Religiosity, Financial Development and Growth

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Abstract

This paper uses cross-country panel data to examine whether and how religiosity affects the relationship between financial development and growth. Building on previous work that found a nonlinear relationship between financialization and growth – that is, beyond a point, high levels of financialization were associated with lower growth – we find that this relationship is affected by the level of religiosity. The nonlinear relationship is present for advanced economies and for "secular" emerging economies, but not for "devout" emerging economies, even at similar levels of financialization.

Keywords: Religion, finance, financial development, financialization, economic growth, advanced economies, emerging economies, secular, devout

JEL Codes: G00, O43, O57, Z12

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1. Introduction

The relationship between a society's religious beliefs and practices and its economic performance has received increasing attention in recent years. Adam Smith (1776) discussed how economic motivations affect religious institutions and behavior, but the impact of religious choices on economic development is typically traced to Weber (1930). While quantitative investigations of the determinants of economic growth, typically exploiting cross-country variations in the data, began earlier (e.g., Kormendi & Meguire, 1985; Barro, 1991), the inclusion of religion as an influencing factor in this empirical approach came with Barro and McCleary, 2003).[1] A recent comprehensive survey and analysis by Becker, Rubin and Woessmann (2024), which is not restricted to cross-country regressions, uses the general macroeconomic framework of a production function to unify a diverse literature on the connection between religion and growth. They discuss four channels for this connection: physical capital, human capital, labor and technology. For example, religion can influence savings behavior, education choices, fertility and various institutions that affect innovation in an economy.[2]

Where does finance or financial development fit into this framework? To some extent, finance is at the heart of capitalism and economic growth, since it enables more efficient saving, and channeling of savings to productive investments. Religion can influence attitudes to saving for the future, as well as attitudes to borrowing and lending. Weber emphasized the role of certain kinds of Protestantism in promoting thrift. Prohibitions or constraints on charging interest to borrowers have been a major aspect of discussions regarding the role of religion in finance.[3] Religion can also influence factors such as trust, which is of general importance in a market economy, but especially so in finance, which relies on intertemporal promises and obligations (Guiso et al., 2003, 2006).[4] Several other channels for the influence of religion on financial institutions and markets are possible, including attitudes to risk and toward religious differences (Becker, et al., 2024).

Independently of religion, there are also potential limits on the positive effects of financial development, or financialization of an economy. Intuitively, there can be "too much finance" for optimal growth if there is some distortion in the economy that involves mispricing, often associated with externalities, but possibly also market concentration. In the case of financial

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[1] Of course, there are many critiques and cautions with respect to the use of cross-country regressions (e.g., Levine & Renelt, 1992; Durlauf, 2009). For the specific case of religion and growth, Durlauf et al., 2012, question the robustness of the original Barro-McCleary results.

[2] Religious institutions are one type of societal institution, of course, and there is another large literature on institutions and growth (e.g., Acemoglu, et al., 2005). Lowes, et al. (2026) provide a recent review of the role of religion in emerging and developing economies, including many aspects of institutional dynamics.

[3] Becker et al. (2024), Section 3, provides a comprehensive review of the mechanisms involved, and the historical evidence for the impacts of such prohibitions and constraints on economic growth.

[4] In keeping with much of the literature, these studies look at "culture" more generally, and distinguish different aspects of religion, such as religious upbringing vs active religious participation.

markets, intertemporal price distortions or mispricing of risk are easy to imagine, in a world of asymmetric information and incomplete markets. Modern macroeconomic policies to manage systemic risks can incentivize "too much finance," as the market participants know that the government provides a backstop that keeps those participants from bearing certain costs of risky behavior. To round out this argument, "too much finance" crowds out more productive, more growth-enhancing investments. Cross-country empirical analyses of the question of "too much finance" began to emerge after the global financial crisis, and include Cecchetti & Kharroubi (2012), Law & Singh (2014) and Arcand, et al. (2015). Indeed, more recent empirical analysis reinforces these earlier results (Cecchetti & Kharroubi, 2026; Arcand, et al., 2026).

In this paper, we extend the literature on the nonlinear relationship between financial development and growth to allow for the religious characteristics of countries in the sample. Specifically, we add an index of religiosity to the usual set of controls in the finance-growth literature. Further, we separately analyze countries based on the level of religiosity, as well as their level of development. We find that the nonlinear relationship between finance and growth is present in subsamples of less religious, or "secular" countries – advanced as well as emerging economies – but not in the subsample of more religious emerging economies. One possible explanation is that in the latter subsample, the character of financial institutions is shaped by religiosity in ways that constrain how financial development affects the economy, perhaps in preserving trustworthiness.

The rest of the paper is organized as follows. Section 2 describes our data, which is combined from several sources, as well as outlining the hypothesis to be tested. Section 3 presents the estimation and results for our cross-country regression analyses. Section 4 provides a summary conclusion.

2. Data and Hypotheses

The dependent variable used throughout our analysis is GDP growth per capita, taken from the World Bank WDI database. We investigate the effect of financial development on this measure of growth, taking account of religiosity. As is typical in the cross-sectional growth literature, we use period averages of the annual growth data. This is done to smooth cycles and short-term fluctuations. Here we use five-year averages, to match the frequency of the survey waves which are the source of the religiosity measure (see below).

While many studies use the ratio of private credit to GDP as a measure of financial development, we prefer the IMF Financial Development Index (FDI), which is a broader measure of financialization of the economy, and provides coverage of more countries. The FDI is aggregated from nine different underlying measures of different dimensions of financial development, covering depth, access and efficiency.

Religiosity is also a composite measure. It is taken from the World Values Survey (WVS) and its predecessor, the European Values Survey. The data covers 7 waves, from 1981 to 2022. Religiosity is measured in several dimensions, including self-identification as being religious, belief in God, active participation in religious services, and so on. The WVS creates its own composite index, based on standardized, survey-weighted country means, which is meant to capture how religious on average a country's population is.

The control variables used are all taken from the World Bank database. They are: initial income, investment, trade, inflation, and population growth.

Combining the datasets and allowing for missing data, our primary sample consists of 97 countries. In some cases, our estimation techniques require balanced panels, which reduces our sample size to 86 countries. For this set of countries, we also separately analyze advanced and emerging economies – the classification used is that of the IMF, and this results in 28 advanced countries and 58 emerging economies in the sample.

Because religiosity is effectively a time invariant variable, this hinders panel analysis involving the religiosity measure directly for the whole sample. Therefore, in some of our analysis, we divide the sample of countries based on the median level of religiosity. This gives us 46 countries below the median – which we will refer to as "secular" countries, and 40 above the median, which we will label "devout." These terms are more pointed than "less religious" and "more religious," but the latter two terms can be used interchangeably for our shorter labels.

Note that 26 of the 28 advanced economies are secular, as are 20 of the 58 emerging economies; the two advanced economies above the median (labeled "devout") are Greece and Italy. Thus 38 of the 40 devout countries are emerging economies.

As noted, we measure financial development with the IMF Financial Development Index (multiplied by 100), and analyze how its relationship with growth depends on religiosity. In particular, we investigate how the nonlinear relationship between finance and growth found in several studies is affected by religiosity. Our approach includes treating religiosity as a continuous variable that affects the coefficients of a quadratic regression, using a dynamic panel threshold model, which locates a turning point of financial development endogenously, and investigating the finance-growth relationship for subsamples of countries based on their development and religiosity levels.

A key underlying property of the sample of countries is a negative correlation between financial development and religiosity. While we do not use the private-credit-to-GDP ratio in our regressions, it is useful for illustrating this negative relationship. For the least religious tercile, the mean ratio is 83%. This falls to 49% for the middle tercile, and 28% for the most religious tercile. These are dramatic differences. Of course, the level of financial development is higher for advanced vs emerging economies. These simple facts underlie our analysis.

Table 1 reports the summary statistics and Table 2 reports the composition of the estimation sample; Figure 1 shows how religiosity is distributed across countries.

Table 1. Summary statistics

Variable	Mean	Std. dev.	Min	Max	N
GDP per capita growth (%)	2.23	2.92	−17.70	19.82	720
Private credit / GDP (%)	59.50	46.71	3.06	252.30	556
IMF FD index ×100	36.47	22.76	4.68	96.07	720
Religiosity index (z-score)	0.05	0.90	−1.89	1.37	720
Ln initial GDP per capita	8.79	1.37	5.71	11.37	720
Investment / GDP (%)	24.27	6.56	3.61	48.92	720
Trade / GDP (%)	77.41	53.67	13.27	425.16	720
Inflation (%)	22.41	136.18	−5.18	2414.35	720
Population growth (%)	1.22	1.44	−5.74	14.65	720

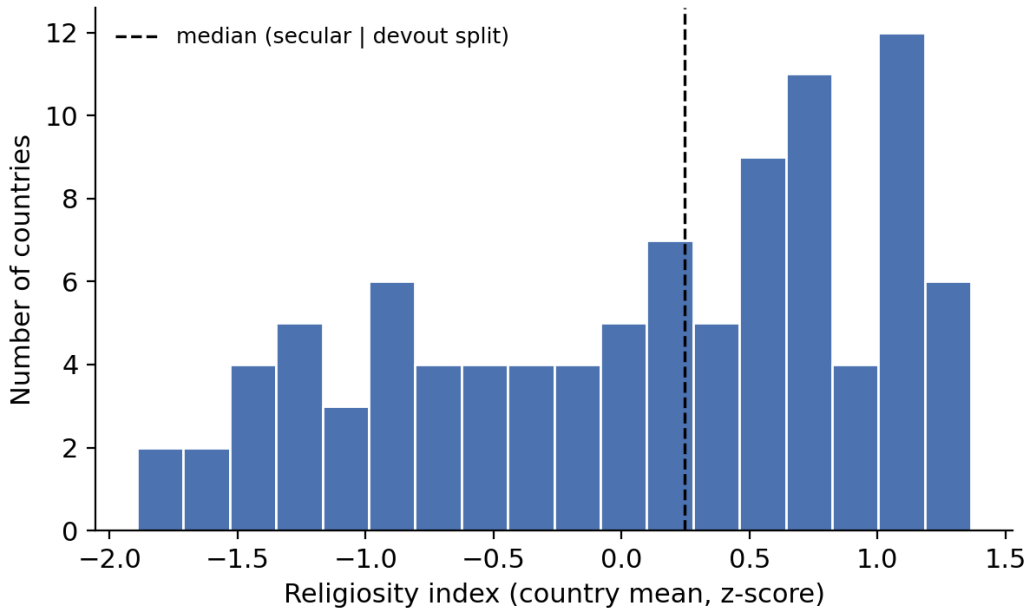
Notes: Country × 5-year period observations; 97 countries. Growth, financial-development and macro controls are from the World Bank WDI; religiosity is aggregated from the World Values Survey and European Values Survey; the FD index is from the IMF (via DBnomics).

Table 2. Sample composition and financial development, by religiosity and development

	Secular	Devout	All
Number of countries			
Advanced	26	2	28
Emerging	20	38	58
All	46	40	86
Median FD index ×100			
Advanced	72	68	—
Emerging	26	24	—

Notes: Balanced FD-index panel (86 countries). "Secular"/"devout" split at the median religiosity index; advanced/emerging per IMF classification. The level of financial development is governed by development (advanced ≈ 70 vs emerging ≈ 25), not by religiosity within a tier: within each development tier the secular and devout medians are almost identical.

Figure 1. Distribution of religiosity across countries



Notes: Each observation is one country's mean religiosity, measured by a composite z-score built from the World Values Survey / European Values Survey (self-identification as religious, belief in God, importance of God, and attendance at services), standardized so that zero is the cross-country mean and higher values denote more religious populations. The dashed vertical line marks the median, which we use to divide the sample into "secular" (below the median) and "devout" (above) groups. Because a country's religiosity is nearly constant over our sample period, we treat it as a time-invariant characteristic.

3. Estimation and Results

As noted, we measure financial development with the IMF Financial Development Index (multiplied by 100), and analyze how its relationship with growth depends on religiosity. We proceed in three steps.

First, we estimate a parametric quadratic specification, which allows the shape of the relationship between financial development and growth to vary smoothly with a country's religiosity.

Second, we estimate a dynamic panel threshold model, which locates a turning point of financial development endogenously and tests, subsample by subsample, whether such a threshold is present at all.

Third, we estimate a simple linear finance–growth slope separately within each group of countries. The logic of this last exercise is that if all countries lie along a single inverted-U curve

but occupy different segments of it, then the sign of the local slope should reveal where each group sits: countries with low financial development should display a positive slope (implying that more finance still raises growth), while countries with high financial development should show a negative slope (since they are past the peak).

3.1 A parametric quadratic that varies with religiosity

We begin with an OLS specification in which growth is a quadratic function of financial development, and both the linear and quadratic terms are allowed to interact with religiosity:

$$g_{it} = \beta_1 f_{it} + \beta_2 f_{it}^2 + \beta_3 (f_{it} \cdot R_i) + \beta_4 (f_{it}^2 \cdot R_i) + x_{it}'\lambda + \tau_t + \varepsilon_{it},$$

where g is GDP-per-capita growth, f is the FD index (×100), R is country-mean religiosity, x is the vector of controls (initial income, investment, trade, inflation, population growth), and τ are period effects. The quadratic in f captures the possibility of "too much finance"; the interaction terms let the shape shift with religiosity. We report the estimates in Table 3.

Table 3. Parametric quadratic in financial development × religiosity (OLS)

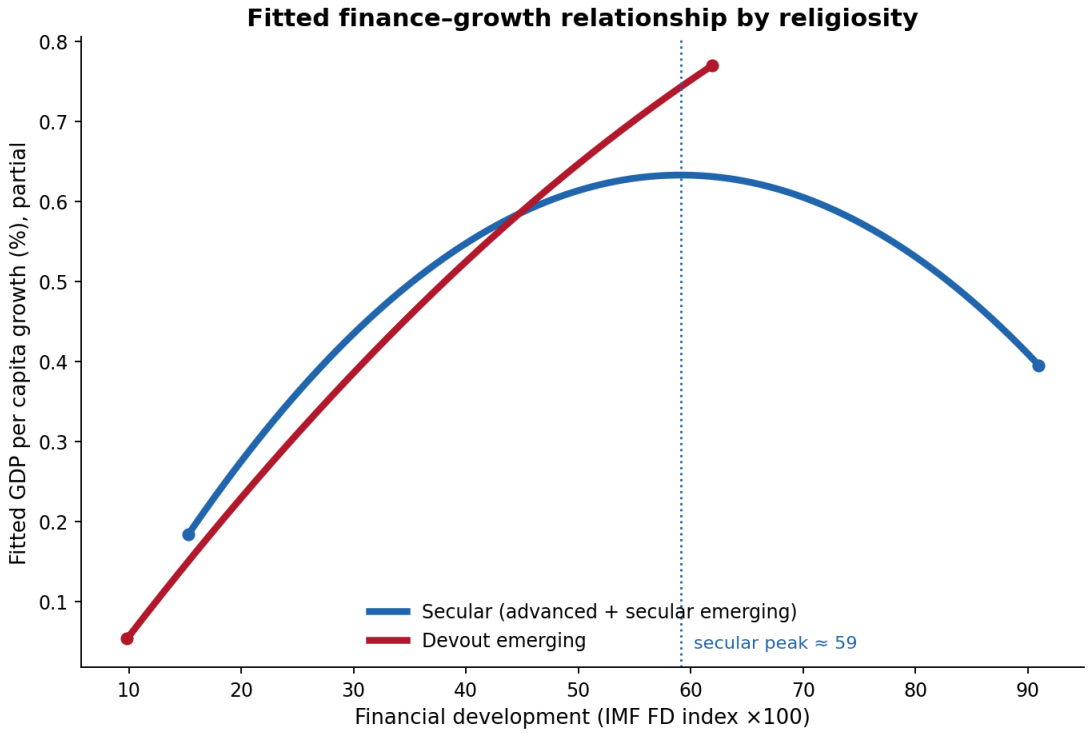
Term	Coef.	Std. err.	p
f (FD index ×100)	+0.0386	0.0217	0.075
f^2	−0.00032	0.00020	0.109
f · R	−0.0257	0.0139	**0.065**
f^2 · R	+0.00036	0.00018	**0.053**

Notes: OLS with standard errors clustered by country; N = 720, 97 countries; controls and period effects included. Coefficients with p < 0.10 on the interaction terms are shown in bold. Implied turning points: ≈ 47 (FD 0.47) for secular countries and ≈ 60 at the sample average, while for high religiosity countries the quadratic term changes sign so that no interior peak exists.

The two interaction terms are the coefficients of interest here. Both are marginally significant with the linear term being negative and the quadratic term being positive. Their signs imply that as religiosity rises, the downward curvature of the inverted-U weakens and eventually flips. Secular countries display a clear interior peak (finance is positively associated with growth up to an FDI ≈ 47–59 and negatively associated beyond that). However, for devout countries the fitted relationship no longer turns down over any plausible range. This is not surprising since devout economies rarely reach a high level of financial development. Only 20% of the devout country observations are above an FDI of 47 and very few go beyond 60 which is the turning point of the inverted-U for secular countries. Figure 2 plots the fitted curves for representative secular and

devout religiosity levels, each drawn only over the range of financial development actually observed for that group.

Figure 2. Fitted finance–growth relationship, by religiosity



Notes: Curves are the fitted values from the parametric quadratic of Table 3, evaluated at a representative secular religiosity level (blue) and a representative devout level (red), with controls held at their means and growth expressed net of controls and period effects ("partial"). Each curve is drawn only over its group's 5th–95th percentile range of the FD index, and the solid dots mark those endpoints; we do not extrapolate either curve beyond the financial-development levels the group actually attains. The vertical dotted line marks the secular turning point (FD ≈ 59). For secular economies the relationship is an inverted U. Financial development raises growth up to the peak and lowers it beyond, whereas for devout economies the curve is monotonically increasing across their observed range: they remain in the region where financial development still raises growth and do not reach the levels at which it becomes harmful.

3.2 A dynamic panel threshold: where does "too much finance" bind?

We next let the data locate a threshold endogenously, using the first-differenced GMM dynamic panel threshold estimator developed by Seo & Shin (2016).[5] The threshold variable is the FD index; the model splits the finance–growth slope at an estimated level γ and a bootstrap test (300 replications) evaluates the null of no threshold (linearity). In contrast to the quadratic model, the threshold model does not force any symmetry on the finance-growth relationship on different

[5] This estimator is implemented through the Stata package xthenreg. The lagged dependent variable and potentially endogenous regressors are included but are instrumented with their own lags. It is an Arellano Bond type instrument and takes care of endogeneity issues to a degree.

sides of the turning point. Since this estimator requires a balanced panel, the number of countries is reduced from 97 to 86 in this case.

An important change from the quadratic model is that we do not use religiosity as a continuous variable. A major reason for this is that the lack of time variation in the religiosity measure (about 96% of the variation is between countries, and only 4% over time) raises estimation challenges for this sample. Therefore, we analyze the role of religiosity by estimating the model for subsamples: the "secular" and "devout" subsamples, as defined earlier in the paper. Furthermore, we allow for differences in levels of development, dividing the sample into advanced and emerging economies as described earlier. Since all but two of the advanced economies are secular, no further division of this subsample is possible, but in the case of emerging economies, we can further split the sample into secular and devout subsamples.

Table 4 reports results by religiosity (Panel A) and by development and religiosity (Panel B).

Table 4. Dynamic panel threshold of finance on growth, by subsample

Subsample	Countries	Threshold γ	z on γ	Linearity p
A. By religiosity				
Full sample	86	32.9	1.23	0.49
Secular	46	44.5	9.83	**≈ 0.00**
Devout	40	39.4	—	0.52
B. By development and religiosity				
Advanced	28	44.2	9.83	**≈ 0.00**
Emerging (pooled)	58	29.1	1.86	0.81
Emerging — secular	20	37.6	3.07	**≈ 0.00**
Emerging — devout	38	12.7	2.01	0.55

Notes: First-differenced GMM dynamic panel threshold estimator (Seo & Shin, 2016; xthenreg); threshold variable = IMF FD index ×100; controls = initial income, investment, trade, inflation, population growth; lagged growth included; 24 moment conditions (not over-instrumented). "Linearity p" is the bootstrap p-value for the null of no threshold; values below 0.05 (in bold) indicate a statistically significant "too much finance" nonlinearity.

A statistically significant threshold is endogenously estimated for secular economies but not for the devout or pooled emerging subsamples. These threshold estimates corroborate the pattern found in the parametric quadratic specification. They are consistent with the parametric result that only secular countries exhibit an interior peak, and it confirms that the finding does not depend on imposing a quadratic form. Panel B indicates that the distinction between secular and devout economies does not simply reflect differences in development.

The threshold remains significant for advanced economies (all but two of which are secular) and, notably, for emerging secular economies, while it is absent for emerging devout economies, even though these two emerging economy groups have almost identical levels of financial development (median FD of 26 versus 24, with comparable shares of observations lying above the threshold). To summarize, the presence of a finance-growth non-linearity for secular emerging economies, but not for devout emerging economies, indicates that there are factors beyond just the level of development that affect the finance-growth relationship.

3.3 Cross-checking the turning point

As a robustness check we re-estimate the quadratic specification within a dynamic, sequentially-instrumented framework (Kripfganz and Schwarz, 2019) and compute the implied turning point for each group by the delta method. Table 5 reports the turning points. This two-step method is designed to deal with the challenge posed by the lack of time variation in the religiosity measure.

The estimating equation augments the parametric specification of Section 3.1 with a lagged dependent variable and country effects, and is estimated by the sequential (two-step) estimator of Kripfganz and Schwarz:

$$g_{it} = \rho\, g_{it-1} + \beta_1 f_{it} + \beta_2 f_{it}^2 + \beta_3 (f_{it} \cdot R_i) + \beta_4 (f_{it}^2 \cdot R_i) + x_{it}'\lambda + \mu_i + \tau_t + \varepsilon_{it},$$

where g_{it-1} is lagged growth, μ_i is a country effect, and the remaining terms are as in Section 3.1. The finance and interaction terms are treated as endogenous and instrumented with a collapsed instrument set to limit instrument proliferation. The implied turning point for a group with religiosity R_i is obtained from the fitted quadratic,

$$f^*(R_i) = -(\beta_1 + \beta_3 R_i) / [2(\beta_2 + \beta_4 R_i)],$$

and is evaluated at representative secular and devout values of R_i, with standard errors computed by the delta method.

Table 5. Implied finance turning point, by religiosity (sequential dynamic estimator)

Group	Turning point (FD ×100)	p
Secular	39.2	**0.004**
Sample average	73.3	0.20
Devout	−10.0	0.93

Notes: Sequential dynamic panel estimator (Kripfganz & Schwarz, 2019; xtseqreg, collapsed instrument set, 29 instruments); N = 713, 97 countries. Turning points computed by the delta method. The turning-point shift across religiosity is not itself statistically significant, but the level of the turning point is precisely located only for secular economies.

For secular economies, the estimated turning point is statistically significant and corresponds closely to the threshold recovered by the Seo and Shin estimator in Table 4. For devout economies, the implied turning point is negative and statistically insignificant, indicating that no interior peak can be identified within their observed range of financial development. Both dynamic estimators thus point to the same conclusion, namely a well-defined point of diminishing returns to finance for secular economies and none for devout economies. Note that the turning point for the entire sample is not precisely estimated – intuitively, this is because the relationship between financialization and growth is different for secular vs devout economies.

3.4 Illustrating how religion and development shape the finance-growth connection

It may be useful to provide a simple illustration of how the level of religiosity and level of development shape the finance-growth connection. We estimate linear equations by OLS with clustered standard errors, without thresholds, for the whole sample of countries and the various subsamples.

$$g_{it} = \theta f_{it} + \mathbf{x}_{it}'\lambda + \tau_t + \varepsilon_{it} .$$

The results are presented in Table 6. Their interpretation is as follows. For the devout economies (where no threshold exists), the finance-growth slope is positive (+0.010; +0.019 for emerging-devout) — they sit on the *upward* part of the inverted-U, where finance still helps growth. Advanced/secular economies have negative slopes (−0.033, −0.024, p≈0.08) — they are past the peak, in the "too much finance" region. For emerging secular economies, the curve is close to flat (straddling the peak). This traces the whole inverted-U across groups. Note that no individual slope is estimated precisely enough to clear the usual $p < 0.05$ requirement. But the sign pattern is still suggestive.

One can possibly interpret this pattern as capturing a "trades growth for stability" logic: devout economies keep finance in the region where there is still growth potential. Possible constraints on finance lead to some foregone growth, but may avoid the over-financialization zone that could threaten economic or social stability, and possibly longer run growth.

Table 6. Group-specific linear finance growth slope

Group	Slope	p
Devout (all)	+0.0099	0.443
Emerging — devout	+0.0193	0.149
Emerging (pooled)	+0.0136	0.249
Emerging — secular	−0.0011	0.942
Secular (all)	−0.0239	0.080

Advanced	−0.0330	0.085
All	−0.0085	0.363

4. Conclusion

The role of religion in financial behavior and financial institutions is complex and multi-faceted (Becker, Rubin and Woessmann, 2024). Religious beliefs can constrain the operation of financial markets and institutions, but also promote individual thrift and societal trust. The historical evidence, summarized in Becker, et al, suggests that in some cases, religion has constrained finance to the point of having a negative effect on development. However, a very different literature has found a robust non-linear relationship between financialization and growth – "too much finance" can reduce growth. This pattern is derived from cross-country panel regressions, in a variety of studies. Religion has not been considered in this literature, although cross-country regressions have separately been used extensively to explore the connection between religion and growth.

This paper fills a gap in the literature by examining the role of religiosity in shaping the finance-growth connection. Using dynamic panel estimation methods employed in the "too much finance" literature, we find that this phenomenon of over-financialization is present only for less religious, or "secular" countries. This result holds even when we control to some extent for the level of development. Secular emerging economies display the threshold behavior, whereas "devout" emerging economies do not. Within this group of emerging economies, the level of financial development does not seem to drive the difference between devout and secular economies with respect to the finance-growth relationship.

The phenomenon we find in the data has not, to our knowledge, been highlighted before. It is consistent with the various possible impacts of religion on the operation of the financial sector. However, given the complexity of the channels through which religion operates on societal and economic structures, there could be other factors at work. In our sample, 17 of the 20 secular emerging economies are former communist or transition economies out of which, 8 of them are former soviet states, and that shared history may play a role in why they are different from the devout emerging economies in the finance-growth relationship. While we do not have a specific explanation, we believe that this paper opens up a fruitful research area, and is a first step toward deepening our understanding of how religion affects finance, and, through that channel, economic growth.

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