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# Secularization, Religious Denominations, and Differences in Regional Characteristics: The State of Research and a Regional Statistical Investigation for Germany

Christian Diller \* and Philipp Gareis 

Department of Geography, Justus-Liebig-Universität Gießen, 35390 Gießen, Germany;  
Philipp.Gareis@geogr.uni-giessen.de

\* Correspondence: christian.diller@geogr.uni-giessen.de

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**Abstract:** The paper pursues the question of the relationship between secularization, religious denominations, and regional characteristics. A literature review leads to the formation of six hypotheses. The analysis of regional statistics for Germany shows clear regional differences in the distribution of the denominational affiliation as well as the secularization of the population. Traditional differences between the federal states and their sub-regions are still recognizable. In particular, there is an obvious difference in secularization between the East German and West German states in relation to the significance of the two large Christian denominations. These differences between the paths of regional development and degree of secularization are so large that most of the hypothesis testing on the association between religious affiliation and demographic and socio-economic variables resulted in different findings for the two areas. Further research is required to pursue more regional differentiation and to include non-Christian faiths in the investigations.

**Keywords:** religious denominations; regional characteristics; paths of regional development

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## 1. Introduction

The aim of this article is to analyze, with statistical data, if there is a spatial relationship between the demographic and economic characteristics of regions and the religious denominations of their inhabitants, as well as to the degree of secularization. According to Max Weber, the Christian denomination of Protestantism compared with Catholicism is seen as a first step towards secularization as an element of modernization of western cultures. Germany will be used for this case study, in order to answer that question. A first look at the German Federal States shows that examples exist that support the thesis of Max Weber, which characterizes Protestantism, in relation to Catholicism, as a first step to secularization, modernization, and economic welfare like Baden-Württemberg. At the same time, the model of Bavaria has shown continuous economic growth for over 50 years, coupling high-tech orientated modern policy with strong Catholicism. For a deeper understanding of spatial patterns of denominations described in Section 1.1, brief historical explanations of the development of the—mainly Christian—denominations and the processes of secularization are helpful. In Section 1.2, an international literature review of the state of research to the topic of the influence of religions, secularization, and religious denominations on demographic and economic regional characteristics and development is carried out. The empirical analysis for Germany starts with the presentation of the methods and data resources. In Section 3, the empirical results are presented: Section 3.1. contains the descriptive analysis of spatial patterns. In Section 3.2., six hypotheses deduced from the literature review concerning the relationship between regional characteristics, secularization, and religious

denominations are formed and tested. The empirical results are discussed in Section 4. The demand for further research that has to go beyond statistical to more historically orientated regional research is pointed out in Section 5.

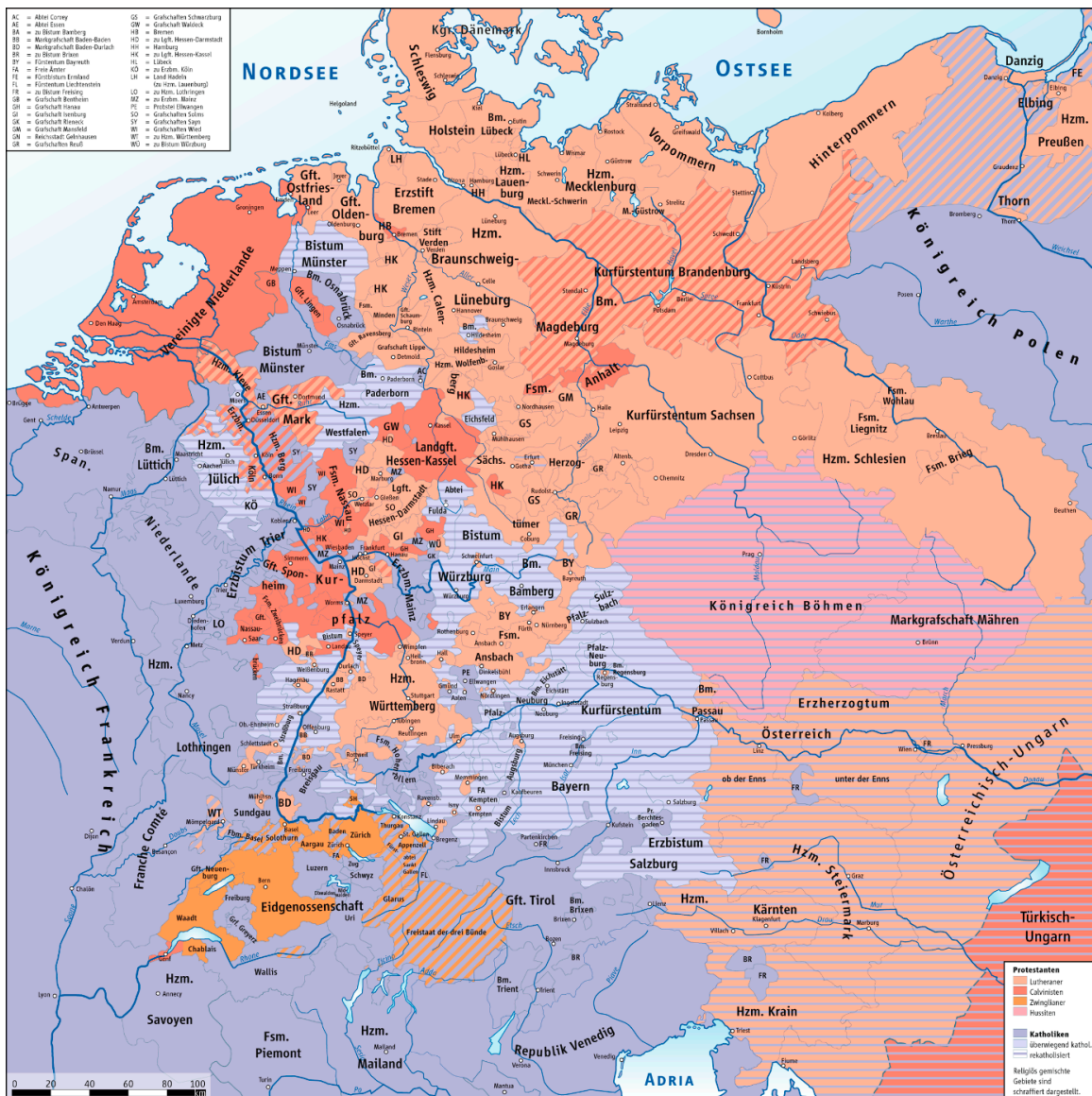
### 1.1. Spatial Distributions and Development of Secularization and Religious Denominations in Germany

Religions can be divided into separate persuasions (denominations), which are, in turn, constituted as institutions in the form of churches. What influence does religious or denominational affiliation have on the demographic and economic development of a region or vice versa? A glance around the world shows that these relationships are not clear. Christianity, for instance, is the dominant religion in the most economically successful countries of Europe ([University Luzern 2019](#)) and the USA, but also in many economically weaker African countries. Equally interesting questions can be posed for the case of Germany. Does the demographic and economic stagnation in East Germany have anything to do with the fact that this can be described as one of the least religious regions of the world ([Posener 2013](#))? Or, differentiating between denominations, is the sustained economic success of Bavaria related to its firmly anchored Catholic-social political model, and the sustained prosperity of northern Baden-Württemberg to the Protestant work ethic that characterizes the area?

The spatial distribution of Catholics and Protestants goes back to the Peace of Augsburg in 1555 and has remained relatively stable throughout the centuries ([Spenkuch 2017](#), p. 194). Figure 1 shows the pattern in 1618. The red areas are predominantly Protestant. Protestants dominate the north and east of Germany, but also large parts of Hesse, Württemberg, and Franconia. The blue and blue striped Catholics are particularly concentrated in the Rhineland, the neighboring areas to the southwest, and in Bavaria, as well as further to the southwest and in the southern central regions of Germany. This spatial pattern has remained relatively stable to this day. According to Thieme, it therefore has a high level of persistence ([Thieme 1984](#)). This counts for human artifacts, the aftermath of behaviors, and hierarchies of values and attitudes.

After the Second World War, 96% of the German population were members of one of the two Christian churches; today, this applies to only 55% of the population. In 2016, 28.6% of the German population were members of the Roman Catholic church and 26.6% were members of the Protestant church. Almost 31 million, 37.5% of the German population, are without religious affiliation, over 4.5 million are members of the Islamic faith (5.5%), and over 1.5 million (1.8%) belong to an Orthodox church ([Kirchenaustritt 2018](#)). About a third of the population is thus Catholic, a similar proportion is Protestant, over a third are without religious affiliation, and an increasing amount—but still under 10%—are members of another religion. Despite the fact that the number of members of the two large Christian denominations has clearly and continually declined, the majority of the German population still belongs to one of these two Christian churches. This will continue to be the case for about another decade, even if the present trends persist.

Over the whole world the Christian churches still have the largest number of members of all religions, making up about 30% of the world's population. So, in a worldwide context, the Christian churches still have the most members, and due to the increasing population of non-European countries, the statistical significance of Christians in absolute numbers is expected to increase. With 55%, the proportion of the German population who are members of the two large Christian churches is somewhat lower than in Austria and Switzerland, where almost 60% of the population belongs to one of the two Christian denominations, not to mention Poland, where 87% are members of the Catholic church, or Italy where 80% of the population are members of the Catholic church ([Theile 2019](#)). However, it is clearly more than, for instance, in the Netherlands, Great Britain, or the USA, where only about 40% of the population are members of a Christian church and those without religious affiliation are especially more strongly represented. In contrast to other continents, in particular Africa and South America, the large Christian denominations have lost significance in almost all Western European countries. In contrast, several Eastern European states experienced a certain religious revival following the collapse of socialism, although whether this will be sustained remains to be seen.



**Figure 1.** Confessions in Central Europe in 1618. Source: [wikipedia.org/wiki/Religionen\\_in\\_Deutschland#/media/File:HolyRomanEmpire\\_1618.png](https://wikipedia.org/wiki/Religionen_in_Deutschland#/media/File:HolyRomanEmpire_1618.png) last attach 20 May 2019.

Why has the membership of churches been in decline? Scandals concerning the financial conduct of church officials and cases of abuse led to short-lived increases in the number of people leaving the church, but the main reason for the decline in membership of the two national Christian churches is more fundamental. Firstly, the church is increasingly understood as an institution of control that does not represent the needs of its members (Theile 2019, p. 76). The other reason is demographic: more members of the two churches are lost through natural deaths than are baptized into the churches or join later (Eicken and Schmitz-Veltin 2010). The pattern of the combination of demographic change and individual decisions to leave the church is practically identical in both the Protestant and the Catholic church.

On the other hand, while the two Christian churches are steadily losing significance, other organized religions are gaining importance in Germany. The 3% increase in population following German reunification in 1990 is largely the result of immigration from abroad, which includes Muslim immigrants and also members of the Orthodox churches. Despite the steady decline in church membership in West Germany, it was still possible to speak of an intact culture of religious affiliation in 1990. In contrast, a culture of non-religiousness had developed in the GDR in a number of waves:

The territory of the former GDR before the second world war was mainly dominated by Protestants (Martin Luther mainly appeared in Thuringia and Saxony-Anhalt). During the period of soviet influence, a process of radical forced secularization led to a “culture of non-confession.” The aggressive policy of the SED-Government against religions and churches was in that sense as “successful” as nowhere else except for Estonia. (Theile 2019). So, already, the German history with the intermittent change from capitalist to socialist economy in its eastern regions shows that the Weberian model of secularization cannot be generalized: the radical secularization in the GDR was not connected with growing economic welfare.

But the influence of socialist policy between 1945 and 1989 does not entirely explain the phenomenon of East German secularization: After reunification, there was a certain experimental impulse among the younger generation (Karstein and Wohlrab-Sahr 2016, p. 19) towards the Christian religion, but this proved temporary: the radical process of secularization was not simply reversed when state repression ended, but was instead sustained by the response of the population of the GDR (Wohlrab-Sahr et al. 2009, p. 13f). In 1996, the exit rate from the Catholic Church was even higher in the East German dioceses than in the West German ones (Henkel 2001, p. 56f). This attitude extends beyond the membership of organized denominations. Thus, in West Germany, over 50% of those without religious affiliation are believers or are at least tolerant of religious beliefs, but in East Germany, almost 60% can be counted as complete atheists who reject not only the institution of the church but also Christian beliefs. These East Germans are not just anti-religious, which would imply a concern with religion, but are in general, simply areligious (Theile 2019, pp. 79, 85, 100).

Weekly attendance of Catholic masses by the registered members of their diocese fell from 50% of all registered members in 1950 to 20% of all registered members in the mid-1990s. The attendance of Protestants was overall significantly lower than that of the Catholics, and only in Bavaria and Baden-Württemberg over 5% of all registered Protestants attended services on a regular basis (Henkel 2001, pp. 59, 593). There were considerable regional fluctuations. All in all, attendance rates are higher in rural regions than in large cities (Rinschede 1999, p. 128). Religious belief is, however, not a sufficient explanation for formal church membership. It is also not a precondition for church membership. Only a small and decreasing proportion of church members practice their religion in their everyday lives. But on the other hand, religiosity is not tied to church membership: A relevant proportion of the population has Christian beliefs but has consciously distanced themselves from church institutions. Many people believe in God and see themselves as Christians without participating in the rituals of their church (Theile 2019).

Against this background, the paper investigates the relationship between denominational affiliations, as made visible by church membership, and regional characteristics. Section 2. discusses the international state of research concerning the correlation between the demographic and economic development of regions and their denominational characteristics. Section 3. presents the results of the author’s regional statistical analysis for Germany. Here, patterns of the spatial distribution of institutionalized denominations are outlined and then hypotheses concerning the relationship between demographic and economic variables of regional characteristics and the denominational characteristics of the regions are presented. Finally, the results are discussed and research gaps are identified.

## 1.2. State of Research

Religion can influence regional development, both on the individual and the institutional level. On the individual level, religions and their value systems may influence behavior, so that people in different regions exhibit different demographic and socio-economic behavior. On the other hand, institutionalized religions may influence political and economic decision-making structures in regions. Lobby interests may be pursued, leading to corresponding incentive and regulatory structures.

Although from a (Western) Eurocentric perspective, religion has steadily lost its institutionalized meaning, worldwide, its importance seems to have increased (Henkel 2004, p. 143ff).

Two models are particularly important for explaining the historical development of religions: the extended secularization model more generally describes the transformation processes of religion under the conditions of modernity, i.e., the modernization of religion goes beyond the simple secularization model, which only diagnoses a loss of meaning of institutionalized religions. It includes aspects of the functional differentiation and rationalization of religions. According to Max Weber (see Section 1.2.2.), Protestantism in relation to Catholicism can be seen as the first step of secularization in capitalist societies. In addition to the erosion of traditional forms of religion, such as deconfessionalization, output components also describe new social forms such as Fundamentalism and sects (Wunder 2004, p. 169ff). This model is contrasted by the religious, economic model, which is shaped by the rational choice approach. Religions are seen as companies operating in a market that compete with one another and, in extreme cases, can even act as monopolistic entities. In contrast to the secularization model, religious pluralization does not go hand in hand with the institutional denomination, but with the stabilization of particular denominations. According to the religion-economic model, denominations, therefore, develop first in urban areas rather than in rural areas, precisely the opposite of the secularization model, in which denominations lose their importance in cities first and have a longer existence in the countryside (Wunder 2004, p. 176f).

Religious geography is a sub-discipline of geography, which tries to explain spatial differences of religion as a social phenomenon of religion itself. It can be classified in the social science orientation of geography, which raises the question of the extent to which religion has an environmental impact, and vice versa how environmental impacts influence religion (Wunder 2004, pp. 204f, 251). In Germany, the geography of religion gained significant importance in the 1970s and developed into the geography of mentality and religion/environmental research (Henkel 1998; Büttner 1998) With the increase in religious conflicts worldwide, it received further attention (Vossen 2003). It also intersects with the field of religious economics, in which research is also explicitly related to space (Iyer 2016).

In addition to the question of the spatial distribution of religions and denominations, the question of the relationship between religions and economic and demographic behaviors is also interesting for religious geography, e.g., regarding marriage, fertility, female labor force participation, education, income, and prosperity (Lehrer 2004).

Research that specifically investigates the role of religion for regional development in Germany is rare. It is, furthermore, notable that even very differentiated cultural, geographical research, investigating economic and cultural transformation in the regions (Danielzyk et al. 1995; Danielzyk and Wiegandt 1985) hardly ever takes religion explicitly into consideration. However, there are a few investigations, especially for the USA, but also in some cases for Germany, which address the question of a connection between religion and regional development. They can be divided according to whether they focus on demographic or economic aspects of development.

### 1.2.1. Demographic Factors

*Be fruitful and increase in number; fill the earth, and subdue it. Rule over the fish in the sea and the birds in the sky and over every living creature that moves on the ground.*

(Genesis 1: 28)

In some cases, there are clearly visible relationships between the rules of religions/denominations and fertility. Differences in fertility between Catholics, Calvinists, Reformed, and non-denominational groups in the Netherlands were clearly due to different attitudes towards birth control (van Poppel 1985). Not all religious communities have preached in favor of an abundance of children. Both the American Shakers and the Russian Skoptsy combined sexual abstinence with an explicit renunciation of propagation (Blume 2014, p. 75ff). However, preserving the human species as God's crowning creation is an inherent part of most religions, which generally means that the more religious a society is, the higher its fertility rates. The hypothesis that suggests there is a connection between the loss of significance of religion and the decline in fertility rates is empirically supported by comparative international research (Norris

and Inglehart 2004, p. 231). Where the welfare state frees people from existential concerns, traditional values and religion lose one of their important functions. There are no regional analyses of this topic for Germany, but two surveys (Blume et al. 2007; Blume 2014, p. 72) confirm the hypothesis: the number of children that participants in the surveys have increased in line with their self-assessments of their religiosity. It is striking that this correlation between religious belief and the number of children is more strongly developed in the wealthy and educated classes than among the less wealthy and less well-educated.

The influence of religious affiliation on demographic factors is relatively well researched in the USA. Fertility rates among Mormons are significantly higher than those of Catholics, which in turn are higher than those of Protestants, which are higher than those of Jews (Alexander and Embry 1983). The participation of women in the labor market is also strongly dependent on the role models communicated by the relevant religion or confession, and is correspondingly lower among Mormons and Catholics than among members of less conservative religions. Education levels also vary slightly between the individual religious groups and are highest among Jews and lowest among conservative Protestants. Religious affiliation also has indirect effects: the divorce rate for marriages where partners come from different religious communities is significantly higher than for marriages where both partners have the same religious affiliation (Lehrer 2004).

However, fertility rates also varied within European countries, including those of the two major Christian denominations: in Northern Ireland, a Catholic woman in the 1980s with over 3 children had an average of 1 child more than one Protestant (Compton and Coward 1989).

However, these differences between the religions are shaped by other social and economic developments in individual countries and regions, so that they are not always clear; some examples show that Islam is the religion with the highest birth rate (Bähr 1992). However, the high fertility of the Islamic countries can be explained more by the socio-economic conditions in the countries than by religion with its rules (Engelhard 1995). Birth rates among West-European and US-American Jews are just as low as those of other religious groups in these countries, but the data for Jews living in Israel and originating from Eastern Europe show considerably higher birth rates (Blume 2014, p. 60ff). Peri-Rotem determined the development of the fertility rates of the largest religious groups for Great Britain, France, and the Netherlands from the 1930s to the 1980s (Peri-Rotem 2016). Despite the decreasing influence of religion on birth behavior, denomination rates were still different in the 1980s. It was particularly interesting that the differences in rates in France and the Netherlands remained relatively constant, while they narrowed in Great Britain. This is also evidence of the over-shaping of religious group-specific fertility by the respective national cultural peculiarities. However, fertility behavior is not solely a question of religion but is influenced by the individual national/regional environment and thus by individual interpretations of religion. Besides, the differences have narrowed in recent years (Rinschede 1999, p. 128).

Against the background of demographic change, particularly problems related to declining birth rates and intergenerational justice, the churches in Germany have recognized that they need to reassess their positions with calls for a more active family policy being heard (Eurich and Frey 2008; Wenzler 2009).

### 1.2.2. Economic Factors

*On the seventh day God rested. And God saw everything that he had made, and, behold, it was very good.*

(Constantine I: Dies Solis 321 A.D.)

While demographic factors such as fertility behavior can be relatively easily explained by religion and related notions of family life and humanity, the connection between religiosity and economic factors, particularly diligence, growth, innovation, wealth, equity and attitudes towards work, is less clear.

With Wilber/Jameson different possible relationships between religion and regional economic development are conceivable (Wilber and Jameson 1980). Secularization can be both: the cause and the

effect of economic growth. First, religion influences individual economic behavior, e.g., the propensity to save, technology adaptation, training, and work ethics. Religious minorities, e.g., are more likely to show more determined, more active economic behaviors than their competitive environment. Second, religious institutions influence economic activity, both positively, e.g., fund development cooperation as well as negative ones, in that certain religious institutional practices require services and resources that cannot, therefore, be included in the economic cycle (Rinschede 1999, p. 179).

On the other hand, if consumer activities replace religious activities, the incentives to work hard are higher. If prosperity is generated, future generations will have more opportunities to consume and less incentive to engage in religion. History certainly shows us many examples where religions hindered advance and innovations (e.g., the Russian Skoptsy), thus obstructing rather than supporting economic development in the medium term. In medieval Christianity, work was actually seen as a Godly punishment. The way in which the Inquisition dealt with the innovations of the modern era is a well-known example demonstrating the hostility of the church towards innovations.

Although controversial, Max Weber's notion that the erosion of the Catholic church by the Reformation was linked to the emergence of capitalism and the resulting economic growth in Europe remains influential. Max Weber's theses were empirically based on the observation that Protestants at that time had higher incomes in Baden than Catholics (Weber 1904, Chapter 2). In his analysis, he diagnosed a close connection between the gain in the importance of Protestantism with its ascetic ethics on the one hand, and capitalism and the industrialization associated with it, especially in Europe, on the other hand. He summarized that economic orientation can be seen as the cause of religious orientation, but the other way around, professional orientation, economic orientation, and economic development are seen as a consequence of "educated intellectual idiosyncrasies" (Weber and Käsler 2013, p. 29), to which religion belongs. Avoiding Protestantism's acceptance of the overindulgence in worldly pleasures while giving priority to work affected the standard of living of whole population groups (Sander 1974). Weber's analyses have a geographical dimension in them, because the development in different countries is compared. Furthermore, the leading role of the cities, as well as the countryside on Protestantism and capitalism, is emphasized (Weber and Käsler 2013, p. 26).

The secularization theory assumes that there is generally tension in the relationship between modernization and religion (Theile 2019, p. 65; Gorski 2000). This also explains why a number of theologians and clergy in the USA emphasize the fundamental compatibility of material wealth with Christian teachings (Copeland 2007; Hagin 2013).

Secularization can be seen as the result of the spatial diffusion process of economic innovation (Wunder 2005, p. 258; Tamney et al. 1989). From the historical perspective, e.g., the economic rise of England and the Netherlands in the 17th and 18th centuries and the simultaneous relative lag behind Spain and Italy are attributed to the different meanings of the two major Christian denominations (Cantoni 2015, p. 561). As Strulik shows in a long-term analysis of historical data on the economic development of 17 European countries, Protestantism was the carrier of a transitional phase between Catholicism and secularization and was associated with an economic upswing in these countries (Strulik 2016).

Even today, there is valid empirical evidence of a negative correlation between religion and innovation or economic growth. The Western religions seem to lose importance with economic prosperity. In an international comparison of about 30 countries (at different points in time between 1980 and 2000), the Princeton researchers Bénabou/Ticchi/Vindigni found a strongly negative relationship between strength of religiosity and economic indicators such as Gross Domestic Product, number of patents per capita, education level, and direct investment (Bénabou et al. 2015). Another investigation of 73 countries for the year 2000 showed a positive correlation between the proportion of Protestants in relation to Catholics in a country and GDP per capita (Spenkuch 2017). Looking at data for 65 countries for the 1990s from surveys (Inglehart and Baker 2000), a connection between certain value patterns and the economic development of the countries is visible. Secular value patterns were associated with more positive economic development than traditional Protestant value patterns with more

influence than Catholic value patterns. In a statistical study of all South American countries that were formerly colonized, Grier made a clear connection between economic growth variables and growth for the period 1961–1990 for the percentage of Protestants in these countries (Grier 1997). Bénabou et al. found a significant negative correlation between the self-assessment of interviewed residents regarding their religiousness and the degree of innovation measured in terms of patent density, both in the international comparison of countries and in the comparison within the United States (Bénabou et al. 2015). This connection remained even when controlling for common variables, which otherwise explain the degree of innovation. Bénabou/Ticchi/Vindigni also analyzed data for the US states for the years 2007–2008 and came to the same conclusion: a non-denominational state was positively correlated with dynamic economic development (Bénabou et al. 2015). Asche analyzed information on job performance and remuneration and proved the theses of religion as an obstacle to economic growth in the USA (Asche 2014).

Other findings were less clear: Lewer/Van den Berg determined to what extent the intensity of trade between pairs of countries, for 84 countries examined in 1998, was related to the importance of the respective religions/denominations (Lewer and van den Berg 2007). For Buddhism, Confucianism, Hinduism, Catholic-Orthodox, and Protestant countries, a denominational agreement had a positive impact on bilateral trade. For the Roman Catholic countries, on the other hand, the religious agreement had a slightly negative effect on trade intensity; no connection was found for Islam and Judaism. For Germany, there are only a few studies available. In a long-term analysis (hundred-year intervals between 1300 and 1900) of 272 German cities, Cantoni was unable to establish any connections between the proportions of the denomination belonging to the two religious groups and the growth development of the cities (Cantoni 2015). Weber's hypotheses could therefore not be confirmed by this long-term analysis. The author explained this by saying that Weber's hypothesis mainly referred to Calvinists and Puritans, but was not valid for the Lutherans relevant in Germany. Starting from Weber's theory concerning the Protestant work ethic, Spenkuch investigated whether wages in Protestant regions differ from those in more Catholic regions (Spenkuch 2017). The analysis showed significant differences between the large Christian denominations in terms of working hours and income: Protestants work 20 min more per week than Catholics and earn about 23 Euros more a month. There are no measurable differences in hourly wages. This is notable because it can be seen that Protestants spend longer periods in training than Catholics and thus invest more in the value of their labor, which is then not measurably rewarded. Variables concerning job performance are only a limited indicator for economic growth and innovativeness and can in theory, also be proof of inefficiency.

A micro-scale investigation (Blume et al. 2007, p. 7) for Germany (individual-level data) further demonstrated that there is no evidence to support the notion that increases in levels of education and wealth correlate to decreases in religiosity. The relationship here is rather not clearly linear but displays an inverted U-function: with increasing income and education, levels of religiosity first increase before decreasing among the group with the highest incomes). This observation is a clear indication of the relative non-religiousness of the economic elites, which can be explained by the large sections of Christian social doctrine that seem hardly incompatible with liberal economic positions (Körner 2017). It is thus hardly surprising that German theologians see the alienation of highly performing milieus from the church, particularly the Catholic church, as problematic. Indeed, considerable effort is expended on demonstrating that not only justice and solidarity but also self-initiative, property, wealth, and even riches are biblically founded (Heisig 2012). On their part, economists attempt to demonstrate, for instance, in management guidebooks, that the Western Christian image of humanity can provide a very suitable foundation for corporate values and principles of behavior (Höcker and Herzberg 2014).

All in all, it can be said that studies, both in an international comparison of countries and a comparative analysis of the US states, show a positive relationship between the degree of secularization and economic development data. For Germany, there are fewer findings on this: Weber's thesis could not be confirmed in the long-term analysis of the development of cities (Cantoni 2015). A recent regionally differentiated study only referred to the income earned comes to the conclusion that



Protestant work ethics are not worthwhile for individuals; it does not provide any results on the question of the effects on regional economic performance. Overall, similar to the question of the relationship between religion/denomination and demographic development, the studies indicate that religious and denominational structures do not in themselves affect the economic development of regions, but are shaped by specific national and cultural development paths.

Religious processes do not take place in a vacuum, but always in the respective national cultural context. The same religion can be progressive and innovative in one country and conservative in another (Rinschede 1999, p. 180) There are historical examples of this: Scottish highlands were Calvinists but not capitalists; Italian merchants, on the other hand, capitalists but Catholics. All religions have values that promote and inhibit economic development, which, depending on the context, can have different effects on economic development. Besides, the relationship between religion and science changed as the basis of innovations in history, as the example of Islam shows. Until the 11th century, it was considered a religion that was very compatible with scientific rationality, but after that it changed and began to act more as a brake on scientific innovations (Bénabou et al. 2014, p. 4ff).

## 2. Material and Methods

The regional statistical analyses carried out for Germany are presented here as follows. After a description of the methodology, the spatial distribution of the major denominations is shown. After that, hypotheses on the connections between the significance of denominations and socio-economic-demographic variables of regional characteristics are presented and tested on empirical material.

Regionalized data from the German Federal Statistical Office and the ongoing spatial monitoring were used for the statistical analysis (INKAR 2018). The central variables for church and denominational affiliation were available for 2011 at the scale of the districts and towns with district status. Therefore, we deal with cross-sectional data in this study. The analysis differentiates between the federal states and also between the categories of the Bundesinstitut für Bau-, Stadt- und Raumforschung (BBSR): firstly, the types of regions (urban regions, regions with agglomeration tendencies, rural regions), secondly, the difference between districts and towns with district status. The proportion of the total population who are members of the Catholic and Protestant churches was used as an independent variable for the correlation analysis. Unfortunately, the official statistic does not allow the differentiation between other than the Christian denominations on the county level. On the superior level of the federal states, the differentiation between non-religious and non-Christian is at least possible, but as well not in between non-Christian religions. These regionalized figures are available for 2011, due to the date of the census. The third category comprises those with no religious affiliation and members of other faiths. This statistical pooling of, in particular, members of Islamic faiths and atheists prevents more differentiated analysis, which would probably be of special interest for the agglomerations. However, the bias possibly caused by this pooling of categories should not be overestimated: in Germany as a whole, 84% of this “others” group, of over 37 million, had no religious affiliation in 2016. Unfortunately, data for religious affiliation are not available for the districts of Mecklenburg-Vorpommern; thus, only Rostock and Stralsund, towns with district status, were included in the analysis for this state. Any resulting bias is negligible in its impact on the core results.

The following indicators were operationalized as explanatory variables (see Table 1).

These variables were then subjected to a correlation analysis to reveal possible relationships, as presented in Section 3.2.2. To control for underlying effects, we calculate partial correlations to test our hypotheses. With this mix of descriptive and inferential statistics, we try to get further insights to the role of religion on regional characteristics.

**Table 1.** Variables and abbreviations.

Abbreviation	Variable Name	Calculation
UnempR	unemployment rate	unemployed/civilian labor force $\times$ 100
ShareFEmp	share of female employees	female employees/all employees $\times$ 100
EmpR	employment rate	employees at place of residence/inhabitant 15–< 65 years $\times$ 100
FertR	fertility rate	$((\text{newborn by women } <20 \text{ J}/\text{women } <20 \text{ years}) + \dots + (\text{newborn by women } >40 \text{ years}/\text{women } 40\text{--}< 45 \text{ years})) \times 5$
HouseInco	household income	disposable income per household/inhabitant
GDP	GDP per inhabitant	GDP/inhabitant/1.000
ShareCath	share of Catholics	Catholics/inhabitant
ShareEvan	share of Protestants	Protestants/inhabitant
ShareNonden	share of nondenominational people	nondenominational people (or non-Catholics/Protestants)/inhabitant

Source: e: [www.inkar.de](http://www.inkar.de) (19 October 2018); Year of data collection: 31 December 2015.

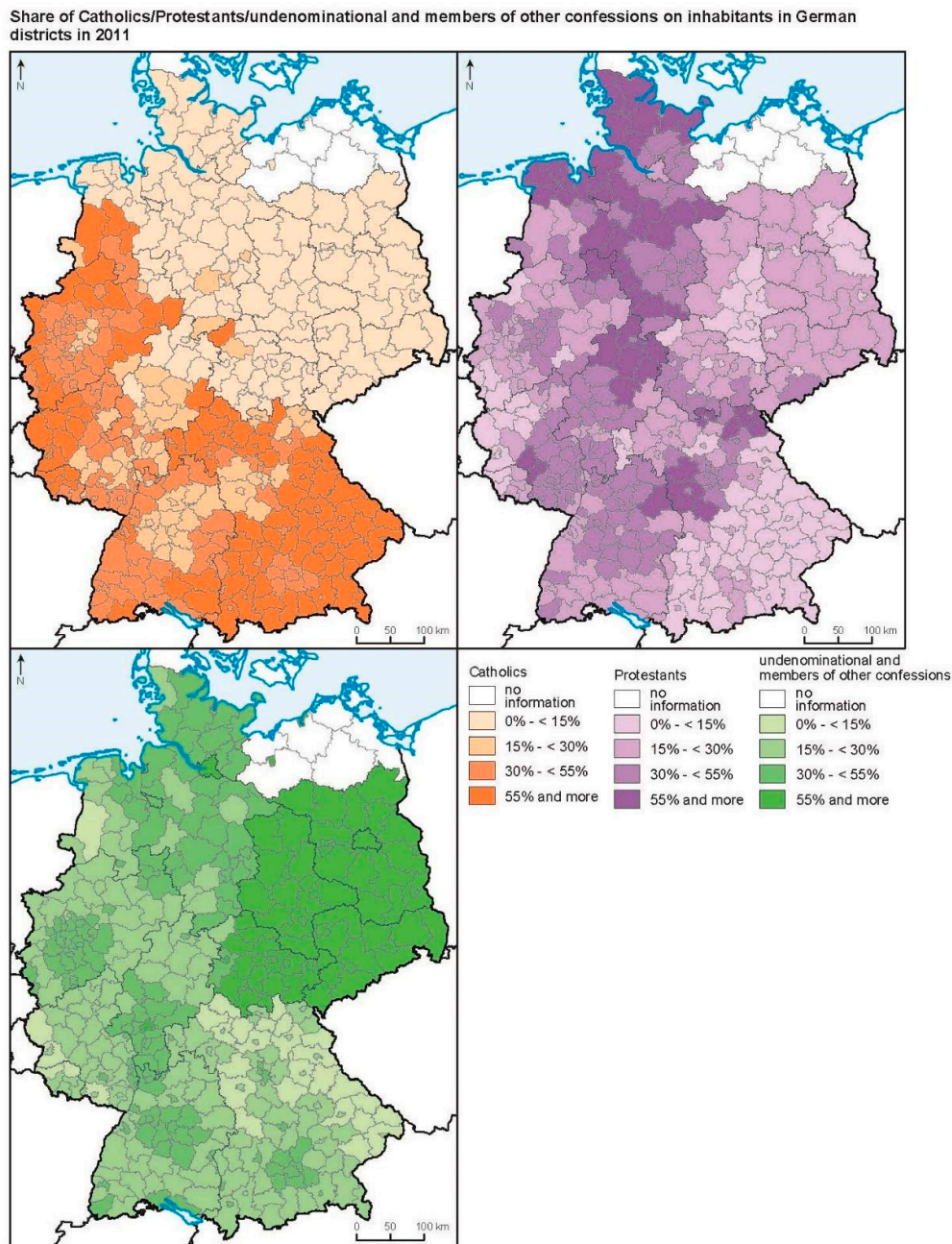
### 3. Results

#### 3.1. Pattern of Spatial Distribution

The regional distribution of organized denominations in Germany is of interest. Figure 2 shows the results for Germany with their spatial distribution based on districts and towns with district status. The proportions of the members of both large Christian population groups in the total population of the counties are shown. The third group comprises other denominations and non-denominational groups, a differentiation within this group is not possible with this database. The representation is an update of previous investigations (Henkel 2001; Spenkuch 2017; Wunder 2004) and confirms their findings (Wunder 2004, p. 176ff). Wunder summarized the regional differences in the de-nominationalization of Germany in such a way that three groups were shown: the first was the strongly de-nominationalized East Germany, the second was the North (Schleswig-Holstein, Lower Saxony, Bremen, and Hamburg), which was predominantly Protestant and the south and west, which were generally characterized by a relatively low level of explicit denomination, and a similar pattern is shown by regionally differentiated surveys on certain religious attitudes, such as the belief in hell, in the south and south-west is much more represented than in the north or even east.

Differences between the federal states are obvious. The west and south of Germany tend to be more Catholic, the north and center of the country are more Protestant, and the east is largely without religious affiliation. The most strongly Catholic states are Saarland, Bavaria, Rhineland-Palatinate, North Rhine-Westphalia and Baden-Württemberg. The states of Schleswig-Holstein, Lower Saxony, Bremen, and Hesse are more Protestant. Baden-Württemberg is the Federal State with the most significant internal regional differences of confessional spatial patterns. With its foundation in 1952, the predominantly Catholic Baden and the predominantly Protestant Württemberg were merged. Parts of Franconia in Bavaria are larger islands of Protestants within a predominantly Catholic Federal State. In Berlin and Hamburg and in all the states of East Germany, those with no religious affiliation clearly dominate. It is important to note that—contrary to the recent mood in the public and media—Muslims in Germany continue to comprise a small proportion of the population: even in the city-states they account for only about 5% of the population, as seen in Figure 3.

Within the group of non-Christians, they account for about 10%. In North Rhine-Westphalia, Baden-Württemberg and Hesse, Muslims make up about a fifth of the group of non-Christians (Statistisches Bundesamt 2020). For further investigations where the data does not permit differentiations, it must thus be assumed that the group of non-Christians is clearly dominated by those with no religious affiliation and not by other religious groups.



**Figure 2.** Spatial distribution of denominational affiliations of residents in Germany in 2016. Source: Statistisches Bundesamt 2020.

If secularization is understood as part of the historical modernization process and it is assumed that in spatial terms, processes of modernization proceed from the centers to the periphery, then it stands to reason that the numbers of those with no religious affiliation are likely to exceed the numbers of Christians in the urban centers in particular. In the 1960s, the narrative of German educational policy focused on the “Catholic girl from the countryside,” suggesting that the Catholic church is more dominant in rural regions, while the Protestant church—with its links to industrialization—is more common in the urban centers. The two largest German cities, Berlin and Hamburg, are particularly characterized by high proportions of those with no religious affiliation, and, as the district-level data show, those with no religious affiliation also comprise the largest group in Cologne and Frankfurt. However, in Munich, there are still more Catholics (43%) than non-Christians (41%). Figures 2–4 show that denominational affiliation is better explained by using the federal state as an explanatory

variable than the degree of urbanization. The variance analysis revealed highly significant correlations between the federal state and denomination for all three groups: Catholics ( $E = 0.81$ ), Protestants ( $E = 0.67$ ), and those with no religious affiliation ( $E = 0.91$ ). On the other hand, only a weakly significant correlation was found between the degree of urbanization and proportion of Protestants ( $E = 0.17$ ), and none at all between the degree of urbanization and proportion of Catholics or non-Christians.

Overall, the distribution of Catholics (Figure 4) in relation to the degree of urbanization is largely undifferentiated. In the states where Catholics are strongly represented, they are over-proportionally represented in all population density categories in comparison to the other states. In these states, differences between the various density categories are only a little larger, and the pattern of the individual states varies: it is only in Rhineland-Palatinate that the proportion of Catholics decreases constantly with density. In Bavaria, the proportion of Catholics is greater in regions with agglomeration tendencies than in rural regions.

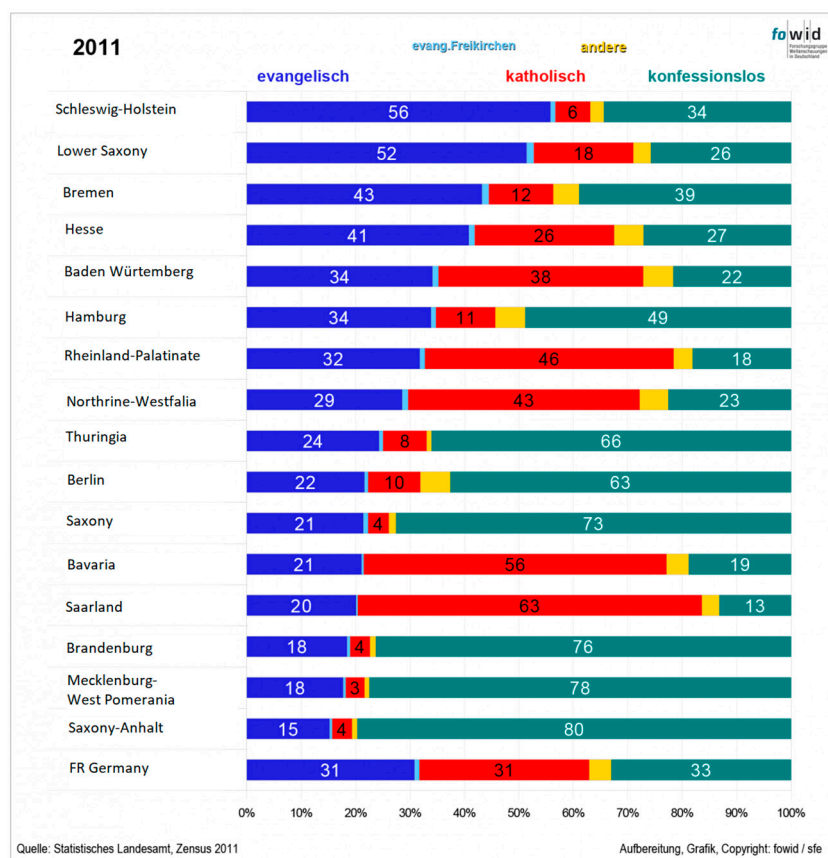
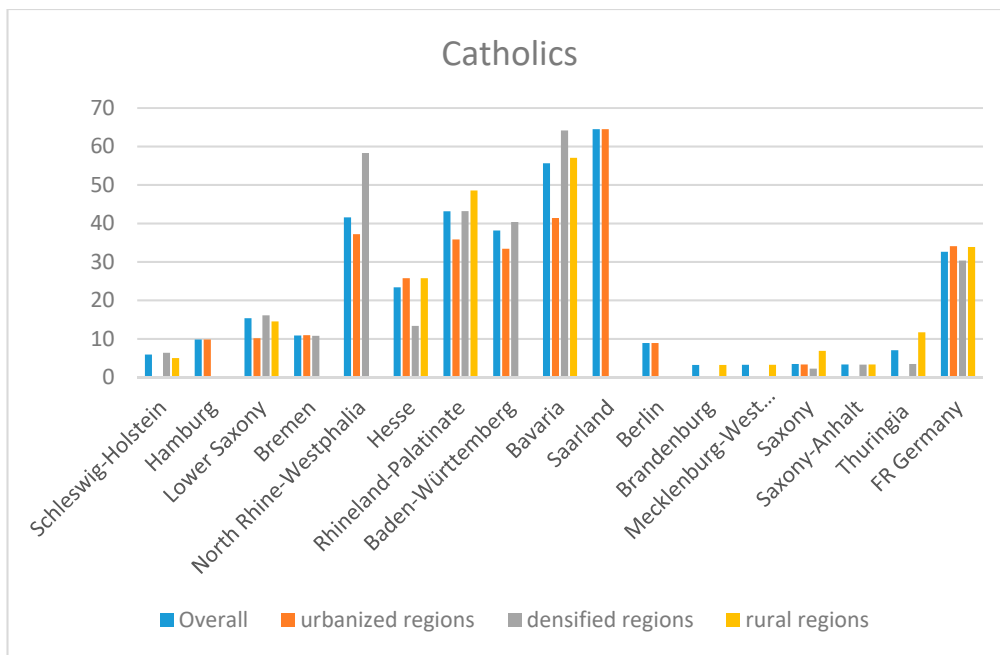
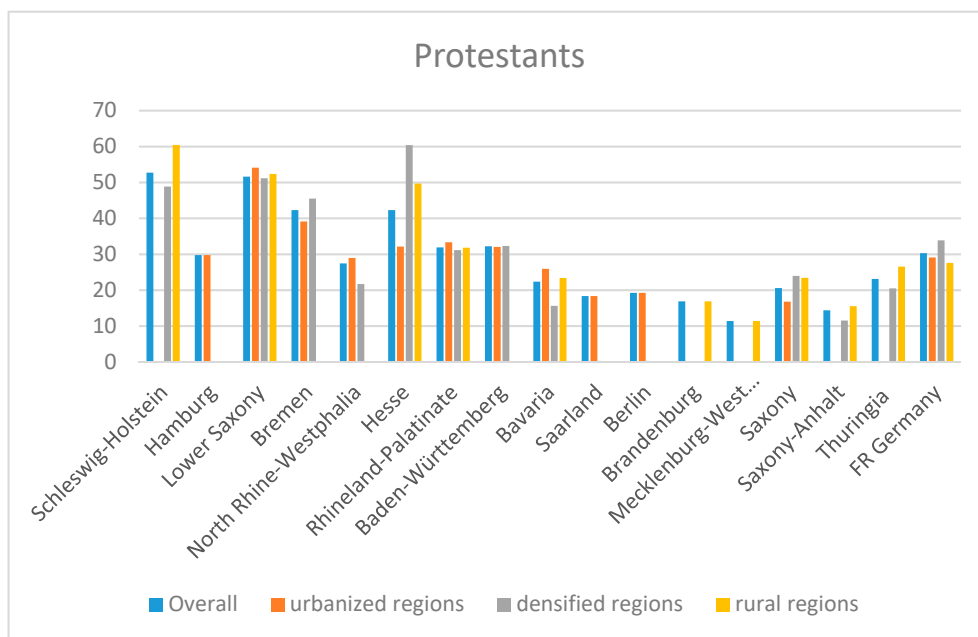


Figure 3. Denominational affiliations by federal state in 2011. Source: Statistisches Bundesamt 2020.

Differences between proportions of Protestants (Figure 5) in regions with differing population density are weakly significant, but the pattern is not linear either: Protestants are most strongly represented in the medium density categories. In the states, there is similarly no linear relationship between the proportion of Protestants and the density of the districts: in Schleswig-Holstein, Protestants are most strongly represented in the rural districts in Lower Saxony in the urban regions, and in Hesse in regions with agglomeration tendencies.

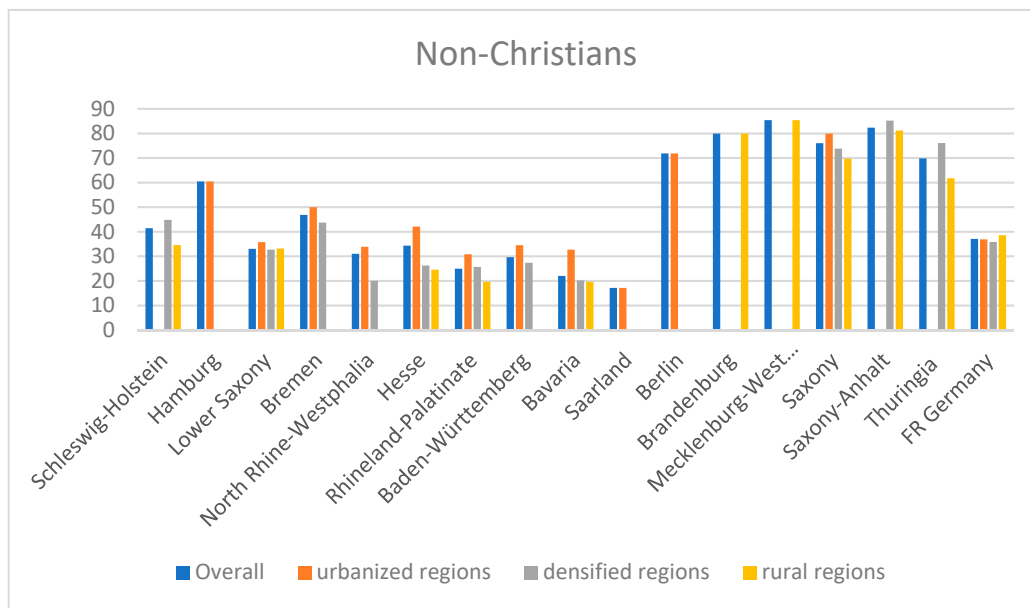


**Figure 4.** Proportion of Catholics in 2011 among the population of the districts in % according to federal state and type of region. Source: author’s calculations, data Bundesinstitut für Bau-, Stadt- und Raumforschung (BBSR).



**Figure 5.** Proportion of Protestants in 2011 among the population of the districts in % according to federal state and type of region. Source: author’s calculations, data BBSR.

Most surprising is certainly the distribution of non-Christians in relation to population density on the regional level. Overall, non-Christians are most strongly represented in rural regions, as seen in Figure 6. This phenomenon is, however, clearly attributable to the large numbers of atheists in the East German states. If the states in West Germany are considered alone, it can be seen that the proportion of people of Christian denominations does indeed decline with population density. Nonetheless, even here, this effect is less pronounced in the non-city states than expected: in Lower Saxony, for instance, it is hardly seen at all.



**Figure 6.** Proportion of non-Christians among the total population of the districts in % in 2011 according to state and type of region. Source: author's calculations, data BBSR.

In terms of spatial distribution, the most important finding is the consistently higher proportion of non-Christians in the states of Eastern Germany compared to Western Germany. The second important finding is that most of the West German states continue to be characterized by the dominance of one or other of the two Christian denominations, a situation bequeathed by history. These patterns dominate spatial differences related to varying densities of the population. It is thus not possible to identify consistent differences in the concentration of the two Christian denominations in relation to different categories of population density. For the group of non-Christians, it can be seen that increasing population density goes hand-in-hand with increases in atheism in West German states. With the exception of the city-states and the large metropolises however, this trend is considerably less developed than expected.

### 3.2. Correlations and Partial Correlations between Denominational Affiliation and Socio-Economic Characteristics

#### 3.2.1. Hypotheses

The evaluation of the state of research showed that clear connections are to be expected between the religious characteristics of a region and certain demographic indicators of regional characteristics, particularly fertility rates. Turning to indicators of economic growth, however, investigations for Germany have indicated less clear if none correlations with religion. The cautious hypothesis that the economic dynamism of a region increases with its religious diversity is rather derived from international research that compares larger and thus more diverse spatial units and discussion about the non-religiousness of top performers in commerce and industry. This triggers the following point about the difference between the two large Christian denominations. A historical approach would come to the hypothesis that, as the younger denomination, the Protestant persuasion is the more modern of the two. Demographic indicators and variables related to employer behavior also suggest that the Protestant church is more modern than the Catholic. However, research that measures income suggests that the Catholic church is more modern than the Protestant.

The following hypotheses can thus be postulated for correlations with demographic and economic data. In relation to the three groups of religious affiliation (1: Catholic, 2: Protestant, 3: Without

religious affiliation/other) the postulated sequence is indicated with which these groups are to be ordered in relation to an increase in the specific variable.

**Hypothesis 1 (H1).** *The fertility rates in the regions of a stronger religious persuasion are higher than in other regions. This correlation is stronger in West Germany than in East Germany (See Section 1.2. for explanation). (3:2:1).*

**Hypothesis 2 (H2).** *Female employment rates increase with the proportion of non-Christians. This hypothesis has not been empirically proven to date. In light of traditional gender role models, it is nonetheless plausible, even if the Christian denominations have undergone modernization in this respect. (1:2:3).*

**Hypothesis 3 (H3).** *Employment rates increase with the proportion of non-Christians. This hypothesis has not been empirically proven, but seems plausible because a high employment rate stands for a high degree of economic modernization, which in turn increases with declining religiosity. (1:2:3).*

**Hypothesis 4 (H4).** *The unemployment rate sinks with the proportion of non-Christians. This hypothesis has not been empirically proven, but it seems plausible because a low unemployment rate stands for a high degree of economic modernization, which in turn increases with declining religiosity. (3:2:1).*

**Hypothesis 5 (H5).** *With reference to household income, it is fundamentally the case that the more Catholic regions display higher GDPs than the more Protestant regions (Spenkuch 2017). The differences between the denominational groups are, however, lower and may also be inverted because Catholic households are more strongly influenced by traditional role models according to which the household income is earned by just one (male) head of the household. (2:1:3).*

**Hypothesis 6 (H6).** *Economic performance (GDP per capita) increases as the proportion of those with no religious affiliation in the region increases (Bénabou et al. 2014). It is lower in the more Catholic regions than in the more Protestant ones (Spenkuch 2017) (1:2:3).*

It has to be noted that on the basis of the literature review, five of the six hypotheses—hypothesis number 5 is the exception—follow the Weberian assumption seeing the Christian denomination of Protestantism compared with Catholicism as a first step towards secularization.

Against the background of the findings to date, it seems useful to consistently differentiate between the states in the west and those in the east of Germany when testing the hypotheses. The accelerated process of atheisticization in the GDR continues to make itself noticeable in the clear differences between the states in this part of Germany and the West German states. Due to its special historical position as a state that was part of both East and West Germany, Berlin is excluded from the following analysis and included only in the overall evaluation. In the resulting group of districts in the West German states, the proportion of Catholics totals an average of 38.8%, the proportion of Protestants is 32.8%, and those with no religious affiliation account for an average of 28.4%. In the group of districts in East German states, there are 4.5% Catholics, 19% Protestants, and 76.5% with no religious affiliation or of other faiths.

### 3.2.2. Results

To capture the influences on the very varied spatial distribution of denominational affiliations, it is necessary to further analyze the aforementioned influencing factors. Several correlation analyses are required in order to identify the relationship between the influencing factors named in the literature and denominational affiliations. An overview of the descriptive statistics of these indicators is found in Table 2.

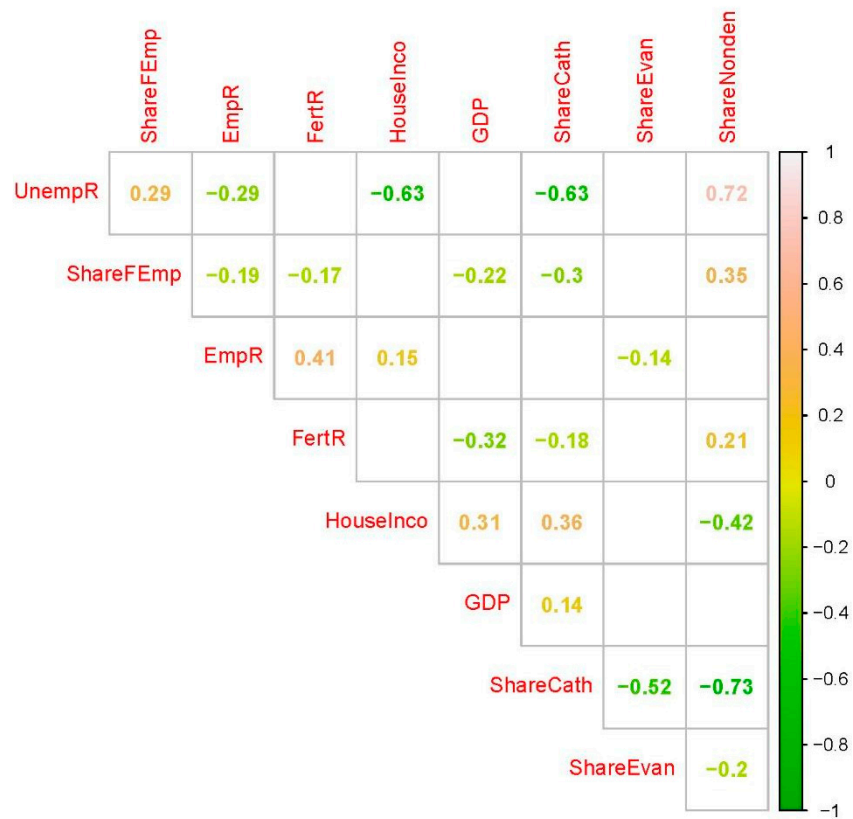
**Table 2.** Denominational affiliations and influencing factors—descriptive statistics.

	<b>N</b>	<b>Mean</b>	<b>St. Dev</b>	<b>Min</b>	<b>Max</b>
ShareCath	70	4.54	8.11	1.66	69.44
ShareEvan	70	18.97	7.75	4.27	40.27
ShareNonden	70	76.5	10.73	19.62	94.07
UnempR	70	10.51	2.47	4.93	16.63
ShareFEmp	70	48.68	3.78	40.61	57.22
GDP	70	23.61	5.01	16.43	36.18
EmpR	70	57.22	3.24	49.89	64.62
CDUCSU	70	29.78	5.28	18.25	47.98
DensityIn	70	299.41	401.28	37	1.715
FertR	70	1.47	0.08	1.24	1.68
HouseInco	70	1421.76	63.84	1311	1643
<b>Descriptive</b>	<b>Statistics</b>	<b>West-Germany (Excl. Berlin)</b>			
	<b>N</b>	<b>Mean</b>	<b>St. Dev</b>	<b>Min</b>	<b>Max</b>
ShareCath	325	38.76	22.22	4.23	87.76
ShareEvan	325	32.79	17.22	4.06	72.34
ShareNonden	325	28.45	10.26	8.1	60.42
UnempR	325	5.63	2.56	1.43	16.29
ShareFEmp	325	45.3	4.28	28.82	57.35
GDP	325	33.38	14.42	13.99	124.01
EmpR	325	53.44	3.87	38.74	60.87
CDUCSU	325	36.52	7.1	20.31	54.82
DensityIn	325	555.58	682.36	40	4.393
FertR	325	1.4	0.1	1.06	1.66
HouseInco	325	1711.22	197.86	1275	3260

Source: author's calculations, data BBSR.

Here differences between West and East Germany are seen not only in denominational affiliation (e.g., 4.54% Catholics in East Germany vs. 38.76% in West Germany) but also in relation to the economic starting position, particularly in terms of household income and unemployment rates. These differences are clearly not to be explained solely by denominational affiliation, but rather by the continued economic adjustments triggered by the reunification of the country. The extent to which these differences are reflected in correlations with denominational affiliation was investigated using the Pearson correlation coefficient. Figures 7–9 present these correlations using a color range from brown (perfect positive correlation of 1) to green (perfect negative correlation of  $-1$ ). The statistical significance is also indicated by the illustration of correlation coefficients in numbers ( $>95\%$  significance level) and blank squares for non-significant values.

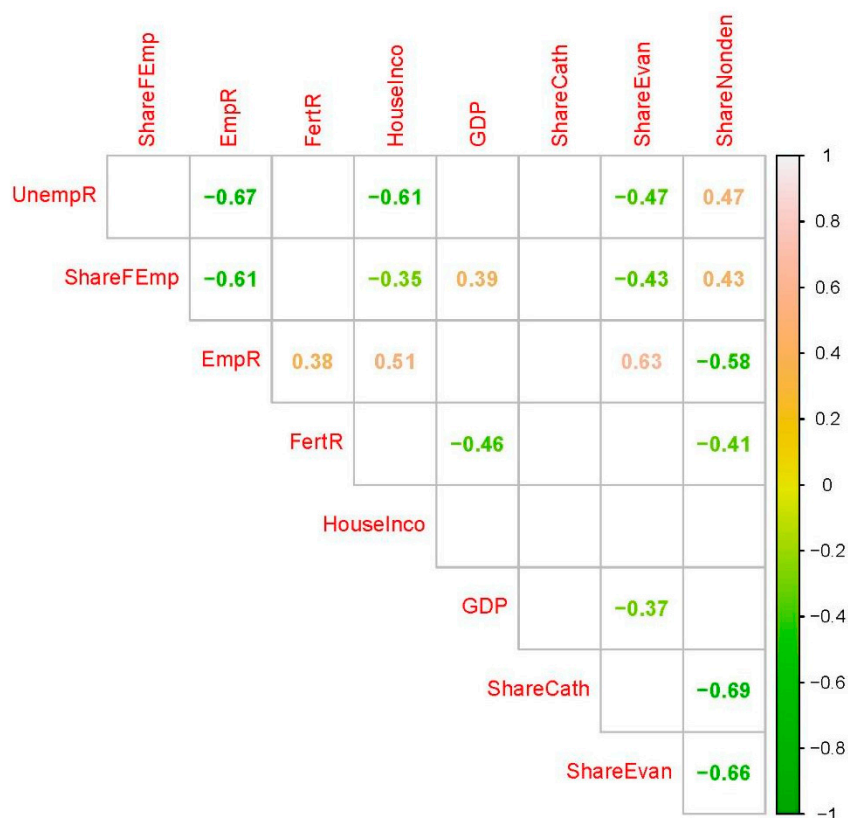




**Figure 7.** Relationships between organized denominations and regional development variables—correlation plot for the whole of Germany. Source: author’s calculations, data BBSR.



**Figure 8.** Relationships between organized denominations and regional development variables—Correlation plot for West Germany. Source: author’s calculations, data BBSR.



**Figure 9.** Relationships between organized denominations and regional development variables—Correlation plot for East Germany. Source: author’s calculations, data BBSR.

In relation to the above hypotheses, the following statements can be made:

On H1: The fertility rates for the whole of Germany show an overall slightly significant negative correlation with the proportion of Catholics and a slightly positive correlation with the proportion of those with no religious affiliation. This trend can no longer be detected, however, if only the West German states are included in the analysis. In East Germany, the correlation is actually completely reversed: high proportions of Catholics and Protestants are associated with higher fertility rates here, while high proportions of those with no religious affiliation are negatively correlated with fertility rates. The original hypothesis could thus not be confirmed for all the sub-regions. Further investigations are clearly necessary here.

On H2: In Germany as a whole, the proportion of female employees is significantly negatively related to the proportion of Catholics and significantly positively related to the proportion of those with no religious affiliation. This tendency still holds when controlling for employment rate (EmpR) in partial correlations. This is not true for West Germany, although here the proportion of Protestants is significantly positively associated with the proportion of female employees when controlling for employment rate in general. In East Germany, results do not hold when controlling for employment rates. In relation to those with no religious affiliation, there seems to be a clear trend towards higher proportions of female employment. Nevertheless, the results are not stable, controlling for employment rate in general, and the hypothesis formed above can be accepted carefully.

On H3: The employment rate for Germany as a whole shows a slightly negative association with the proportion of Protestants and a slightly positive association with the proportion of those with no religious affiliation. In West Germany, this is reversed for those with no religious affiliation and the proportion of Catholics also shows a slightly positive correlation with employment rates. In East Germany, the situation is completely different. Here, there is a moderately strong positive correlation with the proportion of Protestants and a moderately strong negative correlation with the proportion of

those with no religious affiliation. When controlling for GDP, these tendencies in the correlation plots sustain. For this hypothesis, it is thus not possible to identify a clear trend in all the sub-areas.

On H4: Unemployment rates show a moderately negative correlation with the proportion of Catholics and a moderately positive correlation with the proportion of those with no religious affiliation. In West Germany, there is also a weak association between increasing unemployment rates and a high proportion of Protestants. The original hypothesis that denominational affiliation is negatively related to unemployment rates could thus only be accepted for East Germany. For this hypothesis, there is, therefore, also no clear trend for all sub-areas. This also holds when controlling for GDP.

On H5: In Germany as a whole, household income displays a negative association with the proportion of those with no religious affiliation and a weakly positive association with the proportion of Catholics. In West Germany, the trend first mentioned above is reversed to become positive. In contrast, the proportion of Protestants shows a significantly negative association with household income. In East Germany, no clear trends can be identified. The hypothesis can thus be neither proven nor rejected; further research is required. This is also proven by the partial correlations controlling for the GDP.

On H6: GDP per capita shows a weakly positive association with the proportion of Catholics for the whole of Germany. In West Germany, districts with a higher proportion of those with no religious affiliation are more prosperous, while districts with a high proportion of Protestants are less economically successful. These results hold when controlling for employment rates in general. In East Germany, this trend is actually stronger. This initial correlation analysis thus confirms the hypothesis that regions with a higher proportion of those with no religious affiliation are more successful. Nevertheless, this result is not stable after controlling for employment rates. Further research to address this question is needed.

#### 4. Discussion

The empirical investigations show, first, that the historical pattern of denominational affiliations in Germany (Figure 1) can still be seen in differences in the present distributions of the various groups in the federal states. This pattern is more strongly manifested than differences between areas with different degrees of population density. However, the federal states are not uniform in their denomination shares.

In particular, however, the investigations reveal the process of accelerated secularization that characterized the GDR and the resulting differences between East and West Germany. What is worth mentioning here, however, is Hölischer's finding (Hölischer 2001, p. 7) based on a map of the frequency of participation in Protestant sacrament celebrations from 1910. He concluded that the German divisional border between Hesse and Thuringia had already been practiced before the Second World War. This showed that differences are not primarily due to state socialism. It also explains why after 1990, the number of non-denominations increased further in the eastern German states; and on a much stronger scale than in West German states. In this respect, the radical denomination of large parts of the GDR was probably linked to a historically older development path.

The accelerated radical secularization of the GDR, combined with the economic restructuring that occurred after 1990, is the reason that the majority of the hypothesis testing of correlations between denominational affiliation and regional development led to different results for West and East Germany.

Based on Weber's considerations, it was assumed that there was a statistical connection between the secularization of a region (with a higher proportion of Protestants compared with the Catholics) and its economic development, expressed in terms of higher economic output (gross domestic product), higher household income, higher employment rate, lower unemployment rate, and higher female participation. In addition, there was a decline in fertility rates as secularization (higher proportion of Protestants) progressed. According to the preliminary considerations, regions with a high proportion of non-denominations are more secularized than regions with a high proportion of Protestants, who in turn are stronger than regions with a high proportion of Catholics. The data basis does not make it possible to distinguish between those without a denomination and members of the two major Christian

religious groups in Germany, but the proportion of members of other religions compared to those without a denomination is low.

All in all, the hypotheses linked to Weber can hardly be confirmed: only two of the six hypotheses derived from the literature analysis based on our own data could be confirmed both for Germany as a whole, and separately, for western and eastern Germany: First, the proportion of female employees decreases negatively with the proportion of Catholics and increases significantly with the proportion of non-denominational (H2). Second, positive correlations between GDP and the share of non-denominational in East and West can be found (H6).

For three hypotheses (H3: employment rate, H4: unemployment rate, H5: household income), the findings were different for West Germany and East Germany, with some aspects confirming the starting hypothesis only for West Germany, but for others only for East Germany. Partial correlation shows that the correlation results are not stable either. Therefore, further investigation of these hypotheses with longitudinal data is necessary. Concerning Hypothesis 6, Weber argued that the Catholic regions in West Germany showed stronger economic growth than the Protestant ones. The finding on Hypothesis 1 was particularly surprising. There is no clear pattern at all between fertility rates and the degree of secularization.

The study thus ultimately also confirms the findings from historical studies: the denomination or degree of the secularization of a country does not in itself affect its demographic and economic development. However, this is particularly true in the context of specific, cultural factors and historical developments, with correspondingly different results. Even for two regions that are relatively similar in international comparisons, such as West Germany and East Germany, the historical development paths were obviously so different that the correlation analyses of denomination and socio-economic characteristics have different results for both regions. In particular, the study gives rise to the assumption that, regardless of their formal affiliation, attitudes and behaviors have already become so secular for members of the two major Christian denominations that their traditional rules and their regional influences cannot be measured statistically without longitudinal data and more sophisticated statistical methods.

## 5. Conclusions and Further Research

Our assumption following Max Weber, the Christian denomination of Protestantism compared with Catholicism is seen as a first step towards an evolving secularization as an element of economic and demographic modernization of western cultures. Most of the hypotheses concerning the relationship between the degree of secularization and the proportion of memberships in both Christian churches, which were based on that assumption, could not be verified. The radical political forced secularization in the eastern part of Germany between 1945 and 1989 led to divergent structures between Western and Eastern Germany which are still visible in the membership rates of the Christian churches and have a significant influence on each statistical analysis concerning the influence of secularization and religious denomination's demographic and economic development. However, the separate analyses for Western and Eastern Germany could not verify the assumptions based on Weber's considerations. Continuing economic welfare can be reached in predominantly Protestant regions like in Württemberg as well as in predominantly Catholic regions like in Bavaria.

The demand for further research can be formulated as follows: the results revealed that in-depth investigations that differentiate between West and East German states would be helpful in order to trace these two very different paths of development. For further research into the spatial effects of denominational affiliation, it would be valuable to have more differentiated regional data that would allow the group of non-Christians to be broken down into those without religious affiliation and those of other faiths, particularly Muslims. At present, this group pools both extreme types of modernity, it seems likely that differentiating between them would clarify associations between religion and regional development comparative research of individual states or even sub-areas of states (e.g., a comparison between Baden and Württemberg or Southern Bavaria and Franconia) could

also result in new findings concerning the correlation between religious development and regional development; for instance, comparing the model of Catholicism as practiced in the Rhineland and Westphalia on the one hand and the successful (south) Bavarian model of state-religion-economic development on the other hand. It is possible that the data in certain Federal States could provide more detailed information, particularly to differentiate between the heterogeneous group of the non-Christians, to separate Muslims from atheists. But a statistical analysis by itself is not sufficient to explain the relationship between regional development and spatial patterns of religious denominations. Historical case studies could show the different regional development paths between and in between the distinct Federal States.

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