Religious Market Theory vs. Secularization: The Role of Religious Diversity Revisited

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Abstract

Iannaccone's (1991) seminal paper assigns basic market principles to the market for religion. In a competitive market with high religious diversity the level of overall religiosity should increase. The Secularization Hypothesis suggests that the establishment of new churches casts doubt on the existing religion, which results in a reduction of religiosity. The present paper reinvestigates this relationship using a broader measure of religiosity than church attendance and calculating a more accurate index of religious diversity. This approach overcomes weaknesses of previous studies and generates more reliable results. These support the Secularization Hypothesis. Moreover, ethnic diversity has a strong positive impact on religiosity. Religiosity and national identity appear to be substitutes.

JEL-classification: O1, Z12

Keywords: Religious Market Theory, Secularization Hypothesis, Religious Diversity, Religiosity, National Identity

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1 Introduction

Freedom of religion is one of the basic human rights in most countries, especially in the Western democracies. What is the consequence of this freedom of choice, does it increase religious involvement? Or does it undermine people's closeness to their church and therefore reduce religiosity? It seems that there are plausible arguments to answer both questions with 'yes'. In fact, in the literature on economics of religion both questions have actually be answered with 'yes'.

The part of the literature that gives an affirmative answer to the first question adheres to the Religious Market Theory. It has mainly been influenced by Iannaccone's (1991) article in which he tries to carry basic microeconomic market theory over to the market for religion. Iannaccone (1991) argues that a monopolistic church, as any other monopolistic firm, earns positive profits and output is smaller than under full competition. In many countries the employees of the church are paid by the government. If their salary is fixed the church can only raise profits by reducing effort. Hence, the quality of the produced religious good will decline which entices consumers to demand less religion goods. It follows that religiosity should be lower in countries where there is a monopolistic church or if one religion is highly favored by the government and protected through legislation or subsidies.

Another negative effect a monopolistic church has on the level of religiosity is that a single church can only serve a fraction of people's beliefs. As Iannaccone (1991) puts it "[a single church] cannot be monotheistic and polytheistic; it cannot proclaim both that Jesus is the Christ and that the messiah is yet to come". On a competitive religious market there is a higher probability that everyone finds a faith that fits his beliefs which increases the demand for religious goods. Since a single church cannot earn positive profits the supply of religious goods will also be higher. Hence, on a competitive market, i.e. with greater religious diversity, the overall level of religiosity should increase. In his empirical validation of the theory Iannaccone (1991) finds that this is especially true for predominantly Protestant countries.

In a study of the 1906 US Census of Religious Bodies Finke and Stark (1988) analyze the impact of urbanization and religious pluralism on religious mobilization. In urban areas religious diversity is higher because in a city coming into contact with different religious denominations is more likely. They find that religious adherence is higher in cities compared to rural areas and argue that religious diversity explains the higher levels of religiosity in urban areas. Gruber (2005) also finds that religious participation increases with market density.

In a study on church attendance rates in ten Western economies from the 1920's to the 1990's Franck and Iannaccone (2009) compare the market model of religion to the Secularization Hypothesis. They find that income, education, or urbanization do not affect the level of religiosity. Instead, they show that the

development of welfare states reduces church participation rates. People do not have to rely on churches any longer because today social benefits are granted by the government. In countries with a monopolistic church this effect is much stronger because in more religiously diverse countries the churches compete with each other. They offer social benefits of higher quality which can compete with government welfare services and attract more people to the churches.

The Religious Market Theory is build on three pillars. First, a monopolistic church has less incentive to exert effort to produce high quality religious goods than churches in a fully competitive market. Second, a monopolistic church can satisfy only a smaller fraction of beliefs than many competing churches. Hence, higher religious diversity should lead to higher levels of religiosity. Third, market forces have crowded out religion. The development of welfare states reduces the church's importance. Many competing churches can supply better social services which attracts more people to each religion. Barro and McCleary (2002) investigate the correlation between religion and economic development in both directions of causation. In their comprehensive study they find, amongst other things, that religious pluralism has a positive effect on religious inputs, such as church attendance, and religious outcomes, such as belief in heaven and hell which supports the Religious Market Theory.

However, in a follow-up paper (McCleary and Barro, 2006) the authors do not find a significant impact of religious diversity on religiosity. But McCleary and Barro (2006) show that GDP has a negative effect on religiosity. The authors state that "this finding supports the secularization view...[although] the proponents of secularization have been in retreat over the last couple of decades." The Secularization Hypothesis has been put forward by social scientists (e.g. Martin, 1979; Stark and Bainbridge, 1986) but has also entered the economic discussion. The main argument is that during the process of economic development the importance of and also the interest in religion decreases. As people become richer they tend to focus on worldly matters. In early times life on earth was meant to be led religiously in order to appease the gods and to make sure that an afterlife in heaven will be allowed. Since the enlightenment humans seem to favor earthly pleasures of higher income and wealth.

Today we also see that in less developed countries religion plays a more prominent role than in the industrialized world (compare Paldam and Gundlach, 2009 or Gundlach and Opfinger, 2011). Whether the causation runs from religiosity to economic development or from higher income to lower religiosity is not definitively resolved. Paldam and Gundlach (2009) present causality tests which show that in the long run causality goes from income to religiosity. The implication over a shorter period is less clear, but the fact that higher levels of economic development correlate with lower levels of religiosity seems unquestionable. Another argument of the proponents of the Secularization Hypothesis is that higher education would lead

to lower levels of religiosity because better education renders mystic or miraculous explanations insufficient. Natural disasters have in early times been deemed a punishment of the gods. Today, in the developed world people know that disasters are due to extraordinary weather conditions, the shifting of tectonic plates, or greenhouse gas emissions.

How is this related to the problem of religious diversity and levels of religious participation? As the world gets ever more globalized and countries develop economically people migrate to countries in order to work or live at a place which fits their preferences better than their place of birth. A situation emerges in which people of different cultural and religious heritage come together in one society which leads to cultural diversification. Diversity will be higher in more developed nations since their economies attract more immigrants. The question remains why higher diversity should lead to lower levels of religious involvement. The Secularization Hypothesis proposes that as long as there is only one religion this religion and its beliefs are undoubtedly correct. If adherents to this monopoly religion become aware of the existence of other churches and faiths the belief in the own religion's correctness might vanish. A higher supply of different beliefs might destroy the trust in the uniqueness of the own church. Consequently people reduce their religious involvement because they are not sure in which religion to trust. Hence, higher religious diversity should lead to lower levels of religiosity.

Sherkat (1991) uses survival models to show that a higher supply of religious goods tends to decrease the ties to one's own religion. Olson (1999) also finds that the rising doubt in the own religion might entice people to reduce their overall religiosity. But he also offers another explanation in favor of Secularization arguing that the reduction in religiosity could also be explained by behavioral motives. In order to signal conformity it can be socially optimal for a religious person to reduce one's own revealed religious involvement further than it would be optimal on the individual level if the surrounding society reveals low religiosity. Furthermore, Olson (1999) criticizes Finke and Stark's (1988) findings on methodological grounds. The positive relationship found in this paper is said to be due to multicollinearity issues which turns the coefficient from negative to positive.

A final argument proposed by Secularization theorists is brought forward in Bruce (2000) where he shows that religious participation in the Nordic states declined continuously although the level of religious diversification has remained more or less constant. He argues that ethnicity and a national identity are more important in explaining religiosity than the structure of the market for religious goods.

The Secularization Hypothesis is also composed of three arguments. First, and probably most intuitively, the establishment of different churches casts doubt on the correctness of one's own belief. This does not induce people to switch religions but to reduce their overall religiosity. Second, it might be behaviorally

optimal to reduce religiosity more than is individually optimal. Finally, ethnicity and national identity seem to be more important for the consumption of religious goods than the market structure.

This is also in line with Breault (1989), or Blau et al. (1993). Bar-El et al. (2010) find that the relationship between religious diversity and religiosity follows an inverted U. At low levels increasing religious pluralism raises religiosity. When the maximum point is reached further increases in religious diversity reduce the level of religious involvement. Chaves and Gorski (2001) come to a similar conclusion. In a summary of the literature they do not find a clear pattern between religious diversity and religiosity.

The aim of this paper is to contribute to the discussion on the relationship between religious diversity and the overall level of religiosity across countries. I try to find out wheather the market effect or the secularization effect dominates in the relationship between diversity and religiosity. This appears to be a microeconomic question. Hanson and Xiang (2011) present a model to determine the market power of a religion. The present paper focusses on the comparison of different markets for religion, markets with low against markets with high levels of religious diversity. That is why a cross-country analysis on the macroeconomic level is applied. It would be desirable to examine the development of religiosity within one country when diversity changes. Since diversity changes only very slowly, data for this kind of investigation is not available. I use a broad data-set and religiosity is measured differently compared to earlier studies. This is one of the main contributions of this paper. Instead of relying on church attendance rates as a proxy for religious involvement I use a more comprehensive measure of religiosity which has been proposed by Paldam and Gundlach (2009). Since it is plausible to assume that religiosity is a more complex phenomenon than the desire to visit a church this approach should produce more reliable results concerning its actual relationship to diversity.

As I will discuss more extensively in the section on data, several earlier studies suffer from problems in the calculation of the index of religious diversity. The second contribution of this paper is that this problem is resolved by relying on data on religious adherence of the whole population within the countries under consideration. Since the religiosity data set is based on the World Values Survey it contains information on industrialized and developing nations. These facts should increase the accuracy of the results and should shed new light on the discussion whether the Religious Market Theory or the Secularization Hypothesis better describes people's attitudes concerning religious behavior.

The paper is organized as follows. In Section 2 I describe the data and methodology, especially the construction of the measure of religiosity and the index of religious diversity. The results are presented in Section 3, followed by some robustness tests. In Section 4 I discuss the results with regards to the underlying theories. Section 5 concludes.

2 Data and Methodology

2.1 Data

In most existing papers church attendance rates are used as a proxy for religiosity. But it is plausible to assume that religiosity is a broader construct than just visiting a church. Religiosity is reflected in people's beliefs and religious practices. For this reason Paldam and Gundlach (2009) construct a comprehensive measure of religiosity. They analyze answers to questions from the World Values Survey which deal with religion and calculate a religiosity score by using factor analysis. On the whole there are 14 questions on religion which Paldam and Gundlach (2009) use to create the religiosity score. These ask, for example, about subjective attitudes to religion, such as if the individual believes in God, thinks that religion is important in life, considers himself a religious person, and about revealed religiosity, such as how often the individual goes to church or if he adheres to a specific denomination. The whole set of questions can be found in Table 4. The religiosity score ranges from 0 to 100 percentage points and will be the dependent variable throughout the whole analysis.

The World Values Survey is based on national surveys conducted in industrialized as well as developing nations. The first wave was undertaken in 1982. Until today there have been four more waves, in 1990, 1995, 2000, and 2005. The questionnaire includes information on the respondents' demographics, such as age and gender as well as information on the economic conditions of the household. Furthermore, it contains questions about people's attitudes concerning politics, religion, life satisfaction, and related topics. Based on the five waves the religiosity score is calculated for 93 countries[1].

The explanatory variable of main interest is religious diversity within each country. Commonly this is measured by a concentration index, called the Herfindahl-Index, which is gained by $H = \sum s^2$ where s is the share of adherents to each religious denomination. This is transformed to the index of religious diversity by $1 - H$. This index for religious diversity will equal 0 if every person in a country belongs to the same religious denomination and will equal 1 if everyone belongs to a different denomination.

Voas et al. (2002) show that the calculation of the index of religious diversity can be problematic. It can cause a positive (Religious Market Theory) or negative relationship (Secularization Hypothesis) between religious diversity and religiosity. The driving force is the variability of the number of adherents to each denomination. If religious diversity grows because of higher variability in denominations with less adherents, a positive relationship emerges. By the same token a change in diversity due to variation in larger religious denominations generates a negative relationship. The authors propose that this mathematical

[1] For further detail on the religiosity score, see the original paper by Paldam and Gundlach (2009)

fallacy can be resolved if, and only if, every person in a country belongs to a religious denomination.

For this reason I use data from the World Christian Encyclopedia (Barrett, Kurian, Johnson, 2002). This encyclopedia reveals in detail for every country the fraction of the population that belongs to each denomination. The World Christian Encyclopedia distinguishes many Christian denominations, such as Roman Catholic, Protestant, Anglican, Baptist etc. Other denominations are Islam, Judaism, Buddhism, Taoism, Shintoism, and indigenous religions. When there is a considerable Shiite population I separate Islam into Sunni and Shiite Islam. In this sample this applies to Azerbaijan, Iran, Iraq, Pakistan, Saudi Arabia, and Turkey. Information on the Shiite population is taken from Riggs (2006). It is also listed which fraction is to be considered non-religious or atheistic. Since it can be expected that this is in most cases a free decision there is no reason to exclude those from the calculation of the index of religious diversity. I include both, non-religious and atheists, as single denominations. Thus, I am able to include the whole population in the calculation of the index of religious diversity which should make the results robust to the mathematical problem discussed by Voas et al. (2002). Table A1 in the Appendix shows the index of religious diversity for the countries used in this analysis.

Due to availability data on income is taken from the Maddison (2010) online database. In my regressions I use income from the year 1973 to reduce the risk of reverse causation from religiosity to income. The year 1973 was chosen because it was the only year prior to the dissolution of the former USSR for which it was possible to get information on income in the single former Soviet nations. If data was not available for some small countries it was taken from the World Bank's World Development Indicators. I control for income to take into account that religiosity is lower in richer countries. Income is used in logarithmic terms because Paldam and Gundlach (2009) propose that secularization is a non-linear process. In order to control for other variables suggested by the Secularization Hypothesis I include population growth over the period 1982 to 2005, the total fertility rate in 1973, and the urbanization rate in 1973. Data on population growth comes from the United Nations Population Division, on the total fertility rate in 1973 from the United Nations Children's Fund, on urbanization rates from the World Development Indicators.

Furthermore, I control for ethnic and linguistic diversity to take into account that there might be cultural differences aside from religious diversity. Data is taken from Alesina et al. (2003) and is constructed equivalently to the index of religious diversification. To check the robustness concerning the results on ethnic diversity I also use the measure of ethnic diversity from Fearon (2003). Population is also included in the regressions to test whether the size of the country influences religiosity. Data comes from the World Development Indicators. Furthermore, I added different measures of democracy to the equations in order to estimate the effect the political circumstances have on religiosity. The polity score is taken from the

Polity IV database and information on political rights and civil liberties from the freedomhouse.org web page. I use the polity score and the information on political rights and civil liberties from the year 1973 because it might take time until changes in political regimes might influence religiosity. Also the year 1973 is chosen to make the control variables fit in the time horizon. I control for education, based on information from the Barro and Lee (2010) dataset. The variable chosen is the percentage of the population aged 25 years or older that completed secondary education. Higher education should be correlated with lower religiosity since it makes mystic or miraculous explanations of certain phenomena insufficient. As Franck and Iannaccone (2009) propose spending on education affects religiosity. I test this assumption by using their data to control for government spending on education.

Fincher and Thornhill (2008) propose that the disease environment influences religious diversity. The authors argue that groups with the same ethnic and cultural heritage emerged in order to protect themselves from alien diseases and pathogens. Their data is taken to test whether the disease environment could be a suitable instrument for religious diversity. Data on another possible instrument, the dummy for the existence of a state religion, is based on Barro and McCleary (2002). They provide data on the existence of a state religion and on state regulation of religion for 59 countries based on the World Christian Encyclopedia by Barrett, Kurian, and Johnson (2002). For the countries that have not been investigated by Barro and McCleary (2002) I used the same data source to complete the sample.

2.2 Methodology

The empirical methodology in this analysis is straight-forward. I run cross-country OLS regressions of the level of religiosity on the index of religious diversity and other control variables. Since religious diversity is almost stable over time and there is only one observation on ethnic and linguistic diversity for each country it is not possible to use panel data methods. Instead I take the average values of religiosity and religious diversity over the period from 1982 to 2005. The estimated model is:

$$religiosity_i = \alpha + \beta \cdot diversity_i + \gamma \cdot X_i + \varepsilon_i$$

where X_i is a vector of control variables. I use clustered standard errors because of the stability over time in the diversity variable. This method avoids to underestimate the standard errors which would result in too large t-statistics. The maximum number of observations for religious diversity is 92. Since there are missing values for some countries in different variables the number of observations is reduced to 74 when all control variables are included as is done in Table 3. Still, this should be sufficient to give a good

indication whether to support the Religious Market Theory or the Secularization Hypothesis.

The coefficient of main interest is β. A positive coefficient would support the Religious Market Theory because this implies that religious diversity is positively correlated with religiosity. In contrast, a negative β would support the Secularization Hypothesis. It might be objected that the variable for religious diversity could suffer from endogeneity due to omitted variable bias or simultaneity issues.

However, the data seem to refute the simultaneity objection. Religious diversity is virtually stable in each single country during the investigation period. It changes only by 0.01 (mean: 0.46). At the same time the religiosity score changes by 6.26 percentage points (mean: 58). Apparently the change in religiosity over time does not affect religious diversity which lets me be optimistic that a cross-country comparison captures the effect of diversity on religiosity. It seems that religious diversity is influenced by other factors than the level of religiosity which implies that simultaneity should not distort the results. Nevertheless, I also use instrumental variable estimations in the subsection on robustness to assure that my estimations are indeed correctly specified. Fincher and Thornhill (2008) propose that the disease environment could explain religious diversity. I use their data on diseases and pathogens in each country as instruments. However, the first stage results show that the instruments are not suitable (first stage F-statistic: 2.3).

Barro and McCleary (2002) propose to use the existence of state religions or state regulation as instruments for religiosity. However, in this analysis the existence of a state religion seems to be a more suitable instrument for religious diversity. A state religion is defined as a religion that is the official religion of a country as stated in the constitution or a religion that is highly favored by the government, for example through subsidies and tax collections or the mandatory teaching of that religion in schools. The classification is based on Barrett et al. (2002). The correlation between diversity and the dummy for the existence of a state religion is -0.64. The dummy for the existence of a state religion enters highly significantly in the first stage of the regression (t-statistic is always >5). The Cragg-Donald test statistic also shows that state religion is a strong instrument. This means that the instrument is partially correlated with religious diversity which is an important condition for the validity of an instrument. The second condition is that the instrument has to be uncorrelated with the error term. It is feasible to assume that the existence of a state religion affects religiosity only through its impact on religious diversity. Since religiosity is a composition of different subjective attitudes it should not be influenced by the existence of a state religion through any other channel. This makes state religion a proper instrument for religious diversity. However, the Durbin-Wu-Hausman test does not reject the hypothesis that religious diversity is an exogenous variable (p-value: 0.19). In this case OLS is the best estimator for the relationship between religious diversity and religiosity. Nevertheless I report the results of the IV estimation in the robustness section.

2.3 Summary Statistics

Table 1 gives an overview of the summary statistics of the variables used in this analysis. The values are the averages over the investigation period. The religiosity score is calculated in percentage points. The mean is about 58 percentage points. The lowest religiosity is measured in Hong Kong with 12.7 percentage points. The country in this sample with the highest religiosity is Nigeria with 88.3 percentage points. The United States have a religiosity score of 68.5 percentage points which is relatively high compared to other industrialized countries, such as France, Germany, the Netherlands, and the UK where the religiosity score lies between 32 and 37 percentage points. This fact has also been revealed in Paldam (2009). Poutvaara and Wagner (2010) propose a model with endogenous demand and supply for religious goods to analyze this relationship and show that such a model has multiple equilibria which might explain the differences between the US and other industrialized nations.

As mentioned above a value of close to 1 in the religious diversity index means that the country is highly diversified. The country with the highest religious diversity is the Republic of Korea with an index value of 0.85, followed by Australia (0.84) and the United States, Ghana, and New Zealand (0.83). The country with the lowest value of religious diversity is Morocco with an index score of 0.03. Other countries with very low levels of religious diversity are Algeria (0.06), Malta (0.10), Colombia (0.12), and Jordan (0.12). These low levels of religious diversity imply that almost the whole population belongs to the same religious denomination.

Variable	*Number of obs.*	*Mean*	*Median*	*Standard Deviation*	*Minimum*	*Maximum*
Religiosity	93	58.19	59.16	19.43	12.70	88.31
Religious diversity	92	0.48	0.51	0.24	0.03	0.85
Income 1973	92	8.35	8.52	0.94	6.21	9.81
Secondary education	83	19.55	18.67	11.88	0.58	56.47
Ethnic diversity	92	0.38	0.36	0.24	0.00	0.93
Linguistic diversity	90	0.34	0.26	0.28	0.00	0.92
Population growth	93	1.20	1.07	1.06	-0.54	3.67
Total fertility rate 1973	83	4.05	3.18	2.07	1.50	8.21
Urbanization 1973	92	51.12	54.10	23.82	3.68	100.00
Education spending	89	4.34	4.30	1.47	1.00	7.90
Polity score 1973	86	-1.37	-7	7.82	-10	10
Political rights 1973	91	4.21	5	2.25	1	7
Civil liberties 1973	91	4.22	5	2.09	1	7
Population (million)	93	53.58	10.3	156.48	0.08	1182.88

Table 1: Summary Statistics

Income in the Maddison (2010) database is measured in 1990 Geary-Khamis dollars. After taking logarithms the mean income in 1973 is 8.35 which corresponds to 4,230 dollars. Switzerland had the

highest income in 1973 with 9.81 logarithmic points which equals 18,215 dollars, whereas the lowest income of 6.21 corresponds to only 498 dollars (Bangladesh). The variable secondary education measures the percentage of the population aged 25 years or older that completed secondary education. The mean is slightly below 20 per cent. But across countries there is substantial variation. In India only 0.58 per cent of the population finished secondary education whereas in Armenia more than half the population (56.5%) completed secondary education.

The variables ethnic and linguistic diversity are constructed equivalently to the measure of religious diversity. The results are very similar for most of the countries. Uganda is the most ethnically as well as linguistically diverse country, 0.93 and 0.92, respectively. The Republic of Korea is in both regards the most homogeneous country, the values differ from zero only in the third decimal. Countries in which these two indices differ substantially are, for example, Jordan where ethnic diversity is high (0.59) but linguistic diversity is low (0.04) or Colombia (0.60 and 0.02, respectively). In both these countries people of different ethnicities live together, but share the same language, Arabic and Spanish, respectively. Contrary, Cyprus and the Netherlands are ethnically homogeneous (0.09 and 0.11, respectively), but the linguistic fractionalization is fairly high, 0.40 in Cyprus and 0.51 in the Netherlands.

Population growth is also averaged over the period under consideration and is measured in per cent. It ranges from -0.54 per cent in Bulgaria to 3.67 per cent in Jordan. The total fertility rate amounted to 1.5 children per woman in 1973 in Finland and to 8.2 children per woman in Rwanda. The urbanization rate in 1973 is also measured in per cent and was highest in Singapore with everybody living in the city and lowest with 3.68 per cent in Rwanda. Education spending measures the percentage of GDP spent on education. Nigeria spent only one per cent of its GDP on education compared to 7.9 per cent in Denmark. The smallest country in the sample is Andorra with less than 80,000 inhabitants, the largest is China with 1.1 billion inhabitants. The Polity IV score ranges by definition from -10 for total autocracies to +10 for full democracies. The index of political rights assigns a value of 1 to countries with full political rights and 7 for no political rights at all, accordingly, the index of civil liberties. In all these three indices there are a lot of countries with a polity score of 10 and political rights and civil liberties of 1. These are mostly Western democracies. On the other end there are mainly developing countries for which the polity score is negative and the indices of political rights and civil liberties are fairly high.

3 Empirical Results

This section presents the results from different regressions. A positive coefficient on religious diversity supports the Religious Market Theory, whereas a negative sign supports the Secularization Hypothesis.

3.1 Main Findings

Table 2 shows the results from the first regressions. Underneath the coefficients the t-statistics can be found in parentheses. In column 1 it is easy to see that religious diversity is negatively related to the level of religiosity, as measured by the religiosity score.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Rel. Diversity	-18.28	-14.30	-24.99	-23.08	-23.42	-18.88	-17.97	-17.65	-16.92	-16.25
	(-2.58)	(-2.06)	(-3.51)	(-2.59)	(-2.90)	(-2.57)	(-2.50)	(-2.45)	(-2.32)	(-2.35)
Log income '73	-11.12	-7.58	-8.62	-9.33	-8.54	-11.14	-11.47	-11.80	-11.02	-12.68
	(-5.96)	(-2.80)	(-4.23)	(-3.84)	(-3.65)	(-5.32)	(-5.74)	(-5.93)	(-6.20)	(-8.06)
Sec. Education		-0.45								
		(-2.79)								
Ethnic Diversity			31.23		35.54					
			(4.13)		(4.27)					
Ling. Diversity				16.22	-3.75					
				(2.06)	(-0.46)					
Polity sc. '73						0.04				
						(0.18)				
Pol. Rights '73							-0.16			
							(-0.23)			
Civic Lib. '73								-0.47		
								(-0.59)		
Educ. Spending									-0.20	
									(-0.16)	
Population										-0.03
										(-2.66)
cons	160.65	137.42	130.91	142.36	129.07	161.02	163.76	167.68	159.70	174.58
	(10.46)	(6.67)	(7.00)	(6.79)	(6.14)	(9.33)	(9.38)	(9.72)	(10.83)	(12.81)
N	91	82	90	88	87	86	90	90	87	91
adj. R^2	0.34	0.38	0.48	0.38	0.49	0.33	0.35	0.35	0.34	0.42

Table 2, own calculations. Dependent variable: religiosity. T-statistics in parentheses. Rel. Diversity is the index of religious diversity, log income '73 is the logarithm of income in the year 1973 in 1990 US-dollars, sec. education is the percentage of the population aged 25 years and older that finished secondary education, ethnic diversity is the index of ethnic diversity, ling. diversity is the index of linguistic diversity, polity sc. '73 is the polity score in the year 1973, pol. rights '73 is an index of political rights in 1973, civic lib. '73 is an index of civil liberties in 1973, educ. spending is the percentage of GDP the government spends on education, and population is the population in million inhabitants.

An increase in the index of religious diversity of 0.1 coincides with a reduction in the level of religiosity by almost two percentage points. This finding is statistically significant at the two per cent level. In this first approach the log of income in 1973 is the only other control variable because it has to be taken into account that the level of income influences religiosity. In fact, an increase in income of one logarithmic point reduces the religiosity score by 11 percentage points. The difference in incomes between the richest and poorest countries amounts to 3.6 logarithmic points. This difference explains a variation in the religiosity score of approximately 40 percentage points. The index of religious diversity is by 0.82 index points higher

in the most diverse country compared to the religiously most homogeneous country. This coincides with a difference in the level of religiosity of 15 percentage points. This shows that the impact of income is higher but still the variation in religiosity that coincides with differences in religious diversity is substantial. These results support the Secularization Hypothesis.

In order to check whether other factors affect the level of religiosity I included other control variables and reran the same cross-country OLS regressions. Religious diversity and the log of income in 1973, as the main argument of the Secularization Hypothesis, are kept throughout all estimations. The main insights from column 1 are obviously preserved. In every specification the coefficient on religious diversity is negative. It is significant at the one per cent level in two, at the two per cent level in four, at the three per cent level in two, and at the five per cent level in one case. The magnitude of the coefficient ranges from 14.30 percentage points in column 2 to 24.99 percentage points in column 3. This implies that the difference in diversity between the most diverse and the most homogeneous countries amounts to a reduction in religiosity by between 11.73 percentage points and 20.49 percentage points. The log of income in 1973 also has a significantly negative impact on the level of religiosity in all estimations. Increasing income by one logarithmic point reduces religiosity by 7.58 percentage points in column 2 and 12.68 percentage points in column 10. In the other models the effect lies somewhere in between. These results give further support to the Secularization Hypothesis.

Taking a closer look at the results on the other control variables can give further information. In column 2 I control for the level of education. Since education is commonly positively related to human development a higher share of people that completed secondary education should coincide with lower levels of religiosity. I find that education does indeed have a negative impact on the level of religiosity which is statistically significant. An increase in the share of the population that completed secondary education by one percentage point is associated with a reduction of religiosity by 0.45 percentage points.

In columns 3 through 5 I control for other measures of diversity to ensure that religious diversity does not capture the effects of general cultural differences. I include a measure of ethnic diversity in column 3. The results indicate that ethnic diversity is strongly positively related to the level of religiosity which suggests that religiosity is significantly lower in countries that are ethnically more homogeneous. I will come back to this point in more detail in the discussion of the results. An increase in the index of ethnic diversity by 0.1 coincides with a change in the level of religiosity of more than 3 percentage points in the same direction. This effect more than offsets the reduction in religiosity that is due to raising religious diversity by the same amount. Comparing the country with the highest ethnic homogeneity where the index is virtually zero to the most diverse country reveals a difference in the religiosity score of 29 percentage

points.

In column 4 a similar measure is added, this time for linguistic diversity. Similar to column 3, higher linguistic diversity correlates with increasing levels of religiosity, although the coefficient is smaller than in column 3. In column 5 all measures of diversity are included. In this specification linguistic diversity loses its statistical significance, the sign even becomes negative. The coefficient on ethnic diversity remains similar to that in column 3, the magnitude is even slightly larger. The difference in religiosity between the countries with the lowest and the highest level of ethnic diversity now adds up to more than 33 percentage points. When I replace the index of ethnic diversity from Alesina et al. (2003) with Fearon's (2003) index the results hold unchanged.

It is also important to note that the coefficient on religious diversity is larger in these three specifications than in the other models. An index value of religious diversity that is higher by 0.1 implies that the religiosity score is lower by 2.31 percentage points in column 4, 2.34 percentage points in column 5 and 2.5 percentage points in column 3. These results imply that ethnic and religious diversity both heavily affect the level of religiosity. High levels of religiosity are correlated with low levels of religious diversity and with high levels of ethnic diversity. Apparently, linguistic diversity does not affect religiosity levels.

In columns 6 through 8 I included different variables that are intended to proxy democratic institutions. In column 6 the polity score from the Polity IV dataset is included, in columns 7 and 8 two variables that measure political rights and civil liberties, respectively. A higher polity score and lower political rights and civil liberties scores suggest that a country is more democratic. Although the coefficients hint in the direction that higher levels of democracy might be correlated with higher religiosity this finding is not statistically significant and the coefficients are only marginally different from zero. The magnitude of the coefficient on religious diversity is slightly smaller than before, especially when political rights and civil liberties are included. In these specifications an increase in the index of religious diversity by 0.1 coincides with a reduction of the religiosity score by approximately 1.8 percentage points. The coefficient on income is slightly larger than before, around 11 percentage points per one logarithmic point.

In column 9 I added a measure of government spending on education to the equation. Franck and Iannaccone (2009) propose that the development of welfare states reduces religiosity. With this explanation they find support for the Religious Market Theory. In column 9 government spending on education does not have any effect on the level of religiosity, the coefficient is basically zero. In contrast, the estimates for religious diversity and income change only very little and remain highly statistically significant.

I control for the size of each country in column 10 to take into account the possibility that diversity depends on country size. The results on religious diversity and income remain unchanged. Population size

is negatively related to religiosity which means that the level of religiosity is lower in larger countries.

In a following step I included all control variables of importance at the same time. The results are presented in Table 3. The main finding of religious diversity's negative relationship with religiosity holds unchanged in the four different estimations. The magnitude of the coefficient varies between 14.96 and 19.84 and it is statistically significant at the one per cent level in three models and at the three per cent level in the other. Comparing the most homogeneous to the most diverse country reveals a difference in the religiosity score of 12.27 percentage points in column 12 and 16.27 percentage points in column 13. Again, these findings support the Secularization Hypothesis.

	(11)	(12)	(13)	(14)
Rel. Diversity	-19.82	-14.96	-19.84	-16.40
	(-2.87)	(-2.24)	(-2.85)	(-2.97)
Log income '73	-7.98			
	(-2.69)			
Sec. Education	-0.29	-0.15	-0.44	-0.14
	(-1.71)	(-0.91)	(-2.68)	(-0.96)
Ethnic Diversity	28.69	19.73	26.54	18.24
	(3.05)	(2.19)	(2.77)	(2.36)
Ling. Diversity	2.97	4.33	7.09	3.89
	(0.41)	(0.81)	(1.13)	(0.68)
Polity sc. '73	0.14	0.08	-0.06	-0.21
	(0.60)	(0.42)	(-0.33)	(-1.41)
Population	-0.03	-0.02	-0.02	-0.02
	(-2.99)	(-2.36)	(-2.70)	(-2.12)
Tot. Fertility '73		5.26		
		(4.82)		
Urbanization '73			-0.20	
			(-2.36)	
Pop. Growth				9.83
				(5.55)
cons	131.16	40.68	76.43	50.43
	(5.45)	(5.01)	(9.49)	(9.11)
N	75	68	75	75
adj. R^2	0.55	0.65	0.52	0.66

Table 3, own calculations. Dependent variable: religiosity. T-statistics in parentheses. Rel. Diversity is the index of religious diversity, log income '73 is the logarithm of income in the year 1973 in 1990 US-dollars, sec. education is the percentage of the population aged 25 years and older that finished secondary education, ethnic diversity is the index of ethnic diversity, ling. diversity is the index of linguistic diversity, polity sc. '73 is the polity score in the year 1973, population is the population in million inhabitants, tot. fertility '73 is the total fertility rate in 1973, urbanization '73 is the percentage rate of urbanization in 1973, pop. growth is the percentage population growth over the years 1980 to 2005.

Secondary education, ethnic diversity, linguistic diversity, the polity score, and population size are included as control variables. In column 11 the log of income in 1973 is also controlled for. To test other predictions from the Secularization Hypothesis I substituted income for total fertility in column 12, for the

urbanization rate in column 13, and for the growth rate of the population in column 14. The Secularization Hypothesis suggests that higher levels of development should correlate with lower levels of religiosity. Since lower fertility rates typically coincide with higher levels of development, a higher total fertility rate should be correlated with higher levels of religiosity. By the same token a higher rate of population growth should also be positively related to the level of religiosity. Urbanization rates increase with economic development which implies that the relationship between urbanization and religiosity should be negative. All these propositions are supported by the results in columns 12 through 14.

Total fertility in 1973 and population growth are both positively and significantly related to the level of religiosity. An increase in the total fertility rate by one child per mother coincides with a 5.3 percentage points higher level of religiosity. A one percentage point higher population growth rate is correlated with a rise in religiosity of 9.8 percentage points. Both findings are significant at the one per cent level. The urbanization rate enters negatively and significantly at the three per cent level. An increase in the urbanization rate by one percentage point correlates to a decrease in religiosity by 0.2 percentage points. These results give further support to the Secularization Hypothesis.

With regards to the other control variables, one thing is especially striking. Ethnic diversity is statistically significant in all four regressions and the impact is much stronger than that of income, education, and democracy. An increase in the index of ethnic diversity of 0.1 index points, i.e. higher heterogeneity, raises religiosity by 18.24 percentage points in column 14 and 28.69 percentage points in column 11. This implies that religiosity is by 16.96 to 26.68 percentage points higher in the most diverse country compared to the ethnically most homogeneous country. Secondary education enters negatively in all four estimations. However, this finding is statistically significant in only one case and the coefficient itself is fairly small. Neither linguistic diversity nor the democracy variable come close to statistical significance. The size of the population is also negatively and significantly related to the level of religiosity. But the coefficient is very small, a population that is larger by 1 million inhabitants is correlated with lower levels of religiosity by only 0.02 percentage points.

In a nutshell, the results provide support for the Secularization Hypothesis. Religious diversity and the level of religiosity are strongly negatively related. The magnitude of this effect amounts to approximately two percentage points per 0.1 index points change in the diversity index. This finding is statistically significant throughout all estimations. Furthermore, income has a negative impact on religiosity as proposed by the Secularization Hypothesis. The total fertility rate and the growth rate of the population are positively and the rate of urbanization negatively correlated with religiosity which further supports the Secularization Hypothesis. Education, linguistic diversity, and democracy do not seem to affect religiosity. An interesting

finding is that ethnic diversity is strongly positively related to religiosity. In all regressions this variable entered highly statistically significantly. The magnitude of the coefficient is even slightly larger in absolute terms than the coefficient on religious diversity.

3.2 Robustness

I ran several robustness checks to minimize the risk that the results suffer from flaws in the data or the empirical methodology. The results are presented in the tables A2 through A6 in the appendix. They confirm the main finding from the OLS regressions which was the negative relationship between religious diversity and religiosity.

I already argued in the section on data and methodology that an objection against the analysis might be the possible endogeneity of religious diversity. Although the Durbin-Wu-Hausman test did not reject the hypothesis of religious diversity's exogeneity, which makes OLS the best estimation strategy, I ran instrumental variable regressions with a dummy for the existence of a state religion as instrument for religious diversity. The results of these regressions can be found in Table A2 in the appendix. The models reestimate the regressions from Tables 3 and 4.

The relationship between religious diversity and religiosity remains negative which confirms the finding from the OLS regressions. The result is statistically significant in all models but two and the coefficient is even larger in absolute size than the OLS estimates. In the OLS regressions the coefficient ranged from -14 to -25, whereas in most instrumental variable regressions it lies between -24 and -39. The religiosity score is higher by 19.7 to 32.4 percentage points in the religiously most homogeneous country compared to the most diverse country.

The other findings from the OLS regressions are also confirmed by the instrumental variable estimation. The coefficient on the log of income in 1973 is negative and significant. The size of the coefficient and the significance levels are very similar to the OLS estimates. The same holds true for population size and for the coefficient on ethnic diversity which is positive, significant and of the same size as the OLS result. All the other variables are not statistically significant.

The results on total fertility, urbanization and population growth also confirm the findings from the OLS estimations. The fertility rate and the population growth rate are positively correlated with religiosity, the urbanization rate negatively. However, it has to be noted that religious diversity is not significant if fertility or population growth are included. But still the coefficient is negative as in all the other models.

As a second robustness check I changed the calculation of the index of religious diversity. I recalculated the index based on the three largest denominations in each country to check whether the results could be

due to only very small religious groups. The results are shown in Table A3 in the appendix. They show that the magnitude and the significance level of the coefficient on religious diversity is reduced in several estimations. These results emphasize the importance of an accurate construction of the index of religious diversity. With an imprecisely calculated index of religious diversity the results might suffer from extensive bias. The negative relationship with the log of income and population size and the positive relation to ethnic diversity are confirmed in this setting. The results on fertility and population growth support once more the Secularization Hypothesis. The other control variables are again not statistically significant.

Thirdly, I checked whether the results could be driven by different levels of income. The favored models are those in which all control variables are included (Table 4). I reran these models twice. The results are shown in Table A4 in the appendix. In the first four columns the data set comprises only those countries whose log of income in 1973 was above 8.52, i.e. 5,000 dollars. Obviously this value can be chosen arbitrarily, but the value of 8.52 leaves me with approximately the richer half of the countries. In the second set of estimations only OECD member countries are included. The negative relationship between religious diversity and religiosity is again confirmed. Only in columns 2 and 4 the coefficient is not significant, but the sign is still negative. The t-statistics on income might suffer from the fact that the sample size is heavily reduced. Nevertheless the coefficient is still negative and of a similar magnitude as in the baseline regressions. Ethnic diversity is still strongly positively related to religiosity although the significance level is lower in the OECD estimations. The result on population growth does not change. However, fertility is not related to religiosity in the OECD sample, whereas urbanization is strongly negatively related to religiosity. In the sample of richer countries urbanization is not significant, but the coefficient on fertility is almost twice in size compared to the OECD sample.

As a fourth robustness check I calculated the diversity index again without considering being non-religious or atheistic as independent denominations. Therefore, the diversity index is based only on those people that declared to belong to an official religious denomination. The results of this exercise are presented in the appendix Table A5. They reveal a coefficient on religious diversity that is smaller than before. An increase in the index of religious diversity by 0.1 is related to a reduction in the religiosity score by 0.7 to 1.6 percentage points. The t-statistics are also smaller, the coefficient fails to reach statistical significance at conventional levels in more than half of the estimations. Similar to the results of the robustness check in Table A3 it becomes obvious that the accurate calculation of the index of religious diversity is crucial for gaining reliable results. Obviously it is of utmost importance to include the whole population, also those who declare to be non-religious and atheistic. The results on the log of income, population size, fertility, population growth, and ethnic diversity are also maintained and are similar in

size to the baseline results. The other control variables remain insignificant.

As a final robustness test I split the sample into two parts. In the first four columns of Table A6 I used information from the waves 1982, 1990, and 1995, and in the last four columns from the waves 2000 and 2005. As is easy to see the results on religious diversity are not affected by this. The coefficient is still negative and of a similar magnitude as in the baseline regression. However, the other implications from the Secularization Hypothesis seem to lose some part of their explanatory importance. The coefficients on income, fertility, urbanization, and population growth are smaller in columns 5 through 8. In contrast, the coefficient on ethnic diversity is larger. It seems that ethnicity becomes more important over time.

Taken together the robustness checks do not give reason to doubt the results from the previous subsection. Apparently the Secularization Hypothesis is supported by these findings, i.e. an increase in religious diversity is correlated with decreasing overall levels of religiosity. The accurate construction of the index of religious diversity is indispensable for reliable results. Additionally, I found that ethnic diversity is strongly positively related to religiosity.

4 Discussion

The aim of this paper was to investigate whether the Religious Market Theory or the Secularization Hypothesis better describe the relationship between religious diversity and the overall level of religiosity. The results suggest that the Secularization Hypothesis seems to dominate over the Religious Market Theory. As the theory of a religious market structure is without doubt plausible the question remains why the market for religion goods does not seem to follow the same rules as other markets. In contrast to a monopolistic market, firms that operate on a fully competitive market offer a higher supply of goods. These are produced with more effort and should therefore be of higher quality. Nevertheless, the demand for religion goods is apparently lower in countries in which there is more variety in religious denominations.

A simple explanation might be that the appeal of each religion, or its market power, decreases. This reduces religiosity more than it is increased due to the number of people that switch to a belief which fits their preferences best. Religious Market Theory argues that higher religious diversity offers more than one set of beliefs and that for this reason more people are attracted to faith itself. The counterargument from the Secularization Hypothesis is that the existence of many denominations casts doubt on the correctness of one's own religion. Thus, people are less religious. If this Secularization effect is stronger or affects more people than the Market effect this could explain why overall religiosity levels are lower when religious diversity is high.

The different measurement of religiosity might also play a role in explaining this finding. In most of the

earlier studies church attendance rates were used as a proxy for religiosity. In fact, McCleary and Barro (2006) find a positive effect of religious diversity on religiosity only when church attendance is used as the dependent variable. Otherwise, they do not find a relationship between diversity and religiosity. In this analysis I use a comprehensive measure of religiosity, constructed from 14 answers to different questions related to religiosity. It is feasible to assume that this measure of religiosity is a better proxy variable for religiosity than church attendance rates.

To explore this argument further I split the comprehensive religiosity score in its single items[2]. These can be interpreted in the same way as the religiosity score and were used as dependent variables in regressions which reestimate model 11 of Table 3. Religious diversity, the log of income in 1973 and ethnic diversity are the explanatory variables of main interest. The results on the coefficients and t-statistics for these variables are presented in Table 4. Secondary education, linguistic diversity, the level of democracy, and population size are also controlled for. The results are not shown, but are available upon request.

	Religious Diversity		Log of income '73		Ethnic Diversity	
dependent variable:	Coefficient	t-statistic	coefficient	t-statistic	coefficient	t-statistic
Importance of religion	-25,12	-2,16	-10,21	-2,03	34,70	2,18
Important child quality	-20,93	-2,10	-8,90	-2,04	37,00	2,99
Affiliation to denomination	-37,69	-4,13	-1,76	-0,54	6,35	0,69
Attending religious service	-15,74	-1,71	-10,56	-3,17	33,89	2,65
Self-assessment religious	-27,83	-3,79	-3,47	-1,15	35,85	4,48
Belief in God	-30,44	-2,84	1,42	0,31	29,82	3,33
Importance of God	-29,79	-2,96	-7,58	-1,77	49,87	3,69
Private moments of prayer	-24,85	-1,93	-8,73	-1,08	68,16	3,88
Unbelieving politician unfit	-3,23	-0,35	14,81	-4,44	35,72	2,22
Appreciation of more believers	-6,41	-0,80	-10,72	-2,04	85,14	6,48
Church answers:						
moral problems	-7,13	-1,02	-5,98	-2,45	21,58	2,79
family life problems	-2,42	-0,28	-5,82	-1,93	32,56	3,46
spiritual needs	-7,11	-0,83	-0,31	-0,07	19,94	2,14
social problems	-15,40	-1,84	-4,04	-1,10	24,98	2,32

Table 4, own calculations. Dependent variables in the left column. These are the single items of the religiosity score. I am grateful to Martin Paldam for providing me these data. The regressions reestimate column 11 from Table 3 with explanatory variables: religious diversity, log of income in 1973, secondary education, ethnic diversity, linguistic diversity, Polity IV score from 1973, and population in million.

[2]The single questions from the WVS are: importance of religion: the question is whether people think that religion is important, people are considered religion if the answer is yes; important child quality: the respondents are asked to list important child qualities, they are considered religious if they mention religion; affiliation to denomination: asks whether people belong to a denomination, answer yes; attending religious service: asks how often people go to church, answer once a month or more; self-assessment religious: asks whether people regard themselves religious, answer yes; belief in God: asks whether people believe in God, answer yes; importance of God: asks whether God is important in life, answer yes; private moments of prayer: asks whether people pray in private, answer yes; unbelieving politicians unfit: asks whether people think that unbelieving politicians are unfit for their job, answer yes; appreciation of believers: asks whether people think that a high number of true believers in a society is good, answer yes; moral problems: asks whether the church can give answers to moral problems, answer yes; family life problems: asks whether the church can give answers to family life problems, answer yes; spiritual needs; asks whether the church fulfills spiritual needs, answer yes; social problems: asks whether the church can give answers to social problems, answer yes.

The results give interesting insights on the question which items of the religiosity score are most affected by different degrees of religious diversity. The importance of religion, the affiliation to a denomination, the self-assessment of being religious, the belief in and importance of God, and private prayer are the variables that are most negatively related to religious diversity. The different indicices are by 2.5 to 3.8 percentage points lower when the diversity index is higher by 0.1. This finding is also statistically significant. Apart from the affiliation to denomination the affected variables are all intrinsic, or subjective, perceptions of religion. Apparently, it is subjective religiosity that is mainly affected by religious diversity. The finding on the affiliation to a denomination supports this finding. If diversity is high people do not switch to another religion which might fit their preferences but they drop out of religion altogether. This is direct support for the main argument of the Secularization Hypothesis suggesting that the doubt in the correctness of the own faith is the main driving force. The coefficient on the attention of religious services is comparatively lower. This might help explain why studies that use church attendance as a proxy for religiosity might come to other conclusions.

The results on income also support the Secularization Hypothesis of declining importance of religion when countries develop economically. The importance of religion, the importance of God, and the attention of religious services are significantly and negatively related to income. These results indicate that in richer societies the role of religion in every day life decision making is reduced compared to developing nations.

The relationship of ethnic diversity with religiosity is opposite to that of religious diversity. Ethnic diversity is always positively related to the single items proxying religiosity. Only the the affiliation to a denomination is not significantly related to ethnic diversity. The effect of ethnic diversity is extraordinarily strong for the appreciation of more believers, private moments of prayer, and the importance of God.

Studies that use church attendance as dependent variable and find a positive relationship might suffer from the fact that people go to church for other reasons than only indulging in their faith. It is possible that people go to church because of network effects or conformism. It could be socially advantageous to go to church although oneself is not a believing person. There is a chance of meeting important people of the local community, such as possible business partners, in church. Visiting the church can have an important signaling effect. As a result connections to the social network might be positively influenced by church visits. That is why the rate of church attendance might overestimate religiosity because it does not capture the effect of actually believing in God, the importance of religion in child education, or private prayer. But all this is captured in the religiosity score used in this analysis. These characteristics could reduce actual religiosity compared to the rate of church attendance. This might explain why the true relationship between religious diversity and religiosity is negative even if church attendance rates might

propose something different.

Furthermore, the results on the other variables also support the propositions from the Secularization Hypothesis. The log of income in 1973 has a significant and economically relevant negative impact on the level of religiosity which supports the idea that religiosity behaves inversely to the process of economic development. The role that religion plays in people's lives decreases as they become richer. The findings on the total fertility rate, urbanization, and the population growth rate also hint in the direction that higher economic development coincides with lower levels of religiosity. Eduction does not show the results that are proposed by Secularization theorists since this variable did not enter significantly.

The question that remains is why other authors find a positive relationship between religious diversity and the level of religiosity. The first argument has already been mentioned. The use of church attendance rates as a proxy for religiosity might not be the best method. The results of the robustness tests show that the composition of the data sample might also influence the results. Using only the three largest denominations, excluding the non-religious or atheists as distinct denominations, or limiting the sample to the richer or OECD member countries, each decreased the impact of religious diversity, in some cases even far enough to render it statistically insignificant. In fact, the impact of diversity on religiosity is virtually equal to zero if the diversity index is based on only the three largest denominations and the data set consists only of OECD member countries with an income in 1973 of more than 5,000 dollars. Using church attention as the dependent variable gives a positive coefficient on religious diversity, although not statistically significant.

The dataset I use is fairly large and covers industrialized as well as developing nations. In addition I employ a comprehensive measure of religiosity. Hence, it is feasible to assume that the relationship between religious diversity and the level of religiosity is indeed negative. This would clearly be in favor of the Secularization Hypothesis instead of the Religious Market Theory.

Another interesting finding of this study that is not necessarily suggested by the Secularization Hypothesis is the robust positive relationship between ethnic diversity and the level of religiosity. It is highly statistically significant in all estimated equations and the size of the coefficient is economically meaningful. An increase in the index of ethnic diversity by 0.1 corresponds to a religiosity score that is by 2.2 to 3.5 percentage points higher. It follows that the level of religiosity is by 20.5 to 32.5 percentage points higher in the country with the highest ethnic diversity compared to the ethnically most homogeneous country if all else is held equal. If ethnic diversity is increased by one standard deviation the level of religiosity is higher by 5.3 to 8.4 percentage points.

What might be the explanation for this strong positive relationship? Probably the reason can be

found in the formation of a national identity. In countries with an ethnically homogeneous society (low diversity), identification on a national level can replace the role of religion. People look for a large social network with which they can identify. The object of identification for the parties involved in this network are shared interests and values. In ethnically homogeneous countries people can form a national identity. If this hypothesis is actually true could be verified with an index of national identity which is part of my future research. In countries that are ethnically highly diverse this identification process with the nationality might not be as easily possible due to a lack of commonness. Consequently, people search for other networks with which they can identify, such as a religious community.

The results from Table 4 support this proposition. The appreciation of more true believers, private moments of prayer, and the importance of God are the items that are most positively related to ethnic diversity. This means that in ethnically very diverse countries the closeness of a small religious community is especially important. In a highly fractionalized country it is necessary for the formation of an identity that people share the same values. That is why the effect on the appreciation of true believers is very strong in ethnically diverse countries. People then feel comfortable in their religious community which is why praying and the importance of God are also heavily influenced by ethnic diversity. This behavioral approach raises the overall level of religiosity in countries that are ethnically highly diverse. Religious involvement can therefore in some respect be seen as a substitute for a national identity. The argument of the importance of national identities in explaining the level of religiosity is also put forward by Bruce (2000).

5 Conclusion

According to Iannaccone's (1991) Religious Market Theory religious diversity should increase religious involvement. Basic microeconomic market theory suggests that a monopolistic firm earns positive profits which should also apply to monopolistic churches so that competitive churches should attract more believers. The Secularization Hypothesis suggests the contrary, higher religious diversity should decrease the overall level of religiosity. If there exists only a monopolistic church people believe that their faith is the only and the right one. If more churches compete people will start to doubt their own faith. Instead of choosing a religion that maximizes personal utility, which would increase religiosity, people reduce their overall level of religious involvement.

Earlier studies found support for the Religious Market Theory as well as for the Secularization Hypothesis. But as Voas et al. (2002) show, many of them suffer from a common weakness that arises if the index of religious diversity is not calculated accurately. Moreover, in almost all of the studies religious involve-

ment is measured by church attendance rates. In this paper I overcome both weaknesses by using detailed data on the whole population to calculate the index of religious diversity and employing a comprehensive measure of religiosity taken from Paldam and Gundlach (2009).

I run cross-country regressions of religious diversity on the level of religiosity with a set of control variables. I find that religious diversity is negatively related to religiosity which supports the Secularization Hypothesis. This finding is stable throughout all estimations and is also robust to the alterations described before. An increase in the index of religious diversity of 0.1 coincides with a reduction of the religiosity score by approximately two percentage points. Income also has a negative effect on the level of religiosity as suggested by the Secularization Hypothesis.

Every church attracts less people when it competes with other churches which explains the negative relationship between religious diversity and religiosity. It loses market power if people start to doubt their faith. This effect is stronger than the Market effect of people finding their utility maximizing denomination.

In addition I found that ethnic diversity is strongly and significantly positively related to the level of religiosity. I argue that national identity and religiosity appear to be substitutes. In ethnically homogeneous countries people identify with their nationality whereas in diverse countries people choose other networks to identify with, such as a religious community.

To conclude, the results imply that basic market theory might not be easily applied to the market for religion. Instead, I find support for the Secularization Hypothesis. Religious diversity as well as income are negatively related to religiosity. Religiosity seems to be lower if more churches compete for people's affection. The roles of ethnic diversity and national identity are left for future research.

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Appendix

Table A1, religious diversification across countries

Albania	0,765	Ghana	0,828	Peru	0,183
Algeria	0,064	Greece	0,133	Philippines	0,510
Andorra	0,202	Hong Kong		Poland	0,153
Argentina	0,345	Hungary	0,574	Portugal	0,163
Armenia	0,425	Iceland	0,194	Puerto Rico	0,425
Australia	0,837	India	0,421	Romania	0,201
Austria	0,404	Indonesia	0,645	Russia	0,672
Azerbaijan	0,296	Iran	0,085	Rwanda	0,675
Bangladesh	0,247	Iraq	0,078	Saudi Arabia	0,121
Belarus	0,693	Ireland	0,268	Serbia	0,638
Belgium	0,327	Israel	0,388	Singapore	0,754
Bosnia-Herzeg.	0,621	Italy	0,320	Slovakia	0,505
Brazil	0,514	Japan	0,615	Slovenia	0,300
Bulgaria	0,454	Jordan	0,125	South Africa	0,763
Burkina Faso	0,633	Korea (South)	0,848	Spain	0,137
Canada	0,784	Kyrgyzstan	0,574	Sweden	0,486
Chile	0,556	Latvia	0,795	Switzerland	0,634
China	0,719	Lithuania	0,321	Taiwan	0,681
Colombia	0,119	Luxembourg	0,185	Tanzania	0,792
Croatia	0,232	Macedonia	0,542	Thailand	0,267
Cyprus	0,234	Malaysia	0,701	Trinidad	0,813
Czech Rep.	0,705	Mali	0,303	Turkey	0,055
Denmark	0,197	Malta	0,097	Uganda	0,670
Domenican Rep.	0,209	Mexico	0,239	United Kingdom	0,741
Egypt	0,269	Moldova	0,732	Ukraine	0,670
El Salvador	0,363	Morocco	0,034	Uruguay	0,508
Estonia	0,792	Netherlands	0,761	United States	0,829
Ethiopia	0,736	New Zealand	0,827	Venezuela	0,198
Finland	0,187	Nigeria	0,743	Viet Nam	0,707
France	0,464	Norway	0,179	Zambia	0,795
Georgia	0,605	Pakistan	0,076	Zimbabwe	0,750
Germany	0,703				

Table A2: robustness (instrumental variable estimation; religious diversity is instrumented by a dummy for the existence of a state religion)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Rel. Diversity	-24.18	-39.48	-35.31	-36.67	-35.10	-31.88	-30.99	-31.58	-26.73	-31.97	-10.46	-34.24	-9.57
	(-2.17)	(-3.93)	(-2.99)	(-3.42)	(-3.03)	(-3.00)	(-2.89)	(-2.77)	(-2.63)	(-2.65)	(-0.93)	(-2.74)	(-0.92)
Log income '73	-8.07	-8.50	-8.97	-8.15	-11.42	-11.53	-11.78	-11.07	-12.78	-7.97			
	(-3.58)	(-5.12)	(-4.68)	(-4.63)	(-5.66)	(-5.98)	(-6.01)	(-5.08)	(-7.60)	(-3.20)			
Sec. Education	-0.39									-0.21	-0.17	-0.36	-0.18
	(-2.09)									(-1.21)	(-1.02)	(-2.09)	(-1.21)
Ethnic Diversity		35.12		35.59						30.21	18.93	28.35	17.24
		(4.90)		(3.88)						(3.09)	(2.03)	(2.79)	(2.05)
Ling. Diversity			20.40	0.78						6.20	3.09	10.90	1.95
			(2.70)	(0.09)						(0.70)	(0.38)	(1.22)	(0.27)
Polity sc. '73					0.05					0.17	0.07	-0.02	-0.23
					(0.21)					(0.77)	(0.36)	(-0.10)	(-1.39)
Pol. Rights '73						-0.01							
						(-0.01)							
Civic Lib. '73							-0.26						
							(-0.28)						
Educ. Spending								-0.44					
								(-0.31)					
Population									-0.03	-0.03	-0.02	-0.02	-0.02
									(-3.26)	(-2.72)	(-2.69)	(-2.14)	(-2.65)
Tot. Fertility '73											5.38		
											(4.98)		
Urbanization '73												-0.20	
												(-2.27)	
Pop. Growth													10.02
													(6.05)
cons	144.92	135.37	143.76	130.56	171.33	170.30	173.01	168.27	180.30	133.59	39.10	79.43	48.67
	(7.76)	(8.86)	(8.48)	(8.27)	(9.27)	(9.15)	(9.11)	(10.03)	(11.79)	(6.50)	(4.90)	(11.66)	(8.85)
N	82	90	88	87	86	90	90	87	91	75	68	75	75
adj. R^2	0.37	0.45	0.35	0.46	0.29	0.32	0.32	0.30	0.40	0.53	0.64	0.49	0.66

Table A3: robustness (3 largest denominations)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Rel. Diversity	-7.27	-20.19	-15.52	-18.37	-11.25	-10.90	-10.50	-9.41	-9.82	-14.39	-11.21	-14.62	-11.09
	(-1.01)	(-2.80)	(-1.74)	(-2.29)	(-1.54)	(-1.53)	(-1.49)	(-1.28)	(-1.34)	(-2.01)	(-1.63)	(-1.95)	(-1.72)
Log income '73	-7.26	-9.13	-10.00	-9.19	-11.29	-11.72	-12.10	-11.23	-12.90	-8.24			
	(-2.54)	-(4.11)	(-3.92)	(-3.72)	(-4.92)	(-5.33)	(-5.56)	(-5.45)	(-6.88)	(-2.69)			
Sec. Education	-0.51									-0.35	-0.19	-0.51	-0.19
	(-2.97)									(-2.03)	(-1.13)	(-2.99)	(-1.24)
Ethnic Diversity		30.07		36.96						28.59	19.48	26.44	17.72
		(3.92)		(4.18)						(2.77)	(1.99)	(2.45)	(2.18)
Ling. Diversity			13.00	-7.05						0.69	2.58	4.83	1.81
			(1.58)	(-0.84)						(0.08)	(0.38)	(0.59)	(0.30)
Polity sc. '73					0.03					0.12	0.06	-0.08	-0.23
					(0.13)					(0.49)	(0.30)	(-0.36)	(-1.49)
Pol. Rights '73						-0.24							
						(-0.29)							
Civic Lib. '73							-0.61						
							(-0.66)						
Educ. Spending								-0.05					
								(-0.05)					
Population									-0.04	-0.03	-0.02	-0.03	-0.02
									(-2.66)	(-3.05)	(-2.42)	(-2.73)	(-2.16)
Tot. Fertility '73											5.45		
											(4.71)		
Urbanization '73												-0.21	
												(-2.20)	
Pop. Growth													10.16
													(6.00)
cons	131.75	130.52	143.37	130.18	156.93	161.25	165.85	155.91	172.03	130.94	38.12	74.75	47.88
	(5.86)	(6.23)	(6.26)	(5.64)	(7.88)	(7.95)	(8.24)	(9.07)	(10.37)	(5.00)	(4.72)	(9.06)	(8.43)
N	82	90	88	87	86	90	90	87	91	75	68	75	75
adj. R^2	0.36	0.43	0.32	0.44	0.29	0.31	0.31	0.30	0.38	0.52	0.63	0.49	0.64

Table A4: robustness (rich countries)

	Income '73 >8.52				oecd =1			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Rel. Diversity	-21.80	-10.42	-20.43	-12.72	-20.11	-19.10	-15.32	-23.68
	(-2.24)	(-1.03)	(-1.94)	(-1.70)	(-2.42)	(-2.34)	(-1.96)	(-3.16)
Log income '73	-14.11				-12.88			
	(-0.95)				(-2.61)			
Sec. Education	-0.19	-0.06	-0.24	0.05	0.00	-0.03	-0.02	-0.01
	(-0.92)	(-0.33)	(-1.18)	(0.35)	(0.01)	(-0.14)	(-0.12)	(-0.03)
Ethnic Diversity	35.38	32.48	33.31	33.69	32.75	26.40	38.28	18.76
	(2.71)	(2.67)	(2.64)	(3.68)	(2.04)	(1.64)	(2.26)	(1.49)
Ling. Diversity	-9.09	-19.35	-9.67	-22.10	-4.53	-4.95	-12.98	-4.83
	(-0.73)	(-1.91)	(-0.81)	(-2.40)	(-0.24)	(-0.26)	(-0.68)	(-0.27)
Polity sc. '73	0.25	0.00	-0.17	-0.37	0.31	-0.03	0.00	-0.17
	(0.38)	(0.02)	(-0.52)	(-2.13)	(0.76)	(-0.08)	(0.00)	(-0.55)
Population	0.05	0.04	0.04	0.02	0.07	0.07	0.05	0.06
	(0.97)	(0.75)	(0.79)	(0.44)	(1.45)	(1.23)	(1.03)	(1.16)
Tot. Fertility '73		6.80				3.09		
		(3.87)				(1.33)		
Urbanization '73			-0.07				-0.27	
			(-0.52)				(-3.01)	
Pop. Growth				10.55				12.55
				(4.87)				(3.19)
cons	183.60	32.34	62.42	43.55	162.85	40.83	63.45	45.20
	(1.43)	(3.26)	(5.67)	(6.94)	(3.93)	(3.59)	(9.53)	(6.27)
N	40	37	40	40	26	26	26	26
adj. R^2	0.22	0.39	0.18	0.54	0.31	0.26	0.33	0.38

Table A5: robustness (diversity without non-religious)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Rel. Diversity	-6.60	-16.70	-12.21	-14.87	-8.73	-8.57	-8.42	-7.12	-6.91	-11.80	-8.89	-11.83	-9.83
	(-1.03)	(-2.74)	(-1.59)	(-2.19)	(-1.34)	(-1.36)	(-1.34)	(-1.12)	(-1.09)	(-1.90)	(-1.50)	(-1.83)	(-1.82)
Log income '73	-7.26	-9.18	-10.04	-9.23	-11.34	-11.80	-12.20	-11.24	-12.85	-8.19			
	(-2.56)	(-4.18)	(-3.97)	(-3.77)	(-5.01)	(-5.43)	(-5.69)	(-5.29)	(-6.87)	(-2.67)			
Sec. Education	-0.52									-0.37	-0.20	-0.52	-0.20
	(-2.98)									(-2.10)	(-1.16)	(-3.07)	(-1.28)
Ethnic Diversity		30.08		37.09						28.51	19.31	26.33	17.77
		(3.79)		(4.12)						(2.77)	(1.94)	(2.45)	(2.07)
Ling. Diverity			12.70	-7.34						0.64	2.51	4.77	1.89
			(1.52)	(-0.90)						(0.08)	(0.37)	(0.60)	(0.29)
Polity sc. '73					0.04					0.13	0.07	-0.07	-0.22
					(0.21)					(0.56)	(0.36)	(-0.32)	(-1.41)
Pol. Rights '73						-0.32							
						(-0.42)							
Civic Lib. '73							-0.70						
							(-0.84)						
Educ. Spending								-0.03					
								(-0.02)					
Population									-0.04	-0.03	-0.02	-0.03	-0.02
									(-2.61)	(-3.00)	(-2.38)	(-2.68)	(-2.12)
Tot. Fertility '73											5.46		
											(4.68)		
Urbanization '73												-0.21	
												(-2.19)	
Pop. Growth													10.20
													(6.12)
cons	132.01	130.78	143.40	130.30	157.04	161.98	166.93	155.54	171.05	130.66	38.07	74.72	48.08
	(5.94)	(6.30)	(6.32)	(5.70)	(8.07)	(8.18)	(8.55)	(9.01)	(10.38)	(5.01)	(4.67)	(9.04)	(8.35)
N	82	90	88	87	86	90	90	87	91	75	68	75	75
adj. R^2	0.36	0.43	0.32	0.44	0.28	0.31	0.31	0.30	0.38	0.52	0.63	0.48	0.64

Table A6: robustness (split sample: The first four columns show the results for the waves 1982, 1990, 1995, the last four columns for the waves 2000 and 2005.)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Rel.Diversity	-17.57	-16.55	-19.89	-24.73	-18.62	-14.01	-18.81	-15.88
	(-2.22)	(-1.89)	(-2.33)	(-2.53)	(-2.59)	(-1.87)	(-2.60)	(-2.17)
Log income '73	-13.50				-7.71			
	(-5.50)				(-2.56)			
Sec. Education	-0.13	-0.07	-0.31	-0.02	-0.30	-0.20	-0.40	-0.26
	(-0.73)	(-0.37)	(-1.60)	(-0.07)	(-2.13)	(-1.37)	(-2.71)	(-1.70)
Ethnic Diversity	26.15	11.05	27.51	9.60	33.68	24.52	30.74	29.96
	(1.73)	(0.79)	(1.82)	(0.81)	(3.40)	(2.38)	(3.12)	(3.53)
Ling. Diversity	6.09	10.68	7.64	11.65	-2.58	0.40	2.67	-0.69
	(0.44)	(0.97)	(0.49)	(1.14)	(-0.30)	(0.05)	(0.34)	(-0.10)
Polity sc. '73	0.67	0.28	0.33	-0.18	-0.03	-0.07	-0.19	-0.44
	(2.36)	(0.96)	(1.08)	(-0.78)	(-0.14)	(-0.38)	(-0.93)	(-2.54)
Population	-0.04	-0.03	-0.03	-0.03	-0.02	-0.01	-0.02	-0.01
	(-3.35)	(-2.40)	(-2.26)	(-2.14)	(-3.22)	(-3.08)	(-3.20)	(-2.35)
Tot. Fertility '73		7.18				4.84		
		(4.83)				(4.15)		
Urbanization '73			-0.29				-0.22	
			(-2.16)				(-2.23)	
Pop. Growth				10.86				6.53
				(4.03)				(3.89)
cons	174.76	35.53	77.82	53.60	128.71	41.91	76.44	55.11
	(8.07)	(2.98)	(7.32)	(6.92)	(5.16)	(5.15)	(10.26)	(8.75)
N	52	47	52	52	67	61	67	67
adj. R^2	0.49	0.54	0.37	0.49	0.57	0.66	0.56	0.59