

## Original Paper

# Do Culture and Religion Matter to Economic Growth?

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Received: May 3, 2022

Accepted: May 25, 2022

Online Published: June 16, 2022

doi:10.22158/rem.v7n2p16

URL: <http://dx.doi.org/10.22158/rem.v7n2p16>

### **Abstract**

*This study offers a different empirical approach to examining the effects of culture and religion on economic growth using time series data for the period 1994-2020. I constructed a cultural index through the Principle Component Analysis (PCA) technique to achieve this goal. This study employs seven leading indicators from the World Values Survey (WVS) and the European Values Study (EVS) for cultural development, such as control, trust, respect, obedience, and identity. Further, the Generalized Method of Moments (GMM) system estimation was adopted. The findings confirm a significant positive impact of culture and religion on economic growth.*

### **Keywords**

*culture, religion, growth, PCA, SYS-GMM*

## **1. Introduction**

Why do some countries do well economically while others fail to develop? What explains these differences, and how can we explain the social variables of culture and religion in affecting economic growth? Most developmental studies justify these inequalities by listing different economic conditions that must be achieved for an economy to develop. For example, Adam Smith's *An Inquiry into the Nature and Causes of the Wealth of Nations* (1776) argued that each individual motivated by the pursuit of his/her interests contributes to the overall public interest in a self-regulating system. Recognizing that the "pursuit of personal interests" involves much more, Smith's *Theory of Moral Sentiments* (1759) discusses behaviors that are motivated by certain attitudes, beliefs, and values that represent an ingrained culture and/or religion found in certain nations. See also Anderson (1988).

In contrast, Karl Marx (1859) argued that the type of social structure and culture are dependent on the existing production structure at the dawn of industrial society. Guiso, Sapienza, and Zingales (2006) interpreted Marxist influences on culture and institutions on economic choices. In his writings, Max Weber (1905; 1906) offered some specific insights into how cultural and religious values could impact economic performance. He argued that the Protestant—specifically Calvinist—work ethic, supported by

various reformation teachings on the pursuit of wealth, instilled the virtues (*wirtschaftsethik*; see Szirmai, 2005, p. 489) needed for maximizing economic productivity. Thus, Weber explained why Protestants were more productive than Catholics in early modern Europe, especially in fostering capitalism.

In the conventional neoclassical growth models, Solow (1956) and Swan (1956) see initial factors such as physical capital and labor that turned into human capital variables, which allowed them to study economic growth and differences across countries. Apart from these classical factors, the debate transformed into other types of determinants that consider new elements in classical production function, such as the role of technology, knowledge, education, institutions, trade, and geography, which endogenized the economic growth process (Romer, 1986; Lucas, 1988; North, 1990; Barro, 1991; Krugman, 1991; Mankiw et al., 1992; and Aghion & Howitt, 1992). Therefore, a country's ability to produce and adapt to these determinants will eventually determine its growth rate and the speed at which it can catch up to developed countries.

However, these lists of economic conditions appeared without critique, and there is a new role for further research on the relationships between social variables—particularly culture and religion—and economic development. Zukin and DiMaggio (1990) found that the role of the state and social structures in business ethics encouraged economic growth in Japan in the mid-1980s and 90s. Their study further argues for the emergence of economic sociology over the dominant neoclassical paradigm. Temple (1999) and Guiso, Sapienza, and Zingales (2006) concluded that culture, political science, and sociology have an essential role in economic growth. See also Helliwell (1996); Hodgson (1998); and Maskell et al. (1998). Following this reasoning, I argue that both culture and religion need to be accounted for when analyzing economic growth given the current rise in economic globalization, human migration, cultural integration, sensitivity, secularization, and its effects on socioeconomic and cultural conditions.

Therefore, this paper aims to empirically investigate the effects of culture and religion on economic growth. Unlike previous studies in the literature, I included seven (7) indicators for culture beyond the traditional variables of trust, respect, and obedience. I employ four (4) additional variables in the cultural index, control, political identity, national identity, and religious identity in our growth equation. To the best of our knowledge, there have not been any studies that tried to estimate growth, cultural, and religious relationships within the study's selected variables and time periods. I also contribute to the previously established neoclassical growth relationship, as well as the recent discussion on the relationships between growth, culture, and religion and between these social variables and economic development.

The study constructed a cultural index from the seven indicators and applied the principal component analysis (PCA) technique to establish cultural development that captures the maximum variations for all of the indicators used. I also apply the dynamic panel data techniques of the system generalized method of moments (SYS-GMM) estimators proposed by Arellano and Bover (1995) and Blundell and Bond (1998), respectively.

This paper is organized as follows: Section II briefly reviews the current literature. Section III describes the data and methodology, while Section IV provides the results of the estimates, and Section V offers a conclusion.

## 2. Literature Review

The works of Max Weber (1905; 1906) form one starting point for examining the links between culture and religion. What is “culture” in the relevant literature? Geertz (1973, p. 89) defines culture as “a historically transmitted pattern of meanings embodied in symbols, a system of inherited conceptions expressed in symbolic forms by means of which human communicate, perpetuate, and develop their own knowledge about and attitudes toward life.” Porter (2000, p. 14) explains *economic* culture as “the beliefs, attitudes, and values that bear on economic activities of individuals, organizations, and institutions.” Guiso, Sapienza, and Zingales (2006, p. 23) characterize culture as “those customary beliefs and values that ethnic, religious, and social groups transmit fairly unchanged from generation to generation.” Boettke (2009, p. 437) notes that “culture is both a binding and bending constraint on human affairs.” From his study of United States culture, Murdock (1965, p. 116, p. 118) found that the country’s language and commerce systems came from the Anglo-Saxon people and Continental Europe. In addition, American religious diversity was inherited from the ancient Babylonians, Egyptians, Hebrews, and Persians. See also Claros and Perotti (2014) and Williamson and Mathers (2009).

The recent literature on culture and economic growth is diverse but often ignored; as its definitions, and within the growth literature, it is somewhat largely ignored or sometimes substituted as institutions effects only or considered jointly as cultural and institutional differences (Barro, 1995; Hofstede, 2001; and Acemoglu et al., 2001, 2002). In fact, recent empirical studies can be divided into two separate strands. The first strand focuses on classification for beliefs, attitudes, trust, values, and obedience, emphasizing that they stimulate social and economic interaction that lead to development. For example, Baumol (1990) argues that if firms’ institutional quality is good, individuals will devote their time to developing their talents and increasing productivity or entrepreneurship. Francois and Zaboynik (2005) and Knaack and Keefer (1997) suggested a strong relationship between trust and economic growth. Coyne and Williamson (2009) found that low levels of social capital would lead to lower levels of respect. Tabellini (2008) and Guiso, Sapienza, and Zingales (2006) focused on explicit models of cultural transmission of preferences and beliefs within families. De Castro Campos et al. (2013) found that cultural “thrift, trust and religiosity” contribute to cross-country private saving heterogeneity in both OECD and eurozone countries.

The second strand within the literature focuses on the role of culture on economic outcomes. For example, Knaack and Keefer (1997) and La Porta et al. (1997) found that social capital could affect economic development in a cross-section of countries. Guiso, Sapienza, and Zingales (2003, 2006) found that trust can affect financial development and entrepreneurship. Tabellini (2009) found a robust causal relationship between culture and economic development across different European countries. Williamson and

Kerekes (2008) showed that culture can lead to more secure private property rights. Grief (1994) concluded that culture should be part of all development policies to be successful. At the same time, Williamson and Mathers (2009) found that economic freedom is more important than culture for growth outcomes.

Much of the literature on religion and economic growth studies measured whether religious belief affects economic performance at the aggregate level using the proportion of people in a country belonging to a particular religion. For example, Barro and McCleary (2003) used religiosity for a broad panel of countries to investigate the effects of attendance at religious services and religious beliefs on economic growth. They found that growth depends on believing family members and religious beliefs which influence individual traits that enhance economic performance. Noland (2005) found that Muslim population shares in cross-country and within-country analyses promote growth. Guiso, Sapienza, and Zingales (2003) found a negative association between religion and attitudes supporting economic growth in countries where Islam is the dominant religion. Durlauf, Kourtellos, and Tan (2012) found little evidence that religious variables help to predict cross-country income differences. Hirschle (2013) found a positive relationship between economic modernization and patterns of religious change. Norris and Inglehart (2011) argue that as religious belief declines due to the advent of industrial society, it is replaced by a process of secularization of values and beliefs, and thus action.

The recent literature on culture and religion's effects on development is rather diverse. Burchardt (2013) focuses on the impact of churches and other Christian organizations on human development via its HIV/AIDS programs in South Africa. Reynolds (2015) explores how different religious groups respond to free trade agreements and how the global marketplace is built on specific cultural values. Kniss and Campbell (1997) argue that northern countries' religious donors powerfully impact developmental projects in developing countries. At the same time, Brenneman (2011) explores how religion can change the educational outcomes of gang members in Central America. Woodberry (2012) finds that Protestants have strongly influenced the rise and spread of stable democracies worldwide. Other studies found that faith-based initiatives or religious beliefs inhibit some forms of economic development (Candland, 2000; and Yunus, 2003).

### **3. Data and Methodology**

The PCA culture index has been used for the five waves of the Integrated Values Survey (obtained by merging the World Values Survey and the European Values Study time-series datasets): Wave 1994-1998, Wave 1999-2004, Wave 2005-2010, Wave 2010-2014, and Wave 2017-2020. Accordingly, all other variables used in the analysis are also averages over the period of each of these five waves. This makes the time dimension short and puts emphasis on the cross-country dimension. All other time series data are taken from the World Bank, World Development Indicator database.

Given that the number of cross sections (countries) is substantially higher than the number of data points used, the GMM specification is most appropriate. Furthermore, the lagged dependent variable implies

that a fixed effects estimate would underestimate its coefficient with an expected bias of order  $1/T$ ,  $T$  being the number of time periods. On the other hand, using OLS would lead to overestimation. The true value of that coefficient, between those from fixed effects and OLS, can be obtained using the system GMM approach.

To explore the relationship between culture and economic growth, this study uses the following model in the form in which growth regressions are usually written:

$$\log GDPPC_{i,t} = \alpha_1 + \beta_0 \log GDPPC_{i,t-1} + \beta_1 Culture_{i,t} + \beta_2 X_{i,t} + \varepsilon_{i,t} \quad (1)$$

Similarly, to explore the relationship between religion and economic growth, this study uses the following model:

$$\log GDPPC_{i,t} = \alpha_2 + \theta_0 \log GDPPC_{i,t-1} + \theta_1 Religion_{i,t} + \theta_2 X_{i,t} + \mu_{i,t} \quad (2)$$

where  $\log GDPPC_{i,t}$  is the natural logarithm of GDP per capita ( $GDPPC$ ) of country  $i$  in period  $t$ ,  $\alpha_1$  and  $\alpha_2$  are the constant terms or intercepts,  $X$  is a vector of control variables as found in standard growth models having possible impact on economic growth,  $\beta$ s and  $\theta$ s are the slope parameters, and  $\varepsilon_{i,t}$  and  $\mu_{i,t}$  are the error terms. (1) and (2) form the baseline specification.

*Culture* is the key explanatory variable, referring to a culture index capturing economic culture—that is, cultural attributes relevant for economic exchange. This economic culture index is created from the merged World Values Survey and the European Values Study time-series datasets. It captures levels of beliefs such as control, respect, trust, and obedience. Different aspects of identity are also captured: political identity, national identity, and religious identity. It is constructed by using principal component analysis (PCA) to extract the common variation among different components and then normalized to a range between 0 and 10.

Trust is measured as the percentage of respondents who answered that “Most people can be trusted.” Respect is measured as the percentage of respondents who noted the quality “tolerance and respect for other people” as being important. Control is measured as the unconditional average response (multiplied by 10) to a question asking respondents to indicate how much freedom of choice and control they have in their life and over how their life turns out (scaled from 1 to 10). Obedience is the percentage of respondents who mentioned that obedience is important. Political and religious identities are measured as the percentage of respondents who mentioned politics or religion as being important in life. National identity is the percentage of respondents who was very proud of their nationality.

#### 4. Empirical Results and Analysis

Using the principal component analysis, the variation matrix's Eigen values are calculated to obtain the principal components and the proportion of variations that are presented in Table 1. The first principal component captures the 41.49% variation in the indicators of economic culture, while the first three components as per cumulative proportion explain the 74.12% variation. The rest of the components, i.e., the fourth to the seventh, explain about 26% of the variation. The second column, i.e., the value column in Table 1 presents the values of the principal components. The value for the first component is 2.90 and

for the last 0.231. This column shows that the first component contains the highest value, which keeps on decreasing until the last component, ending with the lowest value, shows that the first component captures most of the variation in the data. The third column, i.e., the difference column, represents the difference between the components, which is also high for the first component and keeps on decreasing until the end.

**Table 1. Principal Components Analysis (Wave 1994-1998 - Wave 2017-2020)**

**No. of observations included: 185**

Eigen Values: (Sum = 7, Average = 1)					
Number	Value	Difference	Proportion	Cumulative	Cumulative
			n	Value	Proportion
1	2.9046	1.4527	0.4149	2.9046	0.4149
2	1.4520	0.6203	0.2074	4.3566	0.6224
3	0.8317	0.0678	0.1188	5.1883	0.7412
4	0.7639	0.3377	0.1091	5.9522	0.8503
5	0.4262	0.0353	0.0609	6.3784	0.9112
6	0.3909	0.1603	0.0558	6.7694	0.9671
7	0.2306	---	0.0329	7.0000	1

  

Eigenvectors (Loadings):							
Variable	PC1	PC2	PC3	PC4	PC5	PC6	PC7
Control	0.0671	0.6088	0.2463	-0.689	0.2349	-0.1646	0.0855
Respect	-0.1288	0.6331	-0.4815	0.3028	-0.4248	-0.274	0.0604
Trust	-0.3517	0.3892	0.3545	0.4739	0.357	0.4557	0.1986
Obedience	0.4334	0.0885	-0.4711	0.2023	0.7184	-0.0905	-0.1313
Political Identity	0.3921	0.0823	0.5988	0.4074	-0.067	-0.530	-0.1718
National Identity	0.4796	0.249	0.0368	-0.0296	-0.3008	0.6102	-0.4929
Religious							
Identity	0.5325	-0.0234	-0.004	0.035	-0.161	0.1698	0.8123

In PC1 (Table 1), the measure of religious identity has the maximum positive weight, indicating that this aspect of economic culture has a strong influence on this component. On the other hand, in PC2, the respect indicator has the maximum positive weight, closely followed by the indicator of control. In PC3, the maximum positive weight of political identity shows that this indicator has strong influence on this component. Trust has the strongest positive influence in PC4, while obedience has the maximum positive weight in PC5. The indicators with the highest positive weights of all the indicators are national identity in PC6 and religious identity in PC7.

Finally, the GMM technique is used to address the problem of endogeneity caused by reverse causation. GMM dynamic system estimation is carried out following Arellano and Bover (1995) and Blundell and Bond (1998), respectively. The regression results are presented in Table 2. The SYS-GMM results in column (1) show that per-capita GDP increases by 0.02% for every 1% increase in culture index with a one-year lag and that this effect is significant at the 1% level.

The SYS-GMM results in column (2) find that that per-capita GDP increases 0.002% for every 1% increase in the religious ratio of the population, with a one-year lag, and that this effect is significant at the 5% level. In column (3), both the culture index and religious ratio, with a one-year lag, find 0.02% and 0.002%, respectively, and are both significant at the 5% level, for every 1% increase in per-capita GDP. These results indicate the sensitivities of the coefficients to the changes in specification. It is observed that changes do not alter the coefficient results to the extent of sign and significance and are marginal.

**Table 2. SYS-GMM: Dependent Variable—Log GDP Per Capita**

	(1)	(2)	(3)
Log GDP Per Capita t-1	0.90884*** (0.01270)	0.89343*** (0.01499)	0.90675*** (0.01529)
Culture Index t-1	0.02186*** (0.00781)		0.02286** (0.00986)
Religious % of Population t-1		0.00182** (0.00077)	0.00164** (0.00071)
Gini	-0.00047 (0.00073)	0.00026 (0.00114)	-0.00024 (0.00098)
Capital Investment	0.03290*** (0.00248)	0.03284*** (0.00484)	0.03537*** (0.00489)
Government Spending	0.02650*** (0.00410)	0.02574*** (0.00468)	0.03065*** (0.00541)
Log Population	-0.02507*** (0.00647)	-0.02566*** (0.00925)	-0.02263** (0.00920)

Trend	-0.00159 (0.02285)	0.04945*** (0.00937)	-0.01110 (0.00725)
Constant	-0.25292 (0.18372)	-0.30537 (0.27074)	-0.49782 (0.31447)
Period	Wave 1994-1998 - Wave 2017-2020	Wave 1994-1998 - Wave 2017-2020	Wave 1994-1998 - Wave 2017-2020
Times Dummies	Yes	Yes	Yes
Countries/Periods	74/5	74/5	74/5
Observations	185	185	185
S. E. of Regression	Level: 0.2178 1st Difference: 0.1984	Level: 0.2175 1st Difference: 0.1986	Level: 0.2257 1st Difference: 0.1988
Pesaran's CD test [p-value]	0.751	0.504	0.660
AR (1) [p-value]	0.017	0.020	0.023
AR (2) [p-value]	0.122	0.157	0.144
Hansen test [p-value]	0.350	0.121	0.164

*Notes.* Standard errors are in parentheses. \*\*\* Significant at the 1 percent level. \*\* Significant at the 5 percent level. \* Significant at the 10 percent level.

Columns (1) Instruments for SYS-GMM: First Differences Equation - L2.log GDP Per Capita, L.Gini, L.Capital Investment, L.Govt. Spending; Levels Equation - DL2.log GDP Per Capita, DL.Gini, DL.Capital Investment, DL.Govt. Spending. Also included the following standard instruments: First Differences Equation - Culture Index t-1, log Population, Time Dummies. Levels Equation - D. (Culture Index t-1, log Population, Time Dummies, Trend).

Columns (2) Instruments for SYS-GMM: First Differences Equation - L2.log GDP Per Capita, L.Gini, L.Capital Investment, L.Govt. Spending. Levels Equation - DL2.log GDP Per Capita, DL.Gini, DL.Capital Investment, DL.Govt. Spending. Also included the following standard instruments: First Differences Equation - Religious % of Population t-1, log Population, Time Dummies. Levels Equation - D. (Religious % of Population t-1, log Population, Time Dummies, Trend).

Columns (3) Instruments for SYS-GMM: First Differences Equation - L2.log GDP Per Capita, L.Gini, L.Capital Investment, L.Govt. Spending. Levels Equation - DL2.log GDP Per Capita, DL.Gini, DL.Capital Investment, DL.Govt. Spending. Also included the following standard instruments: First Differences Equation - Culture Index t-1, Religious % of Population t-1, log Population, Time Dummies. Levels Equation - D. (Culture Index t-1, Religious % of Population t-1, log Population, Time Dummies, Trend).

The estimated impact of culture and religion on economic development is robust under different equation specifications. The variance inflation factors (VIFs) calculated post-estimation were used to test for



multicollinearity among the regressors. In all cases, none of the VIFs was high enough. The Durbin-Wu-Hausman (DWH) tests for endogeneity of regressors were performed to determine whether estimation of instrumental variables is necessary, and the SYS-GMM specification was chosen accordingly. Therefore, the study shows an autoregressive (AR) process while estimating the equation to remove any autocorrelation problem from the models. The Hansen test of over-identifying restrictions presents evidence of the joint validity of all instruments, and the model is also validated overall.

## 5. Conclusion

In this paper, based on the principal component analysis (PCA) and system generalized method of moments (SYS-GMM) approach, using time series data for the periods 1994-2020 for seven leading indicators from the World Values Survey (WVS) and the European Values Study (EVS) for cultural development, such as control, trust, respect, obedience, and identity. I have attempted to examine the relationship between culture and religion and economic growth. The empirical findings confirm a significant positive impact of culture and religion on economic growth. Overall, the findings suggest that given the current rise in economic globalization, policymakers need to consider, when analyzing economic growth: human migration, cultural integration, sensitivity, secularization, and its effects on socioeconomic and cultural conditions enhancing sustainable economic growth.

## Acknowledgments

The authors are very grateful to the editor and the anonymous referees whose comments have significantly improved this work. All remaining errors are ours. This Paper should not be reported as representing the views of the AXA. The views expressed in this working paper are those of the author(s) and do not necessarily represent those of the AXA or AXA XL policy. This working paper describe research in progress by the author(s) and are published to further the debate topic.

## Conflicts of Interest

The author has no conflicts of interest to declare.

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