | h | NTr | NCo |
| STRENGTH_PROT | -0.14**<br>(0.068) | 20 | 134 | 63 | -0.15**<br>(0.087) | 15.92 | 113 | 55 |

| Dependent variable: BIGGEST_SHAREHOLDER | Conventional Inference | | | | Robust Inference | | | |
|---|---|---|---|---|---|---|---|---|
| | Estimate | h | NTr | NCo | Estimate | h | NTr | NCo |
| STRENGTH_PROT | -0.28**<br>(0.149) | 20 | 134 | 63 | -0.34*<br>(0.240) | 11.54 | 94 | 45 |

**Table 7 (continued)**

*Panel B: Insider Ownership*

| Dependent variable: INSIDER | Conventional Inference | | | | Robust Inference | | | |
|---|---|---|---|---|---|---|---|---|
| | Estimate | h | NTr | NCo | Estimate | h | NTr | NCo |
| STRENGTH_PROT | -0.26** (0.145) | 20 | 134 | 63 | -0.31* (0.210) | 13.63 | 109 | 47 |

**Notes:** This table reports the results of a Geographical Regression Discontinuity Design based on the sample firms located at the religious border in Bavaria with data from 2010. Panel A (B) presents the effect of Protestant norms on ownership concentration (insider ownership). Results are estimated with a local linear regression with triangular kernel weights on each observation's distance to the point of estimation. A sharp regression discontinuity design is assumed. The estimate indicates the point estimate (difference in ownership concentration/insider ownership across treated and control areas). In the conventional inference, we manually chose the fixed bandwidth h (in kilometers). In the robust inference, we apply the optimized bandwidths of the command rdrobust. NTr and NCo indicate the effective sample size used for the estimation in the treated and control areas, respectively. *#BLOCK* is the number of blockholders per firm. *BLOCK* is the number of blockholders to the number of shareholders per firm. *SHAREHOLDERS_REQUIRED* is an indicator variable equal to 1 if the firm needs only 1 shareholder to form a block of 25 percent. *BIGGEST_SHAREHOLDER* is the logarithm of the shares held by the largest shareholder. *INSIDER* is the proportion of shares owned by managers per firm. In all regressions we control for *SIZE*, *FIRMAGE*, *RISK*, *LEV*, *LOSS*, and *GROWTH*. Standard errors are reported in parentheses. *, **, and *** indicate one-tailed significance at the 10 percent, 5 percent, and 1 percent level, respectively.

**Table 8**
Regression Analysis of the differences in ownership structures of firms located in border districts.

| VARIABLES | (1b) #BLOCK_ DIFF | (2b) BLOCK_ DIFF | (3b) SHAREHOLDERS_REQUIRED_DIFF | (4b) BIGGEST_ SHAREHOLDER_DIFF | (5b) INSIDER_ DIFF |
|---|---|---|---|---|---|
| STRENGTH_PROT_DIFF | -0.06 | -0.14* | -0.05 | -0.21* | -0.08 |
| | (0.206) | (0.086) | (0.059) | (0.129) | (0.081) |
| SIZE_DIFF | -0.18** | -0.09*** | -0.07*** | -0.14*** | -0.08*** |
| | (0.073) | (0.032) | (0.020) | (0.039) | (0.025) |
| FIRMAGE_DIFF | 0.05 | -0.01 | -0.09** | -0.16* | 0.05 |
| | (0.165) | (0.065) | (0.045) | (0.087) | (0.054) |
| RISK_DIFF | -0.12 | -0.05 | -0.13*** | -0.13 | -0.05 |
| | (0.114) | (0.058) | (0.043) | (0.093) | (0.053) |
| LEV_DIFF | 0.64** | 0.30** | 0.42*** | 0.79*** | 0.03 |
| | (0.321) | (0.144) | (0.140) | (0.255) | (0.119) |
| LOSS_DIFF | -0.06 | -0.16* | -0.15** | -0.31*** | 0.07 |
| | (0.179) | (0.084) | (0.060) | (0.119) | (0.071) |
| GROWTH_DIFF | 0.78 | 0.45 | 0.31 | 1.06** | 1.06*** |
| | (0.790) | (0.329) | (0.225) | (0.496) | (0.317) |
| Constant | -0.47** | -0.01 | -0.10* | -0.19 | 0.14 |
| | (0.181) | (0.129) | (0.057) | (0.154) | (0.116) |
| state fixed effects | YES | YES | YES | YES | YES |
| Observations | 147 | 147 | 147 | 147 | 147 |
| F-statistic | 4.27*** | 2.87*** | 2.98*** | 3.62*** | 4.29*** |

**Table 8 (continued)**

| | | | | | |
|---|---|---|---|---|---|
| Adjusted R-squared | 0.150 | 0.217 | 0.338 | 0.367 | 0.229 |

**Notes:** This table reports the differences results based on the pairwise comparison of all firms located in districts at the religious border using the religion data from 2010. All models are estimated by OLS. All dependent, independent, and control variables are the differences in the respective characteristics of firms located in Protestant and Catholic dominated border districts which share a common borderline. *#BLOCK* is the number of blockholders (shareholders who hold more than 25 percent of firm shares) per firm. *BLOCK* is the number of blockholders to the number of shareholders per firm. *SHAREHOLDERS_REQUIRED* is an indicator variable equal to 1 if the firm needs only 1 shareholder to form a block of 25 percent. *BIGGEST_SHAREHOLDER* is the logarithm of the shares held by the largest shareholder. *INSIDER* is the proportion of shares owned by managers per firm. *STRENGTH_PROT* is the number of Protestant adherents in the municipality where the firm's headquarters are located divided by the number of Christian adherents in the same municipality. *SIZE* is the logarithm of total assets winsorized at 99 percent. *FIRMAGE* is the logarithm of firm age in years. *RISK* is the difference between the maximum and minimum of the return on equity over the past three years winsorized at 99 percent. *LEV* is the ratio of debt to assets winsorized at 99 percent. *LOSS* is an indicator variable equal to 1 if the firm realized a loss in at least one of the past three years (measured in terms of return on equity), 0 otherwise. *GROWTH* is the average growth in total assets over the last three years winsorized at 99 percent. We control for state fixed effects. *, **, *** indicate one-tailed significance for the predictions at the 10 percent, 5 percent, and 1 percent levels, respectively; significance is two-tailed otherwise. Robust standard errors are reported in parentheses. For an overview on the variables, see Appendix 1.

**Table 9**
Instrumental Variable Approach.

| VARIABLES | (0) STRENGTH_PROT | (1a) #BLOCK | (1b) #BLOCK | (2a) BLOCK | (2b) BLOCK | (3a) SHAREHOLDERS_REQUIRED | (3b) SHAREHOLDERS_REQUIRED | (4a) BIGGEST_SHAREHOLDER | (4b) BIGGEST_SHAREHOLDER |
|---|---|---|---|---|---|---|---|---|---|
| Stage | *First stage* | | | | *Second stage* | | | | |
| STRENGTH_PROT | | -0.10** | -0.18*** | -0.04* | -0.02 | -0.04*** | -0.03* | -0.06** | 0.02 |
| | | (0.045) | (0.075) | -0.05 | (0.040) | (0.014) | (0.023) | (0.036) | (0.057) |
| *Instrument* | | | | | | | | | |
| STRENGTH_PROT_1555 | 0.29*** | | | | | | | | |
| | (0.012) | | | | | | | | |
| *Control variables* | | | | | | | | | |
| GENDER | 0.51 | | -0.39 | | 1.56 | | 0.54 | | 2.88* |
| | (1.234) | | (2.001) | | (0.990) | | (0.617) | | (1.580) |
| AGE | 0.031*** | | -0.01 | | -0.01** | | -0.00 | | -0.02** |
| | (0.005) | | (0.011) | | (0.006) | | (0.004) | | (0.009) |
| MARRIED | -1.043*** | | 0.24 | | 0.12 | | 0.01 | | 0.22 |
| | (0.240) | | (0.450) | | (0.240) | | (0.142) | | (0.365) |

**Table 9 (continued)**

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| MUNICIPALITYSIZE | -0.004 | | -0.02* | | -0.00 | | -0.00 | | 0.00 |
| | (0.004) | | (0.010) | | (0.005) | | (0.003) | | (0.008) |
| INCOME | 0.243*** | | 0.07 | | -0.02 | | -0.01 | | -0.04 |
| | (0.064) | | (0.098) | | (0.053) | | (0.032) | | (0.084) |
| MINORITIES | -0.296 | | 0.55* | | -0.07 | | 0.08 | | -0.10 |
| | (0.193) | | (0.292) | | (0.173) | | (0.097) | | (0.227) |
| EDUCATION | -0.115* | | 0.01 | | -0.09 | | -0.04 | | -0.15 |
| | (0.069) | | (0.118) | | (0.061) | | (0.036) | | (0.091) |
| TAX | -0.044*** | | -0.01 | | -0.02 | | -0.02** | | -0.03 |
| | (0.015) | | (0.028) | | (0.015) | | (0.009) | | (0.022) |
| SIZE | 0.001 | | -0.04*** | | -0.04*** | | -0.02*** | | -0.05*** |
| | (0.002) | | (0.008) | | (0.004) | | (0.003) | | (0.006) |
| FIRMAGE | 0.000 | | 0.02* | | -0.04*** | | -0.01* | | -0.05*** |
| | (0.003) | | (0.013) | | (0.007) | | (0.005) | | (0.011) |
| RISK | 0.001 | | -0.00 | | 0.01* | | 0.01* | | 0.02** |
| | (0.003) | | (0.012) | | (0.006) | | (0.003) | | (0.009) |
| LEV | 0.004 | | 0.07* | | 0.04** | | 0.02 | | 0.03 |
| | (0.007) | | (0.035) | | (0.018) | | (0.012) | | (0.029) |
| LOSS | -0.003 | | -0.02 | | -0.01 | | -0.01** | | -0.02 |
| | (0.004) | | (0.019) | | (0.010) | | (0.006) | | (0.014) |
| GROWTH | -0.018** | | -0.03 | | 0.07*** | | 0.01 | | 0.10*** |
| | (0.009) | | (0.038) | | (0.023) | | (0.013) | | (0.032) |
| INTERLOCK | -0.001 | | -0.02 | | -0.08*** | | -0.03*** | | -0.13*** |
| | (0.004) | | (0.019) | | (0.010) | | (0.007) | | (0.016) |
| Constant | -2.88*** | 1.40*** | 1.62 | 0.72*** | 1.17** | 0.96*** | 1.18*** | 4.06*** | 4.21*** |
| | (0.674) | (0.026) | (1.218) | (0.013) | (0.571) | (0.008) | (0.385) | (0.019) | (0.860) |

**Table 9 (continued)**

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| legal form fixed effects | YES | | YES | | YES | | YES | | YES |
| dialect fixed effects | YES | | YES | | YES | | YES | | YES |
| industry fixed effects | YES | | YES | | YES | | YES | | YES |
| year fixed effects | YES | | YES | | YES | | YES | | YES |
| Number of observations | 16,468 | 16,468 | 16,468 | 16,468 | 16,468 | 16,468 | 16,468 | 16,468 | 16,468 |
| Adjusted R-squared | 0.704 | | 0.014 | | 0.070 | | 0.038 | | 0.056 |
| Partial R-squared | 0.401 | | | | | | | | |

**Notes:** This table reports the results from an instrumental variable regression. Religious adherence in 1555 is used as an instrument for *STRENGTH_PROT*. All models are estimated by OLS. Model (0) reports the results from the first-stage regression. Models (1)-(4) report the results from the second-stage regressions. Models (1a), (2a), (3a), and (4a) are estimated without controls. Models (1b), (2b), (3b), and (4b) are estimated with controls. *#BLOCK* is the number of blockholders (shareholders who hold more than 25 percent of firm shares) per firm. *BLOCK* is the number of blockholders to the number of shareholders per firm. *SHAREHOLDERS_REQUIRED* is an indicator variable equal to 1 if the firm needs only 1 shareholder to form a block of 25 percent. *BIGGEST_SHAREHOLDER* is the logarithm of the shares held by the largest shareholder. *STRENGTH_PROT* is the number of Protestant adherents in the municipality where the firm's headquarters are located divided by the number of Christian adherents in the same municipality. *GENDER* is the proportion of female inhabitants in the district where the firm's headquarters are located. *AGE* is the average age of the inhabitants in the district where the firm's headquarters are located. *MARRIED* is the proportion of married people in the district where the firm's headquarters are located. *MUNICIPALITYSIZE* is the logarithmized sum of Catholics, Protestants, and members of other religions/undenominational inhabitants in the municipality where the firm is headquartered. *INCOME* is the logarithmized available income per inhabitant in the district where the firm's headquarters are located. *MINORITIES* is the proportion of foreigners in the district where the firm's headquarters are located. *EDUCATION* is the proportion of inhabitants having a general or subject-linked higher education entrance qualification in the district where the firm's headquarters are located. *TAX* captures the trade tax rate ("Gewerbesteuer") in the municipality where the firm's headquarters are located. *FIRMAGE* is the logarithm of firm age in years. *RISK* is the difference between the maximum and minimum of the return on equity over the past three years winsorized at 99 percent. *LEV* is the ratio of debt to assets winsorized at 99 percent. *LOSS* is an indicator variable equal to 1 if the firm realized a loss in

## Table 9 (continued)

at least one of the past three years (measured in terms of return on equity), 0 otherwise. *GROWTH* is the average growth in total assets over the last three years winsorized at 99 percent. *INTERLOCK* is an indicator variable equal to 1 if at least one shareholder of a firm is also shareholder within another firm in the same year, 0 otherwise. Furthermore, we control for legal form, dialect, industry, and year fixed effects. *, **, *** indicate one-tailed significance for the predictions at the 10 percent, 5 percent, and 1 percent levels, respectively; significance is two-tailed otherwise. Robust standard errors clustered at the municipality level are reported in parentheses. For an overview on the variables, see Appendix 1.

**Table 10**
**Channel Analysis.**

| VARIABLES | (1) TRUST | (2) #BLOCK | (3) BLOCK | (4) SHAREHOLDERS_REQUIRED | (5) BIGGEST_ SHAREHOLDER | (6) INSIDER |
|---|---|---|---|---|---|---|
| STRENGTH_PROT | 0.03*** | -0.10*** | -0.04*** | -0.02*** | -0.04* | -0.01 |
| | (0.005) | (0.031) | (0.015) | (0.009) | (0.022) | (0.018) |
| TRUST | | 0.00 | -0.02 | -0.02* | -0.13*** | -0.06** |
| | | (0.052) | (0.026) | (0.016) | (0.038) | (0.031) |
| GENDER | 4.11*** | -0.49 | 1.39** | 0.61 | 3.18*** | 0.68 |
| | (0.208) | (1.382) | (0.664) | (0.422) | (1.003) | (0.777) |
| AGE | -0.01*** | -0.02*** | -0.01*** | -0.01** | -0.01*** | -0.00 |
| | (0.001) | (0.007) | (0.003) | (0.002) | (0.005) | (0.004) |
| MARRIED | -0.03 | 0.41 | 0.07 | 0.04 | 0.15 | -0.02 |
| | (0.044) | (0.305) | (0.149) | (0.094) | (0.220) | (0.173) |
| MUNICIPALITYSIZE | 0.01*** | -0.02*** | -0.01 | -0.00 | -0.00 | -0.00 |
| | (0.001) | (0.007) | (0.003) | (0.002) | (0.005) | (0.004) |
| INCOME | 0.02* | 0.04 | -0.02 | -0.01 | -0.02 | 0.04 |
| | (0.011) | (0.069) | (0.034) | (0.023) | (0.052) | (0.040) |
| MINORITIES | 0.24*** | 0.44** | -0.09 | 0.08 | -0.05 | -0.32*** |
| | (0.032) | (0.208) | (0.104) | (0.065) | (0.153) | (0.120) |
| EDUCATION | -0.05*** | 0.04 | -0.07 | -0.04 | -0.13* | 0.04 |
| | (0.013) | (0.092) | (0.046) | (0.030) | (0.070) | (0.053) |
| TAX | -0.03*** | 0.01 | -0.01 | -0.02*** | -0.04*** | 0.01 |
| | (0.003) | (0.020) | (0.010) | (0.006) | (0.015) | (0.011) |

**Table 10 (continued)**

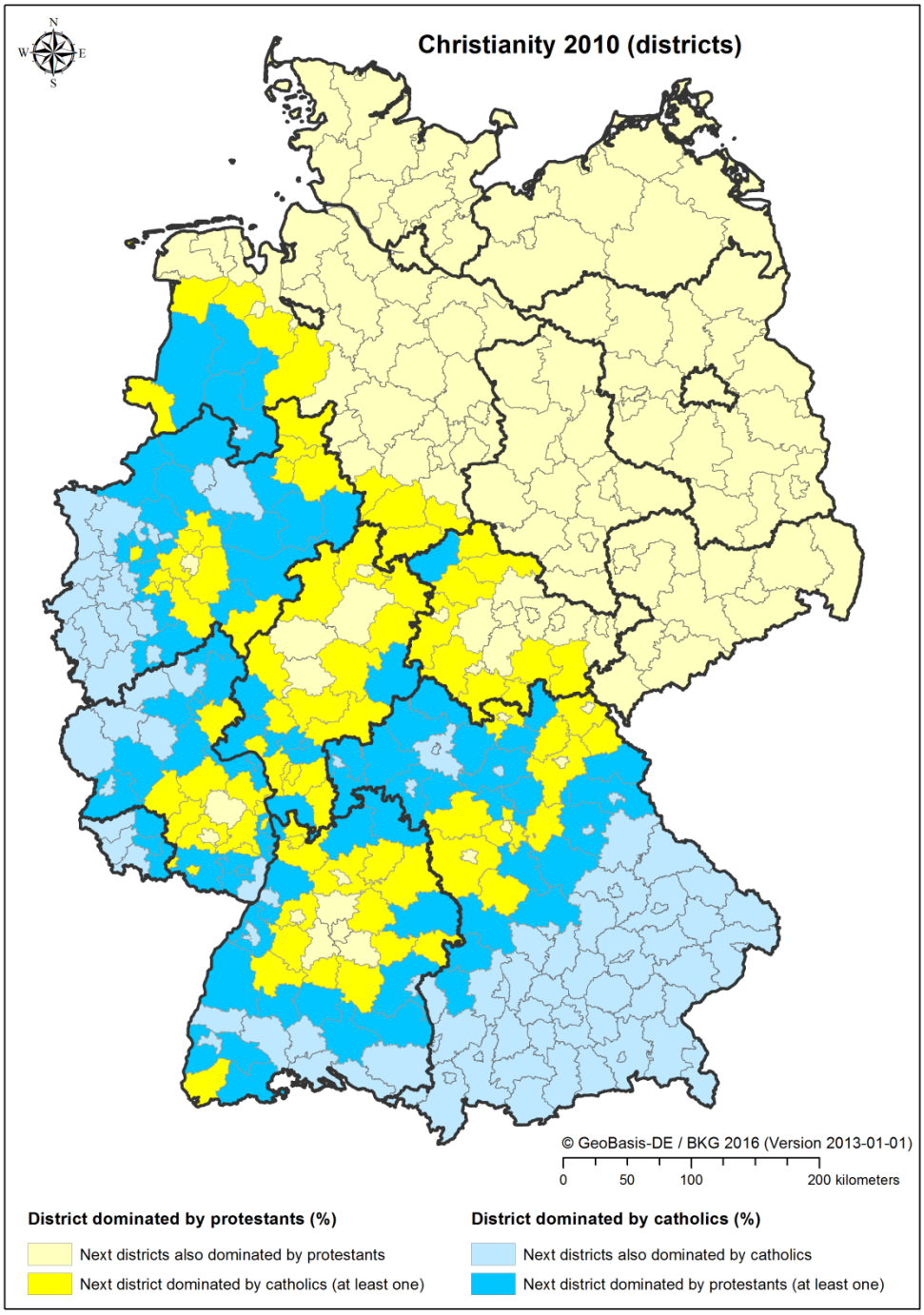
| | | | | | | |
|---|---|---|---|---|---|---|
| SIZE | -0.00 | -0.04*** | -0.04*** | -0.02*** | -0.05*** | -0.03*** |
| | (0.001) | (0.005) | (0.002) | (0.002) | (0.004) | (0.003) |
| FIRMAGE | 0.00 | 0.02** | -0.04*** | -0.01*** | -0.05*** | -0.03*** |
| | (0.001) | (0.009) | (0.005) | (0.003) | (0.007) | (0.005) |
| RISK | -0.00 | -0.00 | 0.01** | 0.01** | 0.02*** | 0.00 |
| | (0.001) | (0.009) | (0.005) | (0.003) | (0.007) | (0.006) |
| LEV | -0.01** | 0.07*** | 0.04*** | 0.01* | 0.02 | 0.04*** |
| | (0.004) | (0.024) | (0.012) | (0.008) | (0.018) | (0.014) |
| LOSS | 0.00 | -0.02 | -0.01 | -0.01*** | -0.02* | -0.04*** |
| | (0.002) | (0.015) | (0.007) | (0.005) | (0.011) | (0.009) |
| GROWTH | 0.01** | -0.04 | 0.07*** | 0.00 | 0.10*** | 0.02 |
| | (0.005) | (0.032) | (0.016) | (0.010) | (0.024) | (0.021) |
| INTERLOCK | 0.00 | -0.02* | -0.08*** | -0.03*** | -0.13*** | -0.06*** |
| | (0.002) | (0.013) | (0.006) | (0.005) | (0.010) | (0.007) |
| Constant | -1.60*** | 2.12*** | 1.20*** | 1.24*** | 3.93*** | 0.26 |
| | (0.123) | (0.803) | (0.391) | (0.258) | (0.588) | (0.461) |
| legal form fixed effects | YES | YES | YES | YES | YES | YES |
| dialect fixed effects | YES | YES | YES | YES | YES | YES |
| industry fixed effects | YES | YES | YES | YES | YES | YES |
| year fixed effects | YES | YES | YES | YES | YES | YES |
| Number of observations | 16,055 | 16,055 | 16,055 | 16,055 | 16,055 | 16,055 |
| Adjusted R-squared | 0.170 | 0.015 | 0.069 | 0.038 | 0.055 | 0.052 |

**Table 10 (continued)**

| | | | | | |
|---|---|---|---|---|---|
| ACME | 0.000 | -0.001 | -0.001 | -0.004+ | -0.002+ |
| Direct Effect | -0.098+ | -0.040+ | -0.025+ | -0.037 | -0.014 |
| Total Effect | -0.098+ | -0.041+ | -0.026+ | -0.041 | -0.016 |
| % of Total Effect mediated | -0.001+ | 0.018+ | 0.025+ | 0.092 | 0.082 |

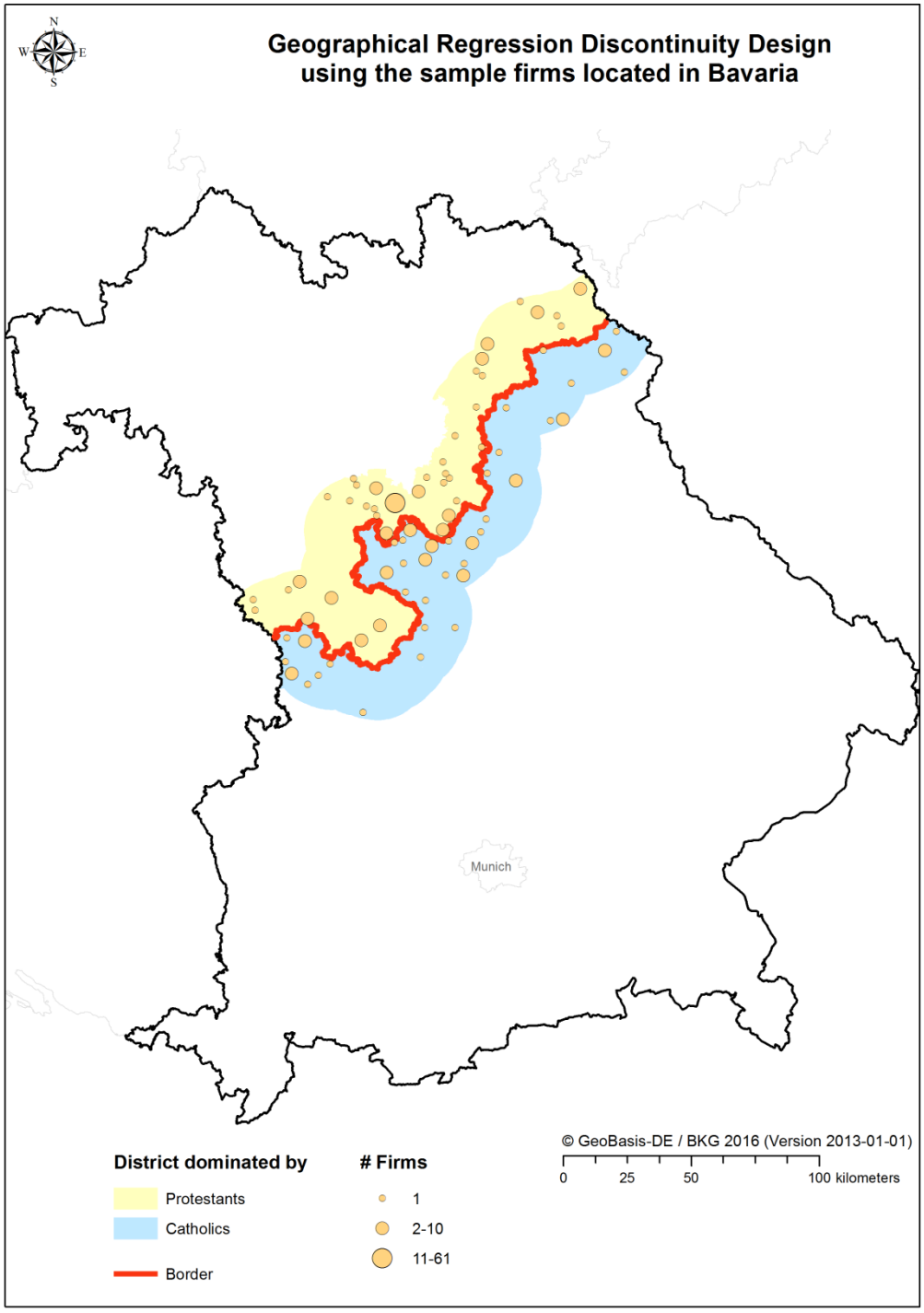
**Notes:** This table reports the regression results estimated by OLS based on a mediator analysis. *#BLOCK* is the number of blockholders (shareholders who hold more than 25 percent of firm shares) per firm. *BLOCK* is the number of blockholders to the number of shareholders per firm. *SHAREHOLDERS_REQUIRED* is an indicator variable equal to 1 if the firm needs only 1 shareholder to form a block of 25 percent. *BIGGEST_SHAREHOLDER* is the logarithm of the shares held by the largest shareholder. *INSIDER* is the proportion of shares owned by managers per firm. *STRENGTH_PROT* is the number of Protestant adherents in the municipality where the firm's headquarters are located divided by the number of Christian adherents in the same municipality. *TRUST* is the proportion of people answering that they are willing to take the risks in trusting other people (answers 5-10). *GENDER* is the proportion of female inhabitants in the district where the firm's headquarters are located. *AGE* is the average age of the inhabitants in the district where the firm's headquarters are located. *MARRIED* is the proportion of married people in the district where the firm's headquarters are located. *MUNICIPALITYSIZE* is the logarithmized sum of Catholics, Protestants, and members of other religions/undenominational inhabitants in the municipality where the firm is headquartered. *INCOME* is the logarithmized available income per inhabitant in the district where the firm's headquarters are located. *MINORITIES* is the proportion of foreigners in the district where the firm's headquarters are located. *EDUCATION* is the proportion of inhabitants having a general or subject-linked higher education entrance qualification in the district where the firm's headquarters are located. *TAX* captures the trade tax rate ("Gewerbesteuer") in the municipality where the firm's headquarters are located. *SIZE* is the logarithm of total assets winsorized at 99 percent. *FIRMAGE* is the logarithm of firm age in years. *RISK* is the difference between the maximum and minimum of the return on equity over the past three years winsorized at 99 percent. *LEV* is the ratio of debt to assets winsorized at 99 percent. *LOSS* is an indicator variable equal to 1 if the firm realized a loss in at least one of the past three years (measured in terms of return on equity), 0 otherwise. *GROWTH* is the average growth in total assets over the last three years winsorized at 99 percent. *INTERLOCK* is an indicator variable equal to 1 if at least one shareholder of a firm is also shareholder within another firm in the same year, 0 otherwise. Furthermore, we control for legal form, dialect, industry, and year fixed effects. *, **, *** indicate one-tailed significance at the 10 percent, 5 percent, and 1 percent levels, respectively, for the predictions (i.e., variable *STRENGTH_PROT* and *TRUST*); significance is two-tailed otherwise. + indicates a significant effect. Robust standard errors are reported in parentheses. For an overview of the variables. see Appendix 1.

**Figure 1**




**Border separating mainly Protestant from mainly Catholic districts in Germany.**
Figure 1 illustrates the geographic distribution of the Christian faith in Germany for the year 2010 on the district level. Districts (states) are marked with grey lines (bold black lines). Municipalities as the smallest administrative units in Germany are not depicted in the map. Yellow indicates that the district is Protestant (i.e., the number of Protestant adherents > number of Catholic adherents). Dark yellow indicates that the district is adjacent to at least one Catholic district. Blue indicates that the district is Catholic. Dark blue indicates that the district adjacent to at least one Protestant district. The figure is created using the dataset from the German Federal Statistical Office ("RDC of the Federal Statistical Office and Statistical Offices of the Länder, Lohn- und Einkommenssteuerstatistik, 1995-2010," own calculations) and the German Federal Agency for Cartography and Geodesy's ("Bundesamt für Kartographie und Geodäsie") administrative regions data from 2013, and is compiled with the help of ArcMap by ESRI.

**Figure 2**




**Border in Bavaria analyzed in the Geographical Regression Discontinuity Design.**
Figure 2 illustrates a religious border separating Protestant and Catholic border districts in Bavaria. The Bavarian state border is marked by black lines. Yellow indicates the border area dominated by Protestants (i.e., the number of Protestant adherents > number of Catholic adherents). Blue indicates the border area dominated by Catholic faith. The circles indicate the number of sample firms located in the border areas. The analysis is based on a dataset on religious adherence in Germany in the year 2010 drawn from the German Federal Statistical Office ("RDC of the Federal Statistical Office and Statistical Offices of the Länder, Lohn- und Einkommenssteuerstatistik, 1995-2010," own calculations) and the German Federal Agency for Cartography and Geodesy's ("Bundesamt für Kartographie und Geodäsie"), administrative regions data from 2013, and is compiled with the help of ArcMap by ESRI.

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*Contact:*
Prof. Dr. Caren Sureth-Sloane
Paderborn University
Faculty of Business Administration and Economics
Department of Taxation, Accounting and Finance
Warburger Str. 100, 33098 Paderborn

trr266@mail.upb.de
www.accounting-for-transparency.de