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Summary

Individual preferences with respect to risk taking play an important role in financial economic behaviour and, hence, in financial markets. Using German microdata, we argue that individual religiosity is a determinant of household willingness to take risks, since it shapes relevant individual values and norms. Controlling for overall level of general risk assessment, firstly, we find that different religious affiliations are associated with distinct financial risk-taking attitudes. Adherents to the two main Christian religions in Germany (Protestants and Catholics) are less risk-tolerant in general, but not in financial concerns. The same holds for Muslims. Further, religious involvement is associated with higher risk aversion. Secondly, we examine the extent to which religion-induced heterogeneity in risk-taking preferences actually influences investment decisions of individuals in Germany. We provide evidence suggesting that religious beliefs and religious involvement influence individual portfolio decisions.

Keywords: church; religion; risk aversion; portfolio choice

JEL Classification: D14, G11, Z12.

I. INTRODUCTION

According to Edmund Phelps, 'values and attitudes are as much a part of the economy as institutions and policies are […]' (Newsweek, 2007, p. 66). Norms capturing how decision-makers should, or how they should not, behave should be incorporated in macroeconomic analysis as the appropriate way for its microfoundation instead of solely presuming the constrained maximization of profit and utility functions, as Akerlof (2007) put it. Further, he argued that 'religious identity gives us a good example of such norms' (Akerlof, 2007, p. 8). Being a recent topic in economics (Alesina et al., 2003; Barro and McCleary, 2003; McCleary and Barro, 2006; Guiso et al., 2003, 2006; Tabellini, 2010), the link, in which macroeconomists are interested, runs from culture to economic performance: cultural values and norms have a direct impact on personal attitudes and preferences, which for their part influence individual economic decisions, and hence, aggregate economic outcomes.

The purpose of this paper is to examine whether religious values and norms, as key factors of one's cultural background, have any effect on one particular personal attitude which is of exceptional importance in economic decision-making – an individual's attitude towards taking risks. In particular, this paper analyses the extent to which cultural background, as measured by religious beliefs and religious activity, is associated with individual risk attitudes. We aim to explain individual heterogeneity in general and in context-specific risk preferences in Germany. In a second step, we analyse whether religion-induced differences in individual and household investment patterns exist. We examine the extent to which individual heterogeneity in risk assessment caused by distinct cultural convictions leads to distinctive actual individual investment. Since people are willing to take risks depending on the context of the decision (Dohmen et al., 2011), in the context of individual investment decisions an individual's financial risk-taking attitude is considered.

Recently, due to the availability of new data sets, several studies have been published on differences in individual risk-taking preferences and their determinants (e.g., Barsky et al., 1997; Halek and Eisenhauer, 2001; Hartog et al., 2002; Dohmen et al., 2011). However, there are only a few contributions pointing additionally to cultural factors as determinants of risk attitudes. Renneboog and Spaenjers (2012) analysed the effect of religious affiliation on individual economic attitudes, such as thrift and risk, and investment behaviour in the Netherlands. They found a positive relationship between individual religious affiliation and both risk aversion and individual propensity to save. Following Dohmen et al. (2011), we also include not only a general risk measure in our analysis of religion-induced heterogeneity in

financial portfolio choices, but also a context-specific risk measure, namely risk taking in financial matters. Moreover, our present paper adds to the literature a specific within-country analysis, as opposed to cross-country studies, to provide further empirical evidence on the impact of religiosity. Studying the economic consequences of religion in Germany may shed light on the distinctiveness of economic values within Christianity. Due to reformation history and recent ecumenical movements, Catholics and Protestants might be adjusted to each other. Instead of focusing mainly on Christian religions, we are explicitly taking Non-Christian religions into consideration, which in Germany are mostly Muslims. Mainly due to migration within recent decades between 3.8 and 4.3 million Muslims (Federal Ministry of the Interior, 2009) lived in Germany. In addition to the religious affiliation, a measure for religious involvement, namely church attendance frequency, is considered.

Using representative survey data on the individual level, the German Socio-Economic Panel (GSOEP), from the years 2003 and 2004, we found substantial differences in risk-taking attitudes as well as household financing behaviour between religious individuals and non-religious ones, which replicates results found for the Netherlands (Renneboog and Spaenjers, 2012; Noussair, 2012). Religiously affiliated people are, in general, more risk-averse than not-affiliated people. However, differences exist between distinct religious groups with respect to individual risk assessment in financial affairs. While, compared to non-religious individuals, Christians are more willing to take financial risks, Muslims are less risk taking in financial matters. When controlling for the overall level of general risk, these differences disappear. Involvement in religious organizations also influences individual risk attitudes. Compared to people who are not involved in religious networks, frequent churchgoers are, in general, more risk-averse, while they show more risk-tolerant attitudes in financial matters. Secondly, individual religiosity also influences an individual's actual economic behaviour. We found that individuals with distinct religious backgrounds show distinct investment behaviour, as measured by the probability to invest in savings accounts, building contracts, life insurances, or in fixed-interest securities (e.g., bonds), other securities (e.g., stocks), firm assets or not at all. Compared to non-religious people, Christians in Germany are more likely to invest in financial products, except for bonds and non-rated firm assets. In contrast, Muslims are less likely than non-religious people to invest in financial products, especially in stock. However, they display a higher propensity than non-religious people to invest in building contracts.

The paper proceeds as follows. In the next section, we provide a literature review and delineate a theoretical background concerning the effect of culture, approximated by religion and church attendance, on risk-taking preferences and economic behaviour. The data and the

empirical strategy are described in Section III. The results are presented in Section IV. The paper concludes with a short summary and discussion in Section V.

II. RELIGIOUS IDENTITY AND FINANCIAL RISK-TAKING

II.1. Institutional background information

The question is why should religion influence individual attitudes towards financial risk? As social identity theory suggests, the process of self-categorization forms an individual's identity, which is therefore derived, at least largely, from such membership in a social group as one's religious denomination (Benjamin et al., 2012). This embeddedness has substantial influence on people's behaviour, since they internalize the attitudes, beliefs and values as well as the behavioural norms of their group (Stets and Burke, 2000). Consequently, by providing moral and ethical teachings for their adherents to encourage them to behave in a specific way, religions might directly influence individual economic behaviour by its impact on traits and attitudes (Barro and McCleary, 2003).

Exemplarily, the Bible directly promotes risk-averse individual financial decisions. Ecclesiastes 11:2 suggests the diversification of financial portfolios and risk. Investment capital should be divided into several parts and not be risked all in one place: 'Divide your portion to seven, or even to eight, for you do not know what misfortune may occur on the earth.' Furthermore, the Bible warns against investing in assets which the investor does not exactly know: 'Desire without knowledge is not good, and whoever makes haste with his feet misses his way' (Proverbs 19:2). The Qur'an also tries to limit the riskiness of financial-related behaviour by prohibiting gambling not only in the sense of games of chance, but also in the sense of investment in risky assets: 'O you who believe, intoxicants, and gambling, and the altars of idols, and the games of chance are abominations of the devil; you shall avoid them, that you may succeed' (Qur'an 5:90). The promoted risk aversion even leads to the rejection of fair gambles with an expected value of zero. Next to the prohibition of investment in forbidden products, like alcohol, tobacco, pork, weapons or pornography, Islamic law prohibits gharar: speculative economic transactions. Hence, it forbids investing in highly hazardous or excessively risky assets where details with respect to the traded item are unknown or uncertain. The Qur'an itself bans trades that are considered to have severe risk due to uncertainty. Furthermore, taking interest (Riba) is forbidden, since it is seen as a form of usury. 'In the modern world, that translates into an attitude toward money that is different

from that found in the West: Money cannot just sit and generate more money. To grow, it must be invested in productive enterprises' (Saleh Ambah, 2008). Summarizing, religious rules explicitly show, in both the Bible and the Qur'an, how much financial risk taking is allowed and in which assets adherents are permitted to invest. Since religious people behave according to risk-limiting religious rules, they might tend to be more risk-averse in financial matters than non-religious people. Regarding the institutional character of religion, religious networks might influence individual finance risk-taking preferences by its impact on individual commitment. The more deeply religious people are involved in their religion, the more risk-averse they are, since they might have internalized the religious rules more profoundly.

II.2. Previous empirical literature

Given the importance of individual risk-taking attitudes for individual economic decisions, like an individual's entrepreneurship choice (Grilo and Thurik, 2008) or the holding of stocks (Guiso et al., 2008; Dorn and Huberman, 2010), recent attention has been riveted on determinants of individual heterogeneity in risk attitudes (e.g., Barsky et al., 1997; Halek and Eisenhauer, 2001; Hartog et al., 2002; Dohmen et al., 2011). Based on a calculation of the upper and lower bounds on relative risk aversion, Barsky et al. (1997) examined how risk tolerance varies by individual demographic characteristics. Among others, he reported that risk tolerance differs significantly by religion. Catholics are less risk averse than Protestants, whereas Jews are the most risk tolerant. Moreover, they showed, that the preference for risk tolerance predicts risky behaviors, like having insurance, choosing risky employment, or holding risky assets. For example, less risk-tolerant respondents hold a higher portion of safe assets, like treasury bills and savings accounts, in their portfolios. Like these authors, Halek and Eisenhauer (2001) also used for their analysis of personal risk aversion determinants data from Wave I of the University of Michigan Health and Retirement Study (HRS) from 1992. In addition to the results of Barsky et al. (1997) they estimated the Pratt-Arrow coefficient of relative risk aversion for nearly 2,400 households. They showed that, although a respondent's religious faith has little effect on risk aversion, the effects depend on the situation: Compared to the average population Catholics and Jews are more averse to pure risk than members of other faiths are, yet at the same time, they are more tolerant of speculative risk-taking. They traced this result to the distinct religious teachings regarding gambling. Hartog et al. (2002) as well relate individual risk aversion to personal characteristics, like gender, marital status,

educational training, employment decisions, income, and wealth. Using three independent data sources, they analyzed the answers of 20,707 respondents with an ordinary least squares (OLS) regression and a Heckman-two step procedure to state the reservation price for a lottery ticket. Determining the Arrow-Pratt coefficient of absolute risk aversion, he confirmed that people belonging to a religion, which promotes specific norms with respect to gambling and investing, could not decide which price to pay without considering their religious convictions (Hartog et al., 2002, p. 9). These previous contributions (Barsky et al., 1997; Halek and Eisenhauer, 2001; Hartog et al., 2002) found a broad spectrum of individual-specific characteristics, ranging from gender, age and body height to education, income and wealth, to influence individual risk-taking attitudes. Further, although they mentioned a significant influence of religious beliefs and church attendance, no explicit link from religion to risk attitudes was established.

However, less attention has been paid to the underlying cultural background of individuals. Some recent studies, though, examine explicitly the impact of religion, as a key feature of culture, on personal attitudes, such as thrift, work ethic and trust toward others (Guiso et al., 2006, 2003; Arruñada, 2010). In particular, several studies have been published pointing to religion as a determinant of differences in individual risk-taking preferences (Bartke and Schwarze, 2008; Dohmen et al., 2011; Renneboog and Spaenjers, 2012; Noussair et al., 2012). Using a constructed sub-data set of the German Socio-Economic Panel (GSOEP) considering immigrants in Germany, Bartke and Schwarze (2008) analysed whether people of different nationalities show distinct general risk attitudes. They found that, compared to Protestants, Muslims displayed higher risk aversion, whereas non-religious people are relatively risk-tolerant. Next to the impact of religious identity on individual general risk assessment, religious affiliation was found to affect risk attitudes in specific contexts, such as individual financial risk-taking preferences (Dohmen et al., 2011). Based on the 2004 wave of the GSOEP, Dohmen et al. (2011) analysed 22,019 individuals in 11,803 different households and found gender, age, body height and parental background to be determinants of the willingness to take risks in general and in specific contexts. Moreover, they validated the behavioural consequences of their risk measures by running a lottery experiment based on a representative sample of 450 adults living in Germany. In their appendix they listed that Catholics, other Christian religions and non-Christian religions are, in general, more risk-averse than Protestants. Contrary, non-religious people are less risk-averse than Protestants. However, their results do not show distinctive attitudes towards taking financial risk for the

different religious traditions. Only non-religious people are willing to face more risk with respect to financial investments than Protestants.

Focusing on Catholics and Protestants in the Netherlands, Renneboog and Spaenjers (2012) looked at the effect of religious affiliation on both economic attitudes and household finance behaviour using data from the annual Dutch National Bank (DNB) Household Survey covering the period 1995–2008. While not considering explicitly religious attendance as a more direct indicator of individual religiosity, they found that Catholics are, in general, more risk-averse than non-religious individuals. Their results show that, compared to non-religious people, religious people are more likely to save. Additionally, Evangelicals are significantly more likely to hold risky assets, while Catholics are less likely to invest in stocks and bonds. Also, analysing data for the Netherlands, Noussair et al. (2012) concentrated on the effects of church attendance and parental religious background. They used a representative internet-based longitudinal panel study of the Dutch population, the LISS panel. Their results show a positive correlation between church membership and risk aversion, which was measured by incentivized experiments. Furthermore, they find that Protestants are more risk-averse than non-members, and Catholics are less risk-tolerant than Protestants.

Analysing risky investment choices, some authors recently found evidence for the effect of religious identity (Diaz, 2000; Hilary and Hui, 2009; Kumar et al., 2011; Benjamin et al., 2012). Diaz (2000) studied the impact of religiosity on risky financial decisions by conducting a telephone survey with Las Vegas residents to analyse whether religious practices affect gambling patterns and, consequently, the underlying willingness to take a certain speculative risk. In a univariate analysis of a random sample containing 513 adults, he found a negative relation between the attendance of religious services, the self-reported level of importance of religion and religious affiliation and the frequency of gambling. Also, Benjamin et al. (2012) examined whether there are religion-induced differences in financial risk taking. Using priming techniques they derived measures of risk aversion in an incentive-compatible experimental choice. Analysing a randomly selected sample of 827 Cornell University students with interval regression techniques, they observed that ‘Catholicism increases risk-taking, rather than Protestantism reducing risk-taking’ (Benjamin et al., 2012, p. 4).

On the more aggregated level, some authors examined how religious risk norms affect the investment and portfolio decisions of firms and institutional investors. Hilary and Hui (2009) used data from the American Religion Data Archives (ARDA), Compustat and Center for Research on Security Price (CRSP) databases to observe how religious participation at the

county level in the U.S. affects a firm's real investment decisions located in this county. They found that firms located in counties with high levels of religiosity engage less often in investment projects with more uncertain pay-offs as measured by variances in equity returns or in returns on assets. This result remained significant when they disaggregated by religious groups, namely Protestants and Catholics. On the other hand, studying the effects of local religions on the risk-taking behaviour of institutional investors, like banks or insurance companies, Kumar et al. (2011) showed that Protestant views on gambling cause Protestants to hold more risk-averse attitudes than Catholics. Institutional investors located in regions with a high proportion of Catholics relative to Protestants 'assign larger portfolio weights to lottery-type stocks' (Kumar et al., 2011, p. 3).

III. DATA, VARIABLES, AND EMPIRICAL STRATEGY

III.1. Data description

The link between religion, attitudes and behaviour, respectively, can be best studied with microdata on the individual and household level. Applying aggregated data at the regional level might lead to a distorted relation between religion and economic outcomes due to other unobserved characteristics, such as a religious war centuries ago. However, country fixed effects cannot be applied to solve the omitted variable problem due to the largely time-invariant character of religion (Guiso et al., 2003). Additionally, microdata show better statistical properties than macro data due to the larger sample size of the former. Containing the necessary information for the analysis, our data are the GSOEP,[1] a large representative panel survey of private households and persons in Germany (Dohmen et al., 2011). The GSOEP provides a rather stable set of core questions asked every year (e.g., employment, education, income) and yearly topics with additional detailed questions. The 2003 wave includes information about individual religions as well as church attendance. The 2004 wave includes questions about risk-taking preferences in general and in different aspects of people's lives as well as questions on an individual's choice of financial products. We focus on a

[1] In the past, the GSOEP has already been used to study the determinants of individual risk assessment, however, not in the realm of different cultural backgrounds. Hence, our paper is related to Dohmen et al. (2011) and Bartke and Schwarze (2008). Dohmen et al. (2011) analyzed the determinants of individual risk assessment. In contrast, we are focusing on culture as our key determinant of risk aversion and trust. Additionally, we study culture-induced differences in investment behaviour, controlling for individual risk assessment. Bartke and Schwarze (2008) looked at the influence of different nationalities on individual general risk assessment. While they contemplate immigrants to Germany, however, they neither consider the degree to which distinct religions causing variation in economic attitudes is associated with differences in investment behavior, nor do they deal with different risk assessments in different life situations, as we do.

sample of 13,754 individuals who are aged between 18 and 65 years and have no missing values in the variables used in this analysis.

III.2. Religious affiliation and church attendance

Our main explanatory variable of interest is an individual's cultural background, as measured by religious affiliation and church attendance. Since the overall cultural background of a country roots in its history and is transmitted from one generation to another, present individual values and customary beliefs of individuals are affected by culture (Guiso et al., 2006). Consequently, even the economic behaviour of those individuals who consider themselves as non-religious might be affected by religious norms and rules (Inglehart and Baker, 2000; Kumar et al., 2011). However, since individual religiosity might be endogenous to an individual's risk assessment, the majority of the authors dealing with the effect of culture on economic variables assume that cultural and religious convictions 'are inherited by an individual from previous generations, rather than [being] voluntarily accumulated' (Guiso et al., 2006, p. 24). Hence, '[b]ecause of the difficulty of changing culture and its low depreciation rate, culture is largely a "given" to individuals throughout their lifetimes' (Becker, 1996, p. 16). Consequently, we assume the causal link running from religion to risk attitudes and not vice versa, since religion and its practice seem to be exogenous – at least to a large extent. In order to mitigate this endogeneity issue further, we use data for religiosity from the 2003 wave, while taking the data for the dependent variables from the subsequent wave of the GSOEP. The variable religious affiliation indicates whether an individual is attributed to one of the following religions: Catholicism, Protestantism, Other Christian religions, Non-Christian religions, Islam and adherents to Other religions. For each religion, we create dummy variables, whereas non-religious people, which includes agnostics and atheists, are the reference category. It equals one if the individual considers herself to have a certain religious affiliation and zero otherwise.

Table 1 gives a first description of the sample used. It reflects the heterogeneity in the religious landscape in Germany. Almost two-thirds of the sample belongs to a church or other religious organizations. With 28 per cent and 32 per cent of the sample, the Roman Catholic Church and the Protestant Church mainly represent the Christian belief in Germany. Although Protestantism is mainly uniformly organized, some Methodists, Baptists and Mennonites and Evangelical trends might be observed. Two per cent of the sample belongs to Islam. Next to these main religions, there are further Other religions, like Hindus and Buddhists, and Other

Christian religions, like Christian Orthodox religions. These two groups might hold too heterogeneous norms and values to yield clear effects of individual religious preference on individual risk attitudes. However, 35 per cent are not affiliated and do not belong to any religious affiliation. We refer to this last group as non-religious people.

Individual attitudes and behaviour were found to be correlated with social interaction (Hong et al., 2004; Ahern et al., 2012). Organizational membership to religions, as a more direct indicator of individual religiosity, is one form of social interaction. There are two channels through which church attendance influences real economic behaviour. First, going to church frequently is assumed to strengthen one's belief (Iannaccone, 1998). Second, attending religious activities builds up social network in a community (Putnam, 2000). Interacting with peers and learning from their financial experience (Hong et al., 2004) might influence one's investment choices.

The variable church attendance is a categorical variable illustrating how often on average a person attends religious services per year. The categories are 'less than monthly', 'at least monthly', 'at least weekly', or 'never attend religious services'. Table 1 also reports the distribution of the regularity of church attendance in the sample. While 65 per cent of the sample are still religiously affiliated, 85 per cent attend religious services never or less than once month. Only 15 per cent regularly take part in religious activates. This ambivalence towards religious affiliation might be an indicator of the growing privatization of religiosity in Germany.

Table 1

Descriptive statistics

Variable	Mean	Std. Dev.	Min	Max
Risk taking preferences (0: risk averse, 10: fully prepared to take risks):				
General risk taking	4.7031	2.2291	0	10
Willingness to take risk in financial affairs	2.6281	2.2034	0	10
Financial investments (ref.: none):				
Savings account (d)	0.7604		0	1
Savings contract for building a home (d)	0.5188		0	1
Life insurance (d)	0.6749		0	1
Fixed interest securities, e.g. bonds (d)	0.1922		0	1
Other securities, e.g. stocks (d)	0.3925		0	1
Firm assets (d)	0.0761		0	1
None (d)	0.0872		0	1
Religious affiliation (ref. non):				
Catholic (d)	0.2859		0	1
Protestant (d)	0.3219		0	1
Other Christian (d)	0.0165		0	1
Islam/Muslim (d)	0.0204		0	1
Other religion (d)	0.0042		0	1
Church attendance (ref.: never):				
Less than monthly (d)	0.3067		0	1
At least monthly (d)	0.0825		0	1
At least weekly (d)	0.0699		0	1
Control variables:				
Female (d)	0.5135		0	1
German Citizenship (d)	0.9599		0	1
Medium school degree (d)	0.3698		0	1
High school degree (d)	0.3099		0	1
Apprenticeship degree (d)	0.6981		0	1
University degree (d)	0.2220		0	1
Unemployed (d)	0.0835		0	1
Employed (d)	0.7209		0	1
Age (in years)	42.9439	12.7297	18	65
Age square/100	20.0621	10.9640	3.24	42.25
Monthly net household income (in 1000 Euros)	2.9962	2.2577	0.24	99.99
16 German federal states				

Notes: Number of observations is 13,754 for all variables. (d) denotes dummy variables.

III.3. Risk attitudes

At first, we analyse the impact of religious activity on risk aversion in order to assess the extent to which religion contributes to the heterogeneity in individual risk attitudes. Using the 2004 questionnaire, we measure a respondent's self-assessed risk propensity on an 11-point Likert scale between '0 – Risk-averse' and '10 – Fully prepared to take risks'. A disadvantage

of the survey data might be that such risk attitudes are not objective measures but rather qualitative indicators, since stating one's willingness to take risks relies on the individual. Qualitative measures include the problem that underlying factors other than risk attitudes could lead to different responses across individuals and, therefore, the responses are not comparable. However, Dohmen et al. (2011) validated the survey risk measures by a field experiment and found that the answers to risk attitude questions predict actual behaviour in their lottery. They confirmed that the risk attitude measure not only reflects subjective beliefs and self-assessment but predicts actual investment behaviour. Unlike Bartke and Schwarze (2008) and Renneboog and Spaenjers (2012), we not only consider a one-dimensional view on risk attitudes, but rather we disaggregate the measurement of risk attitudes by different contents. Next to the main question on general risk assessment, we further take into consideration a question on the willingness to take risks in financial affairs. To elicit information about risk taking in financial affairs, people were asked again to rate their willingness to take risks in financial matters on an 11-point risk scale between '0 – Risk-averse' and '10 – Fully prepared to take risks'.

In order to estimate the impact of individual religiosity, i.e., religious affiliation and church attendance, on measures for individual risk attitudes, namely individual risk attitudes in general and risk attitudes towards financial concerns, we apply ordinary least squares (OLS) regressions, because the variables measuring risk-raking attitudes can be treated as quasi-continuous. We estimate the following multivariate model:

$$Risk\ attitude_i = \alpha + \beta\ Religiosity_i + X'_i\gamma + \varepsilon_i \qquad (1)$$

In Equation (1) *i* indexes a specific individual, and *Risk attitude* is the outcome variable which denotes individual risk attitudes either in general or in financial matters. α is a constant. *Religiosity* is either the vector of explanatory variables for individual religious affiliation, i.e., being Catholic, Protestant, Other Christian, Muslim, adherent to Other religions or non-religious, or the vector for religious involvement. The impact of religiosity on risk attitudes is measured by the coefficient β. X denotes other regressors, namely, German citizenship, education, employment status, monthly net household income, age and dummies for federal states. γ specifies the strength of this impact. ε is an unobserved stochastic error term. All results report robust standard errors in parenthesis to deal with possible heteroskedasticity.

Table 1 shows summary statistics for the variables, which are included in the subsequent regression analyses. On average, individuals in the sample used are moderately willing to take risks in general. However, on average, they are only partly prepared to face risk in financial

concerns, namely 2.6 risk points. Table 1 further shows that our sample is nearly equally split between males and females. Separate analyses for the genders did not show noteworthy differences, so we decided to run the subsequent regressions for the complete sample. We include a dummy variable for German citizenship as the nature of some religions is rooted in different national cultures. However, since only 4 per cent of the individuals in the sample are non-Germans, a further breakdown of nationality would cause high correlations to variables such as religion. Binary variables for secondary schooling, apprenticeship and university degrees are also included. The employment status of workers is considered through dummies for unemployment and employment, whereas non-employed individuals serve as a reference group. Wealth effects are covered by including the monthly net household income which is measured in €1000. As religious activity and risk taking are likely to vary systematically by age, age in years and its squared term are included. To control for regional differences (e.g., east vs. west, north vs. south), dummies for the 16 German federal states are included.

III.4. Investment behaviour

Next, the impact of religious belief and activity as well as of individual financial risk attitudes on actual individual investment choices will be studied. Therefore we apply seven different binary outcome variables on self-reported information on financial investments: (1) holding a savings account, (2) holding a savings contract for building a home, (3) holding a life insurance, (4) investments in fixed-interest securities (e.g., savings bonds, bonds or federal savings bonds), (5) holding other securities (e.g., stocks, funds), (6) holding firm assets, and (7) holding no assets. These financial assets can be distinguished not only by their expected returns, but also by their potential risk, which individuals have to face when investing (Barasinska et al., 2012). In each category, systemic risks, like default risks of the issuer or market breakdowns, and non-systemic risks, such as value losses, might be distinguished. Savings accounts are deemed as squeaky-clean assets, that is, except for the risk that the market interest rates are changing, losses in value and reliability risks are almost excluded. When holding a savings contract for building a home, individuals do not have to face risks with respect to value changes in their savings or default risks of the issuer. Instead, risks with respect to the allocation of the mortgage savings amount exist. Life insurances also incorporate risk elements. This is partly due to the possibility that the guaranteed interest payments fall, or the insurance company becomes insolvent. Obviously, there are also risks when investing in fixed-interest securities and other securities. Next to reliability risks,

investors investing in fixed-interest securities mainly have to face risks due to changes in the market-price of their security papers. While fixed-interest securities promise to pay regular and guaranteed interests, they show lower expected returns than other securities, like stocks. Consequently, the risk of changes in market-prices might be less for fixed-interest securities. Finally, when investing in company assets, operative risks have to be taken into consideration.

Table 1 further shows average values for the different financial investments. Sorted in ascending order by their associated potential risk, 76 per cent of the people in the sample own a savings account. Half of the sample stated that they put money aside in a savings contract for building a home. Next to these low-risk asset types, two-third save money in a life insurance, which involves a moderate risk. While only 19 per cent invested in fixed-interest securities with moderate risk-return trade-off, 39 per cent decided to invest in other security papers, e.g., in papers of listed companies. This asset type is assumed to involve high risk. Only 8 per cent invested in companies not listed.

Since the variables for investment decisions are binary coded, we apply a Probit model to estimate the effects of religious activity and financial risk-taking preferences on the probability that an individual invested in the different investments. Using the latent variable approach, we specify the Probit model as follows:

$$y_i^* = \alpha + \beta\, Religiosity_i + \delta\, Risk_{Finance_i} + X'_i\gamma + \varepsilon_i \qquad (2)$$

In Equation (2) the variables used are the same as in the above Equation (1). Additionally, δ measures the influence of individual willingness to take financial risks on individual investment choices. The unobserved latent variable is connected to the observable binary response categories via the following measurement model:

$$Investment_i = \begin{cases} 1 \;\; if\; y_i^* > \tau \\ 0 \;\; if\; y_i^* \leq \tau \end{cases}. \qquad (3)$$

In Equation (3) the observed categories change when the latent variable crosses a threshold τ. Since the probability to observe a positive investment behaviour depends on the distribution of the error term, we estimated the model

$$Pr(Investement = 1|x_i) = F(\alpha + \beta\, Religiosity_i + \delta\, Risk_{Finance_i} + X'_i\gamma) \qquad (4)$$

where F is the cumulative distribution function for the normal distribution with Var(ε) = 1. For each asset class, *Investment* represents the binary choice variable whether to invest money in a certain asset or not. Given the nonlinearity of Probit models, we report average marginal effects.

IV. MICROECONOMETRIC RESULTS

IV.1. Religious activity and risk-taking preferences

In order to determine whether religion and church attendance are robust determinants of risk attitudes once we control for differences in individual characteristics, we first estimate regressions where the dependent variable is an individual's response to the general risk question and the specific risk content. Table 2 presents the results of the regression of the answers to the general risk question as well as to the specific financial risk-taking question considering different religious affiliations and different levels of religious involvement.

Column (1) of Table 2 shows a significant negative relationship between most religious affiliations and the general risk-taking attitudes of individuals. Except for Other religions, for which we do not find statistically significant results, religious people are significantly less willing to take risks in general than non-affiliated people. Not only are these results highly statistically significant, but the impact of religious affiliation on general risk assessment is also sizeable. A Catholic individual reports a 0.36 risk points and a Protestant a 0.26 points lower willingness to take risks in general on the 11-point scale than a non-religious person. Hence, Catholics are more risk-averse than non-religious people and Protestants. These results are not only statistically, but also economically relevant. Being Catholic, compared to non-religious people, decreases an individual's willingness to take risks in general by about 7.66 per cent of the mean. Comparing these results with the impact of religious minorities on risk attitudes, we find that Other Christians and Muslims are in general more risk-averse than Catholics and Protestants. Being Muslim, as opposed to being non-religious, increases the individual will to be risk-averse in general by 14.98 per cent of the mean. This result is also highly statistically significant. Contrary to the negative and significant relation between general risk-taking preferences and religiosity, as column (1) had shown, considering the impact of religious beliefs on individual risk attitudes towards investments in risky financial assets, column (2) shows no significant impact of religiosity. Muslims and Other religions, however, are an exception. Both are more risk-averse in financial concerns. Muslims display a 0.27 risk points lower willingness to take financial risks. This result is significant at the 10 per cent level only. Adherents to Other religions show a 0.50 risk points lower willingness to take financial risks, which is significant at the 5 per cent level.

Table 2

The impact of religion on the willingness to take risks in financial affairs

	(1)	(2)	(3)	(4)	(5)
Religion (reference: non)					
Catholic	-0.3626***	0.0746	0.2268***	-0.2803***	0.1945***
	(0.0546)	(0.0546)	(0.0500)	(0.0626)	(0.0562)
Protestant	-0.2639***	-0.0073	0.1035**	-0.2075***	0.0529
	(0.0487)	(0.0486)	(0.0445)	(0.0545)	(0.0494)
Other Christian	-0.7699***	-0.0621	0.2611**	-0.6294***	0.2826**
	(0.1556)	(0.1510)	(0.1301)	(0.1639)	(0.1372)
Islam/Muslim	-0.7046***	-0.2739*	0.0219	-0.6189***	0.0147
	(0.1733)	(0.1593)	(0.1377)	(0.1755)	(0.1414)
Other religion	0.1997	-0.5043**	-0.5881**	0.3551	-0.5373**
	(0.2963)	(0.2569)	(0.2580)	(0.3007)	(0.2608)
Church attendance (ref.: never)					
Less than monthly				-0.0868*	0.1369***
				(0.0477)	(0.0420)
At least monthly				-0.1161	0.0155
				(0.0749)	(0.0619)
At least weekly				-0.2321***	-0.0868
				(0.0826)	(0.0703)
General risk-taking			0.4198***		0.4198***
			(0.0079)		(0.0079)
Control variables as in Table 1	Yes	Yes	Yes	Yes	Yes
Constant	6.3216***	2.8376***	0.1839	6.2808***	0.1858
	(0.2842)	(0.2738)	(0.2424)	(0.2842)	(0.2426)
R^2	0.0884	0.0987	0.2631	0.0890	0.2640

Notes: OLS regressions for the willingness to take risks (0: risk averse, 10: fully prepared to take risks). In column (1) and (4) the dependent variable is general risk-taking. In column (2), (3) and (5) the dependent variable is the willingness to take risk in financial affairs. Number of observations is 13,754 in all specifications. Robust standard errors in parentheses. Coefficients are significant at * 10%, ** 5%, and *** 1%.

However, an underlying general risk attitude exists which drives specific risk assessments, as Dohmen et al. (2011) stated. Consequently, column (3) controls additionally for general risk preferences to account for the 'stable, underlying risk trait […] that is common across contexts' (Dohmen et al., 2011, p. 18). In line with Dohmen et al. (2011), the general risk attitude is found to be positively correlated to financial risk attitudes. As column (3) indicates, although all religions are in general more risk-averse, when controlling for the overall general risk attitude, Christian people are less risk-averse in financial concerns than non-religious people, that is, for example, they might invest more in risky assets. Catholics report a 0.22 risk points (8.63 per cent of the mean) higher willingness to take risk in financial affairs than non-religious people, while Protestants state a 0.10 risk points higher willingness to face risks in financial concerns. When controlling for the overall level of general risk, a Muslim's belief

is not statistically significantly associated with the individual attitudes towards taking risk in financial concerns. Other religions are not only more risk-averse in general than non-religious people, but also with respect to financial decisions.

These results remain striking when adding the frequency of church attendance as a measure for individual involvement in religious organizations, although the magnitude of the coefficients on individual religious beliefs reduces. Thus, attending religious services regularly helps to explain distinct risk-taking attitudes. Column (4) shows that the more strongly people are involved in religious activities, the more risk-averse they are in general, since they might have internalized the religious rules more profoundly. Individuals attending religious service at least weekly are more risk-averse than people never attending religious services. The same picture arises when considering the influence of involvement in religious organizations on financial risk assessment in column (5). The less people attend religious services, the less risk-averse they are in financial concerns. That is, individuals who are more involved in their religion might invest in a more cautious way. Column (5) shows that even when individuals have the same general risk assessment and are equally involved in religious activities, differences in the risk assessment of financial choices between religious and non-religious people stay robust.

To preclude that the found results are driven by differences in individual characteristics, we control for a wide range of covariates. These results are omitted from the tables for brevity. In line with former research results (Dohmen et al., 2011), we find that females are less willing to take risks in general, and with respect to financial decisions, than males. Older individuals are less likely to take risks in general, as well as in the considered specific situation, than younger individuals are. When assuming an equal general risk level, older people are, however, more willing to invest in risky assets. The results for both measures of education show that better-educated people are willing to face more general risks. The willingness to face financial risks is higher among well-educated individuals than among less well-educated people. With respect to employment status, one has to differentiate. While both employed and unemployed individuals are less risk-averse in general than non-employed individuals are, employed individuals report a 2.3 points higher and unemployed a 2.4 points lower willingness to take risks in financial matters than non-employed individuals. Since a higher net monthly income might smooth the impact of negative income shocks (Dohmen et al., 2011), it is not surprising to find that a net monthly income is positively correlated with the willingness to take risks. Moreover, richer people take more risks in financial affairs. However, as Dohmen et al. (2011) pointed out, the direction of the relationship is far from

being clear, since wealthier people might also be more risk-tolerant. Controlling for the overall level of risk aversion, these results remain robust.

IV.2. Religious activity, risk-taking preferences and individual investment behaviour

We focus on financial decisions and estimate Probit regressions where the explanatory variables of interest are an individual's religious affiliation, the level of religious involvement and individual willingness to take risk in financial matters. The dependent variable is an individual's binary response with regard to her financial asset management. Since Dohmen et al. (2011) pointed out that the best predictor of investing in financial assets is the question about willingness to take risks in financial matters, rather than the general risk question or questions incorporating different contexts, we include the risk attitude towards financial investments in our analysis.

As Table 3 shows more financial risk-taking preferences, as expected, are positively correlated with the likelihood of investments, especially with investments in stocks. The higher the individual financial risk aversion, the less individuals are willing to invest in risky assets. We further find evidence that even when controlling for financial risk-taking attitudes, religious adherence still has consequences for real financial behaviour, that is, religious beliefs not only influence individual financial risk-taking attitudes directly, but also have a direct effect on financial outcomes. However, since the coefficients on individual religiosity barely change when controlling for individual finance risk preferences, individual religiosity might influence investment decisions mainly through other channels, such as education. While controlling for overall level of financial risk aversion, column (1) in Table 3 shows that Catholics are 7.8 percentage points more likely to own a savings account, and Protestants have a 5.58 percentage points higher likelihood of owning a savings account than non-religious people. As suggested above, the behavioural differences between Catholics and Protestants in Germany are not very big and not statistically significant. In contrast, Muslims and adherents to Other religions display a lower savings propensity than non-religious people. However, believing in Islam raises the probability of owning a savings contract for building a home by 10.77 percentage points compared to non-religious people. Both Catholics and Protestants also have a higher probability of saving money in contracts for building a home than non-religious people. Though showing a slightly positive attitude towards financial concerns when controlling for overall risk assessment, Muslims are less likely to invest in relatively secure life insurances than non-religious people. This behaviour is contrary to

Christian religions. While Muslims display a 6.65 percentage points lower willingness to invest in life insurances, Catholics and Protestants display almost the same likelihood of investing in life insurances, which is, nonetheless, higher than for non-religious people. Furthermore, Christian religions have a higher likelihood than non-religious individuals not only of investing in fixed-interest securities, but also in other securities which are more risky. Conversely, Muslims have a higher aversion to investing in highly risky assets than non-religious people do. They are 19.82 percentage points less likely to invest in other, highly volatile and risky other securities.

Comparing the results between the different financial products, Table 3 shows that, Christian religions in Germany, compared to non-affiliated people, have the highest probability of investing in relatively secure financial products, like savings accounts, savings contracts for building a home and life insurances. Further, they also have a higher probability of investing in more risky assets, like stocks and firm assets, than non-religious people. Although Muslims are less likely to own a savings account than Christians and non-religious people, they focus on investing in savings contracts for building a home. Since the Qur'an fosters investments in real financial assets, investments in building contracts seem to be more related to real life than investing in other assets, or not investing at all in conventional financial assets. Furthermore, Muslims show the lowest probability of investing in more volatile stocks and bonds.

Table 3

The impact of religious affiliation on investment behaviour

	(1) savings account	(2) savings contract for building a home	(3) life insurance	(4) fixed interest securities (e.g. bonds)	(5) other securities (e.g. stocks)	(6) firm assets	(7) none
Religion (reference: non)							
Catholic	0.0780***	0.1114***	0.0662***	0.0499***	0.0456***	0.0103	-0.0217***
	-0.0101	-0.0128	-0.0118	-0.0106	-0.0134	-0.0064	-0.0046
Protestant	0.0558***	0.0776***	0.0543***	0.0387***	0.0343***	0.0115**	-0.0175***
	-0.0093	-0.0116	-0.0107	-0.0094	-0.0121	-0.0056	-0.0042
Other Christian	0.0131	0.0680*	0.0312	-0.0418	-0.0239	-0.0153	-0.0103
	-0.028	-0.0348	-0.0311	-0.0261	-0.0361	-0.0144	-0.0097
Islam/Muslim	-0.0255	0.1077***	-0.0665*	-0.0361	-0.1982***	-0.0370***	0.0089
	-0.0304	-0.0355	-0.0357	-0.0303	-0.0334	-0.0127	-0.0133
Other religion	-0.0821	0.1317**	0.059	0.0513	-0.0791	-0.0427**	0.0205
	-0.0591	-0.0626	-0.0561	-0.0574	-0.0624	-0.0191	-0.0259
Risk finance	0.0031*	0.0071***	0.0099***	0.0090***	0.0479***	0.0039***	-0.0035***
	-0.0018	-0.0021	-0.002	-0.0016	-0.0021	-0.0009	-0.0009
Control variables as in Table 1	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Predicted probability	0.7604	0.5188	0.6749	0.1922	0.3925	0.0761	0.0872
Pseudo-R^2	0.0299	0.0378	0.0693	0.0717	0.1348	0.0945	0.167

Notes: ML-Probit regressions for the probability to hold financial assets. Marginal effects at the mean of all covariates. Number of observations is 13,754 in all specifications. Robust standard errors in parentheses. Coefficients are significant at * 10%, ** 5%, and *** 1%.

Since these results might vary with levels of religious involvement, we include the frequency of attending religious services as an additional variable in Table 4. The results of the impact of religious beliefs on investment decisions remain robust; however, changes in the magnitude of the coefficients occur. While for Christian religions the effect of religious affiliation on investment decisions decreases when controlling for church attendance, the negative coefficient for Islam belief increases. Further, Table 4 shows a positive relationship between the frequency of attending religious services and the probability of investing in financial products. However, the results do not indicate that more involved individuals have a higher likelihood of holding financial assets. The effects seem to be strongest when attending religious services at least monthly. Column (1) illustrates that people attending religious services are more likely to hold a savings account. Therefore, people attending religious services less frequently have a 6 percentage points lower probability of holding a savings account than people attending at least monthly. However, non-statistically significant differences were found between people attending at least monthly and people attending at least weekly, although the latter have a 7.4 percentage points higher probability of owning a savings account than people never attending. The same pattern occurs with respect to the likelihood of investing in savings contracts for building a home, life insurances and fixed-interest securities. However, the probability of investing in highly volatile and risky assets, such as other securities, is negatively correlated with the frequency of church attendance. The more people are involved in their religion, the lower their probability is of investing, for example, in stocks, although this result is not statistically significant. As expected, people attending religious services have a lower probability of not investing at all. Summing up, taking part in institutionalized religion fosters the individual probability of investing in secure assets rather than in unsecure financial products. This result supports the hypothesis that not only religious beliefs but also religious organizations affect individual risk assessment and investment behaviour.

Again, we include a wide range of control variables in both analyses. These findings, which are not presented in the table to economize on space, are in line with former results (Barasinska et al., 2012). In general, women have a lower probability of investing in financial assets, except for other securities, like stocks, which are very volatile and therefore imply high risk. Although we did not find statistically significant results with respect to the impact of German nationality on risk attitudes, one's nationality is significantly positively associated with an individual's investment decisions. Age not only influences individual attitudes towards risk negatively, but also the probability of investing in savings accounts or fixed-

interest securities. However, the older the individual, the higher is the likelihood of investments in relatively liquid assets, like life insurances, other securities or not at all. Being more risk-tolerant, higher-educated individuals are also more likely to invest in financial assets. As expected, unemployment is negatively correlated with the holding of financial assets. In comparison to non-employed individuals, on average unemployed individuals have a 12 percentage points lower probability of possessing a savings account, while having a higher probability of not investing at all. Conversely, employed individuals have a higher likelihood of investing in relatively safe financial assets, such as savings contracts for building a home and life insurances.

Table 4

The impact of religious affiliation and church attendance on investment behaviour

	(1) savings account	(2) savings contract for building a home	(3) life insurance	(4) fixed interest securities (e.g. bonds)	(5) other securities (e.g. stocks)	(6) firm assets	(7) none
Religion (reference: non)							
Catholic	0.0360***	0.0517***	0.0269**	0.0078	0.0349**	0.0019	-0.0084
	-0.012	-0.0147	-0.0137	-0.0113	-0.0152	-0.0067	-0.0055
Protestant	0.0231**	0.0326**	0.0215*	0.01	0.0201	0.0058	-0.0059
	-0.0107	-0.013	-0.012	-0.0101	-0.0133	-0.006	-0.0048
Other Christian	-0.0518	-0.0224	-0.0192	-0.0864***	-0.0215	-0.0229*	0.0082
	-0.0336	-0.0379	-0.0351	-0.021	-0.0379	-0.0131	-0.0141
Islam/Muslim	-0.0760**	0.0508	-0.1074***	-0.0710***	-0.2017***	-0.0403***	0.0278*
	-0.0337	-0.0377	-0.0374	-0.0252	-0.0334	-0.0114	-0.0168
Other religion	-0.1586**	0.0383	0.0122	-0.0155	-0.0707	-0.0458***	0.0483
	-0.065	-0.0686	-0.0619	-0.0479	-0.0646	-0.0162	-0.0343
Church attendance (ref.: never)							
Less than monthly	0.0486***	0.0757***	0.0560***	0.0353***	0.0331***	0.0037	-0.0216***
	-0.0091	-0.0112	-0.0103	-0.009	-0.0115	-0.0053	-0.0039
At least monthly	0.1080***	0.0913***	0.0827***	0.0993***	0.0211	0.0332***	-0.0290***
	-0.0118	-0.0172	-0.0148	-0.0157	-0.0184	-0.01	-0.0045
At least weekly	0.0743***	0.1380***	0.0620***	0.0950***	-0.0188	0.0105	-0.0195***
	-0.0139	-0.0185	-0.0171	-0.0176	-0.0197	-0.0103	-0.0056
Risk finance	0.0031*	0.0072***	0.0099***	0.0093***	0.0478***	0.0040***	-0.0034***
	-0.0018	-0.0021	-0.002	-0.0016	-0.0021	-0.0009	-0.0009
Control variables as in Table 1	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Predicted probability	0.7604	0.5188	0.6749	0.1922	0.3925	0.0761	0.0872
Pseudo-R^2	0.0351	0.0419	0.0717	0.0766	0.1355	0.0964	0.1725

Notes: ML-Probit regressions for the probability to hold financial assets. Marginal effects at the mean of all covariates. Number of observations is 13,754 in all specifications. Robust standard errors in parentheses. Coefficients are significant at * 10%, ** 5%, and *** 1%.

V. DISCUSSION AND CONCLUSION

Only recently economic research considered cultural determinants in its analysis. Studying the effects of religiosity on individual risk attitudes, in a first step, and on individual investment decisions in financial assets, in a second step, we aimed to shed light on the intermediate step in the link running from cultural conditions via individual attitudes to aggregate economic outcomes. Although Germany is a secular country, we found that one's cultural heritage, measured by religious tradition and activity, affects individual risk attitudes. Although some contrary studies on a more aggregated level stated that Catholics display a higher willingness to take risks than Protestants (Kumar et al., 2011; Shu et al., 2012), we found that Catholics are in general more risk-averse than Protestants. This is in line with other recent research (Dohmen et al., 2011; Renneboog and Spaenjers, 2012). We further found Muslims in Germany to be less risk taking in general than Catholics, Protestants, and non-religious people. Additionally to previous studies conducted, a context-specific risk attitude, namely financial risk taking, is explicitly considered. Christians were found to be less risk-averse in financial matters than non-religious people. In contrast, comparing Muslims and non-religious individuals, the former are less risk taking in financial concerns. However, their risk assessment in financial concerns depends on their general risk assessment. Furthermore, individual religiosity is associated with one's investment choices. Although Christians are less risk taking in general, they are more likely to invest in financial products, except for bonds and firm assets. In line with Renneboog and Spaenjers (2012), we also found that they are more likely than non-affiliated people to hold such risky assets as stocks. Conversely, Muslims are less likely than Christians and non-religious people to invest in financial products, especially in risky stocks, while they display a higher likelihood of investing in building contracts. Next to individual religiosity, religious activity helps to explain different attitudes towards taking risks. In line with the results of Noussair et al. (2012), deeply involved individuals are less risk taking in general and in financial matters, as expected. Attending religious services is also positively correlated with individual investment choices.

These findings might have important consequences. Culture-induced differences in risk preferences might be one factor contributing to the explanation of individual differences in socio-economic outcomes (Iannaccone, 1998; Hoffmann, 2012), such as entrepreneurship decisions, labour market outcomes (Lehrer, 2008; Becker and Woessmann, 2009; Fernández, 2010) and wage rates (Ewing, 2000), or wealth accumulation (Keister, 2003) and savings behaviour of households (Fuchs-Schündeln and Schündeln, 2005). Culture-induced

heterogeneity in individual risk attitudes yielding distinct economic choices might further provide a microeconomic foundation for divergent aggregate outcomes. Contributions to the literature document the macroeconomic consequences of religious beliefs on economic growth (Barro and McCleary, 2003; Acemoglu et al., 2005), economic development (Alesina et al., 2003), savings and investment ratios (Guiso et al., 2006), the quality of the governmental systems (La Porta et al., 1999; Arruñada, 2010) and expenditures for welfare systems (Tabellini, 2010).

What can policymakers learn from these findings? Since culture-induced individual heterogeneity in risk assessment was found, distinctive individual values and norms, which are mainly shaped by cultural factors, should be taken into the political decision-making process. Instead of strengthening only external constraints, such as enhanced monitoring of financial institutions or issuing improved transparency rules, moral standards should be strengthened too. Recently, the importance of moral standards for risk-taking preferences and risky behaviour has been seen in distinct risk-taking behaviour by Islamic and conventional banks in the ongoing financial crisis. Since 'earning returns based on chance is strongly discouraged and gambling is strictly forbidden' (Bohnet, 2010, p. 816), Islamic banks tend to invest more conservatively than Western banks. Following the principles of Islamic law (Sharia) and the Qur'an, the former are not permitted to handle excessive risk-taking transactions. Islamic law requires risk-sharing strategies to be pursued, and hence profits and losses of financial transactions to be shared, consequently using less risk-seeking financial instruments and choosing customers' projects to finance more selectively (Hassan, 2009). These cultural constraints prevented them from accumulating high losses during the first wave of the recent financial crunch, the sub-prime mortgage crisis in the USA, compared to conventional banks (Hasan and Dridi, 2010; Baele et al., 2012; Bourkhis and Sami Nabi, 2011). However, more risk aversion in financial concerns, in the sense that it might be harder to get a loan from an Islamic bank than from a conventional one, might hamper the economic development of Islamic countries and might lead to a shortage of cash supply for business financing. Positive effects of religion on individual risk-taking attitudes and economic risky behaviour would further justify public subsidies. Although influencing individual religiosity is difficult, organized religion might be supported. For example, introducing a tax system to raise church taxes and foster governmental church subsidies might lower church costs.

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