Afterlife Beliefs, Work Ethic, and Economic Outcomes

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Abstract

This paper expands on the body of literature relating spiritual or religious beliefs to economic outcomes. It focuses on a hypothetical mechanism whereby cultural values are produced by religious beliefs and these cultural values, in turn, produce economic outcomes. World Values Survey data is leveraged to provide evidence for this mechanism using the proportion of a countrys population that believes in heaven or hell and a measure of the countrys work ethic.

1 Introduction

McCleary and Barro's 2006 paper conducted a survey of quantitative treatments of religiosity and economic outcomes. They systematically looked at religiosity as a dependent and independent variable, determinants of various religious beliefs and participation, and how beliefs and attendance impact economic performance. When looking at economic growth, they find robust support for the impact of belief in hell, monthly attendance, and shares of various religions in a country on economic growth, namely a positive effect on belief in hell and a negative effect on attendance, though they emphasize that the relation of beliefs to attendance is important (McCleary & Barro, 2006, pp. 67-68). McCleary and Barro suggest that this supports a Weberian view of religion and economics; that is, religion produces beliefs in individuals that impact their attitudes and values which, in turn, impact economic outcomes (Religion and Economy, 2006, p. 68).

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Taking this analysis further, McCleary and Barro try to determine the drivers of specific attitudes or traits by examining how work ethic, honesty, and thrift are impacted by a belief in hell, heaven, or an afterlife where all variables are expressed as a proportion of the population. They find the strongest result for work ethic regressed on belief in hell, reported in Equation 1 with standard errors in parentheses (McCleary & Barro, 2006, p. 70).

Equation 1 – McCleary and Barro (2006, 70) regression for work ethic on belief in hell

work ethic =   *1.20*   *+ 0.200 (belief in hell)*   *-0.091 (log per capita GDP)*   *+0.307 (ex-communist)*

           (0.28)   *(0.0098)*   *(0.027)*   *(0.052)*

$R^2=0.55$

They find slightly weaker results when other beliefs are substituted in or when a different cultural trait is looked at. The positive and statistically significant (at the 5% level) coefficient on belief in hell indicates that an increased proportion of the population that believes in hell drives, or is at least correlated with, an increased proportion of the population that thinks hard work is important to teach children, a proxy for work ethic. McCleary and Barro interpret this as evidence for Webers suggestion that religion, working through beliefs, impacts work ethic (Religion and Economy, 2006, pp. 70-71). This can, intuitively, impact economic outcomes.

Taking a step back from their results, I found it curious that only belief in hell was worth including in the model. A belief in an afterlife, generally, can mean many different things, including belief in heaven and hell, just one of the two, or some other notion of what happens when one passes that cannot be readily surveyed. The fact that this variable was not indicative is not surprising as it is too high-level and vague to capture any meaningful, specific belief. On the other hand, specific beliefs in hell or heaven are related, but neither perfectly correlated nor mutually exclusive. That is, someone can believe in heaven and not hell, hell and not heaven, both, or neither. Since hell is generally seen as a punishment while heaven is seen as a reward, I would expect people to respond based on their perception of both incentives and not just one of them.

McCleary and Barro also leave open the question of whether work ethic, especially the portion of work ethic attributable to beliefs, impact economic outcomes (Religion and Economy, 2006).

This intuitive importance of the combination of belief in hell and belief in heaven as a determinant of work ethic can be confirmed through analysis of World Values Survey data. The same analyses also suggest a different direction for the effect of belief in hell than McCleary and Barro found. I find support for the hypothesis that work ethic, specifically the portion due to an individuals beliefs in heaven and hell, determines economic growth.

2 Review of Cultural Explanations for Economic Outcomes

Cultural explanations for economic outcomes date all the way back to Adam Smith and John Stuart Mill, who considered cultural explanations to sometimes be stronger than those based on individual rationality (Guiso, Sapienza, & Zingales, *Does Culture Affect Economic Outcomes?*, 2006, p. 26). Wesley, the founder of the Methodist Church, demonstrated this perspective by urging congregants to accrue wealth, save, and give (McCleary & Barro, 2006, p. 51).

Other economists saw problems with this direction of causality. Namely, Marx suggested that the means of production influences the social and political structure of a society, in a word, its culture (Guiso, Sapienza, & Zingales, *Does Culture Affect Economic Outcomes?*, 2006, p. 26). Some, like Marx, argue that humans, through the way they organize, create religion (Guiso, Sapienza, & Zingales, *People's opium? Religion and economic attitudes*, 2003, p. 230). This explanation implies that religion conforms to the cultural context it is given and does not play a role in its creation. Given this view, religious explanations, or even cultural explanations, for economic outcomes are rooted in the fundamental organization of society, which already directly influences economics outcomes.

The basis for todays work on culture and economics, though, is Max Webers seminal work, The Protestant Ethic and the Spirit of Capitalism. Webers core thesis is the Protestant Reformation laid the groundwork for the rise of capitalism in Europe, meaning that religion lead directly to economic outcomes. A key teaching during the Protestant Reformation was that the accumulation of wealth was a respectable duty imposed on all followers (Guiso, Sapienza, & Zingales, *Does Culture Affect Economic Outcomes?*, 2006, p. 26). When a sufficient portion of the population holds this view, it

has the power to legitimize a change in economic order (Pryor, 2005, p. 451). Eisenstadt gave this phenomenon the term "transformative potential" to describe the capacity of religions to legitimize new institutions or activities (Guiso, Sapienza, & Zingales, *People's opium? Religion and economic attitudes*, 2003, p. 229).

For quantitative analyses of cultural explanations for economic outcomes, a theorized mechanism is needed. Religion can produce some type of good, like religious beliefs. Alternatively, religion can have a network effect. That is, formal services or other organized events connect religious followers, and these connections lead to economic growth or other outcomes. For Weber, religion produces beliefs. These beliefs, including work ethic, trust, and thriftiness, are what matter in determining economic outcomes (McCleary & Barro, 2006, p. 51).

Following Weber, though, economists largely ignored cultural explanation for economic outcomes, especially religious explanations (Noland, 2005, p. 1216). As institutional analyses started to grow in the late twentieth century, culture received more attention (Guiso, Sapienza, & Zingales, *Does Culture Affect Economic Outcomes?*, 2006, p. 28). Landes, specifically, stresses the mechanism where culture influences beliefs and values, which influence economic outcomes (The Wealthy and Poverty of Nations, 1999). Values like hard work, tenacity, and honesty were linked to economic development. These cultural traits are notable in that fit well in a Weberian framework, a fact which Landes acknowledges (Landes, 1999, p. 516). McCleary and Barro analyze religiosity and economic growth and conclude that a combination of religiosity (beliefs relative to participation) and religious types (denominations) are important for explaining economic growth (Religion and Economy, 2006, p. 69).

This intellectual tradition of cultural explanations, focusing on cultural values, for economic outcomes has specific examples in the literature. Trust is a popular variable to examine, likely due in part to its easy connection to economic outcomes. Trust is a substitute for complete contracts. If two parties to an arrangement can trust the other to act in good faith, a complete contract is not needed. This lowers the cost of transactions and encourages the proliferation of economically beneficial arrangements. Guiso, Sapienza and Zingales find specific evidence of religions impact on trust; being raised religious increases a constructed trust index by 2% while regularly attending

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service raises it by 20% (*Does Culture Affect Economic Outcomes?*, 2006, p. 30). In turn, several studies have found trust to be an important explanatory variable for economic growth (Knack & Keefer, *Does Social Capital Have an Economic Payoff? A Cross-Country Investigation*, 1997; Knack, Trust, associational life, and economic performance, 2001; Zak & Knack, 2001).

Another common cultural value that is studied is thriftiness. The hypothesized mechanism by which thriftiness impacts economic outcomes is through individual saving, which impacts investment and thus growth. Guiso, Sapienza and Zingales find a link between thriftiness as a cultural value and the national savings rate; a 10% increase in the proportion of the population that thinks thriftiness is an important value to teach children is related to a 1.3% increase in the national savings rate (*Does Culture Affect Economic Outcomes?*, 2006, p. 38). More importantly, they find evidence to suggest that the explanatory power of this cultural value is comparable to that of the life-cycle model. Relevant to the Weberian hypothesis, Guiso, Sapienza, and Zingales ascribe the cultural value of thriftiness to religion. They found significant, positive coefficients on Catholicism and Protestantism related to the likelihood of teaching thriftiness as an important value to children (Guiso, Sapienza, & Zingales, *Does Culture Affect Economic Outcomes?*, 2006, p. 38).

While thrift and trust have been studied extensively, work ethic has been looked at in less depth. Formerly, Protestant Work Ethic could be defined as "a dispositional variable characterized by a belief in the importance of hard work, rationality, and frugality which acts as a defense against sloth, sensuality, and religious doubt" (McMurray & Scott, 2013, p. 656). Today, a more generalized conception that severs the religious undertones can be used to define work ethic. When looking at worth ethic, literature has noted that the GNP of an individuals country of birth strongly indicates their work ethic, even after residing in another country for some time (McMurray & Scott, 2013, pp. 661-662). This could underscore a tie between economic performance and work ethic, but I find it more likely given the literature discussed above that GNP in an individuals birth country is a proxy for the culture the individual was socialized in and thus subscribes to. That is, there is a cultural explanation for the variation in work ethic across individuals. Examinations of a specific work ethic construct, Islamic Work Ethic (IWE), have found a positive relationship on the individual level between IWE and organizational commitment (Ali & Al-Owaihan, 2008, p. 15). This intuitively

connects to economic outcomes, though an empirical link is not available. McCleary and Barro provide the strongest support that religious beliefs impact work ethic as a cultural value, but they do not tie this cultural value to economic outcomes (Religion and Economy, 2006, p. 70).

Yet other studies have criticized the tie between religion, work ethic as a cultural value, and economic outcomes. Blum and Dudley analyze Webers work and conclude that the work ethic taught by the Protestant Reformation was not responsible for the rise of capitalism. Instead, they argue for the importance of information networks that were enabled and spread by the Protestant Reformation (*Religion and economic growth: was Weber right?*, 2001, pp. 210, 229).

While the specifics may be unclear, the history of cultural explanations for economic outcomes is complemented by studies that conclude that religion or cultural explanations matter. Noland finds that the hypothesis that religious affiliation is uncorrelated with economic performance can often be rejected, although he does not find a clear result for any particular denomination driving this (Noland, 2005). Guiso, Sapienza, and Zingales, after a review of the literature, conclude that, on average, religion has a positive effect on the development of attitudes conducive to economic growth (*People's opium? Religion and economic attitudes*, 2003). Again, they find inconsistent evidence as to any denomination behind this relationship. On the question of whether religion drives economic performance, Weber may have been correct.

3 Hypothesized Mechanism

The reason studies find support for cultural, specifically religious, explanations of economic outcomes but not for any denominational effects may have to do with a misunderstanding of the mechanism by which religion affects economic growth. Following Weber, I argue that the chain of causality can be summarized as in Figure 1.
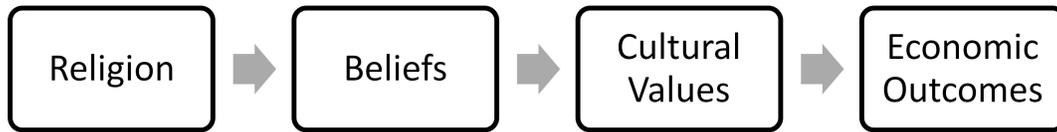
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Religion	➡	Beliefs	➡	Cultural Values	➡	Economic Outcomes

Figure 1 – Theoretical Mechanism

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When studies look at religious denominations, they are skipping one or both of the intermediate steps by which religion impacts economic outcomes. There may also be more clear results if the definition of religion is expanded. In the United States, 18% of the population identifies as spiritual but not religious (Pew Research Center, 2012). That is, they do not identify with an established religious tradition or institution, but they may still believe in God, believe in an afterlife, and hold what have traditionally been thought of as religious beliefs. Scholars argue that religious institution are in constant competition in todays society with non-religious institutions for the provision of social, cultural, or welfare goods that used to be solely provided by religious institutions (Hirschle, 2013, p. 414). In this framework, individuals attend and practice religion less. However, there need not be an immediate or long-term effect on religious beliefs (Hirschle, 2013, p. 421).

Given this perspective, I find it more valuable to look at spiritual beliefs. This raises the question of how these beliefs are produced as a Weberian argument, where religion produces beliefs, is unsubstantial. There may, in fact, be multiple pathways that produce spiritual beliefs, including casual interactions with established denominations or the way one is brought up, even if that never involved formal religious participation. Spiritual beliefs are beliefs in the supernatural that need not be related to any denomination; they include a belief in hell, heaven, or any other notion of an afterlife.

The theoretical connection between spiritual beliefs and cultural values is given by Azzi and Ehrenberg (Household Allocation of Time and Church Attendance, 1975). Azzi and Ehrenberg describe a rational choice model in which households maximize their utility between their time on

earth and their time after. In such a framework, seemingly irrational attitudes can be taken as perfectly rational. Consider the hypothetical case where an individual is told by a religious institution they have to take a mission trip, from which they derive no value, and pay the opportunity cost of schooling or lost wages that time represents. If the individual has no spiritual beliefs, they would never go on the mission trip. However, if the individual has beliefs that indicate a mission trip must be conducted for entrance into a good eternal state after death, then it becomes rational to undertake the mission trip as the opportunity cost is likely less than the benefit of a good eternal state. If the mission trip in this example is thought of as service, frugality, or hard work, then the connection, underpinned by rational choice, between spiritual beliefs and cultural attitudes becomes more apparent.

The connection between cultural values and economic outcomes is intuitive. Good cultural values, like thriftiness or hard work, when aggregated lead to observable economic outcomes like saving or productivity, respectively.

My data analysis focuses on the connection between spiritual beliefs and work ethic as a cultural value and the connection between work ethic as a cultural value and economic growth, tying both links in the chain to the entire mechanism whereby spiritual beliefs affect economic growth through work ethic.

4   Data Analysis

4.1   Data Sources

McCleary and Barro, for the regression presented in Equation 1, utilize the 1994-1999 and 1999-2004 waves of the World Values Survey. I began my analysis by trying to replicate their result, but on a wider range of data. My work used all waves of the World Values Survey readily available at the time of this analysis. These waves covered 1981-1984, 1989-1993, 1994-1999, 1999-2004, and 2005-2007. The data for this last wave was the first half of all the data that is now available for 2005-2009, meaning that the dataset for this time period is smaller than for other waves.

The World Values Survey samples representative samples from many countries worldwide. A

qualitative analysis of the surveys indicates that most responses were collected in the second year of the wave, though some responses may be from any time period within the years the wave covers. The dataset I used had 257,597 individual responses covering 1079 variables.

I looked at three major variables: belief in hell, belief in heaven, and a variable meant to reflect work ethic. Belief in hell was coded to be 1 if the respondent believed in hell and 0 otherwise. Belief in heaven was coded to be 1 if the respondent believed in heaven and 0 otherwise. Respondents who gave "dont know," "no answer," or "not applicable" to either of these survey questions were dropped from the analysis, as were those missing answers for these two variables. I then determined which individuals believed in heaven and not hell and coded a new variable as 1 if this was true. If this variable was 1, then belief in heaven was coded 0 for that observation to avoid double counting individuals.

To proxy work ethic in a country, I followed the lead of McCleary and Barro (Religion and Economy, 2006). Respondents were given a list of qualities that children can be encouraged to learn at home and asked, "Which, if any, do you consider to be especially important? Please choose up to five." One of these qualities was "hard work." If a respondent considered hard work to be a top five trait, out of 12 traits provided, the response was coded 1. If the respondent answered the question but did not select hard work as a top 5 trait, the response was coded 0. Henceforth, this will be referred to as work ethic, following the approach of McCleary and Barro in accepting this as a good proxy of an underlying cultural value (Religion and Economy, 2006, p. 70). As before, all other observations were dropped. After validating the data for meaningful answers to the questions of interest, I was left with 140,908 observations across 67 countries.

McCleary and Barro make their dataset available from Robert Barros website (Barro, 2003). This dataset was used primarily to determine which countries are or formerly were Communist. Any country that was Communist for a period since 1925 was marked as ex-communist for my analysis. Economic variables at the country level were acquired from The World Banks "World Development Indicators" database. GDP per capita data was gathered for the first two years of each wave, averaged together, and then logged for use in analysis. GDP per capita growth, as a percentage of constant 2005 US dollars (or real GDP per capita growth), was gathered for a

span of three years, starting with the last year of each survey wave, and averaged together. The intent was that this would be somewhat lagged from the bulk of the survey data, reducing concerns about endogeneity. Fertility data and gross capital formation data was also gathered from the same database for the first year of each survey wave. Life expectancy at birth was collected in the same way and inverted for use in my analysis, per McCleary and Barro (Religion and Economy, 2006).

4.2   Combinations of Beliefs and Work Ethic on the Individual Level

I began by looking at the data on the individual response level. I used a logistic regression with the work ethic indicator as the dependent variable. The results are reported in Equation 2.

Equation 2 – Logistic regression for work ethic using individual responses

$$\text{work ethic} = \quad 0.1793 \quad + 0.4757 \text{ (belief in hell)} \quad -0.4045 \text{ (belief in heaven)}$$
$$(0.0099)*** \qquad (0.0164)*** \qquad\qquad (0.0177)***$$

* indicates significance at 10% level; ** significant at 5%; *** significant at 1%

Equation 2 indicates, with the significant coefficients on beliefs, that both belief in hell and belief in heaven, separately, are important in determining an individuals likelihood of holding work ethic as an important value. Since this is a logistic regression, the coefficients are additive and can be interpreted as log odds. This means that they can be converted to probabilities with a simple transformation. These probabilities describe the portion of the dataset that thinks work ethic is important, conditioned on each of the four combinations of beliefs. These proportions are summarized in Table 1 along with the proportion of the dataset that holds that combinations of beliefs.

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Table 1 - Combinations of beliefs and probability work ethic is important

Combination of beliefs	Probability of thinking work ethic is important	Proportion of dataset with combination of beliefs (rounded to nearest integer)
Only hell	0.6581	<1%
Only heaven	0.4439	12%
Heaven and hell	0.5623	58%
Neither heaven nor hell	0.5447	29%

One observation from Table 1 is that there are very few, less than 1000 people in my sample, that believe in hell and not heaven. This is as small as to be treated as 0. That is, the beliefs and resulting values of this population likely have no bearing on macroeconomic outcomes and are generally too small, when spread across countries and time, to yield useful insights. The key insight of Table 1, though, is a nontrivial proportion of people believe only in heaven. This group is worth noting because they have radically different views on work ethic than other combinations of beliefs. There is little difference in the importance of work ethic between those that believe in heaven and hell and those that believe in neither while there is a precipitous drop from about 55% to about 44% in the proportion of people who think work ethic is important among the population that believes only in heaven.

This phenomenon makes sense when viewed through a rational choice framework. If individuals make choices that maximize their utility on earth and after earth, then those that believe they already have maximized their after-life utility, that is they think the only place to go is heaven, turn to maximizing their utility on earth. This likely involves less hard work than an individual who thinks hard work, while it may take away from utility in the present, will improve their chances of going to heaven. The flaw with this explanation is that it does not explain the slightly lower work ethic among those that believe in neither heaven nor hell. However, if we take this non-belief to suggest they are neither religious nor spiritual, then it may make sense for this group to work hard on earth. Work generally allows for consumption. If an individual is not spiritual or religious, it is

possible they may value consumption more than an individual who is, since religion can teach and incentive moderation. In order to obtain this consumption, they need to be productive and work. However, this discussion concerns itself with the sources of beliefs, a topic beyond this paper.

Given the insights of my logistic regression, I did not find it unimaginable that variables for specific combinations of beliefs could be more useful in explaining work ethic as a cultural value than just belief in hell.

4.3 Mimicking McCleary and Barro

Putting this insight about the combination of beliefs aside for a moment, I was interested in whether the results McCleary and Barro arrived at for the association between belief in hell and work ethic could be repeated on a larger dataset. I followed their approach in aggregating the proportion of respondents that held a certain belief or felt work ethic was important and grouping the results by country and then by survey wave. I then ran a regression of work ethic on the same explanatory variables they used, though over more survey years. The result is presented in model 1 in Table 2.

Table 2 Work ethic modeled by various beliefs

	Reflecting Mc-Cleary and Barro (2006, 70)	Adding in belief in only heaven	Adding in survey waves as fixed effects	Removal of ex-communist
belief in hell	-0.0587	-0.1358	-0.1873	-0.1917
	(0.0842)	(0.0828)	(0.0875)**	(0.0843)**
belief in only heaven		-0.6695	-0.6422	-0.6559
		(0.1874)***	(0.1899)***	(0.1759)***
ex-communist	0.0649	0.0098	0.0085	
	(0.0430)	(0.0436)	(0.0428)	
log of GDP per capita	-0.0989	-0.0909	-0.0889	-0.08936
	(0.0163)***	(0.0156)***	(0.0153)***	(0.0151)***
wave 1989-1993			0.2331	0.2343
			(0.0870)***	(0.0864)***
wave 1994-1999			0.1991	0.1992
			(0.0748)***	(0.0744)***
wave 1999-2004			0.2498	0.2495
			(0.0804)***	(0.0800)***
wave 2005-2007			0.2170	0.2151
			(0.1110)***	
constant	1.3635	1.4382	1.2397	1.2504
	(0.1684)***	(0.1610)***	(0.01744)***	(0.1649)***
R^2	0.3298	0.4025	0.4577	0.4575
Adjusted R^2	0.3109	0.3797	0.4148	0.4203

* indicates significance at 10% level; ** significant at 5%; *** significant at 1% Omitted wave is

1981-1984. All numbers are rounded to four decimal places. All had 110 observations. Observations are at

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the country level. Work ethic is proportion of population that thinks hard work is an important value to teach children. Beliefs are as percentage of a countrys population.

Model 1 in Table 2 presents a favorable adjusted R2 and the model is significant at the 1% level. However, my results disagree with McCleary and Barros displayed in Equation 1. The reason for these substantially different results could be numerous. It is possible that McCleary and Barro used other control variables that I did not or they coded variables in a slightly different way. For example, my coefficient on ex-communist reaches fairly far back. So if a country had a communist regime in 1925, the indicator would still be true decades later. I might have also used a different temporal relationship between the survey waves and the GDP per capita data than McCleary and Barro. However, I have general confidence in my model specification because the coefficient on GDP per capita is nearly the same as McCleary and Barros: -0.0989 versus -0.091.

The most important disagreement is in the direction, and significance, of the coefficient on belief in hell. My results suggest that there is no discernible effect of the proportion of the population in a country that believes in hell and the proportion of the country that holds work ethic as an important cultural value. This fails to support the theoretical mechanism outlined above. However, the coefficient is insignificant and thus I find no need for further explanation as to its sign.

4.4 Impact of Combination of Beliefs on Work Ethic

My initial attempt to find support for the mechanism I outlined above should be viewed in the context of my findings about the importance of combinations of beliefs. That is, it is possible that the above specification for the model of afterlife beliefs impacting work ethic omits the beliefs, or combination of beliefs, that actually matter. Referring to Table 1, there are very few people that believe only in hell and not in heaven. Given the similarity, when considering work ethic, between those that believe in heaven and hell and those who believe in neither heaven nor hell, it is not surprising that the inclusion of just one belief yields insignificant results. Given my above findings, adding in a term for the proportion of the population that believes only in heaven though small should have a significant effect in determining the proportion of people that hold work ethic as an important cultural value. The results of this are given by model 2 in Table 2.

The results of this addition of a variable to capture those that believe only in heaven, and who I showed have radically different feelings about worth ethic, has the significant effect I expected. In model 2, any significance on the belief in hell term disappears while the belief only in heaven term becomes significant at the less than 1% level. The R^2 is satisfactory for a model built on vague concepts like beliefs and values, which undoubtedly result in measurement error when attempted to be quantified in a survey across languages and cultural histories. The specific interpretation of these results is that the proportion of the population that holds work ethic as an important variable decreases by about 0.67% for every 1% increase in the proportion of the population that believes only in heaven.

Once again, the sign on belief in hell is negative, opposite the results of McCleary and Barro. However, I ignore that result for now as it is insignificant at any reasonable level of significance.

Model 2 of Table 2, through only two terms, captures the full range of opinions on an afterlife available in the World Values Survey. Since everyone that believes in hell believes in heaven with all but a few exceptions, the term for belief in hell generally captures all those that believe there is an afterlife described by a heaven or hell idea. However, since not everyone that believes in heaven believes in hell, this model also captures that subset of people. The results can be thought of as relative to a country of complete nonbelievers (when both the belief in hell and the belief only in heaven terms would be 0).

I wish to test the robustness of these results. This can be done by adding in dummies for the survey waves. The possible effects that these dummies control for are numerous. For one, though the same question was used in each wave, the accuracy of its translation between years may have differed, as might have the methodology for administering the survey. Alternatively, adding in fixed effects can capture temporal swings between periods that are otherwise hidden, like global economic outlook or the impact of recent scandals on various religions or individuals beliefs. The results of this are reported in model 3 in Table 2, with the coefficients on the survey wave dummies relative to the 1981-1984 wave. The first question when analyzing the results in model 3 of Table 2 is if dummies for the survey waves are needed. The result is clear that they are; the adjusted R^2 increased from 0.3797 to 0.4148 with the addition of the fixed effects while the coefficients on the

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dummies are significant at the 1% level, except in the case of 2005-2007 where the significance of the coefficient is hampered by the smaller sample available from that wave.

The second observation from model 3 in Table 2 is that the term for belief in only heaven is still significant and barely changes. This gives me confidence that my findings around the significance of belief in only heaven on work ethic are robust.

However, this regression also presents an intriguing result that I previously ignored: the sign of the coefficient on belief in hell is negative, and in model 3 it is significant at the 5% level. McCleary and Barro arrive at a positive coefficient and my analysis up until this point suggests that this should have a positive coefficient as well. One explanation is that this is an endogeneity problem. In order to make this argument, one has to believe that work ethic can influence beliefs. This is not unimaginable as it exhibits a desire of individuals to believe in a way consistent with their actions. If someone works very hard, he might reflect on this and decide he needs a reason or explanation for working very hard. If he formerly believed in hell, he may be less likely to believe in hell, or at least less likely to believe he might be going to hell, once he or recognizes how hard he is working. He thus might be properly classified as believing only in heaven after this reflection, but retains a token belief in hell that is reported in the World Values Survey. This endogeneity problem does not have any clear solution as no instruments are readily available to instrument for belief in hell.

In addition, I think individuals are less likely to change the core beliefs they might have grown up with than change their actions to be in line with their beliefs. Literature supports this by suggesting that individuals do not become more or less religious as they grow wealthier, but they just come to relate to religious needs in a different way (Hirschle, 2013, p. 421). If this is the case, a better explanation of this negative coefficient might be a view of these results as relative to nonbelievers. This interpretation says that as people work harder, they come to find meaning in their work and perhaps less in the incentive of hell or heaven as a stick or a carrot. This does not harmonize with my earlier findings about combinations of beliefs and views of work ethic on an individual level. I take solace in the fact that the significant coefficient on belief in hell is not a robust result, appearing in only two of the models in Table 2.

I also note from models 1, 2, and 3 in Table 2 that the coefficient on the ex-communist indicator

is insignificant. I remove it to see if the adjusted R2 increases from this better-specified model. The result is presented as model 4.

Removal of the non-significant term for ex-communist country improved the adjusted R2. Other conclusions remain the same, with a similar and significant coefficient on the proportion of the population that believes only in heaven and the proportion of the population that believes in hell. This latter result still lacks a clear interpretation.

Model 4 is the most powerful model I present in Table 2 for linking beliefs in heaven and hell to the cultural value of work ethic. With an R2 of 0.4575 and an adjusted R2 of 0.4203, the model is strong in explaining work ethic as a cultural value. An increase of 1% in the proportion of the population that believes only in heaven corresponds to a decrease of 0.656% in the proportion of the population that holds work ethic as an important value. Similarly, an increase of 1% in the proportion of the population that believes in hell corresponds to a decrease of 0.192% in the proportion of the population that feels work ethic is an important value. This significant latter observation does not fit with the theories I put forward above for explaining how beliefs, especially those in the afterlife, might impact work ethic. Intriguingly, it also is at odds with what is expected given the logistic regression results in Equation 2.

My conclusion from this final model is that afterlife beliefs are related to the importance of work ethic as a cultural value. I call into question the mechanism behind this relationship. I theorized that if an individual believes in hell and heaven, he or she should be more likely to work hard in an effort to earn a spot in heaven and avoid hell. However, my results suggest an increase in spiritual beliefs about the afterlife relate to less of an emphasis on work ethic. One possible explanation, not tested here, is that individuals are more concerned with salvation being related to formal religious services and thus feel that hard work is less important while time spent in religious contemplation or at religious services is more important. The direction of this causality can also be flipped, introducing a problem of endogeneity, as individuals who work harder shift their beliefs to line up with their actions, maintaining only a token belief in hell and being better classified as believing only in heaven. This endogeneity cannot be readily instrumented. Barring this endogeneity problem, my results suggest a link between beliefs and cultural values, specifically

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combinations of possible beliefs in an afterlife and work ethic.

4.5   Work Ethic and Economic Performance

After establishing a link, albeit of questionable theoretical explanation, between beliefs and work ethic, I turn to the question of whether work ethic matters for economic outcomes. I focus specifically on economic growth in terms of per capita GDP.

Work ethic should impact economic growth. If work ethic is an important value for a culture, that is more people think it is an important value to pass on to children, that culture will work harder than one that does not share this value. That hard work will translate into productivity which will translate into economic growth.

To begin with, I identified five outliers in economic growth and removed them from the dataset. These outliers were three-year economic growth averages above 10.8% or below -5.1% and significantly skewed my work when left in.

With this cleansed dataset, I added in additional variables using guidance from McCleary and Barro (Religion and Economy, 2006, p. 67). They include variables such as the inverse of life expectancy, years of school attainment, openness and trade growth, indicators for democracy, the log of fertility, and the ratio of investment to GDP (McCleary & Barro, 2006, p. 66). Due to constraints on what was available from the World Bank, I use the inverse of life expectancy, the log of fertility, and the gross capital formation as a percent of GDP. I add in a variable for the proportion of the population that thinks hard work is an important cultural value. Model 1 in Table 3 presents the results.

Table 3 Percentage growth in GDP per capita modeled by work ethic

	Proportion of population that thinks hard work is important to teach children used for work ethic	Belief in hell and only heaven used as instruments for work ethic
work ethic	1.30613 (1.3296)	0.2300 (5.041)*
log of GDP per capita	-0.9894 (0.2605)***	-0.0782 (0.6007)
log of fertility	-3.0684 (0.8359)***	-0.2863 (1.9347)
capital formation (investment)	-0.0494 (0.0399)	-0.0311 (0.0491)
inverse of life expectancy at birth	-84.1969 (194.4104)	-562.5000 (194.4104)
constant	15.4434 (3.9782)***	7.4717 (6.5002)
R2	0.327	(Not applicable)
Adjusted R2	0.2912	(Not applicable)

* indicates significance at 10% level; ** significant at 5%; *** significant at 1% All numbers are rounded to four decimal places. Both models had 100 observations.

Model 1 in Table 3 is significant at the 1% level with a respectable R2, indicating its explanatory power. The added term for hard work does not pick up a significant coefficient, though. This fails to support the theorized link between cultural values and economic outcomes, particularly work ethic and economic growth.

There may be a problem with the simple model specified in model 1, though. The two-way interaction between work ethic and economic growth is not hard to imagine. I explained how work ethic might drive economic growth, but it is possible that economic growth influences work ethic. As an economy grows, individual businesses see an increase in business. This increase in business prompts employees to work harder to keep up until new employees can be hired, a process that takes time. To remain consistent with their actions, employees might tend to think hard work is an important cultural value. Alternatively, if a countrys growth is due to factors not dependent on the labor force, like an increasing demand for a rare resource the country possesses, then economic growth will be disconnected from hard work. Individuals may feel a lack of need to work hard, thinking that the economy will grow regardless of their efforts. In terms of my regression, this describes an endogeneity problem.

I try to address this endogeneity problem with instrumental variables, namely the beliefs in an afterlife examined above. It is hard to make an argument for how beliefs might be influenced by economic growth, though if beliefs come from attendance at religious services and attendance at religious services declines due to economic growth as the secularization hypothesis suggests, there might be a two-way interaction. This two-way interaction would take place over many years, though probably decades. Different beliefs in an afterlife tend to be core to religions and thus the first thing religious individuals are taught, usually when they are growing up. Thus, they are likely among the last beliefs an individual would let go off as they drift away from religion. To imagine that these beliefs are quickly changed on a mass scale due to an already slow decline in attendance due to economic growth does not make sense, especially given that I look at economic growth data that lags very closely behind the survey data.

The second interpretation of an instrumental variables approach in this context is that it captures the portion of work ethic as a cultural value that is attributable to afterlife beliefs. This is an approach and interpretation that has precedence in literature (Guiso, Sapienza, & Zingales, *Does Culture Affect Economic Outcomes?*, 2006, p. 35). The results of my instrumental variables technique, using the proportion of the population that believes in hell and the proportion that believes only in heaven as instruments, are given by model 2 in Table 3.

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The results of the instrumental variable technique in model 2 of Table 3 are fairly strong, taking away the significance of the coefficients on variables that are traditionally important in modeling economic growth. This model suggests that the only significant coefficient for explaining economic growth is the portion of work ethic that can be explained by beliefs in the afterlife. That is, an increase of 1% in the proportion of the population that thinks work ethic is an important value is attributable to a 0.0992 percentage point increase in GDP per capita growth. Since this was instrumented for by spiritual beliefs in the afterlife, this result refers specifically to the portion of work ethic attributable to such beliefs.

The diagnostics for the instrumental variables, presented in Table 4, suggest that I identified a problem of endogeneity and approached it properly. The models above discuss how work ethic can be modeled with afterlife beliefs; this is analogous to the weak instruments test in Table 4.The standard test statistic for the significance of an instrumental variables regression is the Wu-Hausman statistic. A Wu-Hausman test has as its null hypothesis that the original estimator, here the coefficient on work ethic in model 1 of Table 3, is consistent by comparing it to the output of an instrumental variables technique. If the null hypothesis is rejected, there is evidence it is inconsistent; said differently, there is evidence that an instrumental variables approach was needed. Here, I reject the null hypothesis at the 10% level of significance. This is confirmed by a Wald Test. Here, the null hypothesis is that the original variable, work ethic, is exogenous. I reject this at any meaningful level of significance and conclude that an instrumental variables approach was valid.

Table 4 Instrumental Variables Diagnostics

	Degrees of freedom 1	Degrees of freedom 2	Statistic	P-value
Weak instruments	3	93	101.996	$2*10^{-16}$***
belief in only heaven	2	92	2.881	0.0611*
ex-communist	5	94	7.04	$1.253*10^{-5}$***

* indicates significance at 10% level; ** significant at 5%; *** significant at 1%

Given the strength of this result, it is important to check to see that the instruments are not correlated with the error terms from model 1 in Table 3, a requirement of instruments. I regressed the residuals from model 1 on the proportion of the population that believes in hell and only in

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heaven. The results are given by Equation 3.

Equation 3 – Test of instruments by regressing residuals of non-instrumented growth model on the instruments

$$residuals = \quad 0.3083 \quad + 0.2744 \text{ (belief in hell)} \quad -3.6818 \text{ (belief in only heaven)}$$

$$(0.6792) \qquad\qquad (0.8758) \qquad\qquad\qquad (2.0508)*$$

* indicates significance at 10% level; ** significant at 5%; *** significant at 1%
R^2=0.0439   F-statistic: 2.227 (2, 97 DF), p-value: 0.1133

Equation 3 Test of instruments by regressing residuals of non-instrumented growth model on the instruments

The results in Equation 3 give some cause for concern in that the proportion of the population that believes only in heaven has a significant coefficient at the 10% level. However, my instruments explain only about 4% of the variation in the residuals from model 1 in Table 3. Further, the regression model is not significant given a p-value of 0.1133; this test of model significance fails to reject the null hypothesis that all of the non-constant coefficients in the regression are zero. With this check of the instruments and the diagnostic tests discussed earlier, I conclude that the instrumental variables approach is applicable in instrumenting work ethic when trying to model economic growth.

With this validation of the instrumental variables technique, I return to the results of model 2 in Table 3. I am skeptical of this output given that the variables I used as controls have a vibrant history of use in modeling economic growth. My model was also certainly underspecified and should have included measures of educational achievement, democratic status, and openness. Regardless, my results suggest that work ethic, as explained by beliefs, is influential in determining economic growth.

4.6   Data Analysis Caveats

The above results are, ultimately, based on survey data. Any attempt to quantify abstract cultural phenomena is going to be met with difficulties. A cross-country survey compounds these difficulties by introducing problems of translation and understanding of religious or spiritual concepts. A

specific concern is the Westernized concept of heaven and hell as good and bad locations a soul ends up in for eternity. Eastern religions have concepts of an afterlife of sorts, but they may be sufficiently far from the Western concept that the survey questions I use inconsistently measure analogous beliefs.

I would also have liked to validate the above findings with results from similar World Values Survey questions or other sources. There are questions in the World Values Survey that could be used to validate the spiritual beliefs I considered and their impact on work ethic; for example, there is a question that asks peoples perception of hard work leading to a better quality of life. Another question asks if work is important in life. These same questions could also be used to validate the connection between work ethic as a function of beliefs and economic outcomes. There may also be other spiritual beliefs that relate to work ethic that can be pulled from the World Values Survey.

5 Conclusion

My hypothesized connection between spiritual beliefs and cultural values and between cultural values and economic outcomes has evidence from World Values Survey data focusing on belief in hell, belief only in heaven, and the importance of hard work as a quality to teach children.

Starting with an expansion on the work done by McCleary and Barro (Religion and Economy, 2006), I examined the importance of various afterlife beliefs in determining work ethic. I found that combinations of beliefs, namely a belief in heaven and not hell, provide a better explanation of work ethic on the country level. Specifically, a 1% increase in the proportion of the population that believes in hell is related to a 0.19% decrease in the proportion of the population that thinks work ethic is an important cultural value. For those that believe only in heaven, a 1% increase in believers corresponds to a 0.66% decrease in the proportion of people that think work ethic is an important cultural value.

I then turned my attention towards the connection between work ethics as a cultural value and economic growth as an economic outcome. Looking directly at work ethic has endogeneity problems, so I instrumented for it with belief in heaven and belief in hell per my earlier analysis.

This captures work ethic as a function of beliefs when modeling economic growth. This approach yielded a significant coefficient on work ethic that suggests a 1% increase in the proportion of the population that holds work ethic as an important value drives a 0.099% increase in real GDP per capita growth. Attempts to validate the instruments and the approach suggest that beliefs in hell and only in heaven were sufficient instruments and an instrumental variables technique was valuable.

The overarching result of this data analysis is support for the hypothesized mechanism that beliefs influence cultural values which influence economic outcomes. This mechanism means that beliefs influence economic outcomes, potentially in a very substantial way.

To relate my results to existing research and hypotheses, I find evidence for a somewhat Weberian view of economic outcomes. I say somewhat because the source of spiritual beliefs, like those in different versions of an afterlife, is not analyzed in my work. Rather, my analysis suggests that more time and attention should be put into looking at specific spiritual beliefs, their relation to each other, and how they impact cultural values. Further work should be done on various cultural values and how they impact economic outcomes, though some literature on this exists for cultural values like trust or thrift. Attempting to look at how religious denominations relate directly to economic performance is putting the cart before the horse.

Acknowledgement

References

[1] Ali, A., & Al-Owaihan, A. (2008). Islamic work ethic: a critical review. *Cross Cultural Management: An International Journal, 15*(1), 5-19.

[2] Azzi, C., & Ehrenberg, R. (1975). Household Allocation of Time and Church Attendance. *Journal of Political Economy, 83*(1), 27-56.

[3] Barro, R. (2003). *Religion Adherence Data.* Retrieved from http://scholar.harvard.edu/barro/publications/religion-adherence-data,

[4] Blum, U., & Dudley, L. (2001). Religion and economic growth: was Weber right? *Journal of Evolutionary Economics, 11*, 207-240.

[5] Guiso, L., Sapienza, P., & Zingales, L. (2003). *People's opium? Religion and economic attitudes. Journal of Monetary Economics, 50*, 225-282.

[6] Guiso, L., Sapienza, P., & Zingales, L. (2006). *Does Culture Affect Economic Outcomes? Journal of Economic Perspectives, 20*(2), 23-48.

[7] Hirschle, J. (2013). "Secularization of Consciousness" or Alternative Opportunities? The Impact of Economic Growth on Religious Belief and Practice in 13 European Countries. *Journal for the Scientific Study of Religion, 52*(2), 410-424.

[8] Knack, S. (2001). *Trust, associational life, and economic performance.* Retrieved February 25, 2014, from Munich Personal RePEc Archive: http://mpra.ub.uni-muenchen.de/27247/

[9] Knack, S., & Keefer, P. (1997). *Does Social Capital Have an Economic Payoff? A Cross-Country Investigation. The Quarterly Journal of Economics, 112*(4), 1251-1288.

[10] Landes, D. (1999). *The Weatlhy and Poverty of Nations.* New York: W.W. Norton.

[11] McCleary, R., & Barro, R. (2006). Religion and Economy. *The Journal of Economic Perspectives, 20*(2), 49-72.

[12] McMurray, A., & Scott, D. (2013). Work Value Ethic, GNP Per Capita and Country of Birth Relationships. *Journal of Business Ethics, 116*, 655-666.

[13] Noland, M. (2005). Religion and Economic Performance. *World Development, 33*(8), 1215-1232.

[14] Pew Research Center. (2012, October 9). *Religion and the Unaffiliated.* Retrieved April 30, 2014, from http://www.pewforum.org/2012/10/09/nones-on-the-rise-religion/

[15] Pryor, F. (2005). National Values and Economic Growth. *American Journal of Economics and Sociology, 64*(2), 451-483.

[16] The World Bank. (2014). *World Development Indicators.* Retrieved from The World Bank: http://data.worldbank.org/data-catalog/world-development-indicators

[17] World Values Survey Association. (2014). *Longitudinal Data.* Retrieved January 23, 2014, from World Values Survey: http://www.worldvaluessurvey.org/WVSDocumentationWVL.jsp

[18] Zak, P., & Knack, S. (2001). Trust and Growth. *The Economic Journal, 111,* 295-321.