Journal of Business and Economics, ISSN 2155-7950, USA
December 2015, Volume 6, No. 12, pp. 2072-2079
DOI: 10.15341/jbe(2155-7950)/12.06.2015/008

http://www.academicstar.us

Religiosity, Attendance of Religious Activities and Economic Growth in the US

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Abstract: Religion has a multitude of impacts on society and two of these aspects are the effect that religiosity and attendance of religious activities have on economic growth. Most past studies on these aspects of religion considered country to country comparisons and found increased levels of religiosity increased economic growth while more frequent attendance of religious activities decreased economic growth. This study extends the existing literature by considering the impact of religiosity on economics growth in just one nation, the United States. Using the level of religiosity and attendance of religious services by state, a model was constructed to evaluate the impact they have on economic growth in each state. Considering only the level of religiosity and attendance of religious services in each state, the results are similar to the studies considering these factors by nation. When control variables were added to the model to isolate their effects on economic growth, both of the religious variables became insignificant. However, the addition of the religious variables did increase the explanatory power of the overall model compared to excluding them from the model indicating they do provide some minimal additional explanatory power for economic growth in a state.

Key words: religiosity; attendance religious activities; economic growth; US states

JEL codes: O1, O5

"Religion is part of the human make-up. It's also part of our cultural and intellectual history. Religion was our first attempt at literature, the texts, our first attempt at cosmology, making sense of where we are in the universe, our first attempt at health care, believing in faith healing, our first attempt at philosophy" (Hitchens, n.d.).

1. Literature Review

The existing literature regarding religion's impact on economic growth within the United States is limited and with mixed results. Rupasingha and Chilton (2009) found participation in religious activities was negatively related to economic growth in the US at the county level in a select group of counties. Lehrer (2004) states that regular participation in religious activities by adolescences led to higher levels of education, which resulted in a better economic outcome in the US. However, the results were dependent on the religious affiliation of the adolescence. Hilary and Hui (2009) observed that firms in more religious counties in the US were more conservative in their activities and demanded a higher return on riskier projects that firms in less religious

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counties resulting in less investment and lower economic growth. Solt, Habel, & Grant (2011) when looking at 50 years of data found that higher levels of religiosity in the US was due to income inequality with rich individuals using religion as a basis to justify their wealth and using this wealth to increase religiosity in the U.S.. Radmard (2012) considered county data in the US and found that increased religiosity activity in a county reduced self-employment entrepreneurial activity in that county, but increased economic growth in neighboring counties with the overall impact positive for economic growth. These previous studies in the US that considered religiosity and attendance of religious activities were at the county level using different countries in each study or looked at the entire country and not by state. This study helps fill a gap in the existing literature of the impact of these two factors by evaluating them at the state level.

When looking at the impact of these factors from a world view there are several seminal studies that found increased religiosity caused increased economic growth and regular attendance of religious activities decreasing economic growth. Barro and McCleary (2003, 2006) found a positive relationship between economic growth and religiosity, but a negative relationship between economic growth and attendance of religious services. Barro and McCleary (2003) and McCleary (2007) feel that greater religiosity has tenants that help to promote economic growth due to the behavioral influence that religion promotes enhance productivity. Barro (2004) asserts that regular attendance of religious services has a negative influence on economic performance due to the time it takes away from economically productive activity.Guisoa, Sapienzad, & Zingalese (2003) state that religious beliefs promote a positive economic attitude that in turn promotes higher per capita income and growth. Noland (2005) recognizes a relationship between economic performance and religious beliefs with no difference due to type of religion. As income increases, belief in religion and religious attendance declined based on the secularization model (Barro & Mitchell, 2004).

2. Model and Data

The model in this study is based on the international model of religion's impact on economic growth used by Alon and Chase (2005). While a few of the variables in the model were not appropriate when considering only one nation, most could be used directly or with a proxy. The dependent variable in the model is the 10-year average economic growth rate in each of the 50 states in the United States (Bureau of Economic Analysis, 2014). The independent variables regarding religion are: percent of the population in each state that considers themselves to be highly religious and the percent of population by state that attend weekly religious services (Newport, 2014 & 2014a).

In addition, several control variables were included in the model to isolate the impact of the religion variables:

- Economic freedom (Mercatus Center, 2013)
- Gross Domestic Product (GDP) per-capita (Bureau of Economic Analysis, 2014)
- Average hourly wage (Bureau of Labor Statistics, 2014)
- Unemployment rate (Bureau of Labor Statistics, 2014)
- Right to work state[1] c (National Conference State Legislatures, 2014)
- Political party of governor (Netstate, 2014)

[1] States that recently changed their laws to become right to work states were considered non-right to work states for this study. This is due to the situation where these recent changes in the law would not have had time to influence economic growth.

3. Regressions

An initial regression was run with just the religious variables and the results indicate that both level of religiosity and religious activity attendance are significant indicators of economic growth at the 5% level (See Table 1). The coefficient for religiosity is positive suggesting that stronger beliefs in religion lead to greater economic growth. This can be attributed to people who are more religious transferring their personal beliefs into their business lives which can be beneficial for economic growth. The coefficient for attendance of religious activities is negative suggesting that as people become more involved in religious activities it leaves less time available for economic gains. These results are similar to the outcomes at the international level for these two variables (Barro & McCleary, 2003, 2006, 2008; Chase, 2014). However, when looking at the Multiple Coefficient of Determination (Adjusted R^2)[2] only about 5% in the variation of the dependent variable is explained by the two independent variables.

Table 1 Religious Variables Only[3]

	Coefficients	P-value
Religiosity**	0.101831	0.046637
Attendance**	-0.12976	0.036146
Adjusted R^2	0.051375	

Note: **Significant at 5% level.

Next, a regression was run using both of the religious variables and all of the control variables (see Table 2). Of the two religious variables only religiosity is significant, and then only marginally at the 10% level. For the control variables, unemployment and per capita GDP are both significant at the 5% level with all of the other control variables being insignificant. Unemployment has a negative coefficient indicating that as unemployment rises the rate of economic growth declines. However, per capita GDP is positive which suggested that as income increased, the rate of economic growth increased which is contrary to the catch-up-theorem of economic growth[4]. Adjusted R^2 for the model increases to almost 25%, indicating that this model has more predictive capability than the model with just the two religious variables.

Two additional regressions were considered with each of the religious variables separately with all of the control variables in the model.

The first regression included the religiosity variable and all of the control variables (see Table 3). The religiosity variable was not significant. For the control variables, unemployment and per capita GDP were significant at the 5% level with unemployment having a negative coefficient and per capita GDP having a positive coefficient again. Adjusted R^2 for the model decreased to about 23%, suggesting this model has less predictive capability than the model with both religious variables.

[2] The Coefficient of Multiple Determination (adjusted R^2) shows the percent of variation that can be explained by the model which adjusts the value downward for the inclusion of superfluous independent variables (Helland, 1987).

[3] The base model has the 10-year average economic growth rate as the dependent variable. The independent variables are the percent of that population that considers their selves to be highly religious and the percent of the population that attend weekly religious services. The religious variables were from a survey conducted by Gallup with a sample size of 177,030 individuals in the United States over 18 years of age (Newport, 2014 & 2014a).

[4] The Catch-Up Theorem of economic growth states that economies that have higher levels of per-capita GDP have lower growth rates than those with lower levels of per-capita GDP. This is based on the idea that there is more that can be done to increase growth rates in low level per-capita GDP economies than high per-capita GDP countries. See Baumol (1986) for further explanation of the catch-up theorem of economic growth.

Table 2 All Variables[5]

	Coefficients	P-value
Religiosity*	0.085803	0.098582
Attendance	-0.07961	0.195057
Unemployment**	-0.28331	0.02561
Average Earning Hour	-0.06883	0.372604
Per – Capita GDP**	6.53E-05	0.00725
Right to Work (Not)	-0.12591	0.747194
Political Party Governor (D)	-0.08489	0.797739
Economic Freedom	0.006924	0.535193
Adjusted R^2	0.248392	

Note" **Significant at 5% level; *Significant at 10% level

Table 3 Only Religiosity Variable in Full Model[6]

	Coefficients	P-value
Religiosity	0.02360765	0.216495
Unemployment**	-0.3429534	0.004619
Average Earning Hour	-0.0417531	0.576485
Per – Capita GDP**	6.1031E-05	0.011432
Right to Work	-0.152313	0.698734
Political Party Governor	-0.0085822	0.979171
Economic Freedom	0.00551188	0.622592
Adjusted R^2	0.23523467	

Note: **Significant at 5% level

The second regression included the religious activities attendance variable and all of the control variables (see Table 4). The religious attendance variable was not significant. For the control variables, unemployment and per capita GDP were significant once again at the 5% level and had the same coefficient signs as in the previous two models. Adjusted R^2 for the model decreased to about 21%, suggesting this model has even less predictive capability that the full model with all of the variables and the model with the religiosity variable and all of the control variables.

Table 4 Only Attendance Variable in Full Model[7]

	Coefficients	P-value
Attendance	0.015393	0.501254
Unemployment**	-0.34859	0.005323
Average Earning Hour	-0.04375	0.570621
Per – Capita GDP**	5.82E-05	0.016085
Right to Work	-0.07896	0.842698
Political Party Governor	0.036181	0.912748
Economic Freedom	0.00487	0.667219
Adjusted R^2	0.215165	

Note: **Significant at 5% level

[5] This model includes both of the religious variables and all of the control variables in an attempt to isolate the additional impact that the two religious variables have on economic growth in each state.

[6] This model isolates the impact of attendance of religiosity on economic growth without considering attendance of religious activities above what the control variables explain.

[7] This model isolates the impact of attendance of religious activities on economic growth without considering religiosity above what the control variables explain.

To consider any possible interaction that might happen between the control variables, an interaction term was created for the two religious variables and run in a regression with all of the control variables (see Table 5). The interaction variable is not significant indicating that the two variables do not seem to be influencing each other. For the control variables, unemployment and per capita GDP are once again significant at the 5% level with the same signs as in the previous models. Adjusted R^2 for the model decreased to about 22%, suggesting this model has less predictive capability than the full model and the model with just the religiosity variable, but more than the model with regular religious activities attendance.

Table 5 Full Model with Interaction Term[8]

	Coefficients	P-value
Interaction	0.0003	0.277308
Unemployment**	-0.3504	0.004293
Average Earning Hour	-0.04084	0.58846
Per – Capita GDP**	6.06E-05	0.0123
Right to Work	-0.1216	0.756229
Political Party Governor	0.008829	0.978581
Economic Freedom	0.005159	0.646067
Adjusted R^2	0.22881	

Note: **Significant at 5% level

A further check was done to see if the religious variables improve on what only the control variables offer, so another model was run with just the control variables (see Table 6). Only the unemployment and per capita GDP are significant at the 5% level with the same signs as in the previous models. Adjusted R^2 for the model decreased to about 22%, which is less than the full model that included the both of the religious variables. It appears that the two religious variables do increase the overall predictability of economic growth in a state.

Table 6 Only Control Variables[9]

	Coefficients	P-value
Unemployment**	-0.33093	0.006201
Average Earning Hour	-0.05649	0.447739
Per – Capita GDP**	5.7E-05	0.017215
Right to Work	0.007592	0.983811
Political Party Governor	0.052585	0.872323
Economic Freedom	0.00476	0.672272
Adjusted R^2	0.225017	

Note: **Significant at 5% level

Since adjusted R^2 falls as superfluous variables are included in at model, a new model was run with the insignificant variables dropped that included only the significant control variables and both religious variables (see Table 7). Both of the religious variables are insignificant. However, the unemployment and per capita GDP are significant at the 5% level with the same signs as in the previous models. The adjusted R^2 for the model

[8] The interaction term is based on the idea that the two terms are not independent and that one influences the other. Since more religious individuals could attend more religious activities or those that attend more religious activities could be more religious.

[9] This model isolates the effect of the control variables on economic growth to show the differential between this model and the models with the religion variables.

increased to over 29%, making this model have the best predictive capability of all the models considered.

Table 7 Religious Variables with Significant Control Variables Model[10]

	Coefficients	P-value
Religiosity	0.067168	0.152823
Attendance	-0.06221	0.272032
Unemployment**	-0.27743	0.014709
Per – Capita GDP**	5.2E-05	0.003682
Adjusted R^2	0.290443	

Note: **Significant at 5% level

As a final check for robustness a regression with just the two significant control variables was run (see Table 8), unemployment and per capita GDP. The variables have the same signs as in the previous models with an adjusted R^2 at about 28%.

Table 8[11] Only Significant Control Variables Regression

	Coefficients	P-value
Unemployment**	-0.3288205	0.002485
Per – Capita GDP**	4.3957E-05	0.006813
Adjusted R^2	0.27794455	

Note: **Significant at 5% level.

4. Conclusion

The results when considering only religiosity and attendance of religious activities produced similar results to previous studies at the international level. Increased levels of religiosity raised economic growth and attendance of religious activities lowered economic growth. However, the overall impact was minimal with 5% of the variation in economic growth being explained by the two religious variables.

Adding the control variables to the model significantly improved the adjusted R^2 of the model to about 25%. However, only one of the religious variables was significant (marginally) along with two of the control variables. Various combinations of the religious variables and the control variables were considered, but except for two models the adjusted R^2 did not increase above the model with all of the variables included. The first model that increased the adjusted R^2 dropped all of the insignificant control variables in the model and included just the two significant control variables. The adjusted R^2 for this model increased to about 28%. The second model with a highest adjusted R^2 used the two significant control variables with both religious variables. Only the two control variables were significant, but the adjusted R^2 increased for the model to just over 29%.[12]

The results indicate that at the state level religiosity and attendance of religious activities have limited impact

[10] Since adjusted R^2 is used to consider the explanatory power of the model and additional superfluous variables reduce the value of adjusted R^2, the insignificant control variables were dropped from the model, but the religious variables were retained in the model (Helland, 1987).

[11] Once again since adjusted R^2 is used to consider the explanatory power of the model and additional superfluous variables reduce the value of adjusted R^2, all the insignificant variables were dropped from the model to see if it improved the model (Helland, 1987).

[12] Adjusted R^2 falls as superfluous variables are added to the model, but the two religious variables caused an increase in adjusted R^2 when added to the model. This indicates that they do offer some additional explanatory power to the control variables (Helland, 1987).

on economic growth rates for a state in the US. While the model with just the two religious variables had them both being significant, the best model in terms of adjusted R^2 included both of the religious variables also even though they were both insignificant. So it seems that the religious variables may have a very minimal effect on economic growth similar to the impact at the international level when controlling for other factors influencing economic growth.

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