Does Religiosity Affect Liquidity in Financial Markets?

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Abstract:
A growing body of research shows that religious culture can influence both macroeconomic and firm-specific outcomes. In this study, we examine how religiosity influences the liquidity of cross-listed stocks. These tests are important given the literature that shows that firms choose (in part) to cross-list their securities in order to access greater liquidity, which can reduce firms' costs of capital. Using an instrumental variable approach, results show that religiosity directly influences the liquidity of cross-listed securities. This link might best be explained by a growing body of research that suggests that religiosity is directly associated with the ethical behavior of firm managers. To the extent that this association exists, the liquidity provider's cost of holding a risky inventory of shares might be lower, thus resulting in an overall improvement in liquidity.

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1. INTRODUCTION

Using a broad sample of countries, Barro and McCleary (2003) show that various measures of religiosity directly affect economic growth rates. Perhaps the reason for this peculiar relationship is based on the idea that religious cultures generate more ethical behavior among individuals (Conroy and Emerson (2004) and Longenecker, McKinney, and Moore (2004)). In more ethical societies, information in markets is likely to be more symmetric. At the macroeconomic level, symmetric information can increase the level of investment and, in turn, affect overall economic growth (Fu (1996)). At the firm level, research shows that in societies that are more religious, firms are more likely to provide credible information and avoid financial reporting irregularities (Grullon (2009), McGuire, Omer, and Sharp (2012), Dyreng, Mayew, and Williams (2012), and Chintrakarn, Jiraporn, Tong, and Chatjuthamard (2015)).[1] To date, the link between religiosity and these types of information asymmetries is based only on anecdotes. The objective of this article is to study this link more carefully.

In his seminal work on liquidity provision in financial markets, Demsetz (1968) discusses the framework for how asymmetric information influences the costs associated with providing liquidity. Recognizing that market makers hold an inventory of shares in order to provide immediacy in liquidity, Demsetz (1968) discusses the costs associated with providing liquidity, which he calls "waiting costs". Market makers earn income in two ways: by managing orders and by assuming risk. While technological innovation has eased the burden of the former, the latter remains an important part in determining the liquidity of financial markets. Without full information – or with information that is only partially credible, market makers experience higher

[1] Recently, Hilary and Hui (2009) and Blau (2015) shows that religiosity is associated with less volatile stock prices, suggesting that religious cultures have a stabilizing influence on stock prices. Alternatively, Callen and Fang (2015) have shown that countries that are more religious have a lower probability of experiencing crashes in financial markets. This stream of research indicates that religiosity may mitigate risk.

levels of risk and will therefore be less willing to provide liquidity. Both the theoretical and empirical research confirms that various measures of risk reduce liquidity in financial markets (Stoll (1978), McInish and Wood (1992), Huang and Stoll (1996), and Venkataraman (2001)).

When identifying the determinants of this type of liquidity, much of the literature focuses on how the structure of markets and the regulatory frameworks influence transaction costs.[2] Other studies examine how liquidity is influenced by stock-specific factors, such as share prices and firm size. Until recently, broader, country-wide determinants of liquidity were missing from this literature. Eleswarapu and Venkataraman (2006) show that the quality of political and regulatory institutions across various countries can lead to more liquidity. Still, other broader determinants of liquidity are likely to exist. In this study, we test the hypothesis that religious culture can impact liquidity of securities. In particular, we test whether or not religiosity – as measured by the degree of religious practice and the strength of religious beliefs – can lead to improvements in liquidity. To the extent that religious culture generates higher levels of ethical behavior and more credible information flow from firms, market makers then face less risk and are more likely to provide liquidity to market participants (Tinic and West (1972), Benston and Hagerman (1974), Stoll (1978), Harris (1994), and Bollen, Smith, and Whaley (2004)).

Testing whether or not religiosity influences the liquidity in financial markets is difficult for two reasons. First, liquidity is heavily affected by the structure of the market and religious culture may endogenously determine the market structure (Naughton and Naughton (2000)). To overcome this first issue, we follow Eleswarapu and Venkataraman (2006) and use a sample of American Depositary Receipts (ADRs), which are certificates that trade on U.S. markets but

[2] See, for example, Christie and Schultz (1994), Christie, Harris, and Schultz (1994), Blume and Goldstein (1997), Bessembinder (1999), Goldstein and Kavajecz (2000), Chung, Van Ness, and Van Ness (2001), Venkataraman (2001), Besseminder (2003), Bessembinder and Venkataraman (2004), among others.

represent shares of foreign companies. Using this sample allows us to isolate the effect of the religious culture in the home country on the liquidity of the securities while holding the structure of the market constant. Furthermore, using ADRs as our sample of securities can provide insight into the liquidity benefits associated with cross listing. The second issue we face is potential endogeneity in describing the direction of causality. Our hypothesis is that religiosity causes an improvement in market liquidity. While examples may be hard to come by, it is possible that a change in liquidity somehow endogenously affects the level of religiosity in a particular country. To overcome this possibility, we follow Barro and McCleary (2003) and use instrumental variable analyses. In particular, we instrument religiosity with an indicator variable capturing whether or not a particular country's government regulates the religion market. This instrument, which is used by Barro and McCleary (2003), is correlated with the level of religiosity but uncorrelated with the liquidity of ADRs.

Our tests show that, after controlling for a number of country-specific and ADR-specific variables, including the percentage of the surveyed population that affiliates with a particular religion, ADRs from home countries with higher degrees of religiosity are generally more liquid than ADRs from home countries with lower levels of religiosity. In our analysis, religiosity is measured two different ways. From World Values Surveys (WVS), we first obtain the percentage of the surveyed population that attends worship services at least monthly and prays frequently. We use both of these characteristics as a measure of religious practice. We also take the average of these two variables as an aggregate measure of religious practice. Second, we gather from the WVS, the percentage of the surveyed population in ADR home countries that believe in God, in an afterlife, in Heaven, and in Hell. Each of these four percentages are used as a measure of

religious beliefs. As before, we also aggregate these religious beliefs by taking the average of these four percentages.

In general, our multivariate tests find that religious practice in the home country lowers bid-ask spreads (and other measures of illiquidity) and increases the amount of trading activity in a particular ADR. In economic terms, a 1% increase in religious practice reduces bid-ask spreads by nearly 1.5%. Further, a 1% increase in religious practice increases trading activity by approximately 4%. These findings seem to indicate that the association between religiosity and market liquidity is economically meaningful.

When examining the effect of religious beliefs in the home country on the liquidity of ADRs, we find that a 1% increase in the percentage of the surveyed population with religious beliefs is associated with a 1% reduction in bid-ask spreads and an approximate 3% increase in trading activity. While the economic magnitude is stronger for religious practice, vis-à-vis religious beliefs, the statistical significance is stronger for the latter.

The results from our tests have important implications. Prior research has shown that firms choose to cross-list their securities, in part, to access greater liquidity (Karolyi (1998) and Foerster and Karolyi (2000)). Perhaps the preference for liquidity access is explained by the findings in Amihud and Mendelson (1986), Amihud (2002), and Acharya and Pedersen (2005) that show that market liquidity reduces firms' costs of capital. Our results have practical implications that suggest that the liquidity benefits associated with cross-listing depend on the religious culture in the home country. Said differently, religiosity in the home country may mitigate information asymmetry between firms and investors and lead to more trading activity and greater liquidity. More broadly, and perhaps more interesting, our findings bridge two streams of research that, until now, have seemed unrelated. While Barro and McCleary (2003) show that religiosity can influence economic

growth, Levine and Zervos (1998) provide evidence that liquid financial markets can also lead to higher economic output. The results in this study suggest that a religious culture's contribution to economic growth may, in part, be explained by religion's contribution to improved liquidity in financial markets.

The rest of the paper follows. Section 2 describes the data used throughout the study. Section 3 presents the results from the empirical tests. Section 4 offers some concluding remarks.

2. DATA DESCRIPTION

The data used throughout this analysis come from several sources. From the Center for Research in Security Prices (CRSP), we obtain daily prices, trading volume, stock returns, and market capitalization. We also gather closing bid and ask prices that allow us to estimate the bid-ask spread.[3] From CRSP, we also obtain share codes that allow us to identify ADRs. To determine the home country, we use Bloomberg and link each ADR to the country in which the company is domiciled. The country characteristics are obtained from two sources. First, we gather macroeconomic data, such as GDP and unemployment rates, from the World Bank Development Indicators. Second, as mentioned above, we obtain religious affiliation, practice, and beliefs data from the World Values Survey (2000). We also obtain the indicator variable capturing whether or not the home-country government regulates the religion market from Barro and McCleary (2003). Given that WVS data is only available in the year 2000, we use CRSP data and the World Bank data from 2001 to 2005. We aggregate the data by taking the average of each of the variables used in the analysis so that we are left with a cross-sectional sample of 316 ADRs. We note that we replicate our analysis using only 2001 data and we are able to draw conclusions that are similar to

[3] Roll and Subrahmanyam (2010) and Chung and Zhang (2014) show that using closing bid- and ask prices to calculate bid-ask spreads closely approximate other measures of bid-ask spreads that are calculated using intraday data.

those reported in this study.[4] We note that the WVS data is not available for all countries depending on the religiosity variables that we focus on. Therefore, the sample ranges from 250 observations to 277 observations depending on the religiosity variable in question.

Table 1 presents the statistics that summarize the ADR data. Panel A presents the summary statistics for the liquidity characteristics while panels B and C show the statistics for the control variables and country characteristics, respectively. %SPRD is the percentage bid-ask spread, which is the difference between daily closing ask prices and bid prices scaled by the spread midpoint. $SPRD is the dollar spread, or the difference between daily closing ask prices and daily closing bid prices. ILLIQ is the Amihud (2002) measure of illiquidity, which is the ratio of the absolute value of daily returns scaled by daily dollar volume (in 1,000,000s). TURN is the ratio of total trading volume scaled by the shares outstanding. VOLUME is the amount of total trading volume. VOLATILITY is the volatility, or the standard deviation of daily returns. SIZE is the market capitalization for each ADR on the last trading day of the year. PRICE is the closing price for each ADR at the end of the each year. NASD is an indicator variable capturing whether ADR *i* is listed on NASDAQ – zero otherwise. GDP/CAPITA is the GDP per capita in the home countries of the sample of ADRs and UNEMPLOY is the unemployment rate (in percent) in each home country.

Panel A shows that the average ADR has a %SPRD of 2.2% and a $SPRD of $.28. The average ADR also has ILLIQ of 3.85, TURN of 27.62, VOLUME of 70 million shares, VOLATILITY of 3.38%, SIZE of $889 million, and PRICE of $20.32. We also note that the mean

[4] We also replicate our tests using a panel dataset, which consists of yearly ADR data from 2001 to 2005. Again, the results are similar to those reported in the study. The reason for extending our data to 2005 is make sure our analysis is biased due to the 2001 market crash (in response to the Technology Bubble). Religious culture is not likely to vary much across time and so extending our sample out over five years can provide a smoothing affect during the macroeconomic conditions that were present in 2001.

of the variable NASD is 0.2547 suggesting that about 26% of ADRs are listed on the NASDAQ stock exchange. Panel C shows that the average ADR country has GDP/CAPITA of $25,090 and an unemployment rate (UNEMPLOY) of 6.8%.

Table 2 shows statistics regarding that WVS religiosity data that summarize the ADR home countries. AFFILIATION is the fraction of the population that belongs to any type of religion (does not include atheist/non-religious affiliations). We include this variable as a control in all of our multivariate tests in order to isolate the measures of religiosity, such as religious practice and religious beliefs, from a simple affiliation to a particular religion. PRAY is the fraction of the population that prays weekly. CHURCH is the fraction of the country's population attends church at least monthly. GOD is the fraction that believes in God. HEAVEN is the fraction that believes in a Heaven. HELL is the fraction that believes in Hell. LIFE is the fraction that believes in life after death. REGULATED is an indicator variable capturing whether a country's government regulates the religion market.

The table reports the that, in the average ADR home country, 87% of the surveyed population is affiliated with a major religion (AFFILIATION), 51% pray weekly (PRAY), 38% attend worship services at least monthly (CHURCH), 82% believe in God (GOD), 61% believe in HEAVEN, 47% believe in HELL, and 63% believe in an AFTERLIFE. Furthermore, we find that 33.7% of countries have regulated religion markets, on average.

3. EMPIRICAL TESTS AND RESULTS

In this section, we present the results from our analysis. First, we examine the association between ADR liquidity and religious practice. Second, we focus our tests on the relation between liquidity and the level of religious beliefs in a particular country. In the tests that follow, we are careful to note that finding a relationship between liquidity and religiosity is not tantamount to

identifying a causal link. To draw stronger causal inferences, we use an instrumental variable analysis, where we instrument religiosity with an indicator variable capturing the whether or not the religion market in a particular country is regulated by the government (Barro and McCleary (2003)). Such regulations are likely to negatively influence the level of religiosity but are exogenous to ADR liquidity.

3.1. Liquidity and Religious Practice

We begin by examining the association between liquidity and religious practice in a particular country. More specifically, we estimate the following cross-sectional regression using the formula below.

$$\begin{aligned} Ln(LIQUIDITY_i) = \beta_1 Ln(PRACTICE_i) + \beta_2 Ln(AFFILIATION_i) + \\ \beta_3 Ln(GDP/CAPITA_i) + \beta_4 Ln(UNEMPLOY_i) + \beta_5 Ln(VOLATILITY_i) + \beta_6 Ln(SIZE_i) \\ + \beta_7 Ln(PRICE_i) + \beta_8 NASDAQ_i + \alpha + \varepsilon_i \quad (1) \end{aligned}$$

The dependent variables include the natural log of our five measures of liquidity. %SPRD is the percent bid-ask spread. $SPRD is the dollar bid-ask spread. ILLIQ is the Amihud (2002) measure of illiquidity. These three measures are inverse approximations for liquidity. TURN is the share turnover; VOLUME is the trading volume of each ADR. The independent variable of interest in the natural log of the fraction of the population that practices their religion (Ln(PRACTICE)). We note that PRACTICE is the average of PRAY and CHURCH. The other control variables include the following: Ln(AFFILIATION) is the natural log of the percent of the population in an ADR country that belongs to one of the ten religious organizations described in Barro and McCleary (2003). Ln(GDP/CAPITA) is the natural log of the per capita GDP in an ADR country; Ln(UNEMPLOY) is the natural log of the unemployment rate in an ADR country. Ln(VOLATILITY) is the natural log of the standard deviation of daily returns for ADR *i*; Ln(SIZE) is the natural log of the market capitalization on the last day of the year for ADR *i*; Ln(PRICE) is the natural log of the closing share price on the last day of the year for ADR *i*; and

NASDAQ is an indicator variable capturing whether or not ADR *i* is listed on the NASDAQ stock exchange. To account for endogeneity, we estimate, in all of the tests that follow, the equation using two-stage least squares (2SLS). The first stage is a regression of our religiosity measure on the instrument REGULATE as well as other control variables. We take the predicted values from the first stage regression and estimate equation (1). Doing so allows us to account for the possibility of endogeneity.

Table 3 provides the results from the analysis. The five columns report the results when we use each of the five liquidity measures. Using the natural logs of liquidity not only allows us to better interpret the estimated coefficients, but taking the natural logs also provides some normalization to the dependent variables. Before discussing the independent variable of interest, we report some of the findings with respect to the control variables. First, we find that the natural log of affiliation is directly related to spreads and illiquidity (columns [1] through [3]) and negatively associated with trading activity (columns [4] and [5]).We also find that market capitalization and share prices are negatively associated with percentage spreads and illiquidity. The results for share turnover and trading volume are mixed. After holding these, and other variables constant, we find that the coefficient on Ln(PRACTICE) is negative and significant (at the .10 level) in columns [1] through [3]. Not only are the coefficients statistically significant, but the results are also economically meaningful. For instance, column [1] suggests that a percent increase in religious practice is associated with a 1.21% reduction in bid-ask spreads. Similar results are found in column [2]. When examining Ln(ILLIQ) in column [3], our results suggest that a 1% increase in religious practice is associated with a reduction in Amihud's (2002) illiquidity of 4.42%.

Columns [4] and [5] show the results for share turnover and trading volume. Again, we find that the coefficients on Ln(PRACTICE) are positive and significant at the .05 level. The results are also economically meaningful. For instance, a 1% increase in religious practice is associated with a 4.03% increase in share turnover and a 3.81% increase in trading volume. These results suggest that as religious practice in a particular home-country increases, bid-ask spreads and illiquidity decrease, and trading activity increases in the ADR.

Tables 4 and Table 5 shows the results when we replicate Table 3 but instead of including Ln(PRACTICE) as the independent variable of interest, we separately include Ln(PRAY) and Ln(CHURCH), respectively. Our objective in doing so is to isolate which, if either of the two variables, is driving the results in Table 3. Table 4 shows the results when the independent variable of interest is Ln(PRAY). In columns [1] through [3], we again find that the coefficient on Ln(PRAY) is negative and both statistically (at the .05 level) and economically significant. In economic terms, we find that a 1% increase in the percentage of the surveyed population that prays frequently is associated with a reduction in percentage bid-ask spreads of .96%, a reduction of dollar spreads of 1.17%, and a reduction in illiquidity of 3.51%.

Columns [4] and [5] show the results for when share turnover and trading volume are included as the dependent variables. Again, the coefficients on Ln(PRAY) are positive and statistically significant in both of the latter columns. The magnitude of the coefficients is also significant. A 1% increase in the fraction of the home country that prays frequently is associated with a 3.20% increase in share turnover and a 3.02% increase in trading volume.

In the last set of tests in this subsection, we include Ln(CHURCH) as the independent variable of interest. Table 5 presents the results from this analysis. As in the last table, we replicate Table 3 but include Ln(CHURCH) as the independent variable of interest instead of

Ln(PRACTICE). The format of the table is similar to the previous two tables. In general, we find that the control variables produce estimates that are similar in sign to previous tables. When focusing on the coefficients on Ln(CHURCH), we find that the estimates are negative in the first three columns and positive in the final two columns. These results are similar to Tables 3 and 4. However, we do not find that the estimate for Ln(CHURCH) is reliably different from zero (estimate = -0.8036, t-statistic = -1.57) in column [1]. The coefficient on Ln(CHURCH) retains its significance in the final four columns. For instance, in column [2], the estimate is -1.0956 (t-statistic = -1.80) and suggests that a 1% increase in the fraction of the home country population that attends worship services at least monthly is associated with a 1.10% reduction in dollar bid-ask spreads. The corresponding coefficient in column [3] suggests that a 1% increase in CHURCH is associated with a 3.32% reduction in Amihud (2002) illiquidity. The latter two columns indicate that a 1% increase in CHURCH leads to a 3.06% and a 2.75% increase in share turnover and trading volume, respectively. These findings support the results in the previous two tables. It seems that the significance of the results is stronger in Table 4 vis-à-vis Table 5, but the magnitude of the estimates is relatively similar. These rough comparisons seem to indicate that while religious practice in the home country seems to improve the liquidity of ADRs, the results are not entirely explained by the components making up our measure of religious practice (PRAY or CHURCH).

3.2.Liquidity and Religious Beliefs

Thus far, we have shown that the level of religious practice in the ADR home country is directly associated with liquidity in ADRs. The use of our instrumental variable analysis allow us to make some causal inferences regarding this relationship. In this subsection, we test whether a similar relation exists between religious beliefs and liquidity. We do so by estimating an equation

similar to equation (1). In particular, we estimate several cross-sectional regressions, which are defined below.

$$\begin{aligned}Ln(LIQUIDITY_i) = \beta_1 Ln(BELIEF_i) + \beta_2 Ln(AFFILIATION_i) + \\ \beta_3 Ln(GDP/CAPITA_i) + \beta_4 Ln(UNEMPLOY_i) + \beta_5 Ln(VOLATILITY_i) + \beta_6 Ln(SIZE_i) \\ + \beta_7 Ln(PRICE_i) + \beta_8 NASDAQ_i + \alpha + \varepsilon_i \quad (2)\end{aligned}$$

As before, the dependent variables include the natural log of our five measures of liquidity. Here, the independent variable of interest in the natural log of our four measures of religious beliefs (Ln(BELIEF)). We note that BELIEF is the average of GOD, AFTERLIFE, HEAVEN, and HELL, all of which have been defined previously. The other control variables been previously defined. As before, we account for endogeneity by estimating the equation using 2SLS. Following Barro and McCleary (2003), we use REGULATED as the instrumental variable in the first-stage regression. The second stage includes the predicted values for the independent variable of interest.

Table 6 reports the results from estimating equation (2). Similar to the preceding tables, columns [1] through [5] show the regression results for each of our five liquidity measures. In general, the control variables provide coefficients that are similar in sign and magnitude to the corresponding coefficients in previous tables. Column [1] shows the results when Ln(%SPRD) is included as the dependent variable. Here, we find that the coefficient on Ln(BELIEF) is negative and statistically significant. Results also show that the estimate is economically meaningful. For every 1% increase in BELIEF, percentage spreads decrease by .85%. Columns [2] and [3] provide similar results and indicates that a 1% increase in BELIEF is associated with a 1.05% reduction in $SPRD and a 3.11% reduction in ILLIQ. Combined, these findings suggest that the level of religious beliefs in the ADR home country meaningfully impact our three (inverse) measures of illiquidity.

When focusing on the latter two columns, we find that the elasticity between BELIEF and our two measures of trading activity is indeed positive and both statistically and economically

significant. For instance, a 1% increase in BELIEF is associated with a 2.75% increase in share turnover and a 2.65% increase in trading volume. These findings again suggest that religious beliefs in the ADR home country can improve the level of liquidity in a particular ADR.

In the following four tables, we estimate variants of equation (2). Instead of using an aggregate measure of religious beliefs, we focus on each individual component. For example, Table 7 reports the results from estimating equation (2) where the independent variable of interest is GOD. As before, the purpose for this type of analysis is to determine which, if any of the components of religious beliefs explain the results we find in Table 6. A few results from Table 7 are noteworthy. First, we find that many of the control variables that produced significant estimates in previous tables, do not do so in Table 7. For instance, while the coefficients on Ln(AFFILIATION) are similar in sign to the corresponding estimates in Table 6, none of the coefficients are reliably different from zero. We also find several of the coefficients on Ln(SIZE) are no longer significant. When focusing on the independent variable of interest (Ln(GOD)), the table shows that while the coefficients have the predicted signs, none of the estimates are statistically significant. These findings indicate that a religious belief in God does not seem to meaningfully contribute to our findings in Table 6.

Table 8 shows the results when Ln(AFTERLIFE) is the independent variable of interest. Here, we find that the control variables, such as Ln(AFFILIATION), Ln(SIZE), and Ln(PRICE), resume their significance in explaining the liquidity of ADRs. Furthermore, we find that the estimates for Ln(AFTERLIFE) are also statistically significant and have the expected sign. In economic terms, a 1% increase in AFTERLIFE is associated with a 1.08% reduction in %SPRD, a 1.33% reduction in $SPRD, a 3.96% reduction in ILLIQ, a 3.50% increase in TURN, and a

3.38% increase in VOLUME. These findings indicate that, relative to the independent variable GOD, the belief in an afterlife seems to have a more reliable effect on ADR liquidity.

In Table 9, we include the variable Ln(HEAVEN) as the independent variable of interest. The table shows that many of the other control variables significantly explain ADR liquidity. For instance, Ln(UNEMPLOY) produces a significant estimate in four of the five columns and suggests that home countries with higher unemployment rates have lower ADR liquidity. We also find that Ln(VOLATILITY) produces significant coefficients in four of the five columns. The estimates on the other control variables are similar in sign and magnitude to those in previous tables. We find that Ln(HEAVEN) produces significant estimates in each of the five columns. In economic terms, a 1% increase in the percentage of people that believe in Heaven is associated with a .54% reduction in percentage spreads, a .67% reduction in dollar spreads, a 1.98% reduction in Amihud's (2002) illiquidity, a 1.75% increase in share turnover, and a 1.69% increase in trading volume. While these coefficients are statistically significant at the .01 level, the magnitude of the coefficients is markedly smaller than those in previous tables. However, we are left to conclude that a religious belief in Heaven by those in an ADR home country is associated with a meaningful improvement in ADR liquidity.

In our final set of tests, we continue our analysis by estimating equation (2) but including Ln(HELL) as the independent variable of interest instead of Ln(BELIEF). Table 10 reports the findings. As in Table 9, many of the control variables produce estimates that are statistically significant. For instance, in column [5], all of the coefficients, except for the coefficient on Ln(GDP/CAPITA), are significant at, at least, the .10 level. Furthermore, we find that Ln(HELL) produces estimates that are statistically significant in each of the five columns. We note that the magnitude of the coefficients on Ln(HELL) are the lowest among any of the tables. However, the

results still seem to be economically significant. For instance, a 1% increase in the percentage of the home country population that holds religious beliefs in Hell is associated with a reduction in percentage spreads of .35%, a reduction in dollar spreads of .44%, a reduction in Amihud's (2002) illiquidity of 1.29%, an increase in share turnover of 1.14%, and an increase in trading volume of 1.10%.

In summary, this subsection suggests that religious beliefs can meaningfully explain the liquidity of ADRs. Comparing the components of religious beliefs suggests that, if anything, the belief in an afterlife is the main driver of the relationship between religious beliefs and liquidity. In a series of unreported tests, we statistically compare the estimates from Ln(AFTERLIFE) to the estimates from both Ln(HEAVEN) and Ln(HELL). While we do not find a reliable difference between the coefficients on Ln(AFTERLIFE) and the coefficients on Ln(HEAVEN), we do find that the estimates for Ln(AFTERLIFE) and Ln(HELL) are statistically different from zero when examining each of the five specifications in Tables 8 and 10.[5]

4. CONCLUSION

This paper develops and tests the hypothesis that religious culture can influence the liquidity of cross-listed securities. This idea is based on the notion that the risks association with liquidity provision are greater in countries with less religious cultures. For instance, prior research shows that in more religious societies, individuals are less likely to engage in ethical behavior and information is more likely to be credible (Conroy and Emerson (2004) and Longenecker, McKinney, and Moore (2004)) as firms are less likely to practice earnings management, backdate stock options, manipulate accruals, misrepresent financial statements, and withhold bad news

[5] We note that the differences between estimates (Ln(AFTERLIFE) and Ln(HELL)) are only significant at the .10 level for both percentage spreads and dollar spreads. However, these differences are significant at the .05 level for Amihud's (2002) illiquidity, share turnover, and trading volume.

(Stulz and Williamson (2003), Grullon (2009), McGuire, Omer, and Sharp (2012), and Dyreng, Mayew, and Williams (2012)). To the extent that this is true, providers of liquidity in stocks from more religious countries face less risk in holding an inventory of securities. Therefore, religiosity may indeed improve liquidity.

Our multivariate results show that countries with higher levels of religious practice and religious beliefs have smaller bid-ask spreads, less price impact, and more trading activity. These findings hold when we account for two types of endogeneity. The first type is that endogeneity depends on the structure of financial markets in a particular country and that the structure might be endogenously determined by the religious culture in the country. The second type of endogeneity may bias the causal inferences we attempt to make. Finding an association between religiosity and liquidity is not tantamount to identifying a causal link. It is possible that causation flows the other way. That is, liquidity in financial markets (or some other type of financial development) is somehow endogenously determining the level of religiosity in a particular country. To overcome the first issue, we follow Eleswarapu and Venkataraman (2006) and examine the liquidity of ADRs while conditioning on the cultural variation in the ADR home country. This setup allows us to hold the structure of financial markets constant while isolating the effect of the religiosity on liquidity. To overcome the second issue, we use an instrumental variable approach by following Barro and McCleary (2003) and instrument religiosity with an indicator variable capturing whether a particular country regulates the religion market. Religious regulation will, no doubt, be correlated with religiosity but should be uncorrelated with ADR liquidity provision. Our tests provide a robust association between religiosity and liquidity that is both statistically significant and economically meaningful. In economic terms, a 1% increase in religiosity is associated with about a 1% decline in bid-ask spreads, an approximate 4% decline in

price impact (Amihud (2002) illiquidity), and a 3-4% increase in trading activity. These findings tend to support the idea that religious culture can influence the quality of financial markets.

Compliance with Ethical Standards

The authors declare that there are no potential conflicts of interest relating to this research. Additionally, no funding was received for this research and human participants/animals were not used during the analysis.

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Table 1
Summary Statistics
The table provides statistics that describe the sample used throughout the analysis. Panel A shows the summary statistics for our measures of liquidity. Panel B reports the statistics for various characteristics of ADRs. Panel C presents the summary statistics for some macroeconomic characteristics of the ADR home country. %SPRD is the percentage bid-ask spread, which is the difference between daily closing ask prices and bid prices scaled by the spread midpoint. $SPRD is the dollar spread, or the difference between daily closing ask prices and daily closing bid prices. ILLIQ is the Amihud (2002) measure of illiquidity, which is the ratio of the absolute value of daily returns scaled by daily dollar volume (in 1,000,000s). TURN is the ratio of total trading volume scaled by the shares outstanding. VOLUME is the amount of total trading volume. VOLATILITY is the total volatility, or the standard deviation of daily returns. SIZE is the market capitalization for each ADR on the last trading day of the year. PRICE is the closing price for each ADR at the end of the each year. NASD is an indicator variable capturing whether ADR *i* is listed on NASDAQ – zero otherwise. GDP/CAPITA is the GDP per capita in the home countries of the sample of ADRs and UNEMPLOY is the unemployment rate in percent in each home country. Our final sample includes 316 ADRs.

Panel A. Liquidity Characteristics					
	Mean	Std. Deviation	Minimum	Median	Maximum
	[1]	[2]	[3]	[4]	[5]
%SPRD	0.0220	0.0310	0.0012	0.0124	0.2912
$SPRD	0.2826	0.3789	0.0159	0.2140	4.6380
ILLIQ	3.8519	15.8685	0.0001	0.0846	148.6354
TURN	27.62	142.04	0.03	5.25	1460.07
VOLUME	70,043,526	333,953,653	19,900	9,935,788	4,596,529,914
Panel B. ADR Characteristics					
VOLATILITY	0.0338	0.0182	0.0084	0.0294	0.1531
SIZE	888,788.39	3,590,762.89	119.72	141,246.66	49,426,182.21
PRICE	20.32	16.79	0.24	16.22	95.25
NASD	0.2547	0.4355	0.0000	0.0000	1.0000
Panel C. Country Characteristics					
GDP/CAPITA	25,089.94	16,005.52	602.64	32,780.13	75,542.76
UNEMPLOY	6.80	4.43	2.20	5.20	27.20

Table 2
Summary Statistics – Religion Characteristics
The table reports the religiosity characteristics used throughout the study. In Panel A, we report summary statistics for variables that capture religious affiliation. AFFLIATION is the fraction of the population that belongs to any type of religion (does not include atheist/non-religious affiliations). PRAY is the fraction of the population that prays weekly. CHURCH is the fraction of the country's population attends church at least monthly. GOD is the population fraction that believes in God. HEAVEN is the fraction that believes in a Heaven. HELL is the fraction that believes in Hell. AFTERLIFE is the fraction that believes in life after death. REGULATED is an indicator variable capturing whether a country's government regulates the religion market.

	Mean	Std. Dev	Minimum	Median	Maximum
	[1]	[2]	[3]	[4]	[5]
AFFILIATION	0.8735	0.1289	0.2880	0.9060	0.9970
PRAY	0.5140	0.2293	0.1960	0.5530	0.9260
CHURCH	0.3758	0.2240	0.0310	0.3830	0.7950
GOD	0.8148	0.1686	0.5260	0.9230	0.9990
HEAVEN	0.6053	0.2450	0.1840	0.6120	0.9990
HELL	0.4670	0.2346	0.0940	0.4370	0.9990
AFTERLIFE	0.6304	0.1577	0.3280	0.6320	0.9950
REGULATED	0.3369	0.4641	0.0000	0.0000	1.0000

Table 3
Multivariate Regressions – Liquidity and Religious Adherence
The table reports the results from estimating the following equation using our sample of ADRs.

$$Ln(Liquidity_i) = \beta_1 Ln(PRACTICE_i) + \beta_2 Ln(AFFILIATION_i) + \beta_3 Ln(GDP/CAPITA_i) + \beta_4 Ln(UNEMPLOY_i) + \beta_5 Ln(VOLATILITY_i) + \beta_6 Ln(SIZE_i) + \beta_7 Ln(PRICE_i) + \beta_8 NASDAQ_i + \alpha + \varepsilon_i$$

The dependent variables include the natural log of our five measures of liquidity. %SPRD is the percent bid-ask spread. $SPRD is the dollar bid-ask spread. ILLIQ is the Amihud (2002) measure of illiquidity. These three measures are inverse approximations for liquidity. TURN is the share turnover; VOLUME is the trading volume of each ADR. The independent variable of interest in the natural log of the fraction of the population that practices their religion (Ln(PRACTICE)). We note that PRACTICE is the average of PRAY and CHURCH. The other control variables include the following: Ln(AFFILIATION) is the natural log of the percent of the population in an ADR country that belongs to one of the ten religious organization; Ln(GDP/CAPITA) is the natural log of the per capita GDP in an ADR country; Ln(UNEMPLOY) is the natural log of the unemployment rate in an ADR country. Ln(VOLATILITY) is the natural log of the standard devation of daily returns for ADR *i*; Ln(SIZE) is the natural log of the market capitalization on the last day of the year for ADR *i*; Ln(PRICE) is the natural log of the closing share price on the last day of the year for ADR *i*; and NASDAQ is an indicator variable capturing whether or not ADR *i* is listed on the NASDAQ stock exchange. To account for endogeneity, we estimate the equation using two-stage least squares. Following Barro and McCleary (2003), we use an instrumental variable approach that is arguably exogenous to the level of religiosity used in the analysis. The instrument is an indicator variable capturing whether or not the ADR country has a regulated religion market. This instrument is used in the first stage estimation to account for endogeneity. The second state includes the predicted values for the independent variable of interest. In parentheses, we also report t-statistics that are obtained from standard errors that cluster across countries and years. *, **, and *** denote statistical significance at the 0.10, 0.05, and 0.01 levels, respectively.

	Ln(%SPRD)	Ln($SPRD)	Ln(ILLIQ)	Ln(TURN)	Ln(VOLUME)
	[1]	[2]	[3]	[4]	[5]
Ln(PRACTICE)	-1.2131*	-1.4720*	-4.4229*	4.0340**	3.8073**
	(-1.80)	(-1.92)	(-1.95)	(1.99)	(2.07)
Ln(AFFILIATION)	6.9768**	7.7034*	24.0138**	-21.2422**	-20.6710**
	(2.01)	(1.95)	(2.06)	(-2.04)	(-2.18)
Ln(GDP/CAPITA)	0.0528	0.0839	0.0411	-0.0582	-0.1455
	(0.97)	(1.35)	(0.22)	(-0.36)	(-0.97)
Ln(UNEMPLOY)	0.0989	0.0918	0.4114	-0.1743	-0.3818
	(1.04)	(0.85)	(1.29)	(-0.61)	(-1.47)
Ln(VOLATILITY)	0.1023	0.2025	-0.6407	1.5833***	1.5473***
	(0.70)	(1.22)	(-1.30)	(3.60)	(3.87)
Ln(SIZE)	-0.1241***	-0.1179***	-0.9206***	-0.2092***	0.8016***
	(-4.85)	(-4.05)	(-10.72)	(-2.73)	(11.48)
Ln(PRICE)	-0.3588***	0.6175***	-0.7011***	0.6034***	-0.4587**
	(-5.43)	(8.22)	(-3.16)	(3.05)	(-2.54)
NASDAQ	-0.0711	-0.1242	0.4341	-0.3190	-0.2371
	(-0.57)	(-0.87)	(1.03)	(-0.85)	(-0.69)
Constant	2.0286**	-2.5544**	5.1775	10.5832***	16.8525***
	(2.05)	(-2.27)	(1.56)	(3.57)	(6.24)
Adjusted R^2	0.4407	0.2701	0.5412	0.0746	0.4354
N	251	251	251	251	251

Table 4
Multivariate Regressions – Liquidity and Religious Adherence
The table reports the results from estimating the following equation using our sample of ADRs.

$$Ln(Liquidity_i) = \beta_1 Ln(PRAY_i) + \beta_2 Ln(AFFILIATION_i) + \beta_3 Ln(GDP/CAPITA_i) + \beta_4 Ln(UNEMPLOY_i) + \beta_5 Ln(VOLATILITY_i) + \beta_6 Ln(SIZE_i) + \beta_7 Ln(PRICE_i) + \beta_8 NASDAQ_i + \alpha + \varepsilon_i$$

The dependent variables include the natural log of our five measures of liquidity. %SPRD is the percent bid-ask spread. $SPRD is the dollar bid-ask spread. ILLIQ is the Amihud (2002) measure of illiquidity. These three measures are inverse approximations for liquidity. TURN is the share turnover; VOLUME is the trading volume of each ADR. The independent variable of interest in the natural log of the fraction of the population that prays at least once a week (Ln(PRAY)). The other control variables include the following: Ln(AFFILIATION) is the natural log of the percent of the population in an ADR country that belongs to one of the ten religious organization; Ln(GDP/CAPITA) is the natural log of the per capita GDP in an ADR country; Ln(UNEMPLOY) is the natural log of the unemployment rate in an ADR country. Ln(VOLATILITY) is the natural log of the standard devation of daily returns for ADR *i*; Ln(SIZE) is the natural log of the market capitalization on the last day of the year for ADR *i*; Ln(PRICE) is the natural log of the closing share price on the last day of the year for ADR *i*; and NASDAQ is an indicator variable capturing whether or not ADR *i* is listed on the NASDAQ stock exchange. To account for endogeneity, we estimate the equation using two-stage least squares. Following Barro and McCleary (2003), we use an instrumental variable approach that is arguably exogenous to the level of religiosity used in the analysis. The instrument is an indicator variable capturing whether or not the ADR country has a regulated religion market. This instrument is used in the first stage estimation to account for endogeneity. The second state includes the predicted values for the independent variable of interest. In parentheses, we also report t-statistics that are obtained from standard errors that cluster across countries and years. *, **, and *** denote statistical significance at the 0.10, 0.05, and 0.01 levels, respectively.

	Ln(%SPRD)	Ln($SPRD)	Ln(ILLIQ)	Ln(TURN)	Ln(VOLUME)
	[1]	[2]	[3]	[4]	[5]
Ln(PRAY)	-0.9629**	-1.1684**	-3.5106**	3.2020**	3.0220**
	(-2.11)	(-2.29)	(-2.39)	(2.42)	(2.54)
Ln(AFFILIATION)	5.2540**	5.6128**	17.7323**	-15.5130**	-15.2637***
	(2.42)	(2.32)	(2.54)	(-2.47)	(-2.70)
Ln(GDP/CAPITA)	0.0390	0.0671	-0.0092	-0.0123	-0.1021
	(0.86)	(1.33)	(-0.06)	(-0.09)	(-0.87)
Ln(UNEMPLOY)	0.1164	0.1130	0.4751	-0.2324	-0.4366**
	(1.39)	(1.21)	(1.76)	(-0.96)	(-2.00)
Ln(VOLATILITY)	0.0950	0.1937	-0.6673*	1.6075***	1.5702***
	(0.76)	(1.39)	(-1.66)	(4.43)	(4.81)
Ln(SIZE)	-0.1322***	-0.1278***	-0.9501***	-0.1823***	0.8271***
	(-6.37)	(-5.52)	(-14.24)	(-3.03)	(15.30)
Ln(PRICE)	-0.3680***	0.6064***	-0.7345***	0.6339***	-0.4299***
	(-6.69)	(9.89)	(-4.15)	(3.98)	(-3.00)
NASDAQ	-0.0593	-0.1099	0.4770	-0.3581	-0.2740
	(-0.55)	(-0.92)	(1.39)	(-1.15)	(-0.98)
Constant	2.4050***	-2.0977**	6.5498***	9.3317***	15.6713***
	(3.28)	(-2.56)	(2.78)	(4.39)	(8.20)
Adjusted R^2	0.5229	0.3521	0.6410	0.1183	0.5416
N	251	251	251	251	251

Table 5
Multivariate Regressions – Liquidity and Religious Adherence
The table reports the results from estimating the following equation using our sample of ADRs.

$$Ln(Liquidity_i) = \beta_1 Ln(CHURCH_i) + \beta_2 Ln(AFFILIATION_i) + \beta_3 Ln(GDP/CAPITA_i) + \beta_4 Ln(UNEMPLOY_i) + \beta_5 Ln(VOLATILITY_i) + \beta_6 Ln(SIZE_i) + \beta_7 Ln(PRICE_i) + \beta_8 NASDAQ_i + \alpha + \varepsilon_i$$

The dependent variables include the natural log of our five measures of liquidity. %SPRD is the percent bid-ask spread. $SPRD is the dollar bid-ask spread. ILLIQ is the Amihud (2002) measure of illiquidity. These three measures are inverse approximations for liquidity. TURN is the share turnover; VOLUME is the trading volume of each ADR. The independent variable of interest in the natural log of the fraction of the population that attends a place of worship once a month (Ln(CHRUCH)). The other control variables include the following: Ln(AFFILIATION) is the natural log of the percent of the population in an ADR country that belongs to one of the ten religious organization; Ln(GDP/CAPITA) is the natural log of the per capita GDP in an ADR country; Ln(UNEMPLOY) is the natural log of the unemployment rate in an ADR country. Ln(VOLATILITY) is the natural log of the standard devation of daily returns for ADR *i*; Ln(SIZE) is the natural log of the market capitalization on the last day of the year for ADR *i*; Ln(PRICE) is the natural log of the closing share price on the last day of the year for ADR *i*; and NASDAQ is an indicator variable capturing whether or not ADR *i* is listed on the NASDAQ stock exchange. To account for endogeneity, we estimate the equation using two-stage least squares. Following Barro and McCleary (2003), we use an instrumental variable approach that is arguably exogenous to the level of religiosity used in the analysis. The instrument is an indicator variable capturing whether or not the ADR country has a regulated religion market. This instrument is used in the first stage estimation to account for endogeneity. The second state includes the predicted values for the independent variable of interest. In parentheses, we also report t-statistics that are obtained from standard errors that cluster across countries and years. *, **, and *** denote statistical significance at the 0.10, 0.05, and 0.01 levels, respectively.

	Ln(%SPRD)	Ln($SPRD)	Ln(ILLIQ)	Ln(TURN)	Ln(VOLUME)
	[1]	[2]	[3]	[4]	[5]
Ln(CHURCH)	-0.8036	-1.0956*	-3.3240*	3.0602*	2.7524*
	(-1.57)	(-1.80)	(-1.88)	(1.93)	(1.95)
Ln(AFFILIATION)	4.0330*	5.2213*	15.6395**	-13.8601**	-12.6141**
	(1.79)	(1.95)	(2.02)	(-1.99)	(-2.03)
Ln(GDP/CAPITA)	-0.0338	-0.0021	-0.2247	0.1956	0.1169
	(-0.84)	(-0.04)	(-1.63)	(1.58)	(1.06)
Ln(UNEMPLOY)	-0.0292	-0.0407	-0.0458	0.2338	0.0226
	(-0.37)	(-0.44)	(-0.17)	(0.97)	(0.11)
Ln(VOLATILITY)	0.1540	0.2585*	-0.4785	1.4691***	1.4722***
	(1.26)	(1.78)	(-1.14)	(3.88)	(4.36)
Ln(SIZE)	-0.1244***	-0.1210***	-0.9148***	-0.2166***	0.8007***
	(-5.29)	(-4.33)	(-11.31)	(-2.98)	(12.35)
Ln(PRICE)	-0.3793***	0.5982***	-0.7678***	0.6505***	-0.4033***
	(-7.29)	(9.68)	(-4.29)	(4.05)	(-2.81)
NASDAQ	-0.1145	-0.2112*	0.2863	-0.1631	-0.0915
	(-1.08)	(-1.68)	(0.79)	(-0.50)	(-0.31)
Constant	3.2989***	-1.2653*	8.9193***	7.2471***	13.4326***
	(5.39)	(-1.74)	(4.24)	(3.84)	(7.97)
Adjusted R^2	0.5181	0.3192	0.6002	0.0818	0.5033
N	277	277	277	277	277

Table 6
Multivariate Regressions – Liquidity and Religious Adherence
The table reports the results from estimating the following equation using our sample of ADRs.

$$Ln(Liquidity_i) = \beta_1 Ln(BELIEF_i) + \beta_2 Ln(AFFILIATION_i) + \beta_3 Ln(GDP/CAPITA_i) + \beta_4 Ln(UNEMPLOY_i) + \beta_5 Ln(VOLATILITY_i) + \beta_6 Ln(SIZE_i) + \beta_7 Ln(PRICE_i) + \beta_8 NASDAQ_i + \alpha + \varepsilon_i$$

The dependent variables include the natural log of our five measures of liquidity. %SPRD is the percent bid-ask spread. $SPRD is the dollar bid-ask spread. ILLIQ is the Amihud (2002) measure of illiquidity. These three measures are inverse approximations for liquidity. TURN is the share turnover; VOLUME is the trading volume of each ADR. The independent variable of interest in the natural log of the fraction of the population that has religious beliefs (Ln(BELIEF)). We note that BELIEF is the average of GOD, AFTERLIFE, HEAVEN, and HELL. The other control variables include the following: Ln(AFFILIATION) is the natural log of the percent of the population in an ADR country that belongs to one of the ten religious organization; Ln(GDP/CAPITA) is the natural log of the per capita GDP in an ADR country; Ln(UNEMPLOY) is the natural log of the unemployment rate in an ADR country. Ln(VOLATILITY) is the natural log of the standard devation of daily returns for ADR *i*; Ln(SIZE) is the natural log of the market capitalization on the last day of the year for ADR *i*; Ln(PRICE) is the natural log of the closing share price on the last day of the year for ADR *i*; and NASDAQ is an indicator variable capturing whether or not ADR *i* is listed on the NASDAQ stock exchange. To account for endogeneity, we estimate the equation using two-stage least squares. Following Barro and McCleary (2003), we use an instrumental variable approach that is arguably exogenous to the level of religiosity used in the analysis. The instrument is an indicator variable capturing whether or not the ADR country has a regulated religion market. This instrument is used in the first stage estimation to account for endogeneity. The second state includes the predicted values for the independent variable of interest. In parentheses, we also report t-statistics that are obtained from standard errors that cluster across countries and years. *, **, and *** denote statistical significance at the 0.10, 0.05, and 0.01 levels, respectively.

	Ln(%SPRD)	Ln($SPRD)	Ln(ILLIQ)	Ln(TURN)	Ln(VOLUME)
	[1]	[2]	[3]	[4]	[5]
Ln(BELIEF)	-0.8470***	-1.0469***	-3.1115***	2.7465***	2.6535***
	(-2.65)	(-3.01)	(-3.43)	(3.31)	(3.51)
Ln(AFFILIATION)	3.5553***	3.8869***	11.5251***	-9.3352***	-10.1190***
	(3.36)	(3.37)	(3.84)	(-3.40)	(-4.05)
Ln(GDP/CAPITA)	0.0434	0.0803**	0.0288	-0.0285	-0.1315
	(1.19)	(2.02)	(0.28)	(-0.30)	(-1.53)
Ln(UNEMPLOY)	0.1301*	0.1371*	0.4696**	-0.2199	-0.4377***
	(1.92)	(1.86)	(2.45)	(-1.25)	(-2.74)
Ln(VOLATILITY)	0.0755	0.1785	-0.7598**	1.6917***	1.6394***
	(0.73)	(1.58)	(-2.58)	(6.28)	(6.69)
Ln(SIZE)	-0.1442***	-0.1478***	-0.9706***	-0.1691***	0.8512***
	(-8.65)	(-8.15)	(-20.56)	(-3.91)	(21.63)
Ln(PRICE)	-0.3710***	0.6109***	-0.7818***	0.6799***	-0.3941***
	(-8.46)	(12.79)	(-6.29)	(5.98)	(-3.81)
NASDAQ	-0.0186	-0.0717	0.6463**	-0.4809**	-0.4038*
	(-0.21)	(-0.73)	(2.52)	(-2.05)	(-1.89)
Constant	2.5551***	-1.9086***	6.7459***	9.0203***	15.3454***
	(4.51)	(-3.09)	(4.21)	(6.14)	(11.48)
Adjusted R^2	0.6125	0.4823	0.7642	0.2208	0.6826
N	250	250	250	250	250

Table 7
Multivariate Regressions – Liquidity and Religious Adherence
The table reports the results from estimating the following equation using our sample of ADRs.

$$Ln(Liquidity_i) = \beta_1 Ln(GOD_i) + \beta_2 Ln(AFFILIATION_i) + \beta_3 Ln(GDP/CAPITA_i) + \beta_4 Ln(UNEMPLOY_i) + \beta_5 Ln(VOLATILITY_i) + \beta_6 Ln(SIZE_i) + \beta_7 Ln(PRICE_i) + \beta_8 NASDAQ_i + \alpha + \varepsilon_i$$

The dependent variables include the natural log of our five measures of liquidity. %SPRD is the percent bid-ask spread. $SPRD is the dollar bid-ask spread. ILLIQ is the Amihud (2002) measure of illiquidity. These three measures are inverse approximations for liquidity. TURN is the share turnover; VOLUME is the trading volume of each ADR. The independent variable of interest in the natural log of the fraction of the population that believes in a Surpreme Being (Ln(GOD)). The other control variables include the following: Ln(AFFILIATION) is the natural log of the percent of the population in an ADR country that belongs to one of the ten religious organization; Ln(GDP/CAPITA) is the natural log of the per capita GDP in an ADR country; Ln(UNEMPLOY) is the natural log of the unemployment rate in an ADR country. Ln(VOLATILITY) is the natural log of the standard devation of daily returns for ADR *i*; Ln(SIZE) is the natural log of the market capitalization on the last day of the year for ADR *i*; Ln(PRICE) is the natural log of the closing share price on the last day of the year for ADR *i*; and NASDAQ is an indicator variable capturing whether or not ADR *i* is listed on the NASDAQ stock exchange. To account for endogeneity, we estimate the equation using two-stage least squares. Following Barro and McCleary (2003), we use an instrumental variable approach that is arguably exogenous to the level of religiosity used in the analysis. The instrument is an indicator variable capturing whether or not the ADR country has a regulated religion market. This instrument is used in the first stage estimation to account for endogeneity. The second state includes the predicted values for the independent variable of interest. In parentheses, we also report t-statistics that are obtained from standard errors that cluster across countries and years. *, **, and *** denote statistical significance at the 0.10, 0.05, and 0.01 levels, respectively.

	Ln(%SPRD)	Ln($SPRD)	Ln(ILLIQ)	Ln(TURN)	Ln(VOLUME)
	[1]	[2]	[3]	[4]	[5]
Ln(GOD)	-8.4311	-0.1042	-30.9731	27.3399	26.4139
	(-0.85)	(-0.87)	(-0.86)	(0.88)	(0.89)
Ln(AFFILIATION)	17.0673	20.5882	61.1634	-53.1507	-52.4506
	(0.91)	(0.90)	(0.90)	(-0.90)	(-0.94)
Ln(GDP/CAPITA)	0.0398	0.0759	0.0158	-0.0170	-0.1204
	(0.35)	(0.55)	(0.04)	(-0.05)	(-0.36)
Ln(UNEMPLOY)	0.5576	0.6656	2.0403	-1.6063	-1.7772
	(0.92)	(0.91)	(0.93)	(-0.84)	(-0.98)
Ln(VOLATILITY)	0.0080	0.0951	-1.0078	1.9105	1.8509*
	(0.02)	(0.23)	(-0.81)	(1.76)	(1.80)
Ln(SIZE)	-0.0823	-0.0713	-0.7432**	-0.3698	0.6572**
	(-0.89)	(-0.64)	(-2.22)	(-1.27)	(2.39)
Ln(PRICE)	-0.4115***	0.5609***	-0.9303*	0.8110*	-0.2674
	(-2.97)	(3.34)	(-1.85)	(1.86)	(-0.65)
NASDAQ	-0.0857	-0.1547	0.3997	-0.2632	-0.1934
	(-0.32)	(-0.47)	(0.41)	(-0.31)	(-0.65)
Constant	0.9505	-3.8920	0.8510	14.2237	20.3726**
	(0.31)	(-1.03)	(0.08)	(1.45)	(2.20)
Adjusted R^2	0.1184	0.0459	0.1481	0.0224	0.0983
N	250	250	250	250	250

Table 8
Multivariate Regressions – Liquidity and Religious Adherence
The table reports the results from estimating the following equation using our sample of ADRs.

$$Ln(Liquidity_i) = \beta_1 Ln(AFTERLIFE_i) + \beta_2 Ln(AFFILIATION_i) + \beta_3 Ln(GDP/CAPITA_i) + \beta_4 Ln(UNEMPLOY_i) + \beta_5 Ln(VOLATILITY_i) + \beta_6 Ln(SIZE_i) + \beta_7 Ln(PRICE_i) + \beta_8 NASDAQ_i + \alpha + \varepsilon_i$$

The dependent variables include the natural log of our five measures of liquidity. %SPRD is the percent bid-ask spread. $SPRD is the dollar bid-ask spread. ILLIQ is the Amihud (2002) measure of illiquidity. These three measures are inverse approximations for liquidity. TURN is the share turnover; VOLUME is the trading volume of each ADR. The independent variable of interest in the natural log of the fraction of the population that believes in an afterlife (Ln(AFTERLIFE)). The other control variables include the following: Ln(AFFILIATION) is the natural log of the percent of the population in an ADR country that belongs to one of the ten religious organization; Ln(GDP/CAPITA) is the natural log of the per capita GDP in an ADR country; Ln(UNEMPLOY) is the natural log of the unemployment rate in an ADR country. Ln(VOLATILITY) is the natural log of the standard devation of daily returns for ADR *i*; Ln(SIZE) is the natural log of the market capitalization on the last day of the year for ADR *i*; Ln(PRICE) is the natural log of the closing share price on the last day of the year for ADR *i*; and NASDAQ is an indicator variable capturing whether or not ADR *i* is listed on the NASDAQ stock exchange. To account for endogeneity, we estimate the equation using two-stage least squares. Following Barro and McCleary (2003), we use an instrumental variable approach that is arguably exogenous to the level of religiosity used in the analysis. The instrument is an indicator variable capturing whether or not the ADR country has a regulated religion market. This instrument is used in the first stage estimation to account for endogeneity. The second state includes the predicted values for the independent variable of interest. In parentheses, we also report t-statistics that are obtained from standard errors that cluster across countries and years. *, **, and *** denote statistical significance at the 0.10, 0.05, and 0.01 levels, respectively.

	Ln(%SPRD)	Ln($SPRD)	Ln(ILLIQ)	Ln(TURN)	Ln(VOLUME)
	[1]	[2]	[3]	[4]	[5]
Ln(AFTERLIFE)	-1.0779***	-1.3324***	-3.9600***	3.4955***	3.3771***
	(-2.61)	(-2.96)	(-3.40)	(3.29)	(3.46)
Ln(AFFILIATION)	3.7220***	4.0929***	12.1375***	-9.8757***	-10.6413***
	(3.29)	(3.32)	(3.81)	(-3.40)	(-3.99)
Ln(GDP/CAPITA)	0.0660*	0.1082**	0.1117	-0.1017	-0.2022**
	(1.68)	(2.53)	(1.01)	(-1.01)	(-2.18)
Ln(UNEMPLOY)	0.1069	0.1085	0.3845**	-0.1447	-0.3651**
	(1.61)	(1.50)	(2.05)	(-0.85)	(-2.33)
Ln(VOLATILITY)	0.0246	0.1156	-0.9469***	1.8568***	1.7890***
	(0.22)	(0.96)	(-3.05)	(6.55)	(6.92)
Ln(SIZE)	-0.1475***	-0.1519***	-0.9828***	-0.1584***	0.8615***
	(-8.73)	(-8.26)	(-20.65)	(-3.65)	(21.63)
Ln(PRICE)	-0.3813***	0.5982***	-0.8195***	0.7131***	-0.3620***
	(-8.62)	(12.44)	(-6.58)	(6.28)	(3.47)
NASDAQ	-0.0093	-0.0602	0.6805***	-0.5111**	-0.4329**
	(-0.10)	(0.60)	(2.60)	(-2.14)	(-1.98)
Constant	2.1795***	-2.3730***	5.3658***	10.2386***	16.5224***
	(3.34)	(-3.34)	(2.92)	(6.10)	(10.73)
Adjusted R^2	0.6044	0.4743	0.7603	0.2183	0.6761
N	250	250	250	250	250

Table 9
Multivariate Regressions – Liquidity and Religious Adherence
The table reports the results from estimating the following equation using our sample of ADRs.

$$Ln(Liquidity_i) = \beta_1 Ln(HEAVEN_i) + \beta_2 Ln(AFFILIATION_i) + \beta_3 Ln(GDP/CAPITA_i) + \beta_4 Ln(UNEMPLOY_i) + \beta_5 Ln(VOLATILITY_i) + \beta_6 Ln(SIZE_i) + \beta_7 Ln(PRICE_i) + \beta_8 NASDAQ_i + \alpha + \varepsilon_i$$

The dependent variables include the natural log of our five measures of liquidity. %SPRD is the percent bid-ask spread. $SPRD is the dollar bid-ask spread. ILLIQ is the Amihud (2002) measure of illiquidity. These three measures are inverse approximations for liquidity. TURN is the share turnover; VOLUME is the trading volume of each ADR. The independent variable of interest in the natural log of the fraction of the population that believes in Heaven (Ln(HEAVEN)). The other control variables include the following: Ln(AFFILIATION) is the natural log of the percent of the population in an ADR country that belongs to one of the ten religious organization; Ln(GDP/CAPITA) is the natural log of the per capita GDP in an ADR country; Ln(UNEMPLOY) is the natural log of the unemployment rate in an ADR country. Ln(VOLATILITY) is the natural log of the standard devation of daily returns for ADR *i*; Ln(SIZE) is the natural log of the market capitalization on the last day of the year for ADR *i*; Ln(PRICE) is the natural log of the closing share price on the last day of the year for ADR *i*; and NASDAQ is an indicator variable capturing whether or not ADR *i* is listed on the NASDAQ stock exchange. To account for endogeneity, we estimate the equation using two-stage least squares. Following Barro and McCleary (2003), we use an instrumental variable approach that is arguably exogenous to the level of religiosity used in the analysis. The instrument is an indicator variable capturing whether or not the ADR country has a regulated religion market. This instrument is used in the first stage estimation to account for endogeneity. The second state includes the predicted values for the independent variable of interest. In parentheses, we also report t-statistics that are obtained from standard errors that cluster across countries and years. *, **, and *** denote statistical significance at the 0.10, 0.05, and 0.01 levels, respectively.

	Ln(%SPRD)	Ln($SPRD)	Ln(ILLIQ)	Ln(TURN)	Ln(VOLUME)
	[1]	[2]	[3]	[4]	[5]
Ln(HEAVEN)	-0.5386***	-0.6657***	-1.9785***	1.7464***	1.6873***
	(-2.72)	(-3.08)	(-3.55)	(3.39)	(3.62)
Ln(AFFILIATION)	3.1053***	3.3306***	9.8719***	-7.8758***	-8.7091***
	(3.48)	(3.42)	(3.93)	(-3.40)	(-4.15)
Ln(GDP/CAPITA)	0.0459	0.0834**	0.0380	-0.0366	-0.1393*
	(1.29)	(2.14)	(0.38)	(-0.39)	(-1.66)
Ln(UNEMPLOY)	0.1354**	0.1438**	0.4894***	-0.2373	-0.4546***
	(2.03)	(1.97)	(2.61)	(-1.37)	(-2.80)
Ln(VOLATILITY)	0.0899	0.1963*	-0.7071**	1.6451***	1.5945***
	(0.89)	(1.79)	(-2.50)	(6.30)	(6.75)
Ln(SIZE)	-0.1439***	-0.1474***	-0.9694***	-0.1702***	0.8501***
	(-8.85)	(-8.31)	(-21.19)	(-4.03)	(22.25)
Ln(PRICE)	-0.3701***	0.6120***	-0.7784***	0.6769***	-0.3970***
	(-8.65)	(13.11)	(-6.47)	(6.08)	(-3.95)
NASDAQ	-0.0051	-0.0550	0.6961***	-0.5248**	-0.4462**
	(-0.06)	(-0.56)	(2.76)	(-2.25)	(-2.12)
Constant	2.6263***	-1.8207***	7.0073***	8.7896***	15.1225***
	(4.86)	(-3.09)	(4.61)	(6.25)	(11.90)
Adjusted R^2	0.6246	0.4944	0.7757	0.2299	0.6955
N	250	250	250	250	250

Table 10
Multivariate Regressions – Liquidity and Religious Adherence
The table reports the results from estimating the following equation using our sample of ADRs.

$$Ln(Liquidity_i) = \beta_1 Ln(HELL_i) + \beta_2 Ln(AFFILIATION_i) + \beta_3 Ln(GDP/CAPITA_i) + \beta_4 Ln(UNEMPLOY_i) + \beta_5 Ln(VOLATILITY_i) + \beta_6 Ln(SIZE_i) + \beta_7 Ln(PRICE_i) + \beta_8 NASDAQ_i + \alpha + \varepsilon_i$$

The dependent variables include the natural log of our five measures of liquidity. %SPRD is the percent bid-ask spread. $SPRD is the dollar bid-ask spread. ILLIQ is the Amihud (2002) measure of illiquidity. These three measures are inverse approximations for liquidity. TURN is the share turnover; VOLUME is the trading volume of each ADR. The independent variable of interest in the natural log of the fraction of the population that believes in Hell (Ln(HELL)). The other control variables include the following: Ln(AFFILIATION) is the natural log of the percent of the population in an ADR country that belongs to one of the ten religious organization; Ln(GDP/CAPITA) is the natural log of the per capita GDP in an ADR country; Ln(UNEMPLOY) is the natural log of the unemployment rate in an ADR country. Ln(VOLATILITY) is the natural log of the standard devation of daily returns for ADR *i*; Ln(SIZE) is the natural log of the market capitalization on the last day of the year for ADR *i*; Ln(PRICE) is the natural log of the closing share price on the last day of the year for ADR *i*; and NASDAQ is an indicator variable capturing whether or not ADR *i* is listed on the NASDAQ stock exchange. To account for endogeneity, we estimate the equation using two-stage least squares. Following Barro and McCleary (2003), we use an instrumental variable approach that is arguably exogenous to the level of religiosity used in the analysis. The instrument is an indicator variable capturing whether or not the ADR country has a regulated religion market. This instrument is used in the first stage estimation to account for endogeneity. The second state includes the predicted values for the independent variable of interest. In parentheses, we also report t-statistics that are obtained from standard errors that cluster across countries and years. *, **, and *** denote statistical significance at the 0.10, 0.05, and 0.01 levels, respectively.

	Ln(%SPRD)	Ln($SPRD)	Ln(ILLIQ)	Ln(TURN)	Ln(VOLUME)
	[1]	[2]	[3]	[4]	[5]
Ln(HELL)	-0.3515***	-0.4345***	-1.2913***	1.1398***	1.1012***
	(-2.76)	(-3.15)	(-3.74)	(3.52)	(3.68)
Ln(AFFILIATION)	2.7891***	2.9398***	8.7104***	-6.8506***	-7.7186***
	(3.54)	(3.45)	(4.08)	(-3.42)	(-4.17)
Ln(GDP/CAPITA)	0.0343	0.0691*	-0.0046	0.0010	-0.1030
	(0.99)	(1.84)	(-0.05)	(0.01)	(-1.27)
Ln(UNEMPLOY)	0.1125*	0.1154*	0.4051**	-0.1629	-0.3827***
	(1.78)	(1.69)	(2.37)	(-1.01)	(-2.58)
Ln(VOLATILITY)	0.0932	0.2003*	-0.6951***	1.6345***	1.5842***
	(0.94)	(1.87)	(-2.60)	(6.50)	(6.83)
Ln(SIZE)	-0.1493***	-0.1541***	-0.9893***	-0.1526***	0.8671***
	(-9.35)	(-8.91)	(-22.86)	(-3.75)	(23.10)
Ln(PRICE)	-0.3613***	0.6229***	-0.7462***	0.6484***	-0.4245***
	(-8.47)	(13.46)	(-6.45)	(5.97)	(-4.23)
NASDAQ	-0.0387	-0.0966	0.5724**	-0.4157*	-0.3407*
	(-0.46)	(-1.05)	(2.48)	(-1.92)	(-1.70)
Constant	2.8099***	-1.5937***	7.6820***	8.1941***	14.5472***
	(5.53)	(-2.89)	(5.57)	(6.33)	(12.17)
Adjusted R^2	0.6322	0.5060	0.7939	0.2446	0.7023
N	250	250	250	250	250