Religious Prohibitions and Investment: the Effect of the Islamic Moral Code on Investment in Foreign Debt Securities

Paweł Niszczota[*]

Abstract: The purpose of this study is to investigate whether religious prohibitions have a significant impact on the propensity to invest in foreign securities. We do this by exploring the effect of the Islamic prohibition of interest, which as we hypothesize, should impact the level of investment in foreign debt securities made from countries with a high Muslim population. We perform a panel regression analysis that gives support for this hypothesis, by demonstrating a negative relationship between the value of investments in foreign debt securities and the percentage of Muslims in the population of the investing country. Our results are robust to the inclusion of several other factors that could impact investment – including culture-related ones – and the use of different estimation procedures and dependent variables.

Keywords: foreign portfolio investments, bond markets, religion, Sharia, Islamic finance

Introduction

For years, the debate on what determines the level of foreign portfolio investments has been dominated by the voices of academics whose research has suggested that the level of investment is the result of an underlying rational factor. There is, however, a growing body of literature that demonstrates that the propensity to invest in foreign securities is to some extent affected by the behavioural and cultural attitudes of individuals, which exhibit considerable variation around the world. Morse and Shive (2011), for example, show that countries that are populated by more patriotic individuals tend to more severely overinvest in domestic equities. Beugelsdijk and Frijns (2010) and Aggarwal et al. (2012) contribute to this body of research by presenting evidence of a link between the level of foreign portfolio investment and (a) the mean uncertainty avoidance and individualism scores of citizens from the country making the investment, (b) the cultural distance between the originating (home) country and the destination (host) country.

The aim of this study is to test whether the prohibitions imposed by a religion can affect the propensity to invest in foreign securities. Islam is perhaps the most interesting religion for financial academics, as it explicitly imposes a rule that should influence the investment

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decisions of individuals that adhere to this religion. The relatively small amount of research relating to this prohibition seems surprising, given that the number of Muslims in the world has been estimated to be around 1.6 billion, or just under a quarter of the world's population (data for 2010). This study contributes to the strand of literature that investigates the impact of religion on economic outcomes (e.g. Guiso et al. 2003, Stulz and Williamson 2003), by analysing whether a specific prohibition imposed by Islam has an effect on foreign investment decisions.

1. Islam and debt securities

Sharia – which constitutes the Islamic moral code, as well as the legal system in select countries – prohibits Muslims from either paying or receiving interest (*riba*). Although it is debated whether this rule relates to all interest or excessive interest (Noorzoy 1982), it is widely believed that it is the former, which in theory should severely affect the financial decisions of Muslims. It is not entirely clear, however, whether the mere existence of such a moral code should lead to the result that countries with a high Muslim population will – on average – invest significantly less in debt securities than other countries, as this would require inhabitants to adhere to this rule in its strict form. This prohibition is rarely enforced by the state (Otto 2008), and thus in most countries individuals can decide for themselves if they are interested in using the services of a conventional banking system or investing in conventional debt securities (which mostly consist of bonds).

Although one would expect the rule under investigation to have an impact on the purchases of debt securities, there are at least two reasons why the level of investments from countries with a high Muslim population could ultimately not be lower than investments from other countries. Firstly, the fact that there is no agreement among Islamic scholars as to what form of interest is prohibited makes it generally less morally troubling to invest in conventional bonds and other debt securities (which is permitted in the more lenient form of the rule). Secondly, analyses suggest that Islamic banking and finance does not in fact significantly differ from their conventional counterparts (Chong and Liu 2009, Khan 2010). This high degree of similarity between conventional and Sharia-compliant securities might dilute any serious moral concerns when considering investments in the former.

It remains to be empirically tested whether the existence of the prohibition under scrutiny translates into a significantly lower level of investment into debt securities, made from countries with a high Muslim population (the hypothesis of this study). In order to resolve this issue, we perform an analysis of the foreign investment patterns of a wide range of countries, which gives us the opportunity to extract more generalizable inferences. It seems straightforward, that the greater the Muslim population (relative to the entire population), the more adverse the effect of the religious prohibition on investment should be. More formally, assuming the adherence of Muslims to the strict form of the

prohibition that forbids investing in interest-bearing securities, we expect to see a negative relationship between the level of investment in foreign debt securities and the percentage of Muslims in a home country's population (after accounting for other factors that affect the level of investment).

2. Data and methodology

We have used data on the bilateral holdings of debt securities from the Coordinated Portfolio Investment Survey (CPIS), which is provided by the International Monetary Fund (IMF). Given that the IMF has been providing such data for many years, this gives us an opportunity to robustly test our hypothesis through panel data regressions.

The dependent variable used in the study is the log of the value of investments per capita (in USD) in debt securities made from each home country into each host country. Contrary to many previous studies, it is advisable to use the absolute level of investment (i.e. not the relative value, or 'foreign bias', see e.g. Beugelsdijk and Frijns (2010)). This is due to the fact that the moral code obviously applies to both foreign and domestic debt securities, and thus in countries highly populated by Muslims the level of investment in both domestic and foreign debt securities should be low (in other words, it is difficult to establish a benchmark, which is necessary to compute the level of bias). The key independent variable is the percentage of a country's population (in 2010) that is Muslim, which is sourced from The Pew Research Center's website.

In line with previous studies, we include several variables that have been shown to have an effect on the propensity to invest in foreign securities. Firstly, we use two proxies for the level of information asymmetry between the country-pairs i.e. the geographic distance between the capitals of the home and host countries, and a dummy variable that takes the value of one when the countries share a common language (in both cases the data is sourced from Mayer and Zignano (2011)). To control for the level of familiarity between the home and host country we include a dummy variable that takes the value of one if the countries share a common legal origin (the data is obtained from La Porta et al. (1999)). We introduce another dummy variable, that takes the value of one when the home and host country have a common dominant religion (a variable used e.g. in Aggarwal et al. 2012), which also partially accounts for cultural similarities between the countries. Next, given that – similarly to international trade – the value of portfolio investments seems to be affected by the size of the home and host country's economy (as postulated by the 'gravity' model, see Portes and Rey (2005)), we include the log of the GDPs of both countries in our specifications. Next, following Chan et al. (2005), we include the log of GDP per capita as a measure of the economic development of the host country. We also include the log of GDP per capita in the home country, as a country's level of economic development can have the potential to impact investment behaviour. Finally, we include three variables that proxy for the attrac-

tiveness of the host country's capital market i.e. market capitalization to GDP[1], financial transparency, and market liquidity.

Table 1

The percentage of Muslims in the population (M/P) in the home countries (in descending order) (%)

Country	M/P	Country	M/P	Country	M/P
Turkey	98.6	Germany	5.0	Aruba	0.4
Egypt	94.7	Sweden	4.9	Malta	0.3
Indonesia	88.1	Greece	4.7	Romania	0.3
Kuwait	86.4	United Kingdom	4.6	Venezuela	0.3
Bahrain	81.2	Denmark	4.1	Hungary	0.3
Malaysia	61.4	Norway	3.0	Bahamas	0.1
Lebanon	59.7	Canada	2.8	Brazil	0.1
Kazakhstan	56.4	Italy	2.6	Chile	0.1
Cyprus	22.7	Argentina	2.5	Colombia	0.1
Israel	17.7	Slovenia	2.4	Costa Rica	0.1
Mauritius	16.6	Spain	2.3	Czech Republic	0.1
Singapore	14.9	Australia	1.9	Estonia	0.1
Bulgaria	13.4	South Africa	1.5	Iceland	0.1
Russia	11.7	Hong Kong	1.3	Japan	0.1
France	7.5	New Zealand	0.9	Latvia	0.1
Belgium	6.0	Barbados	0.9	Lithuania	0.1
Thailand	5.8	Bermuda	0.8	Macao	0.1
Austria	5.7	Finland	0.8	Mexico	0.1
Switzerland	5.7	United States	0.8	Poland	0.1
Netherlands	5.5	Panama	0.7	Slovakia	0.1
Philippines	5.1	Portugal	0.6	Uruguay	0.1
Mean					13.0
Median					**2.3**
Standard deviation					**26.2**

Source: The Pew Research Center.

Due to the availability of data concerning the control variables, our dataset – based on the 2001–2012 surveys – documents end-year holdings that reflect investments made from 63 home countries into 30 (mostly developed) host countries[2]. It is important to point out that for a number of countries the CPIS database does not provide full information concerning the level of holdings in the partner countries. Given that it is very likely that in cases where no data is provided there is simply no investment made in the debt securities, we

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[1] Information on GDP, GDP per capita, and the market capitalisation to GDP ratio are sources from the World Development Indicators.

[2] We have excluded six countries for which there is little information concerning the debt investments of their inhabitants, possibly due to underreporting (when included in the sample, it proved difficult to compute parameter estimates).

amend the database by adding a value of zero for home country-host country pairs for which the CPIS does not provide data (as our dependent variable is the log of the level of holdings, we substitute the log of 0.001 for cases where no investment has been made, or when this seems to be the case). After the introduction of the additional data, our sample consists of 21,646 observations.

In Table 1 we present the percentage of Muslims in the population (M/P ratio) in the home countries used in the study. The data suggests that the distribution of the M/P ratio is highly skewed, with a mean ratio of 13.0% and a median of 2.3%. The shape of this distribution is largely driven by the fact that 28 home countries (44% of the countries in the sample) have a ratio of less than 1%, and out of these countries 16 have a ratio estimated to be 0.1%. Given that it is possible that the inclusion of a large number of countries with a very minor Muslim population can bias the results, it seems warranted to simultaneously analyse the effect of variation in the M/P ratio with and without the inclusion of these 'outlier' countries. Moreover, it is possible that we have introduced some errors while assigning zero holdings (i.e. for country-pairs with no data in the CPIS), and thus we will also investigate a subsample in which we exclude all zero holdings.

Given that the structure of our data and the fact that a large portion of our regressors are time-invariant, we use a random-effects model to obtain parameter estimates. To insure that our inferences are trustworthy, we have computed cluster-robust standard errors.

3. Results

We have presented the results of the regression analysis in Table 2. Given that countries with a high Muslim population are generally less economically developed, we demonstrate how the key independent variable affects the level of investment before controlling for the level of development of the home country, and after controlling for this effect by adding a GDP per capita (logged) variable to the model. The M/P variable in the first specification has a negative coefficient and is statistically significant ($p < 0.01$), which suggests that prior to controlling for the effect of economic development of the home country, a higher relative number of Muslims in the population of the investing country leads to less investment in thedebt securities of foreign countries, as hypothesized. We amend the first specification by the inclusion of the log of GDP per capita in the home country. The results demonstrate that controlling for the effect of variation in the home country's level of economic development reduces the size of the coefficient of the variable under investigation, to the extent that it is no longer statistically significantly different from zero (although the p-value is only marginally above conventional levels). However, if we use the same regressors on a subsample which excludes cases when a home country has no holdings in debt securities in a given host country (specification 3) the negative relationship is statistically significant.

As mentioned earlier, the distribution of the Muslims-to-population ratio has the potential of introducing bias in the results, and thus in the three last specifications presented

in Table 2 we investigate the effect of the key variable on a subsample in which we discard observations made from countries with an M/P ratio that is smaller than 1%. Similarly to the results based on the full sample, in the specification that does not control for differences in the level of economic development of the home countries, the M/P has a negative coefficient and is significant at the same level. However, contrary to the results that we obtained for the full sample, if we include the 'GDP/capita (home)' variable in the model, the key independent variable retains its statistical significance ($p < 0.01$), although the size of the coefficient

Table 2

The percentage of Muslims in a home country's population and the level of foreign debt investment per capita

	All home countries			Home countries with a Muslim population of at least 1%		
	Including zero holdings		Excluding zero holdings	Including zero holdings		Excluding zero holdings
	(1)	(2)	(3)	(4)	(5)	(6)
Muslims/pop. (M/P)	−2.261***	−0.401	−0.235**	−2.960***	−1.336***	−0.745***
	(0.244)	(0.256)	(0.120)	(0.282)	(0.292)	(0.133)
Geographic distance	−1.104***	−0.886***	−0.383***	−1.073***	−0.814***	−0.413***
	(0.064)	(0.057)	(0.023)	(0.082)	(0.072)	(0.029)
Common language	1.306***	1.238***	0.570***	0.659**	0.727***	0.383***
	(0.206)	(0.172)	(0.070)	(0.257)	(0.208)	(0.095)
Common legal origin	1.012***	0.605***	0.284***	0.551***	0.372**	0.176***
	(0.139)	(0.115)	(0.052)	(0.184)	(0.148)	(0.065)
Common religion	−0.234	0.003	0.118**	−0.108	0.118	0.223***
	(0.150)	(0.123)	(0.055)	(0.199)	(0.158)	(0.068)
GDP (home)	0.317***	0.044	−0.200***	0.363***	−0.001	−0.260***
	(0.036)	(0.030)	(0.014)	(0.056)	(0.052)	(0.023)
GDP (host)	0.475***	0.516***	0.245***	0.572***	0.586***	0.304***
	(0.081)	(0.070)	(0.029)	(0.103)	(0.088)	(0.035)
GDP/capita (home)		1.464***	0.944***		1.323***	0.868***
		(0.062)	(0.026)		(0.076)	(0.032)
GDP/capita (host)	0.277***	0.336***	0.088***	0.180*	0.263***	0.094***
	(0.071)	(0.061)	(0.026)	(0.096)	(0.081)	(0.032)
Market cap./GDP	0.090	0.068	0.102***	0.162*	0.137	0.135***
	(0.068)	(0.066)	(0.024)	(0.092)	(0.088)	(0.029)
Financial transparency	0.929***	0.832***	0.230***	0.729***	0.632***	0.185***
	(0.146)	(0.126)	(0.055)	(0.191)	(0.164)	(0.068)
Market liquidity	0.002	0.001	0.002***	0.001	0.002	0.002**
	(0.002)	(0.001)	(0.001)	(0.002)	(0.002)	(0.001)
Number of observations	21 646	21 646	14 502	12 053	12 053	8 751
Adjusted R^2	0.098	0.148	0.233	0.105	0.157	0.248
F-statistic	107.5	163.1	190.3	64.3	97.8	125.2

***, **, * denote significant coefficients at the 1%, 5%, 10% levels, respectively.

Source: author's computations.

is smaller than in the specification that excludes the additional control variable. The results in specification 5 show that a one percentage point increase in the Muslims-to-population ratio yields a 1.3% drop in the level of investment in debt securities, after controlling for the level of economic development and other variables included in the specification. The last specification in Table 2 in which we only investigate those cases with positive holdings in foreign debt securities yields estimates that reassure us that the relationship between foreign debt investment and the Muslims-to-population ratio is indeed negative and statistically significant.

Overall, the results show that due to the religious prohibition imposed on Muslims (and their adherence to the Islamic moral code), the level of investment in foreign debt securities is smaller for investments made from countries where Muslims are more prevalent, although the significance of the results in one of the cases depends on whether we include investments from countries with a very small number of Muslims in its population. However, there remains the possibility that our results are driven by the estimation procedure used or the choice of the dependent variable. Therefore, we consider an alternative estimation procedure and three other dependent variables. In our first robustness check, we used the same specification and sample as in specification 5 (presented in Table 2)[3], but estimate parameters by using a censored (Tobit) model (analogously to Beugelsdijk and Frijns (2010)).

Moreover, we used the log of the level of investment (as applied in Aggarwal et al. (2012))., and foreign bias (which measures the observed weight in a country's portfolio relative to a weight that is optimal from a diversification perspective; this dependent variable is used in Beugelsdijk and Frijns (2010) and Niszczota (2014)). Finally, we investigated whether the results that we obtained are similar if we consider the probability of making an investment, by using a dependent variable which takes the value of one when an investment from a home country into a host country is made and zero otherwise, and estimating parameters via the Probit procedure. The results of these robustness checks are presented in Table 3. As is evident by the sign and significance of the M/P variable, each of the regressions suggest that a greater number of Muslims in a country's population leads to smaller investment in foreign debt securities (first three specifications), and decreases the probability of making such an investment (last specification).

Given that is also possible that our results are driven by model misspecification, in an additional analysis (unreported) we check whether the M/P variable retains its effect on foreign debt investment after the introduction of additional control variables. As it has been argued in previous research that the propensity to invest in foreign securities can be the results of cultural differences between investors, and the level of similarity of cultures between the home and host country, we added variables that proxy for the uncertainty avoidance propensity of investors in the home country (one of Hofstede's (1980) cultural dimensions),

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[3] This specification seems to be best suited to serve as a reference, as it is not affected by the potential bias resulting from the inclusion of home countries with a very minor Muslim population, and considers the effect of the home country's level of economic development, which is clearly related to the level of investment.

Table 3

Regressions based on different estimation procedures and dependent variables

	Log of invest-ment per capita (Tobit)	Log of invest-ment	Foreign bias	Probit
	(1)	(2)	(3)	(4)
Muslims/pop. (M/P)	−1.137***	−3.072***	−0.816***	−0.668**
	(0.315)	(0.674)	(0.242)	(0.289)
Geographic distance	−0.906***	−1.874***	−1.256***	−0.605***
	(0.088)	(0.165)	(0.081)	(0.071)
Common language	0.938***	1.666***	−0.157	0.393**
	(0.240)	(0.478)	(0.280)	(0.186)
Common legal origin	0.368*	0.866**	0.861***	0.301**
	(0.202)	(0.342)	(0.159)	(0.134)
Common religion	0.177	0.295	0.049	0.154
	(0.187)	(0.363)	(0.153)	(0.149)
GDP (home)	−0.097*	0.982***	0.066	0.221***
	(0.054)	(0.119)	(0.049)	(0.043)
GDP (host)	0.600***	1.350***	0.294***	0.397***
	(0.084)	(0.203)	(0.084)	(0.074)
GDP/capita (home)	1.624***	2.057***	0.193***	0.508***
	(0.071)	(0.175)	(0.068)	(0.055)
GDP/capita (host)	0.325***	0.605***	0.742***	0.128***
	(0.088)	(0.187)	(0.061)	(0.048)
Market cap./GDP	0.223***	0.316	−0.046	0.045
	(0.069)	(0.204)	(0.070)	(0.055)
Financial transparency	1.074***	1.451***	0.680***	0.442***
	(0.232)	(0.377)	(0.159)	(0.132)
Market liquidity	0.003	0.004	−0.001	0.000
	(0.003)	(0.004)	(0.002)	(0.001)
Number of observations	12,053	12,053	12,053	12,053
Adjusted R^2		0.151	0.099	
F-statistic		93.3	57.5	

***, **, * denote significant coefficients at the 1%, 5%, 10% levels, respectively.

Source: author's computations.

as well as the cultural distance between the home and host country (computed as in Kogut and Singh (1988)). Next, we added a variable that measures the mean level of patriotism in the home country, which is motivated by the aforementioned results provided by Morse and Shive (2011). Lastly, we added two variables that measure the riskiness of investments in the host country i.e. the volatility of market returns, and exchange rate volatility. The results obtained via specifications that include all of the additional controls are qualitatively the same to those that are presented in Table 2.

Conclusions

The purpose of this study was to investigate whether the religious prohibition imposed on Muslims that forbids them from receiving and paying interest translates into a significantly lower level of investment in foreign debt securities made from countries with a high Muslim population. All of the regressions (bar one) give support for the existence of such a relationship. The results are robust to the inclusion of numerous control variables, and are not affected when we use different dependent variables or estimation procedures. Altogether, the results suggest that the commonality of Muslims in a country's population should be controlled for in future studies that concentrate on investments in foreign debt securities, especially those that to some extent focus on investments made from less developed countries.

At this point it seems warranted to present two inferences that can be drawn from our results. Firstly, it seems that it is the countries that are located closest to countries with a high Muslim population that are most affected by the investigated religious 'bias'. Put differently, countries that are located closely to states with a relatively high Muslim population do not receive foreign debt investment at a level that could be expected according to the 'gravity' model. Secondly, due to the fact that Muslims are becoming more prevalent in many non-Islamic countries (and in the world population in general), one can expect that the rise of the importance of Sharia-compliant securities should continue, that is if we assume the same level of adherence to the investigated prohibition in the future.

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ZAKAZY RELIGIJNE A INWESTYCJE: WPŁYW ISLAMSKIEGO KODEKSU MORALNEGO NA INWESTYCJE W ZAGRANICZNE PAPIERY DŁUŻNE

Streszczenie: W artykule dokonano oceny wpływu istniejącego w religii islamskiej zakazu pobierania odsetek na inwestycje w zagraniczne papiery dłużne. Zgodnie z przyjętą w pracy hipotezą, zakaz ten powinien wpłynąć na poziom inwestycji z krajów zamieszkanych przez względnie dużą liczbę Muzułmanów. Wyniki analizy regresji dla danych panelowych dostarczyły wyniki będące zbieżne z przyjętą hipotezą tj. dane sugerują istnienie negatywnej relacji między wartością inwestycji w zagraniczne papiery dłużne a udziałem Muzułmanów w populacji kraju inwestującego. Uzyskane wyniki uwzględniają wpływ innych czynników oddziaływujących na skalę inwestycji – w tym czynników o charakterze kulturowym – i są zbieżne dla wszystkich wykorzystanych metod estymacji i postaci zmiennej zależnej.

Słowa kluczowe: inwestycje portfelowe, rynek obligacji, religia, szariat, finanse islamskie

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