The Role of Altruism and Fatalism in Economic Development

by

Colin A. Moore

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This Thesis has been approved on the dates shown below

Paul N. Wilson
Professors Name

June 12, 2015
Date

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ABSTRACT

This thesis empirically tests the hypothesis that countries with cultures that are inherently less fatalistic and more altruistic generally outperform countries with a culture defined by fate and extreme self-centeredness. Data was taken from the most recent World Values Survey (WVS) conducted in 2010 thru 2013. The values incorporated in this study pertain to both the level of personal control an individual believes they have over her own life outcomes, and also the extent to which an individual identifies with the belief that it is important to "do good for society." The analysis incorporates OLS, 2SLS, and 3SLS in order to estimate the effects of *fatalism* and *altruism* on both the level of GDP per capita in 2010, and the Human Development Index estimate for 2010. After controlling for factors related to geography, neoclassical growth, and institutions, results from this analysis imply that cultural variables, such as *fatalism* and *altruism*, are determining factors in economic development.

Chapter 1: Introduction

1.1 Overview

In the field of development economics there has most certainly been extensive research devoted towards examining the extent to which variables such as investment, geography, and institutions have determined a country's level of economic and human development. Despite the numerous critical contributions that have been made from research of this nature, there remains a significant void in the literature that attempts to explain a country's level of development through the utilization of cultural variables. Undoubtedly the employment of cultural variables in exploring economic development has been substantially hindered by the debate surrounding the definition of culture, the deficiency of cultural data, and the challenges associated with the measurement and evaluation of "culture" within different countries.

Billions of dollars are spent annually on development aid throughout the world in hopes of achieving, among other objectives, the United Nations Millennium Goals. The United Nations Millennium Campaign was established in 2002 in order to achieve the United Nations Millennium Goals by the year 2015. The campaign has been developed so as to stimulate interest, and motivate action from a wide range of individuals and organizations residing in countries across the globe. However, despite the concern and action from individuals and various interests groups devoted to eradicating extreme poverty, a large portion of the world's population continues to live in impoverished conditions. Could an understanding of the culture that exists within a country help strengthen the results of economic development projects throughout the world?

1.2 The United Nation's Millennium Development Goals Report (2014)

1.2.1 Global Poverty:

According to the United Nation's Millennium Development Goals Report in 2014[1] (United Nations, 2014), almost half of the population that was living in developing countries lived off of less than $1.25 a day in 1990. However, by 2010 the proportion of people living on less than $1.25 a day had fallen to 22 percent. This astounding benchmark of halving the number of people earning an income of less than $1 day occurred 5 years ahead of the Millennium Development Goals schedule. Additionally, the number of people who were living in conditions of extreme poverty fell by approximately 33 percent between the years of 1990 to 2010. These results are certainly a positive sign that the international community's effort to successfully target extreme poverty is bearing significant outcomes.

However, the pattern of poverty reduction is not entirely consistent among all developing countries. While Eastern Asia and South-Eastern Asia as regions have both successfully reduced the number of people living in extreme poverty by half, both sub-Saharan Africa and Southern Asia are still behind schedule. The proportion of people living on less than $1.25 a day in sub-Saharan Africa and Southern Asia fell by 14 and 41 percent respectively between the years 1990 and 2010. Clearly, sub-Saharan Africa is lagging far behind the rest of the regions in the world, and is more than likely to fall well short of the 2015 target of halving the number of people living in conditions of in extreme poverty.

According to the 2014 report, India alone accounts for approximately 396 million of the 1.2 billion people currently living in extreme poverty. Following this staggering number of people confronted with extreme poverty in India, China accounts for 156 million, Nigeria

[1] Downloadable at http://www.un.org/millenniumgoals/reports.shtml

accounts for 108 million, and both Bangladesh and the Democratic Republic of Congo account for 60 million respectively. These five countries (located within the regions of sub-Saharan African and Southern Asia) combine for 780 million of the 1.2 billion people (65 percent) throughout the world living in extreme poverty.

Further complicating the matter, slow global economic growth in 2013 hit developing country labor markets hard, and subsequently stunted the prospect for further reducing the prevalence of low-quality employment, or the "vulnerable employment-rate." In 2013, the vulnerable employment-rate in developing countries was estimated to be 56 percent, while in developed countries the vulnerable employment-rate was only 10 percent. During the period of 2003-2008, the decline in the vulnerable employment-rate had been 4 percentage points. However, given the slow global economic growth associated with global recession, the decline in the vulnerable employment-rate was slowed to 2.8 percentage points during the period of 2008-2013.

According to the 2014 report, when the vulnerable employment-rate is significantly high, it indicates that there exists a substantial prevalence of "informal working arrangements," which effectively lead to inadequate social safety nets, lower incomes, and grueling working conditions for those who find themselves in such arrangements. Further complicating the matter of limited job quality improvement, during the time period of 2008-2013, the average annual labor productivity growth rates in developing countries fell from 5.6 percent to 4.0 percent.

1.2.2 Global Education:

There has certainly been a significant improvement in reducing the number of children who for a multitude of reasons remain out of primary school. However, in 2012 it

was estimated that approximately 58 million children could still be found outside of primary school. Sub-Saharan Africa has experienced considerable progress in increasing the number of children who have enrolled in primary school, yet they currently face mounting difficulties with rapid population growth and escalating armed conflicts. There are reportedly 35 percent more school-aged children in sub-Saharan Africa today than compared to the year 2000, and with mounting conflict in the region more and more children are being kept from school. According to the 2014 report, while the number of children who have enrolled in primary school has increased from 62 million in 1990 to 149 million in 2012, there remains an estimated 33 million potential students (56 percent of whom are girls) who have not attended school.

The most common reasons for why children remain outside of school are poverty, gender inequality, and remote geographic locations (rural households). According to the 2014 report, comparing children from the poorest 20 percent of households to children from the richest 20 percent of households indicates that children from the poorest households are more than three times as likely to be outside of school. Within these households, it was discovered that girls were more likely than boys to be absent from school. Furthermore, potential students who are located in rural areas were twice as likely to be absent from school than potential students who reside in urban areas. Lastly, children with disabilities were at considerable risk of absenteeism given that such students require an adapted curriculum, which is something that is substantially taxing to provide in developing countries.

While curtailing the level of absenteeism is of critical importance, graduation is the ultimate goal for these children. During the period of 2000 to 2011, the primary education

dropout rate was 27 percent, as only a reported 73 percent of students finished their final requirements. The primary school dropout rates in developing countries are largely driven by children who are either over the age for their grade placement, have to travel long distances to attend their schools, or are members of a household trapped in poverty and forced to become income generators for the family.

As a result of these difficulties in primary education, the 2014 report estimates that globally in 2012 there were approximately 781 million adults and 126 million children who were deficient in even the most basic reading and writing skills. Of this population of total illiterate individuals, women accounted for more than 60 percent.

1.2.3. Child Mortality Rates:

Globally, the 1990 under-five mortality rate of 90 deaths per thousand live births was nearly been cut in half by the year 2012, where the rate had dropped to 48 deaths per thousand live births. However, like many of the other Millennial Development Goals that have been discussed thus far, there are still regions of the world that continue to struggle with child mortality rates. While, all other regions in the world have cut their mortality rates in half, both sub-Saharan Africa and Oceania have reduced their under-five mortality rates by 44 percent and 26 percent respectively. As a result, the 2014 reports estimates that the goal of globally reducing the child mortality rate by two-thirds will most likely be achieved in 2028, which is 13 years behind schedule.

Sadly the majority of under-five deaths are largely preventable given that "most of the 6.6 million deaths in children under age five in 2012 were from leading infectious diseases such as pneumonia, diarrhea and malaria" (United Nations, p.21). Furthermore, an estimated 2.9 million deaths took place during the first 27 days of the child's life, of which

many could have been potentially avoided had there been more maternal care provided during the child's first 24 hours of life. Of the total 6.6 million under-five deaths in 2012, 3.2 million of them occurred in sub-Saharan Africa, where one out of ten children die before the age of five, and the mortality rate is 16 times the average of developed regions. Furthermore, sub-Saharan Africa has the highest discrepancy of child mortality among income levels.

1.3 Motivation

This project begins with the argument that it is imperative for the success of economic development that there be a concrete understanding of the cultures that exist within an under developed country. It is also important to be aware of how the existing culture influences either the success or failure of development aid. If culture is avoided, or even misunderstood, a substantial portion of the resources devoted to development are poorly utilized. Too often well-intentioned development projects fail to achieve meaningful long-term change in the lives of those that the project was designed to help (Kottak, 1990).

Many times these unsuccessful projects fail to meet their goals because the agencies that implement them either fail to take into account whether or not the project design is appropriate for the environment that it is intended for, or they believe that what has worked once in one location is likely to work again in another location. However, given the limited resources available for development projects, surely those who design and implement projects ought to take into consideration the likelihood that the strategies they ultimately decide upon may fail to achieve long-term success. Failure could very well stem from the fact that many of the development projects that have been attempted appear to the community adopting them to be both foreign, and mandated with a top down

philosophy. These failures could perhaps be avoided if those who construct development projects not only understand the cultural setting they plan to enter, but also if they work closely with the people within the communities they intend to serve. If development organizations adopt a more inclusive approach, they may be able to better ensure that the methods they select are aligned with the current cultural practices in place within the community.

Very little empirical work in field of culture and economic development ha been conducted by economists, and therefore there are very few blueprints that would help guide the process of designing economic development projects. Previous empirical research has largely ignored cultural components and subsequently focused upon the contributing roles that (i) institutions, (ii) investment and human capital (neoclassical growth models), and (iii) geography have had in explaining economic development. For the purpose of this introduction, I will illustrate and highlight some of the main contributing factors that each of these three potential explanations for development have played in the expanisve literature as it pertains to economic and human development, and then subsequently return to the discussion pertaining to potential cultural explanations.

1.4 Geographical, Neoclassical Growth Model, and Institutional Explanations

1.4.1 Geography:

Geography plays an intricate part in a country's potential for economic growth by determining the type, initial stock, and accessibility of natural resources that can be harvested by a country (Briguglio, 1995; Diamond, 1997; Gallup, and Sachs, 2000; Ram, 1997; and, Sachs, 1995). Geography also imposes its influence on economic growth by determining the extent to which countries have access to long distance trade (landlocked

countries are less likely to have extensive trading partners), and by exacerbating the prevalence and persistence of not only deadly diseases such as malaria, but parasites that destroy crops, or limit the success of agriculture.

It is generally true that a substantial stock of a high valued natural resources is an immense asset for pursuing economic growth, however, some countries with such an endowment of natural resources tend to get stuck in a web of their own undoing (natural resource curse). While heavily relying on the ease of extraction, and the "steady flow" of revenues that natural resource abundance brings, these countries neglect developing other sectors of the economy and essentially drain themselves of future growth potential. Much like a country's rate of savings, natural resources are pitted in a struggle between current and future social net benefits that often times leads to non-optimal outcomes (Sachs and Warner, 1995).

Furthermore, geography can determine the number of trading partners that a country may realistically engage with. Landlocked countries are largely dependent upon trade with their immediate neighbors, who may also be in less-than-ideal geographic locations. Countries with greater access to coastline have access to ports, and thus have the potential to trade with a more diverse group of countries and at greater distances (Gallup and Sachs, 1999; and Radelet and Sachs, 1998). The potential for disruption to trade should also lessen when countries have a greater number of trading partners with diverse backgrounds; however, disruptions increase when a country is located in a politically unstable region (Ades, 1997).

Beyond impacting the extent to which a country has access to trade, geography can also impact a country's ability to effectively and efficiently produce a variety of goods for

consumption. Countries in tropical areas continuously struggle with surpassing the economic challenges associated with the prevalence of deadly diseases such malaria and crop damaging parasites (Diamond, 1997; Briguglio, 1995; Gallup and Sachs, 2000; Ram, 1997). As a result of diseases such as malaria, and their ability to persist as a constant threat to the health of the potential labor force, productivity in many tropical climate countries can be significantly hindered. Sick individuals lead to greater absenteeism at work, which in turn increases the likelihood that a family will remain trapped in poverty. This perpetual state of poverty may lead to a greater dependence upon children to become income generators, which leads to greater absenteeism at school (children may also be absent from school because they too are sick), which then leads to a deficiency in a country's stock of human capital. The cycle is most certainly vicious, and overtime it can significantly disrupt a country's overall productivity, and its ability to invest in the sectors that would lead to economic growth and human development.

1.4.2. Neoclassical Growth Model:

Neoclassical growth models play an intricate role in development economics and have had a multifaceted history. Various contributing authors, whose work has helped future research focus on a well-established set of explanatory variables, have made periodic improvements and amendments to the existing neoclassical growth models. While it is not the intent of this project to duplicate, or incorporate the sophisticated models that exist within the literature, it is certainly important to pay heed to the critical explanatory variables that these models incorporate in their analysis.

Neoclassical growth models have devoted significant attention to illustrating the specific effects that variables such as the savings ratio, the capital-output ratio, the growth

of the labor market, physical and human capital accumulation, and investment (Barro, 1991) have on economic growth (Solow, 1956; and, Barrow, 1991). A country's rate of savings is paramount to the level of growth that it experiences, given that what is saved in the current period can be devoted to future growth through investment.

The accumulation of physical (machinery and infrastructure) and human (labor skills) capital is essential for promoting growth in a country, and has a significant effect on the total productivity of the factors incorporated in the production process (Barro, 1991; Porter, 2000; and, Solow, 1956). There is little argument against the notion that modern technology is vastly more efficient than antiquated tools, and that having a labor force that is equipped with the knowledge of not only how to adapt new technologies to the production process, but also how to improve upon them, is far more useful in the production process than a labor force whose skills are rooted in the use of outdated tools (Diamond, 1997; Landes, 1998, 2000; and, Porter, 2000). Therefore, not surprisingly, the initial stock of the educated labor force that exists within a country has been shown to play an intricate role in the economic growth trajectories of countries. Higher fertility rates have been shown to have a negative effect on a countries ability to grow economically, as higher fertility rates are associated with the opportunity costs of raising children. Therefore fertility rates have been used as a proxy for human capital and economic productivity, as the trade off between raising children and working indicates the value of time.

Furthermore, as human capital expands and technologies are able to be improved upon, the cost of production for many of these technologies may in fact be significantly lowered in the process, and thus further the course of technological advancement into the future. This can be seen in the formation of agglomerations, or centralized hubs of

specialized industries (Porter, 2000). Agglomerations similar to Silicon Valley in California continue to emerge as countries become more specialized in particular industries due to their competitive advantages over others.

Partly (perhaps even entirely) due to the type of institutions and governance that exist within a country, foreign entities, such as international corporations are constantly exploring new avenues to increase their return on investment and therefore represent a considerable source of economic growth for countries that are capable of attracting foreign direct investment (FDI) (Busse and Hefeker, 2007). Again, a country's ability to accumulate capital, both physical and human, is pivotal component in determining the amount of FDI the country ultimately receives.

1.4.3. Institutions:

Lastly, institutions can largely be defined as the rules that govern the way that individuals are able to interact, within a country or economy. Institutions help establish a code of what is deemed to be appropriate behavior, and clearly identify the ramifications for any deviation from what has been formally established. "Institutional constraints include both what individuals are prohibited from doing and, sometimes, under what conditions some individuals are permitted to undertake certain activities … they therefore are the framework within which human interaction takes place … they consist of formal written rules as well as typically unwritten codes of conduct that underlie and supplement formal rules" (North, 1979, p. 4).

Institutions help to not only clearly demarcate what is to be expected from individual citizens in order to have standing within a society, but institutions also establish what individual citizens can expect from those in political and bureaucratic offices (North,

1979; Acemoglu, Johnson, and Robinson, 2002). “The evolution of polities from single absolute rulers to democratic governments is typically conceived as a move toward greater political efficiency. In the sense that democratic government gives a greater and greater percentage of the populace access to the political decision-making process, eliminates the capricious capacity of a ruler to confiscate wealth, and develops third-party enforcement of contracts with an independent judiciary,” (North, 1979, p. 51).

Institutions that have been well defined – or appropriately designed – generally contribute positively to economic development by both inducing individuals to invest by providing clean incentives, and by facilitating an environment that is conducive to the creation of essential goods and services (Acemoglu, Johnson, Robinson, 2002; Busse and Hefejer, 2007; Nabli and Nugent, 1989; and, North, 1979). Investment is enhanced in countries whose institutions are designed (and implemented) such that private property rights are well established, and therefore protected against expropriation by individuals and the government. Property rights can be considered to be well defined when the “property rights are an instrument of society and derive their significance from the fact that they help” an individual “form those expectations which he can reasonably hold in his dealings with others,” (Demsetz, 1967, p. 347).

Additionally, institutions can be conducive to investment if they help curtail corruption, if they help foster an efficient regulatory environment where laws are not arbitrarily designed and are easily understood, and if they induce an environment of checks and balances on power (Tanzi, 1998). It is the responsibility of any government to establish an environment governed by laws that encourage firms to make long-term strategically

oriented investments to enhance productivity (Porter, 2000). Countries that have better institutions are also more likely to be involved in trade (Dollar and Kraay, 2003).

1.5 Potential Cultural Explanations

Only recently has there been a growing interest in exploring the role of culture in economic development. One of the major contributors to the discussion of culture, and its role in economic development, has been Lawrence E. Harrison. Primarily, Harrison has discussed the role of culture in a series of books through a case study and historical documentation lens. In general, the role of culture in economic development has largely been ignored by economists. The neglect of culture in the empirical economic development literature could be partly attributed to the fact that the study of culture is not only a hotly debated and controversial topic, but that economists have also struggled with being able to quantify culture.

There are most certainly a wide variety of components that define our understanding of "culture," however, for the purpose of my research I will narrow the definition of culture to two specific elements: altruism and fatalism. In *The Central Liberal Truth*, Harrison hypothesizes that (1) countries with a population that maintains a healthy optimistic perspective regarding the amount of control they have over their lives tend to do better economically than those who believe that their life outcomes are determined by either luck or fate, and (2) countries that have a population driven by ethical morals similar to those prescribed by the "Golden Rule" generally do better economically relative to those countries where individuals do not share such an ethical code of conduct (Harrison, 2006).

These two hypotheses lend themselves to an interesting aspect of economic development research that has been largely ignored in the literature. Previous research has

been largely focused upon examining the contributing roles that institutions, investment (neoclassical growth models), and geography have had on human development, and have generally allowed culture to be observed in their respective error terms. However, with a growing interest in how culture can be defined and subsequently measured, greater attention can be made to exploring the potential avenues in which culture affects economic development.

Altruism introduces the concept of living a life for reasons that extend beyond enhancing individual prosperity. However, that is not to argue that altruism cannot the increase an individuals' utility (level of "happiness") through the enhanced satisfaction that is garnered from the realization that an individual's actions has led to an improvement in the life outcomes of others (Gowdy, 2002). If viewed from this perspective, a developing or underdeveloped country that exhibits altruistic characteristics could very well bolster living standards for individuals who reside in impoverished conditions. If an individual actively demonstrates altruistic behavior, she is "likely to live by a reasonably rigorous ethical code; honor lesser virtues; abide by the laws; identify with the broader society; form social capital," (Harrison, 2006, p. 55).

Fatalism, on the other hand introduces the notion of destiny (life outcome) and whether or not an individual's position in life is a function of her own actions. Therefore, a fatalistic culture – where an individual believes that her lot in life is entirely outside the realm of their own control - provides a disincentive for the individual to attempt to change their standard of living, and can therefore cement an individual's low standard of living. If an individual believes that the actions that she takes can positively alter her life outcomes, then she is more likely to "focus on the future; see the world in positive-sum terms; attach a

high priority to education; believe in the work ethic; save; become entrepreneurial …" (Harrison, 2006, p. 55).

Taken together, the "stock" of altruistic and fatalistic (lack there of) cultural traits that are present in a society could potentially promote improvements in human development within countries where the necessary services (or institutions) that contribute positively to the overall standard of living may be deficient. According to Harrison (2006), there are four potential avenues in which culture can either be classified as "progress-prone"(prosperous), or "progress resistant" (less prosperous). These four possible channels are: worldview, values and virtues, economic behavior, and social behavior. I will discuss each channel in light of this current research effort.

Worldview consists of subcategories for religion, destiny (fatalism), time orientation, wealth, and knowledge. Religion can be a powerful driving force in building and nurturing a culture that is grounded in ethical behavior (among other positive qualities), and in establishing a work ethic that reverberates across generations (e.g. the Protestant work ethic). For example, "Protestantism of the sort found in the US encouraged commerce by promoting networks of trust among the members of each sect. Early Protestantism enjoined its members to behave morally not just towards fellow believers, … but towards all human beings" (Fukuyama, 2001, p. 3133).

Both destiny and time orientation encompass the notion of fatalism, and is critical for individual investment in the future. Individuals who are of the belief that they are unable to change their future are naturally drawn to consider only the present time, and thus seldom consider the future ramifications of their present decision processes. Harrison argues that when individuals are culturally oriented towards the future, they are able to

acknowledge the opportunity for change and progress, while those who dwell in the present are less likely to save and plan for the future. Furthermore, Harrison argues that for cultures that are not future oriented, the efficient use of time and punctuality are not of critical importance (Harrison, 2006).

The prospect of accumulating wealth is a cultural trait that facilitates a mindset that counters the notion of a zero-sum game. A zero-sum game can be thought of as worldview that finds credence in the notion that someone's gain is another person's loss. Harrison argues that a zero-sum game, or worldview, is a consistent negative quality that exists within peasant societies. The belief within these societies is that there is only a finite amount of desirable possessions, or, "good things" in the world, and that access to them is generally outside their reach.

Lastly, a society's view towards knowledge impacts human development. Knowledge is the foundation for which individuals and societies increase productivity, enhance competition, and lead to the design of institutions that govern the way individuals interact with one another. If a society does not respect facts, according to Harrison, it will be severely hindered in the areas mentioned above.

Values/Virtues encompass an ethical code, the lesser virtues (explained below), and education. A rigorous ethical code can serve as the foundation for the formal institutions (rules that govern the way society interacts) that are ultimately designed and implemented. The ethical code of conduct that permeates through society may engender an environment of mutual trust and respect for individuals with whom another individual may or may not have any prior knowledge of. There are undoubtedly a great deal of profound human

conditions that allow for the development of a generalized form of ethical behavior, but one such human condition is the ability to identify with others (Platteau, 1994b).

To be able to see one's self in the eyes of another person, and to subsequently recognize that fundamentally the other individual generally hopes for the same things, is surely a quality that deters an individual from inflicting harm upon another person (The Golden Rule). Furthermore, individuals seek to be loved and respected, and thus any behavior that would limit the way they are perceived could very well serve as a deterring factor when people are presented with an opportunity to take advantage of someone (Platteau, 1994b).

L*esser virtues* consist of a job well done, tidiness, courtesy, and punctuality. Something as simple as the cultural adherence to punctuality is a quality that is practiced in each of the top 15 countries on the World Economic Forum's competitive rankings (Harrison, 2006). Punctuality is potentially not only a form of the efficient use of time, but punctuality could also be thought of a measure of respect towards others, as it acknowledges the opportunity costs that are accumulated through tardiness. In addition to the lesser virtues, countries that hold the belief that education should be universal, and not limited to only a specific gender or sector of society tend to perform better on the global economic stage. Again, this belief that everyone should be able to seek an education if they so choose is a form of general morality. This cultural norm acknowledges that we are all an equally important component in the movement towards becoming a more productive society.

Economic Behavior encompasses work/achievement, frugality, entrepreneurship, risk propensity, competition, innovation, and advancement. Harrison (2006) argues that

cultures that have adopted the belief that one of the virtues of life is that you are given the ability to work are generally more advanced economically than those cultures that believe in order to live, you have to work, or that work is a task left solely for the poor. Furthermore, cultures that generally save (frugality) and invest (entrepreneurship) what they earn have greater income equality and subsequently less envy, whereas cultures that do not emphasize the view that everyone should save and invest, experience much more envy and limited savings (generally, saving is largely done by the rich) as a result.

Furthermore, prosperous cultures exhibit a moderate amount of propensity to risk, as no investment for the betterment of the future is without the potential for failure. Less prosperous cultures on the other hand, are very risk averse, and subsequently do not invest or plan for the future because they are generally fatalistic and believe that their lot in life has already been pre-determined. Progress-prone cultures are also generally open to competition, and open to the possibilities that are presented by constant innovation, while progress resistant cultures view competition as sign of aggression and privilege, and are very weary of any new innovation. Lastly, prosperous cultures believe that their advancement in life is brought upon by merit and social networking, while less prosperous cultures believe that advancement can only come from within the family, or close ties to the boss or "patron."

Social Behavior includes rule of law and corruption, the radius of identification and trust, the family, association (social capital), the individual/the group, authority, the role of elites, the church-state relationship, gender relationships, and fertility. Prosperous cultures are generally law abiding and have disdain for corruption. On the other hand, less

prosperous cultures have less respect for the laws that govern, and they tolerate, if not outright accept the notion that corruption is a present and persistent part of everyday life.

Progress-prone cultures have a stronger affinity to trust those who they do not know, while progress-resistant cultures generally do not trust anyone outside the close circle of people with whom they regularly interact. Prosperous cultures extend the notion of "family" to include the broader community, while less prosperous cultures tend to believe that family is what shelters the vulnerable from the broader community. Progress-prone cultures are generally more open to cooperation and participation given their predisposition to trust individuals outside of those with whom they generally interact with, and their familial ties to the community as a whole. Conversely, progress-resistant cultures gravitate towards extreme individualism given the general distrust for others, and the suspicion of the larger community.

Prosperous cultures have established decentralized forms of authority with systems of checks and balances to ensure that the will of the people is upheld by those who hold office, while less prosperous cultures are largely defined by centralized forms of authority which are often times left unchecked, thus leaving those in power to pursue exploitive measures. Progress-prone cultures are open and embrace equality across genders and look to ensure that everyone, regardless of their gender is afforded an equal playing field, while in progress-resistant cultures women are viewed as subordinates to men, and are limited to the types of economic activities that they can engage in. Lastly, according to Harrison (2006) prosperous cultures generally believe that the number of children per household should be constrained by the family's capacity to raise and educate them, while less

prosperous cultures generally believe that children are a gift and that they could serve as economic assets (child labor).

As mentioned, Harrison has primarily examined the role of culture through a case study and historical documentation lens. In contrast to the methods utilized by Harrison, this research project empirically tests the hypothesis that *altruism* and *fatalism* are cultural variables that have a vital role in explaining both economic and human development. I, as closely as possible, replicate the data that has been utilized in the previous economic development literature. Given the general lack of cultural data (while there has been steady improvement in the number of potential non-proprietary sources, or datasets that have been contributed by researchers), the relatively small sample size of countries presents some complications in duplicating or incorporating some of the explanatory variables that have been used in the past. This thesis contributes to the literature by using cultural variables associated with altruism and fatalism, to explain a country's level of economic and human development. As far as I know, there have been no apparent attempts to analyze (at least empirically) whether altruism and fatalism together contribute to our understanding of economic and human development.

This thesis is organized as follows: The next chapter reviews the literature that has focused on cultural explanations for economic development. While the literature may not directly refer to the certain measures of culture as altruism or fatalism, there certainly have been some studies that have explored cultural components that are quite similar to the definition of altruism that I am using in this paper. Chapter 2 begins by defining my two main explanatory variables, altruism and fatalism, and is followed by a discussion pertaining to the dynamic relationship that exists between culture and institutions. I then

present the methodologies that have been incorporated in the analysis of cultural explanations for economic development, and the empirical results that have been discovered. Chapter 3 provides a description of the empirical models and the specific variables that have been incorporated in my analysis. Chapter 4 discusses the results that have been obtained from the economic modeling. Chapter 5 synthesizes my findings with implications for economic development policy and future research or the role of culture in human flourishing.

Chapter 2: Literature Review

2.1 The Definition and Theoretical Determinants of Altruism and Fatalism

2.1.1. Altruism:

For the purpose of this analysis *altruism* will be defined as (1) the individual's acknowledgement that the lives of people with whom they may or may not have knowledge of are equally as important as their own life, and (2) by the individual's belief that they are morally obligated to respect and adhere to a code of personal behavior that ensures the lives others will not be cheapened by selfish motives. As noted earlier one of the challenging aspects of the current analysis is that little attention has been given to exploring the role that altruism has on economic development, and thus, there is difficulty in establishing a singular definition of altruistic behavior.

The selection of particular cultural traits by various researchers has largely centered on the discussion pertaining to the distinction between generalized and limited morality. General morality is observed in an individual's adherence to a code of moral behavior when interacting with others who reside outside of their familial circle, whereas limited morality is the observed moral behavior that occurs within the tightly woven family dynamic. "In hierarchical societies, codes of good conduct and honest behavior are often confined to small circles or related people (members of the family, or of the clan). Outside of this small network, opportunistic and highly selfish behavior is regarded as natural and morally acceptable. This contrasts with modern democratic societies, where abstract rules of good conduct apply to many social situations, and not just in a small network of friends and relatives" (Tabellini, 2007, p. 12). Max Weber (1970) argued that it was the migration of generalized morality, and the ability for the individual to associate freely with an

individual with whom they had previously no dealings that was responsible for freeing the individual from their feudal arrangements.

According to Platteau (1994b), the foundation for generalized morality is found in a set of moral norms. Norms are defined as the "expectations about one's own action and/or that of others which express what action is right or what action is wrong. The concept suggests a standard of conduct which people believe they ought to follow lest they should expose themselves to some way of sanctioning or unpleasant experience" (Platteau, 1994b, p. 765). You might also add that the grief that one feels, or the damage that is done to an individual's conscience, as a result of having taken advantage of another person also serves as a possible ramification, and thus, a potential constraint on individual behavior.

When individuals adopt these moral norms as a way of life – based upon on their personal connection to the acts themselves (both the personal rewards of compliance, and the cost of deviation) – these moral norms become part of a society's fabric and thus reverberate throughout society and subsequently define how individuals are expected to conduct themselves. Platteau argues that individuals begin to mature once they are able to internalize moral norms and empathize with the lives of others, and that this maturation process is crucial for how people will ultimately interact with one another. As individuals undergo this maturation process, they begin to understand the impact that their actions have on the lives of the people that surround them, and how they themselves are ultimately perceived within society as a result of their actions. Platteau argues that it is the threat of not living up to the expectations of those who surround us, and thus not being worthy of their respect or admiration, that is often times enough to stop an individual from behaving in a manner that is inconsistent with society's moral norms.

Additionally, Platteau argues that through the early processes of maturation, or the period of primary socialization (the values that individuals learn from observing and interacting with others throughout their childhood), individuals begin to behave in a manner that is consistent with how they wish others would behave. However, an individual's adherence to such behavior is contingent upon whether or not they actually observe the individuals around them behaving similarly. In order for generalized morality to be a form of social capital which is "capable of sustaining order in the marketplace," Platteau argues that "it is essential that concern for others or ability to see things from another's viewpoint be based on identity or loyalty feelings towards a large reference group actually encompassing all the relevant market transactions" (Platteau, 1994b, p. 768).

When generalized morality is viewed from a social capital perspective, it is natural to consider the fact that like any other form of capital, general morality is susceptible to depreciation, and thus requires continuous investment. Secondary socialization, or what the individual learns from those she interacts with outside of her close family circle, serves to build upon what they have learned during their primary socialization period. Examples of secondary socialization include the workplace, school, church, or any other setting where individuals interact with one another. Platteau argues that secondary socialization is strengthened when it occurs in settings (such as church) where discourse is often times structured around the general morality that individuals were introduced to during their primary socialization.

Organized religion often was best suited for the supporting role that secondary socialization plays given that organized religion reinforced the notion that while

individuals might be able to escape punishment from their peers, they could not escape the watchful eyes of God. Additionally, it was important that those in power exhibited strong moral qualities, as the existence of role models is key to reminding individuals that there are honest people in society.

Paul Streenten (2006) argued that within each society there is a set guiding ethical principles that allow for the construction of global ethics, which in turn establish at the very least the minimum standards that any society should observe. However, there will undoubtedly be many variations to the central ethical principles as there are certainly a multitude of potential historical influences that have played an import role in shaping a society's ethical principles. At the very least, ethical principles should include the respect for life, the need to lessen the suffering of others whenever possible, and avoid any action that would intentionally inflect harm on another person.

2.1.2. Fatalism:

For the purpose of this analysis *fatalism* is defined as an individual's belief that they are unable to control their own life outcomes, and are simply living out what destiny has chosen for them. Bernard et al. (2011, p. 3) defined fatalism as "a sense of helplessness that a person may feel with regard to proactively modifying her future." Joel Shapiro and Stephen Wu (2011, p. 2) have defined fatalism as "the belief that one has little control over future actions, i.e. luck, rather than personal actions, determines one's fate."

Similarly, Meader et al. (2006) have argued that fatalists' generally believe that they have little control over their lives, and that the systems that govern society are "unpredictable and unfair." Fatalists' generally assume that the natural environment is equally volatile and they believe that they have no capacity to prevent potential

environmental catastrophes. Fatalists' also tend to believe that the economy is also too unpredictable, and as a result they have to consume the benefits of the world if resources are within their reach. If fatalists are unable to enjoy the resources that are at their disposal, then they believe that they must learn to cope with their deficiencies.

Conversely, Fukuyama (2001) argued that Max Weber in *The Protestant Ethic and the Spirit of Capitalism*, put forth the notion that it was the Calvinist doctrine of predestination that "led believers to seek to demonstrate their status" of being chosen for salvation by "engaging in commerce and worldly accumulation." As a result individuals began to value working hard not for the rewards that it provided, but because it was an individual quality, or virtue, to be desired.

Surely, the belief that one cannot control their own life trajectory is a serious hindrance to individual motivation, and it may lead people to refrain from making investments in future prosperity, because they believe that such investments are "either infeasible or would not lead to significant changes" (Bernard et al., 2011). If an individual truly believes that it is her destiny to toil in poverty, and wrestle with the hardships that accompany it, where does she find motivation to invest or save for her future? Tabellini (2007) argues that individuals who are characterized as being highly motivated to succeed, and who also believe that the extent to which they experience economic success is dependent upon the choices that they make, are more likely to exhibit a strong work ethic, an interest in investing for the future, and willingness to innovate and peruse new economic initiatives. While on the other hand, individuals who believe that their life outcomes are largely determined by either luck or fate are less favorable towards economic activity.

Fatalism can extend beyond the individual and become a systemic problem that influences the way in which a country views itself in the global economy. A substantial degree of attention – particularly from David Landes (2000) – has been paid to how a country's belief in that a country's level of development is primarily the result of exploitation or manipulation from more economically advanced countries (i.e. dependency theory) – has left a lasting imprint on how individuals within the country view their perspective opportunities to control their life trajectories. "By fostering a morbid propensity to find fault with everyone but oneself, they promote economic impotence" (Landes, 2000, p. 5).

Dependency theory supports the mindset that the plight, or economic status of a country, is the consequence of actions that have been taken by other countries with motives of personal, rather than general, gain. According to Landes (2000), countries that have come to believe that their economic positioning in the world is the result of the actions of others, have adopted a mindset, which perpetuates the notion of inferiority and subsequently the inability to control one's own fate.

Pointing to examples from Argentinian and Japanese history, Landes (2000) provides case study evidence for how a country with a culture that identifies its critical flaws and works to correct them can economically outperform a country that places blame for its flaws on the actions of others. While there may be some truth to the argument that economically advanced countries have caused their fair share of economic disturbances in lesser developed countries (LDC), it is also true, as Landes (2000) argues, that a great deal of responsibility lies with the passive nature of those who sat on the sidelines and failed to pursue alternative policies of their own.

As a result of Argentina's past dealings with British and United States investment (both countries faced their own domestic events that required less foreign investment), many economists and policy makers in Argentina were quick to demonize the intentions of foreign trade powers, and thus adopt more isolationist measures. As a consequence of these isolationist policies, Argentina like many other countries who have adopted similar measures, was able avoid some of the more calamitous effects of the Great Depression, however, countries who implemented isolationist policies also limited their access to competition and other factors necessary for economic growth (Landes, 2000).

In contrast, after identifying the critical flaws within their society – a realization that eventually facilitated the environment necessary for the Japanese Revolution of 1867-68 – the Japanese strove to correct their perceived weaknesses, and subsequently set out to accomplish the modern economic feats of those countries that they admired. In order to achieve this goal, the Japanese invested heavily in building human capital by seeking knowledge from foreign sources. However, what separated the Japanese experience from that of Argentina (and other countries who fell victim to the dependency theory trap) was a steadfast determination to implement what they had observed from foreigners, and adapt what they had learned into a method of development that was uniquely Japanese.

In order to facilitate the type of modernization required to ascend the ranks of economic prosperity, a culture of group responsibility had to be instilled within the citizenry. To the Japanese, economic development meant more than just tasting the fruits that accompanied individual accomplishment, economic development was also a national requirement. To not participate in the economic growth that was transpiring in Japan was not only a familial hindrance, but shirking your responsibilities was also considered a

damaging blow to the nation of Japan. What transpired from this commitment to progress was a work ethic that could not be denied.

2.2 Conceptual and Empirical Studies

2.2.1. Altruism:

i. Licht et al. (2007):

As mentioned earlier, there are very few, if any, instances where altruism is explicitly mentioned in the empirical research on factors contributing to economic or human development. However, it is important to acknowledge that previous literature has incorporated measures that are closely aligned with altruistic properties. For instance, measures of both social embeddedness and autonomy have been used by Licht et al. (2007) in order to capture the "desirable relationship between the individual and group." Embeddedness in the context of culture refers to the extent to which an individual is "embedded" within a group or community, and their commitment to the maintenance of the status quo, or, social order within their particular group or community.

Conversely, autonomy refers to the extent to which an individual "finds meaning in his or her own uniqueness." The variables *embeddedness* and *autonomy*, were implemented in Licht et al., in order capture the extent to which as society was founded on collectivism or individualism. Additionally, Licht et al. uses *hierarchy* and *egalitarianism* to capture the extent to which societies adhere to the notion that the lives of each individual within the society is viewed as equally important. The variables chosen by Licht et al. were taken from the Schwartz (1999) where they are defined as (pp. 27-28):

- *Embeddedness* – "A cultural emphasis on maintenance of the status quo, propriety, and restraint of actions or inclinations that might disrupt the solidary group or the traditional order (social order, respect for tradition, family security, wisdom)."
- *Autonomy* – "A cultural emphasis on the desirability of individuals independently pursuing their own ideas and intellectual directions (curiosity, broadmindedness, creativity)."
- *Hierarchy* – "A cultural emphasis on the legitimacy of an unequal distribution of power, roles and resources (social power, authority, humility, wealth)."
- *Egalitarianism* – "A cultural emphasis on transcendence of selfish interests in favor of voluntary commitment to promoting the welfare of others (equality, social justice, freedom, responsibility, honesty)."

Summary statistics in this study indicate that countries with high scores for measures of *rule of law* and *control of corruption* tend to also be largely categorized as countries with high levels of *autonomy* and *egalitarianism*, and lower levels of *embeddedness* and *hierarchy*. Using Ordinary Least Squares (OLS), Licht et al. find that national culture explains nearly 50 percent of the variance in both *rule of law* and *control of corruption.* Controlling for British heritage, Licht et al. find that countries that shared a British colonial heritage also had higher levels of measured governance. The inclusion of British heritage does not alter the significance of the *embeddedness (autonomy)* and *hierarchy (egalitarianism)* cultural variables, thus according to the authors, the "association between these cultural emphases and the rule of law is thus unrelated to heritage of British rule and to other factors such heritage may reflect" (Licht et al., 2007).

Similar regressions were run to control for *Protestantism* (given Weber's argument regarding the association that the religion had to individualism), *ethnic fractionalization*, and *common law* (origin of country's legal system). The authors found that the inclusion of these control variables does not drastically weaken the explanatory power of the *embeddedness (autonomy)* variable for both the *rule of law* or *control of corruption*. However, after the inclusion of control variables for Protestantism, ethnic fractionalization, and common law, *hierarchy (egalitarianism)* losses significance in its explanatory power for *rule of law*. Protestantism was observed to have a positive and statistically significant effect on both the *rule of law* and *control of corruption*.

The researchers find that *ethnic fractionalization* has the predicted negative effect on both *rule of law* and *control of corruption*, but that it is not statistically significant. The measure of *ethnic fractionalization* in the author's research is founded on the definition provided by Schwartz (2004). According to Schwartz, ethnic fractionalization leads to a society that is more inclined to find individual identification through group affiliation and is subsequently associated with a high degree of embeddedness. "Societal fractionalization is also associated with lower egalitarianism … This suggests that national cultural orientations may mediate effects of ethnic heterogeneity on norms of governance" (Licht et al., 2007).

In order to account for reverse causality (or institutions and economic development having an influential effect on a country's level of culture), the authors incorporate the use of Two-Stage Least Squares (2SLS) regressions. A dummy variable for languages that drop the use of pronouns for "I," "You," etc. was used as an instrumental variable for the *embeddedness* and *autonomy* explanatory variables. Furthermore, in order to control for

economic development, the research team added a control variable for the log of the average GDP per capita from 1990 to 1998. The results from the 2SLS model show that both *embeddedness* and *autonomy* exhibit strong coefficients with signs that are consistent with the authors' hypothesis. British heritage remains positively associated with *rule of law* and *control of corruption*, while *hierarchy*, *ethnic fractionalization,* and *ln GDP/capita* are not statistically significant.

ii. Greif (1994):

Greif has argued that in general, developing countries can be identified as being "collectivists," while developed countries can be identified as "individualistic." Collectivist societies are generally highly segmented where individuals tend to only interact with those who are similar to one's self (e.g. ethnicity and religious faith), similar to limited morality. Conversely, individualist societies are much more integrated and tend to interact across the different segments of society.

The methodology for this study incorporated both game theory and sociological concepts in order to provide a comparative historical analysis of culture and its relationship with institutional design and how the differing institutions lead to different economic opportunities. This study examines the cultural components of two pre-modern trading societies, one being the Maghribis' from the Muslim world, which resembles modern day collectivist societies, and the other being the Genoese from the Latin world, which resembles modern day individualist societies. The author's Goal is to determine why these two societies had such divergent paths of institutional design. According to Grief, the Maghribis' resemble modern day developing countries, while the Genoese resemble modern day developed countries, and that historically the "differences in the societal

organization of the two trading societies can be consistently accounted for as reflecting diverse cultural beliefs"(Grief, 1994, p. 914).

While Greif acknowledges that there is a need for further research, he does argue that his findings indicate that both collectivist and individualist cultural beliefs have identifiable effects on a society's institutional design. Collectivist cultural beliefs led to the Maghribis' to formulate a collective enforcement mechanism, while individualist cultural beliefs led the Genoese to implement a second-party enforcement mechanism. Collectivist cultural beliefs led the Maghribis' to invest heavily on the acquisition of information, while individualist cultural beliefs led the Genoese to a very low level of communication. The Maghribis' were highly segregated with horizontal economic interactions, while the Genoese incorporated a vertical social structure with economic and social integration. Lastly, the Maghribis' implemented a system of general wealth redistribution, while the Genoese implemented a system of wealth transfer to the relatively poor.

The differing institutions led to varying degrees of success with regards to "intraeconomy" and "intereconomy" relations. Collectivists were more capable of conducting and maintaining low transaction cost intraeconomy relations, but were less successful in their attempts to engage in intereconomy relations. Conversely, individualists were more capable of engaging in intereconomy relations than they were intraeconomy relations.

"The analysis in this paper enables conjecturing about the possible long-run benefits of the individualistic system. To the extent that the division of labor is a necessary condition for long-run sustained economic growth, formal enforcement institutions that support anonymous exchange facilitate economic development. Individualist cultural

beliefs foster the development of such institutions and hence enable society to capture these efficiency gains" (Greif, 1994, p. 943).

iii. Tabellini (2007):

Tabellini captures the extent to which generalized morality exists within a society, by incorporating regional level survey responses of "tolerance and respect of other people" to the World Values Survey question: "Here is a list of qualities that children can be encouraged to learn at home. Which, if any, do you consider to especially important? Please Choose up to five." The variable *respect* is the proportion of people who indicated that they would want their children to have respect and tolerance for others. Not only does this particular question serve as a measurement of how parents view the importance of respect and tolerance, but it also provides some potential insight into how cultural traits are transmitted from one generation to the next, which is surely an important area of focus given the pivotal roles respect and tolerance have on a countries economic success.

According to Tabellini, respect and tolerance are important components in determining the extent to which individuals are participating in the political and administrative facets of their local communities. The level of public participation will help to both organize the distribution of necessary public goods, and also provide a check on the power of those who are in power. "If individuals lack respect for other members of their community and for the 'res publica,' public good provision is bound to be inadequate, and public administrators are likely to engage in nepotism or outright corruption" (Tabellini, 2007, p. 10).

Tabellini uses two different OLS regressions, one where the cultural explanatory variable is not weighted by the number of individuals who were polled in each region, and

the other where the cultural explanatory variable is weighted by the number of people who were polled in each region. The author regresses the variable *respect* on the average gross value added (GVA) in international prices and adjusted for purchasing power over the period of 1995-2000 for regions across Europe. In his OLS regressions, Tabellini controls for the gross student enrolment rate for both primary and secondary schools in 1960, as well as the percentage of the regional population that was living in cities with populations greater than 30,000 in the year 1850.

In the two initial OLS regressions, the explanatory variable *respect* is both positive and statistically significant at the one percent level. The coefficient is found to be slightly larger for *respect* when the number of people who are polled in the region is taken into account. Both of the control variables are also positive, yet only urban population in 1850 is statistically significant in both OLS regressions.

Following the initial use of OLS, Tabellini incorporates 2SLS while using the instrumental variables measuring both the percentage of people in 1880 who could both read and write (*literacy)*, and the first principal components of the measures for historical institutions. The data measuring historical institutions is for the years of 1600, 1700, 1750, 1800, and 1850 (*pc_institutions)*. The variable *pc_institutions* is incorporated as a potential explanatory variable for the cultural the variable *respect*.

In the first-stage OLS, both *literacy* and *pc_institutions* are positively related to *respect* and can explain 61 percent of the variation in *respect.* However, *literacy* is not statistically significant, while *pc_instituions* is statistically significant at the one percent level. The second stage results indicate that after instrumenting *respect* with *literacy* and *pc_institutions*, the coefficient for the unweighted measure of *respect* is increased by

approximately 86 percent. It should be noted that the control variable for school enrolment rates, given its insignificant effect in the OLS regressions, was dropped from the 2SLS.

Lastly, using OLS the author regresses *respect* on the average yearly growth rate of GVA over the period of 1977-2000, while controlling for the initial level of GVA in 1977 and urban population in 1850. Results indicate that *respect* is both positive and statistically significant at the five percent level. These results would indicate that as the proportion of people who would want their children to be respectful and tolerant of others, the level of economic prosperity increases as well.

2.2.2. Fatalism:

i. Bernard et al. (2011):

These researchers used rural household survey data in Ethiopia in order to examine whether or not fatalistic beliefs had an effect on investment in the future for rural families stricken with poverty. Survey questions where formulated to identify whether or not an individual identified success with either hard work or luck and fate. For example (Bernard et al., 2011, p.10):

For each of the following, please tell me which of the two propositions you most agree with:

a. *1.) "Each person is primarily responsible for her success or failure in life"*

2.) "One's success or failure in life is a matter of her destiny"

b. *1.) "To be successful, above all one needs to work very hard"*

2.) "To be successful, above all one needs to be lucky"

Using a logit model, the authors predict the probability that an individual would have limited aspirations given their belief that "*one's success or failure in life is a matter of her destiny*," and that "*to be successful, above all one needs to be lucky*." Thus the dependent variable in the logit model is *aspirations*, which is proxied by the respondent's belief that their life outcome is a product of their own doing rather than fate. The dependent variable is measured between 0 and 1, with the lower bound being defined as individual with no aspirations, and upper bound being defined as individual who is full of aspirations. The independent variables in the logit model are values for the respondent's age (both linear and squared), the gender, literacy status, self-reported wealth, and a dummy variable controlling for the village in Ethiopia where the respondent lives. While there is no direct causal linkage between perceived level of poverty and aspirations, Bernard et al. find that as an individual's perceived level of poverty decreases, their predicted level of aspirations increases.

Additionally, in an attempt to measure the likelihood that an individual could have a positive role model outside of someone with whom they have regular contact, the authors use another logit model in order to estimate the predicted probability that an individual has regular communication with another individual who lives outside of the respondent's district. The independent variables are again the respondent's age (both linear and squared), gender, literacy status, self-reported wealth, and a dummy variable for the village in which the respondent lives.

Similarly, Bernard et al. find that as an individual's perceived wealth increases, the likelihood that they have regular communication with an individual outside of their district increases. Again, the research team is cautious to report any causal relationship, however,

the two logit models do indicate that there appears to be a correlation between the respondent's belief that she can control her life outcome and the respondent's "window" of opportunity for successful role models, as indicated in the Table 1 below.

Table 2.1. Locus of Control, Peers and Aspiration Windows

The percentages in columns 1 thru 3 indicate the proportion of the individuals who have responded favorably to the questions below	(1) Total	(2) Internal locus of control (own effort)	(3) External locus of control (destiny and fate)	Difference (2)-(3) (p-value)
Communicate regularly with at least one person outside the village? (%)	66.5	68.0	63.3	0.14
Communicate regularly with at least one person outside the district? (%)	44.2	46.4	39.6	0.05
Listen to radio more than once a year (%)	57.3	61.7	47.2	0.00
Role model lives in same village (%)	88.6	88.8	88.0	0.68

Source: Bernard et al. (2011)

The results from Table 2.1 indicate that the difference in proportions between respondents who believe that they are in control of their own lives, and those who believe that fate or luck determines their life outcome, is statistically significant at the five percent level for individuals who either have regular contact with those outside of their district, or listen to the radio. This means that fatalists are less likely to have access to people or information from outside their immediate surroundings. This has an impact on the fatalists' perception of potential life outcomes that exist outside of the environment that they live. Table 2.2 shows that individuals who believe that they are capable of altering their life outcomes (non-fatalists) are subsequently more likely to adopt measures that could potentially alter their life in a positive manner.

Table 2.2. Aspiration Gap and Locus of Control

The percentages in columns 1 thru 3 indicate the proportion of the individuals who have responded favorably to the questions below	(1) Total	(2) Internal locus of control (own effort)	(3) External locus of control (destiny and fate)	Difference (2)-(3) (p-value)
Can become as successful as role model within five years	72.8	75.2	66.8	0.00
Would like to change main income earning activity	45.5	45.7	40.5	0.02
Is willing to move to improve standard of living	28.0	29.9	23.9	0.03
Is happy or very happy (instead of unhappy or very unhappy)	71.3	74.7	63.9	0.00

Source: Bernard et al. (2011)

The authors also attempt to examine whether or not fatalistic individuals would subsequently have less of a demand for the credit needed to plan for the future. Respondents where asked to answer the following questions regarding demand of credit (Bernard et al, 2011, p.16):

Q21: A banker came to you and offered to lend you any amount of money you ask …

a. *1: How much would you ask for if the loan was payable in 1 year?*

   2: What would you use this money for?

b. *1: How much would you ask for if the loan was payable in 5 years?*

   2: What would you use this money for?

c. *1: How much would you ask for if the loan was payable in 10 years?*

   2: What would you use this money for?

At the time of the survey, the Ethiopian currency was valued against the US dollar as one US dollar being equal to 10 Birr. Table 2.3 reports the amount of money individuals would request under the specified loan payment schedules, while Table 2.4 reports the usage of the hypothetical loan.

Table 2.3. Fatalism and Borrowing (1)

The percentages in columns 1 thru 3 indicate the proportion of the individuals who have responded favorably to the questions below	(1) Total	(2) Internal locus of control (own effort)	(3) External locus of control (destiny and fate)	Difference (2)-(3) (p-value)
Amount borrowed for one year	2055	2131	1883	0.07
Amount borrowed for five years	3051	3074	3001	0.67
Amount borrowed for 10 years	3561	3699	3248	0.03

Source: Bernard et al. (2011)

The results from Table 2.3 and Table 2.4 indicate that those who are more fatalistic, or in other words believe that their life outcomes are dependent upon fate or luck, are more likely to request less money when offered a loan, and are similarly less likely to invest the money that they do request in long-term investment opportunities. Table 2.3 demonstrates the differences between fatalists and non-fatalists in the amounts of money that they would request in varying time specific loans. The results in the table show that the difference in the amounts requested are statistically significant for loans based on one year and ten years.

Table 2.4. Fatalism and Borrowing (2)

Use of hypothetical loan	(1) Total	(2) Internal locus of control (own effort)	(3) External locus of control (destiny and fate)
Short term investment (immediate consumption)	3.95	3.79	4.37
Medium term investment (farm implements, oxen)	42.82	40.44	48.81
Long term investment (Education, new business)	53.22	55.77	46.93
		Person Chi-square (2) = 5.8039	Probability =0.05

Source: Bernard et al. (2011)

Table 2.4 highlights how the hypothetical loan would be used by individual who received it. From the table we can observe that fatalists are more likely to use a greater proportion of the loan on short-term and medium-term investments, while non-fatalists are more likely to use the loan for long-term investments.

ii. Shapiro and Wu (2011):

Shapiro and Wu examined how much an individual decides to save based upon her perception of how current levels of savings will impact future wellbeing through the

implementation of survey data taken from the National Longitudinal Survey of Youth in 1979. The survey data covers the time span of 1957 to 1964, and collects information regarding "labor market activities, outcomes, and other significant life events of respondents" (Shapiro, J., and Wu, S., 2011). The data used by Shapiro and Wu captured (1) both an individual's belief in how much control they have over the events that transpire in their life, and also the individual's level of optimism for life, (2) the individual's preference for risk, (3) the individual's propensity to save, and (4) the extent to which an individual exerts effort in planning for their retirement.

Utilizing two probit models, Shapiro and Wu (2011) estimate the predicted level of effort an individual is likely to make in their attempts to save and invest for the future, as well as the predicted effort an individual is likely to exert in researching methods (i.e. reading books and magazines) for retirement. The proxy for effort is measured by the response to the following questions (1=yes; 0=no) (Shapiro and Wu, 2011, p. 647):

1.) "*Have you or your Spouse/partner's name ever calculated how much retirement income you would need at retirement?*"
2.) "*Have you or your Spouse/partner's name read any magazines or books on retirement planning?*"

Fatalism is measured by the response that individuals give to the survey question, "*I have little control over the things that happen to me."* Responses to the survey question measuring fatalism are measured on a scale of 1 to 4 where, 1 is equal to "strongly disagree," and 4 is equal to "strongly agree."

Control variables include demographic and economic variables such as, the respondent's age, race, gender, marital status, number of children, education, and self-

reported health status. Given the likelihood that a fatalistic individual also has a more negative outlook on life, Shapiro and Wu (2011) include an additional control variable that measures how strongly the respondent agrees or disagrees with the statement "I take a positive attitude toward myself." The results from the two probit model regressions indicate that when controlling for demographic and economic variables, fatalism has a negative and statistically significant effect on the respondents likelihood to expend effort on saving and investment activities for retirement.

In addition to examining the likelihood to devote effort to retirement, the authors estimate an OLS regression to determine whether or not the level of money an individual reported that she would save from a lump sum payment is affected by fatalism. Their results indicate that fatalism has a negative and statistically significant affect on the amount of money people would set aside for savings when the respondent is classified as moderately risk adverse, and that fatalism has a positive and statistically significant affect on the amount of money an individual would save if they were classified as a highly risk adverse.

iii. Tabellini (2007):

Tabellini examined the extent to which an individual believes that her individual work ethic or effort is likely to alter their lives in a meaningful way, through the use of survey data taken from the World Values Survey from 1990 to 1997. The survey question asked: "Some people feel they have completely free choice and control over their lives, while other people feel that what we do has no real effect on what happens to them. Please use this scale (from 1 to 10) where 1 means 'none at all' and 10 means 'a great deal' to indicate how much freedom of choice and control in life you have over the way your life

turns out." Tabellini (2007) uses the unconditional average response in each region for his final measure of control.

Initially using two different OLS regressions, one where the cultural explanatory variable is not weighted by the number of individuals who were polled in each region, and the other where the cultural explanatory variable is weighted by the number of people who were polled in each region. The author regresses the variable *control* on the average gross value added (GVA) in international prices and adjusted for purchasing power over the period of 1995-2000 for regions across Europe. Similar to his OLS regressions measuring *respect*, Tabellini controls for the gross student enrollment rate for both primary and secondary schools in 1960, as well as the percentage of the regional population that was living in cities with populations greater than 30,000 in the year 1850.

In the two initial OLS regressions, the explanatory variable *control* is both positive and statistically significant at the five percent level, with almost no distinguishable differences in the coefficients. Both of the control variables are also positive and statistically significant in both OLS regressions.

Following the initial use of OLS, Tabellini incorporates 2SLS again using the instrumental variables *literacy*, and *pc_institutions* as potential explanatory variables for the cultural variable *control*. In the first-stage OLS, both *literacy* and *pc_institutions* are positively related to *control* and can explain 55 percent of the variation in *control.* However, *literacy* is not statistically significant, while *pc_instituions* is statistically significant at the ten percent level. The second stage results indicate that after instrumenting *control* with *literacy* and *pc_institutions*, the coefficient for the unweighted measure of *control* is

increased dramatically. Again, the variable measuring school enrollment rates was dropped from the 2SLS model.

Lastly, using OLS Tabellini regresses *control* on the average yearly growth rate of GVA over the period of 1977-2000, while controlling for the initial level of GVA in 1977 and urban population in 1850. Results indicate that *control* is both positive and statistically significant at the ten percent level, meaning that as the proportion of individuals who believe they have control over their life outcome increases, so to does the level of economic growth in the region.

2.3 Summary of Literature Review

2.3.1. Altruism:

The literature that has examined cultural qualities that are closely aligned with the definition for altruism has shown that in countries, or communities, where each individual is viewed as an equally important member of society, the prospect for economic development is greater. Both Licht et al. and Greif found that societies based on the principles of individualism, rather than the principles of collectivism, had greater opportunity for economic growth. This heightened opportunity for growth resulted from culture's influence on both the institutions that were ultimately devised and implemented, and the extent to which political figures were held accountable for their adherence to the institutions that were created. It is important for the reader to recall that according to Grief, individualism is closely aligned with societies that tend to be more inclusive.

Given that individualism induces an environment that produces a wide array of potential relationships between people, it is possible that individualism has allowed for the growth of altruistic principles. In other words, because people are more likely to be

engaged in frequent interactions with individuals from differing backgrounds, it could be that individualism allows for, or enhances the opportunity for, the expansion of the Golden Rule to a larger proportion of people. Tabellini (2007) demonstrated that the as the proportion of people within European regions who want their children to have feelings of respect and tolerance for others increases, the likelihood that these regions would have higher levels of economic development and growth increased.

2.3.2. Fatalism:

Countries with a citizenry that believes that their life outcomes can be partly determined by their own doing tend have better practices of personal savings, and have generally outperformed countries who do not have similar beliefs. Bernard et al. (2011), found that rural families in Ethiopia who tended to believe that they could not alter their life trajectory also had fewer opportunities to observe how potential "role models" were capable of making significant alterations to their life outcomes. As a result fatalists in rural Ethiopia were less likely to pursue new economic opportunities. The authors also found that when fatalists did pursue hypothetical loans, they tended to request less than non-fatalists, and fatalists generally used the money they did receive for short and medium term investments rather than long-term human capital investments. Similar to Bernard et al. (2011), Shapiro and Wu (2011) found that the tendency to pursue, or plan for, personal savings significantly differed between fatalists and non-fatalists. Lastly, Tabellini (2007) also discovered that as the proportion of individuals who believe that they have control over their lives increases, so too does the likelihood that the European region in which they live has a higher level of economic development and growth.

Chapter 3: Data and Empirical Models

The empirical research literature as it relates to culture and economic development is undoubtedly a growing field of interest. Where previous economic analysis has ignored cultural variables, allowing for them to be "observed" in the error term, a new wave of economists have begun the process of collecting data that will allow future economic research to extract the cultural component from the residuals. While the number of data sources, and measurement techniques related to quantifying culture remain rather limited, there has been a considerable push to incorporate the data that has been gathered thus far, usually in the form of ethnographic case studies, in order to expand our knowledge of economic development.

The utilization of existing cultural data, coupled with the vast amount of data that has been collected for various other measures of economic growth (such as institutional, geographical, and neoclassical growth model data) will only further the efforts to formulate new cultural hypotheses, and allow for future researchers to test their validity. In the following section I will identify the variables that I have selected, based on previous economic development studies, for my analysis. This chapter is organized as follows: first, I describe the dependent variables that have been chosen to explore; second, I identify the cultural explanatory variables that have been taken from the World Values Survey (WVS); third, I discuss the control variables utilized in the analysis by their respective categories (geographical; neoclassical growth model; institutional; and potential proxies for initial level of economic prosperity); fourth, I specify the empirical models that will be used to estimate the effect that cultural variables have on economic development; and, fifth, I conclude this chapter with a discussion related to the methods used to check the model for

robustness. Summary statistics for the variables used in this analysis can be found in Table 3.1, which is located at the end of this chapter.

3.1 Dependent Variables

3.1.1. Gross Domestic Product (GDP) per capita adjusted Purchasing Parity Power (PPP) in mil. 2005US$:

One of the measures of economic development used in this analysis is an expenditure measure of GDP per capita, adjusted for PPP. The data were taken from the latest Pen World Tables (PWT8.0) that was released July 2, 2013[2]. In order to calculate GDP per capita for the year 2010, the value for the variable $CGDP^e$ was divided by the population data for 2010 provided by the PWT 8.0[3]. The natural log of GDP per capita is taken in order to change a possibly skewed univariate distribution to a more symmetric and, therefore, closer to a normal distribution.

This particular measure of GDP per capita is useful for comparing relative living standards across different countries at a single point in time (Feenstra, Inklaar, and Timmer, 2013). Since the data that I am working with is survey data pertaining to a WVS wave that was conducted between 2010 and 2014, GDP per capita for 2010 was chosen for this analysis.

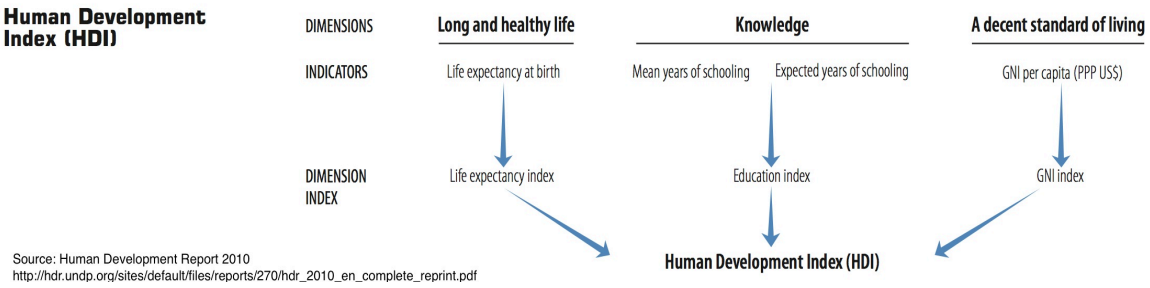
3.1.2. Human Development Index (HDI):

The second measure of economic development used in this analysis is HDI for the year 2010 constructed by the United Nations[4]. The HDI provides a broader measure of human well-being than the measure of GDP per capita. Figure 1, graphically illustrates how

[2] Downloadable at http://www.rug.nl/research/ggdc/data/pwt/pwt-8.0
[3] Feenstra, R.C., R. Inklaar, and M.P. Timmer, "The Next Generation of the Penn World Table," Forthcoming *American Economic Review,* (2015), available for download at www.ggdc.net/pwt
[4] Downloadable at http://hdr.undp.org/en/content/human-development-index-hdi-table

HDI is comprised of life expectancy, educational attainment, and gross national income per capita. According to Todaro and Smith (2009), the value of the HDI as an indicator of development is found in the components that define it. The three main components (*life expectancy, education, and GNI per capita*) seen below in Figure 3.1, remind the observer that human flourishing is more than just improvements in level of income. Truer human flourishing occurs when the standards for health and education are increased for everyone within the society. The authors point to the fact that many oil-producing countries have experienced rapid growth in income, but have failed to fully "develop" given their failure to improve the educational and health standards that exist within their borders (e.g. Nigeria).

Figure 3.1: Human Development Index Formation



Source: Human Development Report 2010
http://hdr.undp.org/sites/default/files/reports/270/hdr_2010_en_complete_reprint.pdf

The indices for *life expectancy, mean years of schooling index* (UNESCO Institute for Statistics based on educational attainment data)*, and expected years of schooling index* (UNESCO Institute for Statistics based on enrolment by age at all levels of education) are constructed using the following methods:

$$Dimension\ index = \frac{Actual\ value - Minimum\ value}{Maximum\ value - Minimum\ value} \quad (3.1)$$

The *life expectancy index* component (dimension) is calculated using equation 1:

$$Life\ expectancy = \frac{Observed\ Life\ Expectancy - Minimum\ value\ for\ Life\ Expectancy}{Maximum\ value\ for\ Life\ Expectancy - Minimum\ Value\ for\ Life\ Expectancy} \quad (3.2)$$

The *education index* component (dimension) of the HDI estimate is calculated using the geometric mean of the two educational subcomponents (mean years of schooling and expected years of schooling), both of which were calculated similarly to the *life expectancy index*:

$$Education\ index = \frac{(Mean\ years\ of\ schooling\ index * Expected\ years\ of\ schooling\ index)^{1/2}}{maximum\ value - minimum\ value} \quad (3.3)$$

The *income index* (measured by gross national income per capita)[5] component (dimension) of the HDI estimate is calculated using the following methods:

$$GNI\ index = \frac{\ln(actual\ value) - \ln(minimum\ value)}{\ln(maximum\ value) - \ln(minimum\ value)} \quad (3.4)$$

Lastly, the HDI is calculated as the geometric mean of the three indices:

$$HDI = (Life\ Expectacny\ index * Education\ Index * Income\ Index)^{1/3} \quad (3.5)$$

[5] The the minimum income is set at $100 (PPP), while the maximum value is established at $75,000 (PPP). Source: Human Development Report 2010

3.2 Cultural Explanatory Variables

3.2.1. Fatalism:

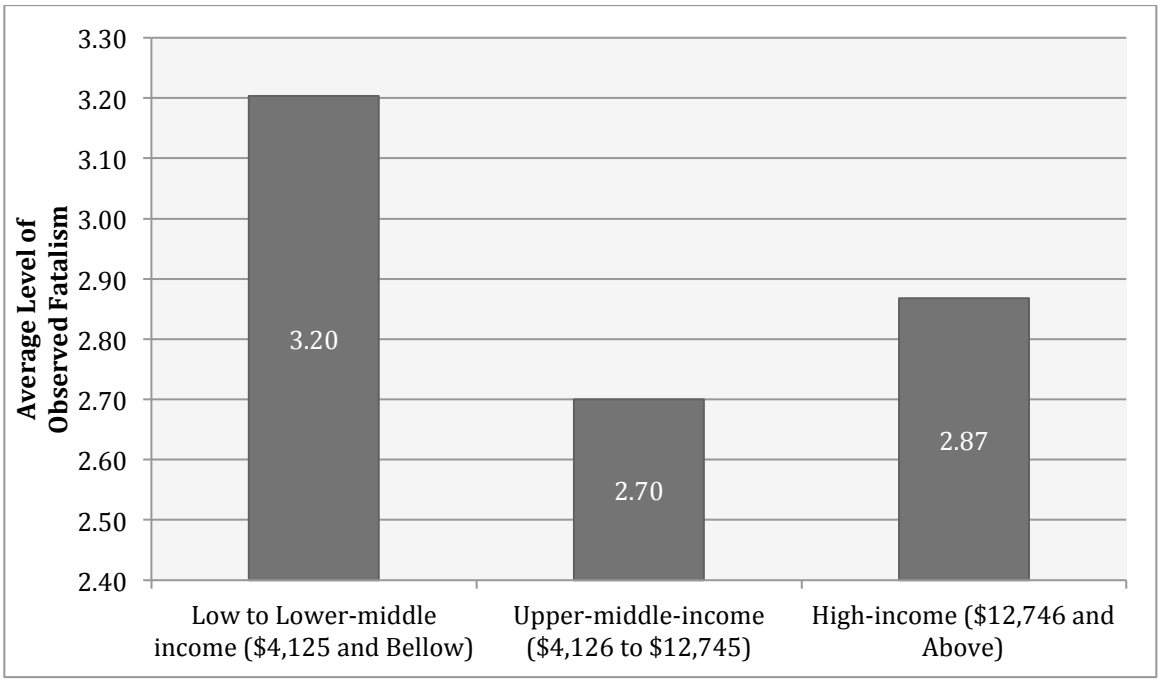
The measure for fatalism used in this analysis is the country's mean response to the following survey question designed and implemented by the World Values Survey (WVS 2010; Wave 6): "Some people feel they have completely free choice and control over their lives, while other people feel that what they do has no real effect on what happens to them. Please use this scale where 1 means 'no choice at all' and 10 means 'a great deal of choice' to indicate how much freedom of choice and control you feel you have over the way your life turns out." This particular survey question has been asked in each of the five previous survey waves (1981 – 2009) conducted by the WVS, and has been utilized in similar research conducted by Tabellini (2007).

Following Harrison's claim, that less fatalistic cultures are better equipped for economic development, I hypothesize that fatalism is negatively related to economic development. Therefore, the WVS responses are transformed by subtracting the country's mean response from the max score of 10. By transforming the data, lower values are now associated with a culture that adheres to the belief that an individual is in control over their life outcomes, while higher values are now associated with cultures that adopt a fatalistic (no control) outlook on life.

Figure 3.2 below, highlights the difference in the mean responses across countries - using the World Bank's most recent classification of country income levels - to the WVS question pertaining to the level of control the individual believes they have over their life. Given that in the sample of countries used in this analysis, there were only two countries that were identified as low-income countries, a *Low to Lower-middle* income classification

group was created. The limited number of countries defined as low income is the result of data availability, and the countries that were surveyed in the latest WVS wave.

Figure 3.2: Mean Level of Fatalism by World Bank Income Classification

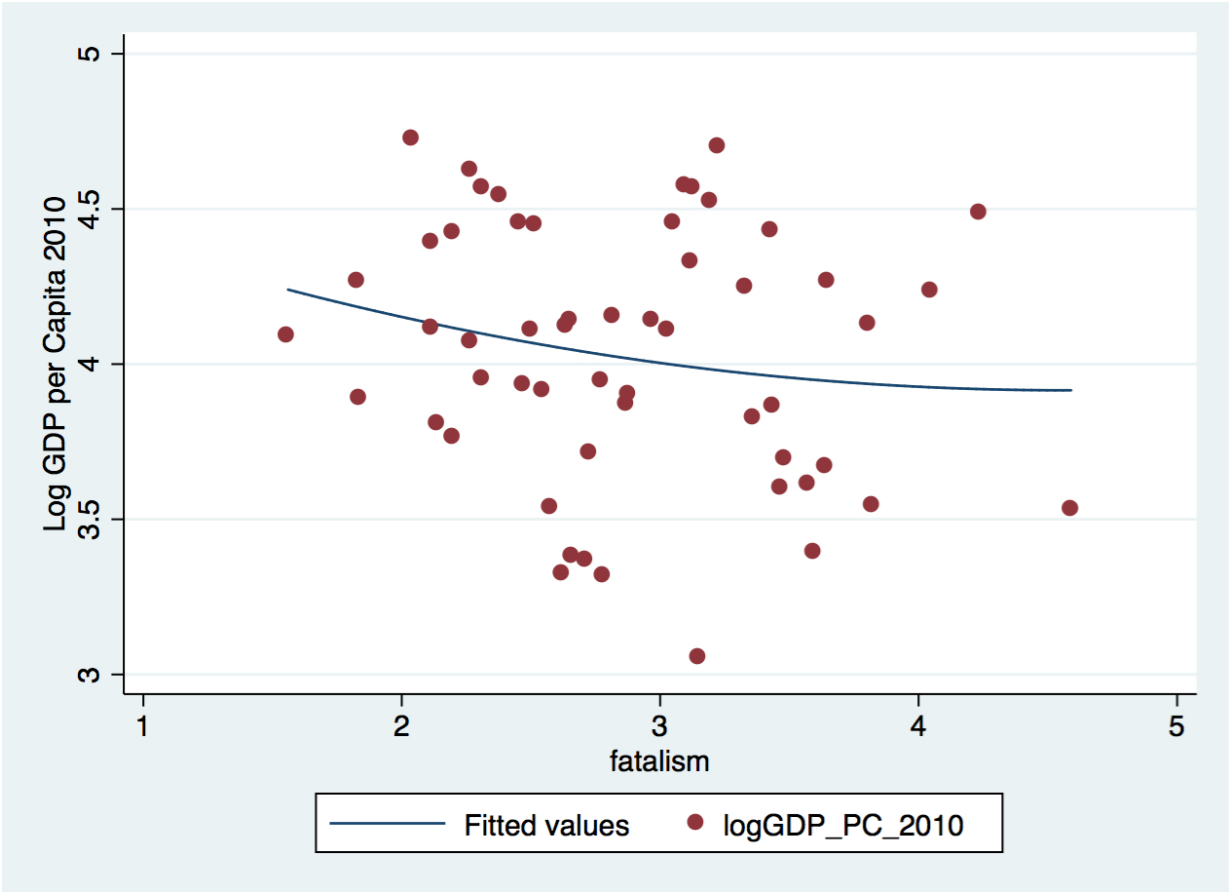


Looking at the data, it appears (prior to any empirical modeling) as though poorer countries are likely to have a relatively more fatalistic outlook on life given their average response to the WVS (WVS 2010; Wave 6). Additionally, descriptive statistics indicate (Figure 3.3) that as a country's level of fatalism increases, its level of GDP per capita (log) in 2010 decreases.

When the data is sorted by quartiles based on the observed level of fatalism for each of the countries in the dataset, descriptive statistics indicate that on average, 18.75% of the respondents living in a country from the upper quartile for fatalism (countries that display a more fatalistic outlook on life) indicated that they had saved money in the past year. This

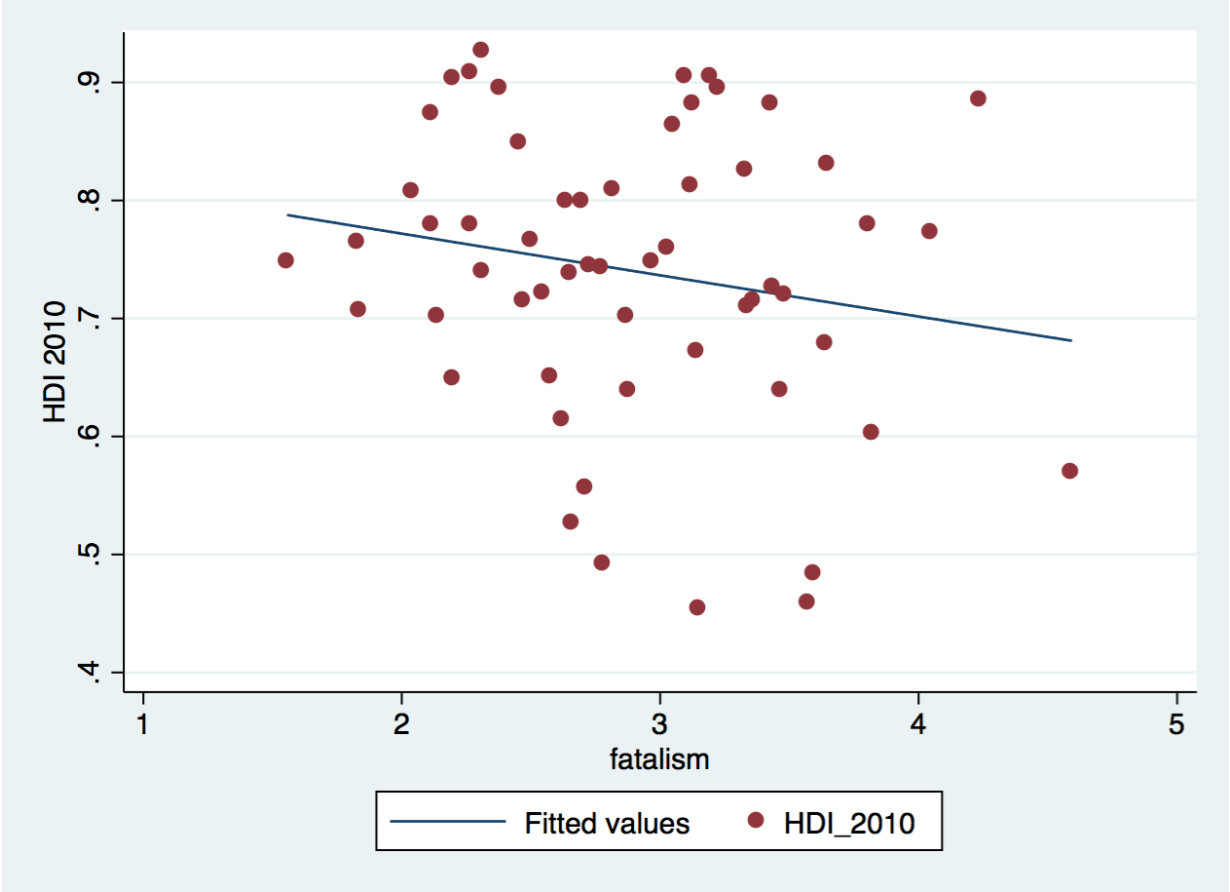
bivariate result is consistent with what was found in the literature pertaining to fatalism and savings. Additionally, respondents from countries in the upper quartile, on average reported that on a scale of 1 to 10 (1 = completely dissatisfied; 10 = completely satisfied), that the level of satisfaction with their life was equal to 5.87. On the other end of the spectrum, on average 27.35% of the respondents who live in one of the countries from the lower quartile for fatalism (countries that are more likely to believe that they are in control of their own life outcomes) indicated that they had saved money over the past year, and also had a mean value for satisfaction of life equal to 7.59.

Figure 3.3: Scatter Plot of GDP per capita Versus Fatalism



Likewise, descriptive statistics (Figure 3.4) also indicate that as the level of fatalism increases in a country, the HDI estimate for the country deceases. For those countries in the upper quartile for fatalism, the average estimated HDI score (0 to 1) in 2010 was .70 (minimum value = .46; maximum value = .88), while lower quartile countries had an average HDI estimate of .80 (minimum value = .65; maximum value = .93).

Figure 3.4: Scatter Plot of HDI 2010 Estimate Versus Fatalism



3.2.2. Altruism:

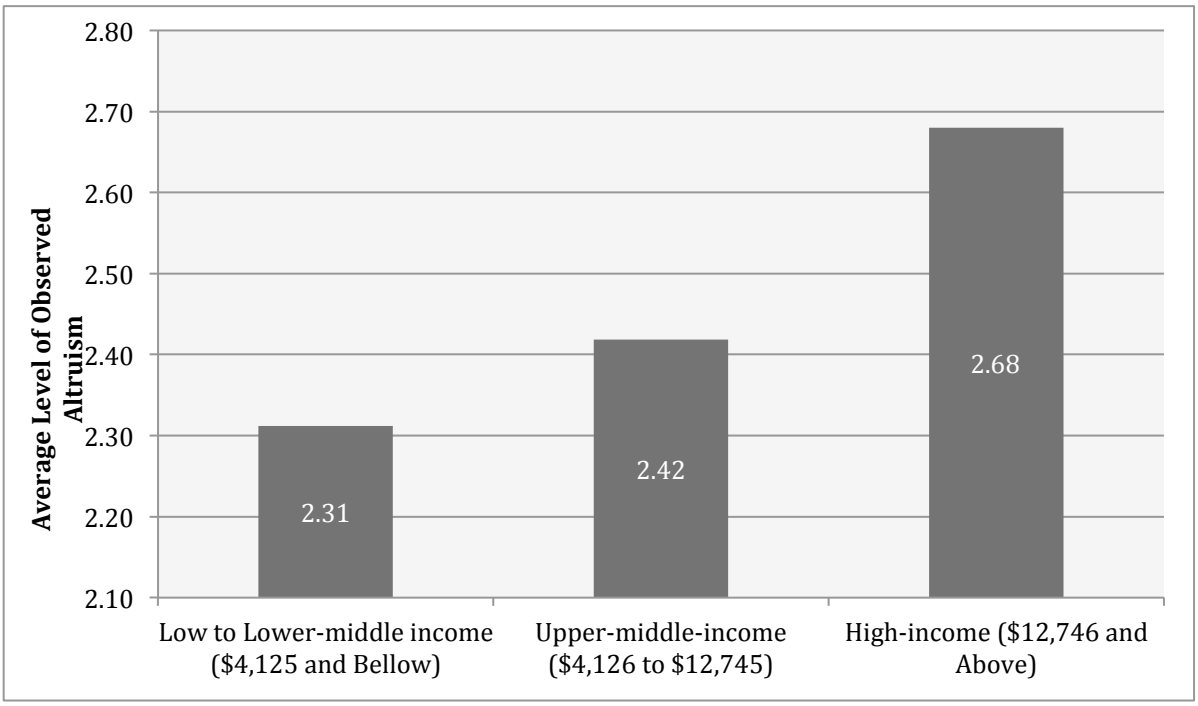
The measure of altruism used in this analysis is the mean country response to the following survey question designed by Schwartz, and subsequently implemented by the WVS (WVS 2010; Wave 6). The question presents the respondent with a hypothetical individual who believes that she ought to do good for society, and then asks the respondent to determine how similar they are to the hypothetical person based on the hypothetical individual's cultural quality. The respondent is presented with the following hypothetical comparison: "Now I will briefly describe some people. Using this card, would you please indicate for each description whether that person is very much like you, like you, somewhat like you, not like you, or not at all like you?: '*It is important to this person to do something for the good of society*'" (1 = Not at all like me; 2 = Not like me; 3 = A little like me; 4 = Somewhat like me; 5 = Like me; 6 = Very much like me). The WVS has only asked this particular survey question in the most recent wave of the WVS survey.

To the best of my knowledge, there has not been another economic development study that has incorporated this particular measure of culture. Despite the lack of literature to review, given the measure's similarity with other variables of generalized morality, I expect that the variable *altruism* will be positively related to both GDP per capita and the HDI estimate.

Figure 3.5 below, highlights the difference in the mean responses across countries - while utilizing the World Bank's most recent classification of country income levels - to the WVS question pertaining to how closely the respondent is aligned with the hypothetical individual who feels that it is important to do good for society. After incorporating the segmentation methods based on the income classification provided by the world bank, it

appears (prior to any empirical modeling) as though poorer countries are less likely to identify themselves with the altruistic cultural trait portrayed by the hypothetical individual.

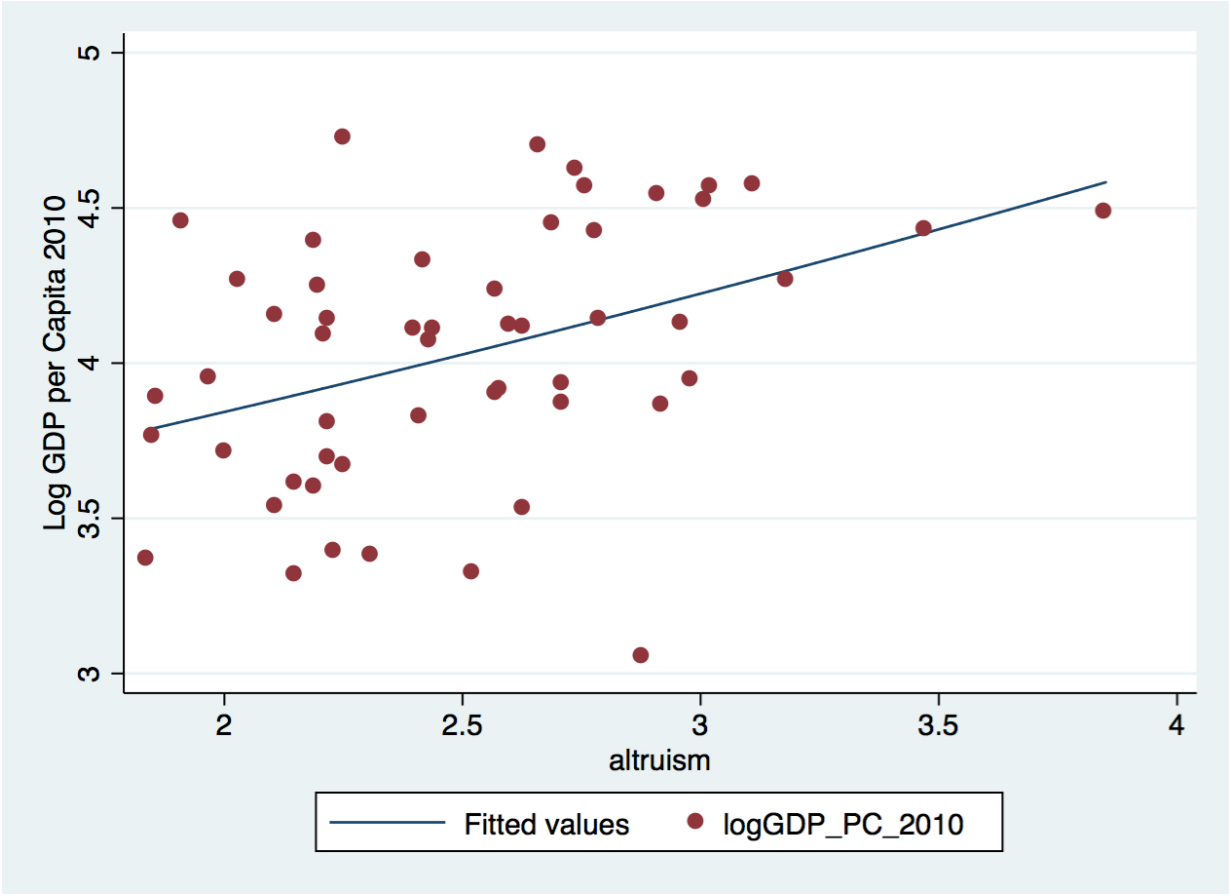
Figure 3.5: Mean Level of Altruism by World Bank Income Classification



Additionally, this altruism data (Figure 3.6) indicate that as a country's level of altruism increases, its level of GDP per capita (log) in 2010 increases as well. It should be noted, however, that through the process of univariate analysis (pertaining to the observed values for both fatalism and altruism), the country of Qatar was identified as a potential outlier, and was subsequently removed from the analysis. Given the small number of observations in my dataset, I was able to observe the isolated, or, irregular levels of cultural values associated with Qatar when comparing it to countries with a similar the level of GDP

per capita. When Qatar was included in the dataset, both cultural variables were found to have an inverse (convex) quadratic relationship with the dependent variable of GDP per capita. Given, the linear relationship reported by Tabellini (2007), it was assumed that Qatar was an outlier. After the removal of the observation, the relationships between the cultural variables and the dependent variables were linear as was initially anticipated.

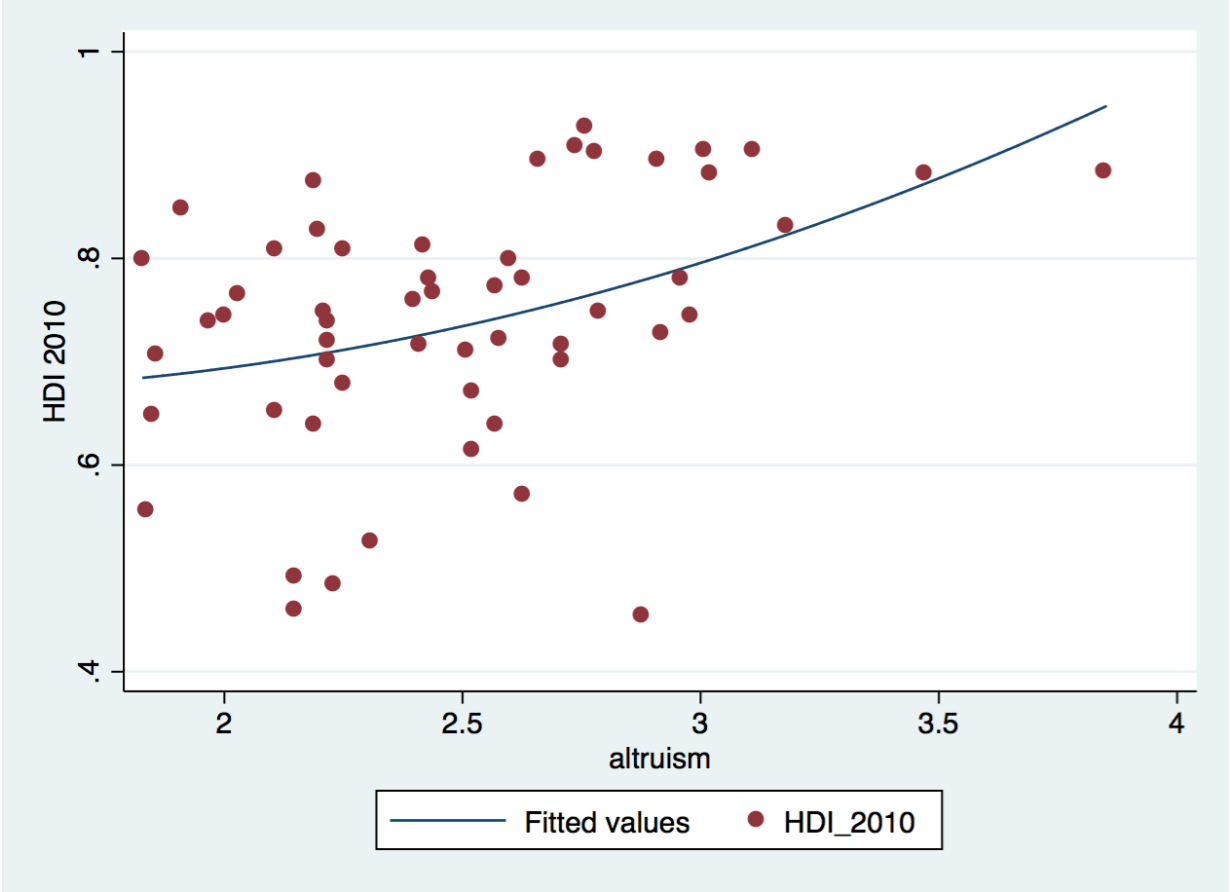
Figure 3.6: Scatter Plot of GDP per capita Versus Altruism



Similarly, descriptive statistics (Figure 3.7) indicate that as the level of altruism increases in a country, so too does the country's estimate of HDI. For those countries in the upper quartile for altruism (more altruistic), the average estimated HDI score in 2010 was

.81 (minimum value = .45; maximum value = .93), while lower quartile (less altruistic) countries had an average HDI estimate of .69 (minimum value = .46; maximum value = .87).

Figure 3.7: Scatter Plot of HDI 2010 Estimate Versus Altruism



3.3 Control Variables

As discussed in Chapter 1, there has been a significant amount of research that has focusing on the determinants of economic development. From this extensive body of research there is a well-established set of variables that has been utilized to explain

economic growth and development. However, as mentioned in both Chapters 1 and 2, little attention has been paid to potential cultural explanations for economic development. The majority of the empirical research that has been conducted in the field of economic development "forced" cultural variables into the error term, while focusing largely on the geographic, neoclassical, and institutional characteristics that are capable of explaining the variation across countries.

3.3.1 Geography:

i. Landlocked:

The geographic measure *landlock* is a dummy variable that takes the value of 1 if the country is without access to the coast, and is subsequently cut off from marine transit. The variable *landlock* takes a value of zero if the country has access to the coast, and is subsequently capable of marine transit. Being landlocked has been shown by Gallup and Sachs (1999), among others, to be a significant burden to a country's ability to engage in long-distance trade. The variable *landlock* is hypothesized to have a negative relationship with both GDP per capita and the HDI estimate for 2010.

ii. Absolute Value of Central Latitude:

The variable *abscent_lat* measures how far a country is from the equator, and thus proxies for the extent to which a country can be considered tropical. The data was taken from Gallup and Sachs (1999), and was transformed by taking the absolute value of the country's observed central latitude[6]. The absolute value is then divided by 100 in order to have a scale that is comparable to the rest of the variables used in the analysis. The hypothesized relationship between the absolute value of the country's central latitude and

[6] Dataset is downloadable at http://www.cid.harvard.edu/ciddata/geographydata.htm

the dependent variables, GDP per capita and the HDI estimate, is positive. Countries that are closer to the equator tend to be at a greater risk of infectious diseases such as malaria, and tend to be associated with lower levels of productivity. Therefore, countries that are further from the equator are generally less susceptible to the harmful consequences of geographic location.

3.3.2 Neoclassical Growth:

i. Total Factor Productivity (TFP):

The variable *total_factor_productivity* is taken from PWT 8.0, and is defined by its authors as "the relative level of output divided by the relative level of inputs" (Feenstra, Inklaar, and Timmer, 2013). While other researchers such as Hall and Jones (1999) have measured TFP with GDP per worker (a measure of productivity) corrected for "differences in tangible capital per worker and human capital per worker," the authors of PWT 8.0 argue that their measure of TFP improves upon those approaches because they have taken into account the differences in depreciation rates across different countries. I hypothesize that the relationship between TFP and the dependent variables GDP per capita and the HDI estimate to be positive.

ii. Fertility Rate:

The variable *Fertility_2010* is a measure of the total fertility rate, and is a proxy for human capital. The variable is taken from the World Bank's *World Development Indicators (WDI)* dataset, and it measures the total number of children that a woman would have if she were to live to the end of her potential child bearing years, and have children "in

accordance with age-specific fertility rates." [7] Fertility rates have been used in the literature in order to measure the opportunity cost of having children.

The argument is that not only women, but families in general, make economic choices between time-spent working, or building human capital, and time-spent raising children (Becker, Murphy, and Tamura, 1994). Furthermore, as countries continue to develop, women are more likely to face more diverse employment opportunities with higher wages, and thus reduce the number of children that they have (Mammen, and Paxson, 2000).

As the number of children increases, it is more likely that the family views children as an economic asset, as children serve as an addition source of labor, income, or retirement option for the family. Viewing children as an economic asset is particularly relevant in lower income rural areas where labor is generally agrarian and less mechanized, and where child labor laws are not particularly stringent (Levy, 1985). Therefore, the argument has been made that more economically productive societies are those that have smaller family sizes, as fewer children display the family's preference for time being spent at work or building human capital. Given the demonstrated relationship that fertility rates have with productivity and rural poverty, I hypothesize that higher fertility rates will be negatively associated with the dependent variables, GDP per capita and the HDI estimates.

[7] World Development Indicators, The World Bank: downloadable at http://data.worldbank.org/data-catalog/world-development-indicators

3.3.3 Institutional:

i. Rule of Law:

The institutional measure used in the analysis is labeled *rule_of_law_2010*, and was taken from the World Bank's *World Governance Indicators (WGI)* dataset[8]. The WGI was constructed by Daniel Kaufmann, Aart Kraay, and Massimo Mastruzzi (2010) for the purpose of capturing the extent to which individuals within the country have faith in, and whether or not they adhere to, the rules that have been established to govern how society functions.

Particular emphasis is placed on whether or not there is an environment within the country that consists of efficient enforcement of contracts, well-defined property rights, proper policing powers, and a legitimate legal system. There is also emphasis placed on the prevalence of crime and violence. Final estimates for the rule of law measure are on a scale ranging from -2.5 to 2.5.

As noted in Chapter 1, the economic development literature has shown that in countries where the rule of law is strong, there is generally an environment that provides efficient incentives to invest, save, and participate in economic activity. Given that this institutional environment, which encourages positive economic behavior, subsequently fosters positive results for both economic and human development, I hypothesize that the *rule of law* will have positive effects in both models.

[8] Worldwide Governance Indicators: downloadable at www.govindicators.org

3.3.4 Potential Proxies for Initial Level of Economic Prosperity:

i. Urban Population:

The variable *urban_pop2010* measures the proportion of the population that lives in urban areas and was taken from the World Bank's *World Development Indicators (WDI)* dataset[9]. Urban population is calculated with population estimates from the World Bank, along with United Nations World Urbanization Prospects data pertaining to urban ratios. According to the World Bank, an area where the population is 2,000 or greater.

The continued growth of cities across the world indicates that there has been a significant transition from the majority of people historically living in rural areas, to the majority of the world's population now living in urban areas. According to the World Bank, the number of people living in urban areas is growing by approximately 60 million people each year, and that the majority of growth in the future will occur in countries that are currently classified as developing. This transition, according to the World Bank, is largely associated with the majority of economies in the world, shifting from largely agriculture-based economies, to economies that are predominantly centered on mass industry, technology, and service.

Given that cities are generally associated with growing employment opportunities, higher incomes, and better access to education and health care, the measure *urban_pop2010*, serves as a proxy for the current stock of economic prosperity in the country. Therefore, the expected relationship between urban population and the dependent variables, GDP per capita and the HDI estimate, is positive.

[9] World Development Indicators, The World Bank: downloadable at http://data.worldbank.org/data-catalog/world-development-indicators

ii. Coastal Population Density:

The geographic measure *coastal_pop_density1995* is taken from Gallup and Sachs (1999), and it captures population density along the coast in 1995[10]. The measure is in persons per square kilometer, and is calculated as follows:

$$\frac{Coastal\ Population}{Coastal\ km^2} = \frac{Population * Pop100km}{Land\ Area * Lt100km} \tag{3.6}$$

Where *Pop100km* is the proportion of the population in 1994 that is living within 100 kilometers of the coastline, and was taken from a Geographic Information Systems (GIS) population dataset provided by Waldo Tobler, Uwe Deichmann, Jon Gottsegen, and Kelly Malloy (1995). *Lt100km* is the proportion of the total land area in the country that is within 100 kilometers of the ocean coastline. The data was calculated using digital coastlines from ArcWorld Supplement.

While coastal density is a geographic measure, it may also be a proxy for economic productivity given that it could be "the result of increasing returns to scale in infrastructure networks, or because of enhanced division of labor," (Gallup and Sachs, 1999), in other words, aggregation economies similar, all though not limited to, that of Silicon Valley. I hypothesize that the variable measuring the coastal population will exhibit a positive relationship in both models.

3.4 Specification of the Models

In order to test Harrison's hypothesis that altruism and fatalism play an important role in a country's ability to develop economically, I will implement two separate OLS

[10] Dataset is downloadable at http://www.cid.harvard.edu/ciddata/geographydata.htm

regressions. The first regression uses the log of GDP per capita as its dependent variable. The explanatory variables are altruism and fatalism, and the control variables consist of measures that capture the effects of geography, neoclassical growth, institutions, and potential proxies for economic prosperity on economic development. The second regression incorporates the same cultural explanatory variables and control variables as the previous regression model, however, the dependent variable is the HDI estimate in 2010.

There is a large segment of the literature devoted to economic development that has incorporated similar OLS regressions in its cross sectional empirical analysis (e.g. Tabellini, 2007; Licht et al, 2007). The results of these empirical studies have produced both statistically significant, and robust results for the control variables previously discussed. While there has been little economic development research (empirical) focusing on the role of culture, the work that has been pursued has generally incorporated OLS. Again, the empirical models yield statistically significant and robust results.

3.4.1 GDP per capita in 2010:

The first model's specification is:

$$Y_j = \beta_0 + \beta_1 x_{1,j} + \beta_2 x_{2,j} + Z_{j,i}\alpha_i + \varepsilon_j \quad (3.7)$$

Where Y_j is the log of GDP per capita in 2010 for country j, $x_{1,j}$ is the measure of *fatalism* for country j, and $x_{2,j}$ is the measure of *altruism* for country j. Additionally, α_i is a (k x 1) vector of coefficients that need to be estimated, where k is the number of control variables. Lastly, $Z_{j,i}$ is a (1 x k) vector of control variables for country j (j = 1, 2, …, n; where n is the number of observations), and ε_j is the error term associated with country j.

3.4.2 HDI Estimate in 2010:

The second model's specification is:

$$H_j = \beta_0 + \beta_1 x_{1,j} + \beta_2 x_{2,j} + Z_{i,j}\alpha_i + \varepsilon_j \quad (3.8)$$

Where H_j is the United Nations estimate for HDI in 2010 for country j, $x_{1,j}$ is the measure of *fatalism* for country j, and $x_{2,j}$ is the measure of *altruism* for country j. Additionally, α_i is a (k x 1) vector of coefficients that need to be estimated, where k is the number of control variables. Lastly, $Z_{j,i}$ is a (1 x k) vector of control variables for country j (j = 1, 2, …, n; where n is the number of observations), and ε_j is the error term associated with country j.

3.5 Robustness Check

In order to check that the sign of the coefficients is stable (does not alternate from positive to negative, and vice versa), alternative specifications of the two OLS regressions will be implemented as follows:

3.5.1. Cultural Explanatory Variables:

A simple regression using only the two cultural explanatory variables was implemented to insure that the signs on the coefficients were as expected. Furthermore, this process demonstrates how the magnitude of the coefficient changes as individual control variables are added to the model.

3.5.2. Controlling for Geography:

This regression takes regression 1 and adds to it the control for geographical variables. Given that a country cannot change its geographic characteristics, this part of the analysis is helpful in identifying differences in countries after cultural and geographic

variables have been accounted for, and additional control variables are added on an individual basis.

3.5.3. Controlling for Neoclassical Growth:

This regression adds to the previous sequence of regressions that included the control for geographic characteristics by subsequently including an additional control for variables that are associated with neoclassical growth models. Again this process allows us to observe how sensitive the model is to its specification, and identify any potential patterns that may be present.

3.5.4. Controlling for Institutions:

This regression adds to the previous sequence of regressions by including the control for the rule of law. Similar to the previous robustness checks, the inclusion of the institutional control *rule of law* allows us to observe how the model results change as another control variable is included.

3.5.5 The Fully Specified Model:

The final regression in this process of observing the sensitivity of the model to the inclusion of particular control variables is the final model specification and includes controls for geography, neoclassical growth, institutions, and lastly the proxies that have been used in the past to measure current economic prosperity.

Summary Statistics and Missing Observations

Table 3.1: Summary Statistics

Variable	N	Mean	Min	Max
logGDP_PC_2010	55	4.03	3.05	4.72
HDI_2010	57	0.74	0.45	0.93
fatalism	58	2.89	1.56	4.59
altruism	56	2.49	1.83	3.85
landlock	58	0.14	0	1
absent_lat	57	0.31	0.01	0.63
total_factor_productivity	47	0.69	0.21	1.81
fertility_2010	56	2.32	1.13	6.02
rule_of_law_2010	57	0.09	-1.81	1.96
urban_pop2010	56	0.66	0.09	1
coastal_pop_density1995	55	326.41	0	6252.32

Correlation Vector

Table 3.2 Correlation Vector

	Log GDP per Capita	HDI 2010	fatalism	altruism	landlock	abscent_lat	total_factor_productivity	fertility_2010	rule_of_law_2010	urban_pop2010	coastal_pop_density1995
Log GDP per Capita	1.00										
HDI 2010	0.91	1.00									
fatalism	-0.18	-0.19	1.00								
altruism	0.38	0.39	0.43	1.00							
landlock	-0.48	0.53	0.17	-0.03	1.00						
abscent_lat	0.34	0.42	0.27	0.36	-0.02	1.00					
total_factor_productivity	0.50	0.20	-0.10	-0.06	-0.04	0.04	1.00				
fertility_2010	**-0.71**	**-0.74**	0.00	-0.36	0.46	-0.33	-0.06	1.00			
rule_of_law_2010	**0.77**	**0.81**	-0.05	0.47	-0.41	0.28	0.19	**-0.54**	1.00		
urban_pop2010	**0.64**	**0.68**	-0.11	0.24	-0.44	0.18	0.08	-0.39	**0.55**	1.00	
coastal_pop_density1995	0.33	0.26	0.14	0.21	-0.12	-0.23	0.18	-0.32	0.32	0.31	1.00

Chapter 4: Regression Results

This chapter presents the results that are obtained from the model specifications (Model 1: GDP per capita 2010; Model 2: 2010 HDI estimate) that were introduced in Chapter 3, and the series of robustness tests that were implemented to ensure the stability of the model. For each of the two model specifications, there will be an identical process of testing the hypothesis that culture matters in economic, and human, development. The discussion begins with the GDP per capita model, and will be followed by the HDI model.

First, the results from the simple regression of the cultural explanatory variables on the dependent variable are discussed. Second, the simple model is augmented by including geographic controls. This augmentation is followed by a discussion regarding the effects that the geographic controls have on the cultural explanatory variables. Third, the model is transformed once more to include the neoclassical growth controls. A similar discussion regarding the effects that the neoclassical growth controls have on the cultural explanatory variables follows. Fourth, the control for rule of law is added to the previous models, and the effect of the institutional control on the cultural explanatory variables will be highlighted. Lastly, the model is fully specified to include proxies for current economic prosperity. A discussion regarding the effect of that the proxies have on the cultural explanatory variables completes the discussion of the results.

After discussing the results from the two OLS models, I examine whether or not the GDP per capita model faces problems of endogeneity (exploration into potential endogeneity problems associated with the HDI model will have to be addressed at a later date given the time constraint on my thesis). During this process I first discuss the Durbin-Wu-Hausman test of endogeneity, and what the results from this test mean for the initial

OLS model specification. Second, if there are any endogenous variables, I will identify the specific variables that are endogenous to the model, and discuss the instrumental variables that will be incorporated in the subsequent 2SLS regression models. If more than one variable is found to be endogenous, the analysis will need to go further than just 2SLS, and therefore may require a 3SLS (or simultaneous equations) model.

4.1 GDP per capita Model

4.1.1 Cultural Explanatory Regression:

Results from the simple OLS regression 1 (Table 4.1), yield the hypothesized relationships and are statistically significant at the one percent level. The results indicate that prior to controlling for geography, neoclassical growth, institutions, and proxies for current economic prosperity, fatalism is negatively associated with GDP per capita, while altruism is positively associated with the dependent variable. The number of observations incorporated in the OLS regression is 53, where the number of countries in the sample is the result of data limitations found in the WVS and PWT 8.0 datasets. The WVS (wave 6; 2010-2014) did not incorporate the survey question relating to altruism in two of the initial 58 countries surveyed in the sixth wave, and the PWT 8.0 did not include data pertaining to the dependent variable for three of 58 counties. The two countries with missing values for altruism are Morocco and Spain, and the three countries missing data for the dependent variable are Algeria, Libya, and Palestine[11].

Prior to controlling for any measures of geographic, neoclassical growth, and institutional influence, the simple OLS regression indicates that the cultural explanatory variables are able to explain approximately 26% of the variation in GDP per capita across

[11] For a table of all the missing data for observations, review Table 4.8 at the end of this chapter, p. 108

the 53 remaining countries. According to Benoit (2011), when using the log form of the dependent variable, in order to identify the effect of the explanatory variable the coefficient (β) associated with the variable is included in the exponential function e^{β}. The effect that the variable has on the dependent variable is observed in the distance that the value obtained from e^{β} is from 1. Therefore, the coefficient for fatalism in regression 1 indicates that an increase of 1% in the country's belief that life outcomes are determined by either fate or luck decreases the GDP per capita by approximately 22% ($e^{-.25} \approx .778$). The coefficient for altruism indicates that an increase of 1% in the country's identification with altruistic properties results in an increase of approximately 73% ($e^{.55} \approx 1.733$) in GDP per capita.

Table 4.1:Model (1) OLS Regression Results

	Dependent Variable: Log of GDP per Capita 2010									
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]
fatalism	-0.25	-0.24	-0.14	-0.23	-0.20	-0.17	-0.17	-0.11	-0.11	-0.09
	(3.00)***	(3.25)***	(3.07)***	(2.63)**	(2.65)**	(2.93)***	(2.54)**	(2.69)**	(3.25)***	(2.96)***
altruism	0.55	0.43	0.25	0.46	0.34	0.36	0.22	0.12	0.14	0.10
	(4.32)***	(3.64)***	(3.17)***	(3.28)***	(2.76)***	(3.74)***	(1.99)*	(1.76)*	(2.45)**	(1.86)*
landlock		-0.39	-0.26		-0.51	-0.50	-0.26	-0.16	-0.08	-0.08
		(3.29)***	(2.66)**		(3.56)***	(4.47)***	(1.83)*	(1.88)*	-1.21	(1.07)
abscent_lat		0.85	0.32		0.67	0.58	0.38	0.24	0.22	0.21
		(3.04)***	(1.74)*		(2.36)**	(2.61)**	-1.50	-1.60	-1.62	(1.74)*
total_factor_productivity			0.54			0.56		0.46	0.48	0.47
			(6.28)***			(5.09)***		(6.50)***	(8.38)***	(8.12)***
fertility_2010			-0.22				-0.23	-0.17	-0.17	-0.17
			(5.09)***				(3.82)***	(4.71)***	(5.38)***	(5.75)***
rule_of_law_2010								0.14	0.09	0.10
								(4.46)***	(3.37)***	(3.77)***
urban_pop2010									0.44	0.46
									(4.15)***	(4.45)***
coastal_pop_density1995									1.08e^-6	
									-0.05	
Constant	3.38	3.45	3.91	3.59	3.66	3.17	4.43	4.04	3.67	3.74
	(10.85)***	(12.67)***	(16.46)***	(10.65)***	(12.86)***	(13.12)***	(13.97)***	(20.67)***	(20.79)***	(21.70)***
N	53	53	44	44	44	44	44	44	42	44
F statistic	10.17	11.23	28.09	6.28	9.19	17.24	12.83	39.21	51.11	54.67
R-squared	0.29	0.48	0.82	0.23	0.49	0.69	0.63	0.88	0.93	0.93
Adjusted R-squared	0.26	0.44	0.79	0.20	0.43	0.65	0.58	0.86	0.92	0.91

*	p-value < .10
**	p-value < .05
***	P-value < .01

4.1.2 Controlling for Geographic Differences:

Results from the OLS regression 2 (Table 4.1), again yield the hypothesized relationships, and results that are statistically significant at the one percent level. Again, after accounting for missing observations the number of countries in regression 2 is 53, as there are no data limitations for the geographic variables (*landlock*, and *abscent_lat*). With the inclusion of the geographic controls, the variables *fatalism*, *altruism*, *landlock*, and *abscent_lat* are capable of explaining approximately 44% of the variation in GDP per capita across the 53 countries in regression 2.

The magnitude of the coefficient associated with fatalism is only marginally different in regression 2 than it was in regression 1. The coefficient associated with altruism on the other hand, experiences a 22% reduction in magnitude. The coefficient for fatalism in regression 2 indicates that an increase of 1% in the country's belief that life outcomes are determined by either fate or luck decreases the GDP per capita by approximately 21% ($e^{-.24} \approx .786$). The coefficient associated with altruism in regression 2 indicates that an increase of 1% in the country's identification with altruistic properties results in an increase of approximately 54% ($e^{.55} \approx 1.733$) in GDP per capita.

4.1.3 Controlling for Neoclassical Growth:

Results from the OLS regression 3 (Table 4.1), continue to yield statistically significant results that are consistent with the hypothesized relationships. The number of countries in regression 3 has been reduced to 44 from 53, where the difference is attributable to missing values associated with neoclassical growth (*total_factor_productivity* and *fertility_2010*).

There are now eight countries that are missing values for TFP in 2010 (Azerbaijan, Belarus, Ghana, Lebanon, Nigeria, Pakistan, Uzbekistan, and Yemen), and one country (Taiwan) missing data pertaining to fertility rates in 2010. The explanatory variables along with the geographic and neoclassical growth controls included in regression 3 are able to explain approximately 79% of the variation in GDP per capita across the 44 countries in the reduced sample. In order to establish whether or not the rapid increase in R-square is related to multicollinearity, variance inflation factors (VIF) associated with the model specification was run. The results in Table 4.2 (p. 66) from the VIF test indicate that there are no significant multicollinear variables in the model[12].

An additional explanation for the sudden change in R-square could be found in the sample size reduction, as smaller sample sizes may inflate the value for R-square. In order to check for this possibility, regressions 1 and 2 were estimated again using the reduced sample size of 44 countries. While the coefficients in regressions 4 and 5 change slightly from those in 1 and 2, the results remain statistically significant with R-square only being marginally different from the previous regressions (Table 4.1; Regressions 4 and 5). Intuitively I believe that there is might be an issue of endogeneity, an issue that is discussed later in this chapter. However, the development literature does put a great deal of emphasis on the importance of productivity on economic development (Porter, 2000). Therefore, it is not entirely impossible that TFP and human capital are capable of explaining a great deal of the variance in GDP per capital.

[12] The VIF uses the coefficient correlations between the independent variables in order show the degree to which the variance of the estimator has been inflated by the presence of multicollinearity. One of the potential causes for high R-square values is multicollinearity. According to Gujarati and Porter, "as a rule of thumb, if the VIF of a variable exceeds 10, which will happen if R^2_j exceeds .90, that variable is said to be highly collinear" (2009, p. 340). However, others have said that any VIF above 4 would indicate a problem of multicollinearity.

Table 4.2: Model (1) VIF for OLS Regressions

	Variance Inflation Factor								
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]
fatalism	1.22	1.25	1.33	1.23	1.30	1.31	1.32	1.40	1.59
altruism	1.22	1.36	1.46	1.23	1.34	1.34	1.45	1.74	1.90
landlock		1.03	1.34		1.04	1.04	1.34	1.46	1.63
abscent_lat		1.20	1.27		1.16	1.17	1.27	1.29	1.81
total_factor_productivity			1.02			1.02		1.08	1.12
fertility_2010			1.60				1.60	1.75	1.98
rule_of_law_2010								1.94	2.31
urban_pop2010									1.71
coastal_pop_density1995									1.77
Mean VIF	1.22	1.21	1.34	1.23	1.21	1.18	1.40	1.52	1.76
Max VIF	1.22	1.36	1.60	1.23	1.34	1.34	1.60	1.94	2.31
Min VIF	1.22	1.03	1.02	1.23	1.04	1.02	1.27	1.08	1.12

The inclusion of measures for neoclassical growth further reduces the magnitudes of the coefficients associated with both fatalism and altruism in regression 3. The results indicate that an increase of 1% in the country's belief that life outcomes are determined by either fate or luck decreases the GDP per capita by approximately 13% ($e^{-.14} \approx .869$). The coefficient associated with altruism from regression 3 indicates that an increase of 1% in the country's identification with altruistic properties results in an increase of approximately 28% ($e^{.25} \approx 1.284$) in GDP per capita.

Given the sizable change in the magnitude of the coefficients associated with both fatalism and altruism, it may be helpful to examine how each of the neoclassical growth variables influences the model. Therefore, regressions 6 and 7 separate the neoclassical growth variables and include them individually in order to see whether or not TFD or

fertility rates are individually responsible for the changes observed in the coefficient magnitudes for the cultural explanatory variables.

i. Controlling for Total Factor Productivity:

Regression 6 (Table 4.1) augments the model specification found in regression 3 by removing the variable *fertility_2010* in order to observe how TFP alone changes the results captured in regression 2, where the model only controlled for geographic influences. The results from regression 6 continue to yield statistically significant results that are consistent with the hypothesized relationships. After augmenting regression 3 to include only the TFP component of the neoclassical growth control, R-square in regression 6 has been reduced by approximately 18% relative to the value of R-square in regression 3.

By comparing the results in regression 2 to the results in regression 6, we can observe the effect of only controlling for TFP. The magnitude of the coefficient associated with the variable *fatalism* in regression 6 has declined by approximately 29% after the inclusion of *total_factor_productivity*, while the magnitude of the coefficient associated with *altruism* has declined approximately 16%.

The results from regression 6 indicate that, under the new model specifications, an increase of 1% in the country's belief that life outcomes are determined by either fate or luck decreases the GDP per capita by approximately 16% ($e^{-.17} \approx .844$). On the other hand, the coefficient associated with altruism in regression 6 indicates that an increase of 1% in the country's identification with altruistic properties results in an increase of approximately 43% ($e^{.36} \approx 1.433$) in GDP per capita (Table 4.1; Regression 6).

ii. Controlling for Fertility Rates in 2010

Regression 7 (Table 4.1) augments the model specification found in regression 3 by removing the variable *total_factor_productivity* in order to observe how fertility rates in 2010 alone change the results captured in regression 2, where the model only controlled for geographic influences. The results from regression 7 continue to yield statistically significant results (the variable *abscent_lat* is no longer statistically significant, where as in regression 3 it was significant at the 10% level) that are consistent with the hypothesized relationships. The fairly high positive correlation between fertility and the absolute value of the central latitude could account for why the variable *abscent_lat* is no longer statistically significant. After augmenting regression 3 to include only the fertility rate component of the neoclassical growth control, the R-square in regression 7 has been reduced by approximately 27% relative to the R-square in regression 3.

Again, by comparing the results from regression 2 to the results in regression 7, we can observe the effect that controlling for fertility has on the model. The magnitude of the coefficient associated with the variable *fatalism* in regression 7 has declined by approximately 29% after the inclusion of *fertility_2010* (similar to the results observed in regression 6), while the magnitude of the coefficient associated with *altruism* was reduced by approximately 49%. This dramatic reduction in the coefficient associated with *altruism* could possibly be explained by the notion that larger families may not have enough additional resources to devote towards anyone outside of their immediate family. Therefore, the belief that it is important to do good for society may not be as important as the belief that the family must come first.

The results from regression 7 indicate that, under the new model specifications, an increase of 1% in the country's belief that life outcomes are determined by either fate or luck decreases the GDP per capita by approximately 16% ($e^{-.17} \approx .844$). The coefficient associated with altruism from regression 7 indicates that an increase of 1% in the country's identification with altruistic properties results in an increase of approximately 25% ($e^{.22} \approx 1.246$) in GDP per capita. While there is an effect of fertility rates on the coefficients for both fatalism and altruism, it would appear that fertility rates have a much larger effect on altruism than they do on fatalism.

4.1.4 Controlling for Institutions:

Results from the OLS regression 8 (Table 4.1), continue to yield statistically significant results that are consistent with the hypothesized relationships. However, the inclusion of the institutional variable *rule_of_law* appears to have influenced the effect of the geographic control variable, *abscent_lat*. The cultural explanatory variables along with the controls for geography, growth, and institutions is capable of explaining 88% of the variation in GDP per capita across the 44 countries in the sample.

The addition of the rule of law measure, again further reduces the magnitudes of the coefficients associated with both fatalism and altruism. After adding the rule of law to the list of control variables implemented in the model, the results from regression 8 indicate that an increase of 1% in the country's belief that life outcomes are determined by either fate or luck decreases the GDP per capita by approximately 10% ($e^{-.11} \approx .896$). The coefficient associated with altruism from regression 8 indicates that an increase of 1% in the country's identification with altruistic properties results in an increase of approximately 13% ($e^{.12} \approx 1.128$) in GDP per capita.

4.1.5 Full Model:

Results from the OLS regression 9 (Table 4.1), yield statistically significant results that are consistent with the hypothesized relationships. However, the variable *urban_pop2010* appears to have influenced both the magnitude of the coefficient and the significance of the geographic variable *landlock*. The change in significance could possibly be related to the change in the number of observations in the regression model. The number of countries in regression 9 has been reduced from 44 to 42, and this reduction is attributable to missing values for the coastal population density for the countries of Bahrain and Cyprus. The fully specified model in regression 9 is capable of explaining approximately 92% of the variation in GDP per capita in the 42 remaining countries (the high R-square could be the result of endogeneity).

After adding the control for current economic prosperity, the coefficient associated with fatalism is unchanged from regression 8. However, the coefficient associated with altruism increases by approximately 17% after the inclusion of both *urban_pop2010* and *coastal_pop_density1995*. The results from regression 9 indicate that an increase of 1% in the country's belief that life outcomes are determined by either fate or luck decreases the GDP per capita by approximately 10% ($e^{-.11} \approx .896$). The coefficient associated with altruism from regression 9 indicates that an increase of 1% in the country's identification with altruistic properties results in an increase of approximately 15% ($e^{.14} \approx 1.150$) in GDP per capita.

4.1.6 Removing Coastal Population Density:

The variable *coastal_pop_density1995* was removed from the model in regression 10 given that it has no distinguishable effect on the dependent variable. After removing *coastal_pop_density1995* from the model specification, the magnitudes of the coefficients for the cultural explanatory variables decrease by 18% (fatalism) and 27% (altruism). Furthermore, altruism is now only statistically significant at the ten percent level. While the magnitudes of the coefficients for the remaining control variables change only slightly, the geographic control variable measuring distance from the equator is not statistically significant at the ten percent level. This change is likely do to the fact that the measure for coastal population density was not a proper proxy for the current level of economic prosperity, but rather another geographic measure capturing the effect of being landlocked.

4.2 Human Development Index Model

4.2.1 Cultural Explanatory Regression:

Results from the simple OLS regression 11 (Table 4.3), yield the hypothesized relationships and are statistically significant at the one percent level. The number of observations incorporated in the OLS regression is 55, where the number of countries in the sample is the result of data limitations found in the WVS and HDI datasets. There are two countries (Morocco and Spain) with missing values for the WVS question related to altruism, and there is one country (Taiwan) missing data for the dependent variable (HDI).

Prior to controlling for any measures of geographic, neoclassical growth, and institutional influence, the simple OLS regression indicates that the cultural explanatory variables are capable of explaining approximately 27% of the variation in the HDI

estimates across the 55 remaining countries. R-square for regression 11 is only marginally larger than its counterpart in regression 1. The coefficient for fatalism in regression 11 indicates that an increase of 1% in the country's belief that life outcomes are determined by either fate or luck decreases the 2010 HDI estimate by approximately 8-percentage points. The coefficient for altruism indicates that an increase of 1% in the country's identification with altruistic properties results in an increase of approximately 16-percentage points in the HDI estimate.

4.2.2 Controlling for Geographic Differences:

Results from the OLS regression 12 (Table 4.3) are consistent with hypothesized relationships, and similar to the results in regression 2, each are statistically significant at the one percent level. After accounting for missing observations the number of countries in regression 12 is now 54, as Palestine is missing data for the geographic measure *abscent_lat*. With the inclusion of the geographic controls, the variables *fatalism*, *altruism*, *landlock*, and *abscent_lat* are able to explain approximately 50% of the variation in the 2010 HDI estimate across the 54 countries in regression 12. The explanatory power of the cultural variables and geographic controls is approximately 14% greater in regression 12 relative to its counterpart in regression 2.

The magnitude of the coefficient associated with fatalism in regression 12 is identical to the coefficient for fatalism found in regression 11, while the coefficient associated with altruism experiences a 25% reduction in magnitude. Recall from regression 2 that the effect of controlling for geographic measures on the magnitudes of both fatalism and altruism is relatively similar to the effect that geographic controls have in regression 12. The coefficient for fatalism from regression 12 indicates that an increase of 1% in the

country's belief that life outcomes are determined by either fate or luck decreases the 2010 HDI estimate by approximately 8-percentage points. The coefficient associated with altruism from regression 12 indicates that an increase of 1% in the country's identification with altruistic properties results in an increase of approximately 12-percentage points in the 2010 HDI estimate.

Table 4.3: Model (2) OLS Regression Results

	Dependent Variable: HDI 2010									
	[11]	**[12]**	**[13]**	**[14]**	**[15]**	**[16]**	**[17]**	**[18]**	**[19]**	**[20]**
fatalism	-0.08	-0.08	-0.05	-0.07	-0.06	-0.06	-0.05	-0.04	-0.04	-0.03
	(3.16)***	(3.64)***	(3.23)***	(2.87)***	(3.24)***	(3.15)***	(3.30)***	(2.93)***	(2.99)***	(3.13)***
altruism	0.16	0.12	0.07	0.14	0.10	0.10	0.07	0.02	0.02	0.02
	(4.42)***	(3.71)***	(2.64)**	(3.61)***	(3.21)***	(3.33)***	(2.49)**	(1.07)	(1.04)	-0.99
landlock		-0.12	-0.09		-0.16	0.16	-0.09	-0.05	-0.03	-0.03
		(3.65)***	(2.66)**		(4.36)***	(4.42)***	(2.59)**	(1.86)*	(1.10)	-1.11
abscent_lat		0.32	0.16		0.24	0.23	0.16	0.13	0.13	0.12
		(4.01)***	(2.57)**		(3.36)***	(3.29)***	(2.61)**	(2.69)**	(2.51)**	(2.95)***
total_factor_productivity			0.05			0.06		0.02	0.02	0.02
			(1.68)			(1.57)		(0.96)	(1.17)	-1.21
fertility_2010			-0.06				-0.06	-0.05	-0.05	-0.05
			(4.37)***				(4.36)***	(3.95)***	(4.04)***	(4.57)***
rule_of_law_2010								0.05	0.04	0.04
								(5.05)***	(3.32)***	4.37)***
urban_pop2010									0.13	0.13
									(3.32)***	(3.78)***
coastal_pop_density1995									9.89e^-7	
									(0.14)	
Constant	0.56	0.58	0.80	0.61	0.63	0.58	0.85	0.85	0.75	0.76
	(6.23)***	(7.79)***	(9.91)***	(6.40)***	(8.71)***	(7.53)***	(10.90)***	(13.38)***	(11.70)***	(12.82)***
N	**55**	**54**	**44**	**44**	**44**	**44**	**44**	**44**	**42**	**44**
F statistic	10.78	14.44	18.53	7.57	14.44	12.48	20.68	30.07	30.78	37.83
R-squared	0.29	0.54	0.75	0.27	0.60	0.62	0.73	0.85	0.90	0.90
Adjusted R-squared	0.27	0.50	0.71	0.23	0.56	0.57	0.70	0.83	0.87	0.87

*	p-value < .10
**	p-value < .05
***	P-value < .01

4.2.3 Controlling for Neoclassical Growth:

Results from the OLS regression 13 (Table 4.3), continue to yield statistically significant results that are consistent with the hypothesized relationships. One of the more glaring differences between regression 13 and its counterpart, regression 3 from model 1 is that the coefficient associated with TFP is neither prominent nor statistically significant.

The fact that TFP is neither prominent nor statistically significant could be the result of the HDI being a composite index of more than just income. There also does not appear to be the same issue of R-square rapidly increasing after the inclusion of the neoclassical growth measures. However, given the sudden drop in the number of countries, I will follow the same methods discussed in section 4.1.3. The results from the VIF can be seen in Table 4.2. The number of countries in regression 13 has been reduced to the same 44 countries that were in regressions 3 thru 8 in model 1. Again, the difference in the number of observations is attributed to missing values for the variables associated with neoclassical growth (*total_factor_productivity* and *fertility_2010*).

The explanatory variables coupled with the geographic and neoclassical growth controls included in regression 13 are able to explain approximately 71% of the variation in the 2010 HDI estimate across the 44 countries remaining in the sample. This is approximately 10% less explanatory power than regression 3 in model 1. Similar to regressions 4 and 5 in model 1, regressions 14 and 15 were implemented in order to test whether or not the sudden drop in the sample size may have influenced the explanatory power of the variables incorporated in regression 13. The coefficients in 14 and 15 change only slightly, however, R-square does appear to make a noticeable increase in the explanatory power of regression 15 relative to regression 12 (Table 4.3; Regressions 14 and 15).

The inclusion of measures of neoclassical growth in regression 13 reduces the magnitudes of the coefficients associated with both fatalism and altruism. The results in regression 13 indicate that an increase of 1% in the country's belief that life outcomes are determined by either fate or luck decreases the 2010 HDI estimate by approximately 5-

percentage points. The coefficient associated with altruism from regression 13 indicates that an increase of 1% in the country's identification with altruistic properties results in an increase of approximately 7-percentage points in the 2010 HDI estimates.

i. Controlling for Total Factor Productivity

Regression 15 augments the model specification found in regression 13 by removing the variable *fertility_2010* in order to observe how TFP alone changes the results captured in regression 12, where the model only controlled for geographic influences. The results from regression 16 continue to yield statistically significant results that are consistent with the hypothesized relationships, and TFP remains to be statistically insignificant. After augmenting regression 13 to include only the TFP component of the neoclassical growth control, R-square in regression 16 has been reduced by approximately 20% relative to regression 13. This is most certainly a stark contrast to the results for regression 6 in model 1

By comparing the magnitudes of the coefficients associated with the variable *fatalism* in regressions 16 and 12, we can see that the magnitude of the coefficient in 16 has decreased by approximately 25% after the inclusion of *total_factor_productivity*. On the other hand, the magnitude of the coefficient associated with *altruism* in 16 was reduced by approximately 17%.

The results in regression 16 indicate that, under the new model specifications, an increase of 1% in the country's belief that life outcomes are determined by either fate or luck decreases the 2010 HDI estimate by approximately 6-percentage points. The coefficient associated with altruism from regression 16 indicates that an increase of 1% in

the country's identification with altruistic properties results in an increase of approximately 10-percentage points in the 2010 HDI estimate.

ii. Controlling for Fertility Rates in 2010

Regression 17 augments the model specification found in regression 13 by removing the variable *total_factor_productivity* in order to observe how fertility rates in 2010 adjusts the results observed in regression 12, where the model only controlled for geographic influences. The results from regression 17 continue to yield statistically significant results that are consistent with the hypothesized relationships. After augmenting regression 13 to include only the fertility rate component of the neoclassical growth control, R-square in regression 17 has been only marginally reduced by approximately 1% relative to regression 13. This is undoubtedly the result of TFP not being a significant factor in explaining HDI.

The magnitude of the coefficient associated with the variable *fatalism* in regression 17 has declined by 38%, relative to regression 12, after the inclusion of *total__factor_productivity*. Additionally, the magnitude of the coefficient associated with *altruism* in regression 17 has been reduced by approximately 42% relative to regression 12, which is very similar to the effect that fertility had on altruism in regression 7 from model 1. The results in 17 indicate that, under the new model specifications, an increase of 1% in the country's belief that life outcomes are determined by either fate or luck decreases the 2010 HDI estimate by five-percentage points. The coefficient associated with altruism from regression 17 indicates that an increase of 1% in the country's identification with altruistic properties results in an increase of 7-percentage points in the 2010 HDI estimate.

4.2.4 Controlling for Institutions:

Results from the OLS regression 18 (Table 4.3), continue to yield statistically significant results that are consistent with the hypothesized relationships. However, the inclusion of the institutional variable *rule_of_law* both significantly reduces the magnitude associated with altruism (71% reduction), and causes altruism to be statistically insignificant. After including the institutional control, the model is capable of explaining approximately 83% of the variation in the 2010 HDI estimates for the 44 countries in the sample.

The addition of the rule of law measure to the HDI model also reduces the magnitude of the coefficient associated with fatalism by 20%; however, the effect of fatalism remains statistically significant at the one percent level. After adding the rule of law to the list control variables, the results from regression 18 indicate that an increase of 1% in the country's belief that life outcomes are determined by either fate or luck decreases the 2010 HDI estimate by approximately 4-percentage points. The coefficient associated with altruism from regression 18 is not statistically significant.

4.2.5 Full Model:

Results from the OLS regression 19 (Table 4.3), again continue to yield statistically significant results for fatalism, but the variable altruism remains statistically insignificant. Furthermore the results maintain their consistency with the hypothesized relationships. However, the variable *urban_pop2010* appears to have influenced both the magnitude and the significance of the geographic variable *landlock*. The number of countries in the sample was reduced from 44 to 42, and is attributable to missing values for the coastal population density for the countries of Bahrain and Cyprus. The sudden change in the number of

observation may be the cause for the sudden loss of significance in the geographic control variable. The fully specified model is capable of explaining approximately 87% of the variation in the 2010 HDI estimates for the 42 countries remaining in the sample.

After adding the control for current economic prosperity, the coefficient associated with fatalism is unchanged from regression 18. The coefficient attached to altruism remains insignificant, and the magnitude is unaffected by the new model specification. The results from regression 18 indicate that an increase of 1% in the country's belief that life outcomes are determined by either fate or luck decreases the 2010 HDI estimate by approximately 4-percentage points.

4.2.6. Removing Coastal Population Density:

Similar to the GDP per capita model, the variable measuring the costal population density has no distinguishable effect on the dependent variable on the Human Development Index. As a result the variable *coastal_pop_density1995* is removed from the model in regression 20. The removal of *coastal_pop_density1995* from the model does not seem to alter the results observed in regression 19.

4.3 Summary of OLS Regression Results

4.3.1. Log of GDP per capita 2010

The results from regressions 1 thru 10 demonstrate stability in that the signs of the coefficients do not alternate from positive to negative, or visa versa, when new controls are added to the model specification. The magnitudes associated with the cultural explanatory variables generally decrease as new controls are added to the model specification. The magnitudes associated with *fatalism* and *altruism* appear to be most effected by the measures of neoclassical growth, specifically the measure of fertility rates in 2010 (which

will be tested for endogeneity). While the R-square for the model specifications is definitely a concern given the small sample size, tests for multicollinearity do not indicate that the inflated R-square is the result of highly collinear independent variables.

The results that are obtained in each of the nine model specifications demonstrate the hypothesized signs, and are consistent with what has been found in the literature. Specifically, similar to the results found by Gallup and Sachs (1999), the variable *coastal_pop_density1995* is statistically insignificant and the magnitude of its effect on the level of GDP per capita is essentially zero. This demonstrates that the model is providing results that are similar to other model specifications used in the economic development literature.

These results indicate that, the hypotheses presented by Harrison (2006), are valid. Recall Harrison hypothesized that "If individual's believe that they can influence their destinies, they are likely to focus on the future; see the world in positive-sum terms; attach a high priority to education; believe in the work ethic; save; become entrepreneurial … If the Golden Rule has real meaning for them, they are likely to live by a reasonably rigorous ethical code; honor the lesser virtues; abide by the laws; identify with the broader society; form social capital …" (Harrison, 2006, p. 39). Each of these values or beliefs, according to Harrison, are associated with positive economic growth.

Within the appendix of this analysis the reader can observe how the coefficients associated with *fatalism* and *altruism* interact with each of the individual controls. For example, the reader may be interested to see how the magnitudes and significance of the explanatory variables changes when only controlling for the rule of law. The regression

results related to this model specification, along with other model specifications are available in the appendix.

4.3.2. HDI 2010

Similar to the regression results observed in regressions 1 thru 9, the results from 10 thru 18 again demonstrate stability with regards to the signs of the coefficients. Again, the size of the coefficients associated with the explanatory variables *fatalism* and *altruism* decrease as new controls are added to the model specification. However, unlike the GDP per capita model, the size of the coefficient associated with the variable *fatalism* remains fairly stable as new controls are added.

Another result that is not observed in the GDP per capita model is that the variable *altruism* is not statistically significant after the control for the country's level of institutions is taken into account. Furthermore, unlike the GDP per capita model, the measure of TFP is not statistically significant in any of the model specifications where it is included, and the magnitude of its coefficient is not particularly large. This finding could be the result of the fact that the HDI is a composite index of more than just a measure of income. While TFP may have a significant effect of measures of income, it may not have the same significant influence on the health and education components within the HDI (something that can be pursued in future research).

Despite the dissimilarities with regards to some of the variables, like the GDP per capita model, each of the 9 specified models yield the hypothesized signs. Again, like the results observed in Gallup and Sachs (1999), the variable *coastal_pop_density1995* is statistically insignificant and the magnitude of its effect on the level of GDP per capita is

essentially zero. This indicates that the model is capable of producing results that are consistent with the literature.

The results from this model indicate that the hypothesis posited by Harrison (2006) is partially valid. The findings indicate that *fatalism* has a statistically significant negative effect on human development, but that *altruism* is only statistically significant in the model specifications that do not include the role of institutions. This result could be perhaps related to an issue of causation between the two variables that has yet to be discovered in this analysis. Again, further tests for robustness are available in the appendix if the reader is interested in understanding how the cultural explanatory variables interact with the individual control variables.

4.4 The Process of Identifying Possible Issues of Endogeneity

Often in the development literature the issue of causality between the dependent and independent variables needs to be addressed. It is not uncommon when working with GDP per capita as a dependent variable that the variables selected to explain it variation might also be influenced by the dependent variable itself. This is complicating factor in the model is referred to as endogeneity.

In order to test for endogeneity in the OLS model, I incorporated the Durbin-Wu-Hausman test. In order to use the Durbin-Wu-Hausman test, exogenous instrumental variables that are uncorrelated with the error term must chosen. Recall from Chapter 3 the specification for the GDP per capita model was:

$$Y_j = \beta_0 + \beta_1 x_{1,j} + \beta_2 x_{2,j} + Z_{j,i}\alpha_i + \varepsilon_j \quad (4.1)$$

where Y_j is the log of GDP per capita in 2010 for country j, $x_{1,j}$ is the measure of *fatalism* for country j, and $x_{2,j}$ is the measure of *altruism* for country j. Additionally, α_i is a (k x 1) vector

of coefficients that need to be estimated, where k is the number of control variables. Lastly, $Z_{j,i}$ is a (1 x k) vector of control variables for country j (j = 1, 2, …, n; where n is the number of observations), and ε_j is the error term associated with country j.

In order to implement the Durbin-Wu-Hausman test, first identify instrumental variables for the independent variables that are believed to be endogenous. Once instrumental variables have been identified, the first stage OLS model must be specified:

$$E_j = a_0 + I_{j,l}\mathrm{b}_l + X_{j,m}c_m + Z_{j,i}d_i + \nu_j \quad (4.2)$$

where E_j is a (n x1) vector of the possible endogenous variables being tested. $I_{j,l}$ is a vector of l potential instrumental variables (where $l = 1, 2, \ldots$), and b_l is a vector of coefficients for the l potential instrumental variables, $X_{j,m}$ is the vector of m cultural explanatory variables (where $m = 1, 2$), and c_m is a vector of coefficients for the m cultural explanatory variables (i.e. fatalism and altruism).

Note that $X_{j,m}$ could include both fatalism and altruism, or could be either fatalism or altruism alone depending on which variable is being tested for endogeneity (i.e. when fatalism is being tested for endogeneity, $X_{j,m}$ will be a (n x 1) vector of altruism). $Z_{j,i}$ is the same (1 x k) vector in equation 1, but could be a (1 x k-1) vector depending on which variable is being tested (i.e. when TFP is being considered as a possible endogenous variable, $Z_{j,i}$ will be a (1 x k-1) vector; and subsequently $X_{j,m}$ will be a (n x 2) vector), and d_i is a vector of coefficients for the i possible control variables. Lastly, ν_j is a vector of (n x 1) residuals for equation 2. From equation 2, we are able to obtain the residuals, $\hat{v}_j$, which will be used in order to complete the Durbin-Wu-Hausman test.

In order to observe whether there is evidence of endogeneity, the residuals, $\hat{v}_j$ from equation 2 are added to the original model:

$$Y_j = \beta_0 + \beta_1 x_{1,j} + \beta_2 x_{2,j} + Z_{j,i}\alpha_i + \gamma \hat{v}_j + \varepsilon_j \quad (4.3)$$

If the coefficient γ, associated with the fitted residuals from equation 2, is statistically significant, then the standard OLS model is not consistent, and should therefore be run incorporating instrumental variables in a 2SLS regression model.

4.4.1 Identifying the Possible Endogenous Variables:

i. Total Factor Productivity

a. Instrumental Variables

(1) Log of average GDP per capita from 1970 to 1995 (*logGDP7095)* – This measure was incorporated as a potential instrumental variable because previous economic growth could be a determining factor for the current level of productivity that exists within a country today. The data was taken from La Porta, Lopez de Silanes, Shleifer, and Vishny (1999)[13].

(2) Capital per worker in 1995 (*Cap_PW95)* – Similar to the log of GDP per capita from 1970 to 1995, the variable capturing physical capital per worker in 1995 provides a proxy for historical productivity. It would make sense that countries with higher levels of physical capital per worker in previous time periods would have a more experienced and efficient workforce. The stock of physical capital in 1995 was divided by the number of people employed in 1995 in order to obtain capital per worker. Data pertaining to both the stock of physical capital and the number of people employed in a country was taken from PWT 8.0.

[13] Data is downloadable at http://faculty.tuck.dartmouth.edu/rafael-laporta/research-publications

(3) British Colony (*british*) – The dummy variable for British colonial rule proxies for a country's historical institutional design. Therefore, the dummy variable is used to measure whether or not a country has had a long history of laws that were capable of establishing an environment conducive for efficient economic activity (i.e. trade and investment). The data was taken from La Porta, Lopez de Silanes, Shleifer, and Vishny (1999).

b. Durbin-Wu-Hausman Test of Endogeneity

The test of endogeneity shows that the measure of neoclassical growth, *total_factor_productivity*, is indeed endogenous, and therefore the OLS model is not consistent. As a result of this finding, a 2SLS regression with the instrumental variables discussed above was implemented for model 1 (GDP per capita). The estimates used meet the 20% threshold for 2SLS relative bias using the minimum eigenvalue statistic provided by STATA's canned 2SLS instrumental variable procedure. This canned procedure also provides the p-values for the Durbin-Wu-Hausman test, and the results from this model specification indicate that the variable *total_factor_productivity* is endogenous at the 5% level. Table 4.5 provides the results of the Durbin-Wu-Hausman test and the subsequent 2SLS regression. While there has been some change to the magnitudes of the coefficients (the largest change is seen in TFP), the cultural explanatory variables maintain their statistical significance. Furthermore, all of the signs are consistent with the hypothesized relationships.

Table 4.4: Model (1) Test of Endogeneity/2SLS regression – Total Factor Productivity

	Durbin-Wu-Hausman Test / 2SLS		
	total_factor_productivity2010 **[21]**	Log of GDP per capita 2010 **[22]**	Log of GDP per capita 2010 **[23]**
logGDP7095	0.17		
	(2.14)**		
britcol	0.35		
	(2.91)***		
Cap_PW95	0.00		
	(0.12)		
fatalism	-0.02	-0.10	-0.10
	(0.28)	(3.42)***	(2.92)***
altruism	-0.06	0.13	0.13
	(0.38)	(2.50)**	(2.13)**
landlock	0.09	-0.07	-0.07
	(0.52)	(1.03)	(0.88)
abscent_lat	0.03	0.24	0.24
	(0.09)	(2.02)*	(1.72)*
total_factor_productivity2010		0.37	0.62
		(5.15)***	(6.29)***
Fertility_2010	-0.01	-0.18	-0.18
	(0.12)	(5.78)***	(4.93)***
rule_of_law_2010	-0.04	0.09	0.09
	(0.54)	(3.23)***	(2.76)***
urban_pop2010	-0.23	0.42	0.42
	(0.82)	(4.15)***	(3.54)***
TFP_residual1		0.25	
		(2.30)**	
Constant	-0.36	3.62	3.62
	(0.49)	(19.09)***	(16.28)***
N	**40**	**40**	**40**
F statistic	3	55	43
R-squared	0.47	0.94	0.92
Adjusted R-squared	0.29	0.93	0.9

*	p-value < .10
**	p-value < .05
***	P-value < .01

ii. Fertility Rate in 2010:

a. Potential Instrumental Variables

(1) Fertility Rates in 1990 - The variable *Fertility_1990* is a measure of the total fertility rate, and is a proxy for human capital. The variable is taken from the World Bank's *World Development Indicators (WDI)* dataset, and it measures the total number of children that a woman would have if she were to live to the end of her potential child bearing years, and have children "in accordance with age-specific fertility rates." [14] Fertility rates have been used in the literature in order to measure the opportunity cost have having children. It makes sense that children who were born in 1990 to large families, and who are physically capable of bearing their own children in 2010, may be caught in a poverty trap and thus have large families as well.

b. Durbin-Wu-Hausman Test of Endogeneity

The test of endogeneity shows that the measure of neoclassical growth, *fertility_2010*, is indeed endogenous, and therefore the OLS model is not consistent. As a result of this finding, a 2SLS regression with the instrumental variables discussed above was implemented for model 1 (GDP per capita). The estimates used meet the 5% threshold for 2SLS relative bias using the minimum eigenvalue statistic provided by STATA's canned 2SLS instrumental variable procedure. This canned procedure also provides the p-values for the Durbin-Wu-Hausman test, and the results from this model specification indicate that the variable *fertility_2010* is endogenous at the 1% level. Table 4.6 provides the results of the Durbin-Wu-Hausman test and the subsequent 2SLS regression. While there has been some change to the magnitudes of the coefficients the cultural explanatory variables

[14] World Development Indicators, The World Bank: downloadable at http://data.worldbank.org/data-catalog/world-development-indicators

maintain their statistical significance. Furthermore, all of the signs, except for *coastal_pop_density1995* (although the variable is insignificant and the coefficient is approximately zero), are consistent with the hypothesized relationships.

Table 4.5: Model (1) Test of Endogeneity/2SLS regression – Fertility Rate 2010

	Durbin-Wu-Hausman Test / 2SLS		
	Fertility_2010 **[24]**	Log of GDP per capita 2010 **[25]**	Log of GDP per capita 2010 **[26]**
Fert90	0.63		
	(14.49)***		
fatalism	-0.22	-0.11	-0.11
	(3.42)***	(3.59)***	(3.32)***
altruism	0.26	0.11	0.11
	(2.31)**	(2.06)**	(1.91)*
landlock	0.30	-0.02	-0.02
	(2.16)**	(0.34)	(0.31)
abscent_lat	0.52	0.20	0.20
	(1.93)*	(1.64)	(1.52)
total_factor_productivity2010	0.25	0.47	0.47
	(2.13)**	(8.66)***	(8.02)***
Fertility_2010		0.00	-0.21
		(0.03)	(5.93)***
rule_of_law_2010	-0.01	0.10	0.10
	(0.19)	(3.97)***	(3.68)***
urban_pop2010	0.13	0.39	0.39
	(0.64)	(3.95)***	(3.65)***
Fertility_residual1		-0.21	
		(2.32)**	
Constant	-0.16	3.89	3.87
	(0.43)	(21.90)***	(20.36)***
N	**40**	**40**	**40**
F statistic	52.13	55.47	54.91
R-squared	0.93	0.94	0.93
Adjusted R-squared	0.91	0.93	0.92

*	p-value < .10
**	p-value < .05
***	P-value < .01

4.4.2 Fataism:

a. Potential Instrumental Variables

(1) Protestantism in 1900 – The variable *PROT1900* measures the proportion of the population that was Protestant in the 1900, and was taken from Barro and Mcleary (2003). Previous literature has argued that early adherence to Protestantism led to what became known as the Protestant work ethic. This work ethic has been argued to have a lasting influence on how people associated individual effort with prosperity.

(2) The Average Youth Unemployment Rate (2005 – 2009) – The variable *av_youth_unemployment_0509* measures the percent of the total labor force within the ages of 15 to 24 that is unemployed. The data was taken from the World Bank's World Development Indicators catalog[15]. If the country has a history of high youth unemployment rates, young people may be less likely to believe that investing in human capital has a financial reward.

(3) Log of average GDP per capita from 1970 to 1995 (*logGDP7095)* – This measure was incorporated as a potential instrumental variable because previous economic growth could be a determining factor for the current level of productivity that exists within a country today.

(4) Life Expectancy in 1965 – The variable *life_expectancy_1965* is taken from Gallup and Sachs (1999), and it captures life expectancy in 1965[16]. If most people who are of the age to be having children in the 1990's were born in an era where their own parent were

[15] World Development Indicators (World Bank) downloadable at http://data.worldbank.org/indicator/SL.UEM.1524.ZS

[16] Dataset is downloadable at http://www.cid.harvard.edu/ciddata/geographydata.htm

likely to die at an early age, then a culture of fatalism flourish. If there are very few prospects for living a long life, then there may be few incentives to invest in the future.

b. Durbin-Wu-Hausman Test of Endogeneity

Table 4.6: Model (1) Test of Endogeneity/2SLS regression – Fatalism

	Durbin-Wu-Hausman Test / 2SLS		
	fatalism	Log of GDP per capita 2010	Log of GDP per capita 2010
	[27]	**[28]**	**[29]**
PROT1900	-0.99		
	(1.70)		
av_youth_unemployment_0509	0.02		
	(1.72)*		
logGDP7095	-0.133		
	(0.92)		
life_expectancy_1965	-0.03		
	(1.01)		
fatalism		-0.07	-0.18
		(1.88)*	(3.09)***
altruism	1.15	0.20	0.20
	(3.59)***	(2.96)***	(2.64)**
landlock	0.17	-0.05	-0.05
	(0.42)	(0.72)	(0.64)
abscent_lat	1.16	0.27	0.27
	(1.60)	(2.13)**	(1.90)*
total_factor_productivity2010	0.44	0.47	0.47
	(1.26)	(8.43)***	(7.53)***
Fertility_2010	-0.09	-0.18	-0.18
	(0.38)	(5.55)***	(4.96)***
rule_of_law_2010	0.11	0.08	0.08
	(0.66)	(3.02)***	(2.70)**
urban_pop2010	-0.35	0.39	0.39
	(0.57)	(3.76)***	(3.36)***
fatalism_residual1		-0.11	
		(1.72)*	
Constant	2.02	3.78	3.78
	(0.99)	(19.49)***	(17.39)***
N	**39**	**39**	**39**
F statistic	2.87	51.33	45.65
R-squared	0.54	0.94	0.92
Adjusted R-squared	0.35	0.92	0.9

*	p-value < .10
**	p-value < .05
***	P-value < .01

The test of endogeneity shows that the measure of neoclassical growth, *fatalism*, is indeed endogenous, and therefore the OLS model is not consistent. As a result of this finding, a 2SLS regression with the instrumental variables discussed above was implemented for model 1 (GDP per capita). However, it must be noted that the instruments that were incorporated in this test are unable to exceed the 30% threshold for 2SLS relative bias.

4.4.2 Altruism:

a. Potential Instrumental Variables

(1) Ethnic Fractionalization – The variable *Ethnic_Frac* captures the likelihood that two individuals when selected randomly would be from different ethnic groups. The data was taken from Alesina, Devleeschauwer, Easterly, Kurlat, and Wacziarg (2003)[17]. The extent to which a country is fragmented my influence the presence of general morality.

(2) Language Fractionalization – The variable *Language_Frac* captures the likelihood that two individuals when selected randomly would speak different languages. The data was taken from Alesina, Devleeschauwer, Easterly, Kurlat, and Wacziarg (2003). The extent to which a country is fragmented my influence the presence of general morality.

(3) Religious Fractionalization – The variable *Religion_Frac* captures the likelihood that two individuals when selected randomly would practice or adhere different religions. The data was taken from Alesina, Devleeschauwer, Easterly, Kurlat, and Wacziarg (2003). The extent to which a country is fragmented my influence the presence of general morality.

(4) The Average Youth Unemployment Rate (2005 – 2009) – The variable *av_youth_unemployment_0509* measures the percent of the total labor force within the ages

[17] downloadable at http://www.cgeh.nl/data#Fractionalization

of 15 to 24 that is unemployed. If the country has a history of high youth unemployment rates, young people may be less likely to believe doing good for society is a top priority.

(5) Log of average GDP per capita from 1970 to 1995 (*logGDP7095)* – This measure was incorporated as a potential instrumental variable because previous economic growth could be a determining factor for the current level of productivity that exists within a country today. Lower growth rates in a previous time period may have an influence on whether or not the notion of altruism has had time to flourish within a country, as poor people are less likely to have resources in order to good for society.

b. Durbin-Wu-Hausman Test of Endogeneity

The test of endogeneity shows that the measure of neoclassical growth, *altruism*, is indeed endogenous, and therefore the OLS model is not consistent. As a result of this finding, a 2SLS regression with the instrumental variables discussed above was implemented for model 1 (GDP per capita). However, it must be noted that the instruments that were incorporated in this test are unable to exceed the 30% threshold for 2SLS relative bias.

Table 4.7: Model (1) Test of Endogeneity/2SLS regression – Altruism

	Durbin-Wu-Hausman Test / 2SLS		
	altruism **[30]**	Log of GDP per capita 2010 **[31]**	Log of GDP per capita 2010 **[32]**
Ethnic_Frac	0.10		
	(0.28)		
Language_Frac	-0.04		
	(0.14)		
Religion_Frac	0.39		
	(1.47)		
av_youth_unemployment_0509	-0.01		
	(2.50)**		
logGDP7095	0.06		
	(0.81)		
fatalism	0.27	-0.16	-0.16
	(2.95)***	(4.64)***	(3.40)***
altruism		0.00	0.34
		(0.03)	(2.58)**
landock	0.03	-0.09	-0.09
	(0.14)	(1.24)	(0.91)
abscent_lat	0.48	0.15	0.15
	(1.24)	(1.16)	(0.85)
total_factor_productivity2010	-0.33	0.49	0.49
	(1.53)	(8.75)***	(6.41)***
Fertility_2010	-0.06	-0.16	-0.16
	(0.52)	(4.22)***	(3.09)***
rule_of_law_2010	0.06	0.08	0.08
	(0.63)	(2.65)**	(1.94)*
urban_pop2010	0.22	0.36	0.36
	(0.61)	(3.53)***	(2.58)**
altruism_residual1		0.33	
		(2.90)***	
Constant	1.34	3.39	3.39
	(1.95)*	(15.22)***	(11.15)***
N	**39**	**39**	**39**
F statistic	3.90	47.98	28.97
R-squared	0.64	0.94	0.88
Adjusted R-squared	0.48	0.92	0.85

*	p-value < .10
**	p-value < .05
***	P-value < .01

4.5 Three Stage Least Squares (3SLS) Approach

Given that there are four endogenous variables in model 1, simultaneous (3SLS) equations are required to estimate the effects of the cultural explanatory variables. The first equation in the 3SLS or simultaneous equations model is the original model specified in Chapter 3. Here, rather than expressing the model in its general form, it will be specified in its applied form.

$$\begin{aligned} Log\ GDP\ per\ capita\ &= \beta_0 + \beta_1\ fatalism + \beta_2\ altruism + \beta_3\ landlock + \beta_4\ abscent\ lat. \\ &+ \beta_5\ total\ factor\ productivity + \beta_6\ fertility\ 2010 \\ &+ \beta_7\ rule\ of\ law + \beta_9\ coastal\ pop.density\ 1995 + \varepsilon \end{aligned} \quad (4.4)$$

The equation (4.5) in the 3SLS model is the altruism model and it incorporates *PROT1900, av_youth_unemployment_0509, logGDP7095,* and *life_expectancy_1965* as instrumental variables. Along with the instrumental variables, the model also includes the dependent variable *Log GDP per capita* and the other endogenous variables that have been identified. The inclusion of these variables are necessary in order to solve the simultaneous equation.

$$\begin{aligned} fatalism = \ & a_0 PROT1900 + a_1 av.youth\ unemployment\ 0509 + a_2 logGDP7095 \\ & + a_3 life\ expectancy\ 1965 + a_4 Log\ GDP\ per\ capita + a_5 altruism \\ & + a_6 total\ factor\ productivity + a_7 fertility\ 2010 + \varepsilon \end{aligned} \quad (4.5)$$

The equation (4.6) in the 3SLS model is the altruism model and it incorporates the *Ethnic_Frac, Language_Frac, Religion_Frac, av_youth_unemployment_0509,* and *logGDP7095*

as instrumental variables, along with the dependent variable and the other endogenous variables.

$$\begin{aligned} altruism = b_0 + b_1 Ethnic\ Frac + b_2 Language\ Frac + b_3 Religion\ Frac \\ + b_4 av.\ youth\ unemployment\ 0509 + b_5 logGDP7095 \\ + b_6 Log\ GDP\ per\ capita + b_6 fatalsim + b_7 total\ factor\ productivity \\ + b_7 fertility\ 2010 + \varepsilon \end{aligned} \quad (4.6)$$

The equation (4.7) in the 3SLS model is the TFP model and it incorporates the instrumental variables discussed above.

$$\begin{aligned} total\ factor\ productivity = c_0 + c_1 logGDP7095 + c_2\ capital\ worker1995 \\ + c_3\ british + c_4\ Log\ GDP\ per\ capita + c_5 fatalsim \\ + c_6 altruism + c_7\ fertility\ 2010 + \varepsilon \end{aligned} \quad (4.7)$$

The equation (4.8) in the 3SLS model is the fertility rate model for 2010, and it incorporates the instrumental variable *fertility_1990* discussed above. Along with the instrumental variables, the model also includes the dependent variable *Log GDP per capita* and the other endogenous variable *total_factor_productivity,* both of which are necessary in order to solve the simultaneous equation.

$$\begin{aligned} fertility\ 2010 = d_0 + d_1\ fertility\ 1995 + d_2\ Log\ GDP\ per\ capita \\ + d_3 fatalism + d_4 altrusim \\ + d_5\ total\ factor\ productivity + \varepsilon \end{aligned} \quad (4.8)$$

The results from the 3SLS model are presented in Table 4.8 with the results from the full OLS regression model, and four 2SLS models. While the coefficients associated with *fatalism* and *altruism* increase significantly, the cultural explanatory variables maintain their level of statistical significance. The results from the 3SLS model indicate that an increase of 1% in the country's belief that life outcomes are determined by either fate or luck decreases the GDP per capita by approximately 16% ($e^{-.18} \approx .835$). The coefficient associated with altruism indicates that an increase of 1% in the country's identification with altruistic properties results in an increase of approximately 42% ($e^{.35} \approx 1.419$) in GDP per capita.

4.6 Summary of the Endogeneity Analysis (GDP per capita)

The results from each of the models incorporated in this thesis indicate that there is a great deal of stability (Table 4.8), as the signs associated with the coefficients do not alternate from positive to negative, or from negative to positive, as new controls are added to the model. The models in this analysis also produce results that are consistent with the economic development literature discussed in both Chapter 1 and Chapter 2.

In the appendix you will find further model specifications that demonstrate how the cultural explanatory variables interact with each of the specified control variables, as well as a series of regressions that check the robustness of the results. In addition to the robustness tests, the variance inflation factors are also included for each of the model specifications in order to identify any potential cases of multicollinearity.

Table 4.8: Model (1) Comparison of OLS, 2SLS, and 3SLS Regression Results

	OLS	2SLS - Fatalism	2SLS - Altrusim	2SLS - TFP	2SLS - Fertility	3SLS
fatalism	-0.09	-0.18	-0.16	-0.10	-0.11	-0.18
	(2.96)***	(3.09)***	(3.40)***	(2.92)***	(3.32)***	(4.30)***
altruism	0.10	0.20	0.34	0.13	0.11	0.32
	(1.86)*	(2.64)**	(2.58)**	(2.13)**	(1.91)*	(3.43)***
landlock	-0.08	-0.05	-0.09	-0.07	-0.02	-0.08
	(1.07)	(0.64)	(0.91)	(0.88)	(0.31)	(1.53)
abscent_lat	0.21	0.27	0.15	0.24	0.20	0.19
	(1.74)*	(1.90)*	(0.85)	(1.72)*	(1.52)	(1.75)*
total_factor_productivity	0.47	0.47	0.49	0.62	0.47	0.52
	(8.12)***	(7.53)***	(6.41)***	(6.29)***	(8.02)***	(7.25)***
fertility_2010	-0.17	-0.18	-0.16	-0.18	-0.21	-0.18
	(5.75)***	(4.96)***	(3.09)***	(4.93)***	(5.93)***	(4.64)***
rule_of_law_2010	0.10	0.08	0.08	0.09	0.10	0.05
	(3.77)***	(2.70)**	(1.94)*	(2.76)***	(3.68)***	(2.33)**
urban_pop2010	0.46	0.39	0.36	0.42	0.39	0.35
	(4.45)***	(3.36)***	(2.58)**	(3.54)***	(3.65)***	(4.14)***
Constant	3.74	3.78	3.39	3.62	3.87	3.51
	(21.70)***	(17.39)***	(11.15)***	(16.28)***	(20.36)***	(15.00)***
N	**44**	**39**	**39**	**40**	**40**	38
F statistic	54.67	45.65	28.97	43	54.91	
R-squared	0.93	0.92	0.88	0.92	0.93	0.89
Adjusted R-squared	0.91	0.9	0.85	0.9	0.92	

*	p-value < .10
**	p-value < .05
***	P-value < .01

4.7 Tests of Endogeneity for Human Development Index

The steps, and instrumental variables used in the process for identifying endogeneity in the GDP per capita model are followed in order to identify any issue of endogeneity with the Human Development Index. The results from the subsequent tests are presented below. The reader can return to section 4.4.1 to review the process of identifying instrumental variables and testing for endogeneity, as well section 4.5 to review the process of implementing 3SLS.

Table 4.9: Model (2) Test of Endogeneity/2SLS regression – Total Factor Productivity

	Durbin-Wu-Hausman Test / 2SLS		
	total_factor_productivity2010 **[39]**	Human Development Index **[40]**	Human Development Index **[41]**
lgnppcav	0.17		
	(2.14)**		
britcol	0.35		
	(2.91)***		
Cap_PW95	0.00		
	(0.12)		
fatalism	-0.02	-0.04	-0.04
	(0.28)	(3.54)***	(3.21)***
altruism	-0.06	0.02	0.02
	(0.38)	(1.30)	(1.18)
landlock	0.09	-0.01	-0.01
	(0.52)	(0.54)	(0.49)
abscent_lat	0.03	0.12	0.12
	(0.09)	(2.72)**	(2.47)**
total_factor_productivity2010		-0.01	0.06
		(0.38)	(1.84)*
Fertility_2010	-0.01	-0.06	-0.06
	(0.12)	(5.10)***	(4.63)***
rule_of_law_2010	-0.04	0.04	0.04
	(0.54)	(4.26)***	(3.86)***
urbpop10	-0.23	0.11	0.11
	(0.82)	(3.24)***	(2.94)***
TFP_residual1		0.07	
		(1.79)*	
Constant	-0.36	0.76	0.76
	(0.49)	(11.42)***	(10.36)***
N	**40**	**40**	**40**
F statistic	2.57	36.73	33.99
R-squared	0.47	0.92	0.9
Adjusted R-squared	0.29	0.89	0.87

*	p-value < .10
**	p-value < .05
***	P-value < .01

Table 4.10: Model (2) Test of Endogeneity/2SLS regression – Fertility Rate 2010

	Durbin-Wu-Hausman Test / 2SLS		
	Fertility_2010 **[42]**	Human Development Index **[43]**	Human Development Index **[44]**
Fert90	0.63		
	(14.49)***		
fatalism	-0.22	-0.04	-0.04
	(3.42)***	(3.59)***	(3.52)***
altruism	0.26	0.02	0.02
	(2.31)**	-0.94	-0.92
landlock	0.30	0.00	0.00
	(2.16)**	-0.07	-0.07
abscent_lat	0.52	0.10	0.10
	(1.93)*	(2.41)**	(2.37)**
total_factor_productivity2010	0.25	0.02	0.02
	(2.13)**	-0.97	-0.95
Fertility_2010		-0.02	-0.06
		-0.57	(5.19)***
rule_of_law_2010	-0.01	0.04	0.04
	-0.19	(4.82)***	(4.73)***
urbpop10	0.13	0.11	0.11
	-0.64	(3.03)***	(2.98)***
Fertility_residual1		-0.04	
		-1.36	
Constant	-0.16	0.83	0.83
	-0.43	(12.99)***	(12.76)***
N	**40**	**40**	**40**
F statistic	52.13	35.1	38.06
R-squared	0.93	0.91	0.91
Adjusted R-squared	0.91	0.89	0.88

*	p-value < .10
**	p-value < .05
***	P-value < .01

Table 4.11: Model (2) Test of Endogeneity/2SLS regression – Fatalism

	Durbin-Wu-Hausman Test / 2SLS		
	fatalism **[33]**	Human Development Index **[34]**	Human Development Index **[35]**
PROT1900	-0.99		
	(1.70)		
youth_unemployment	0.02		
	(1.72)*		
lgnppcav	-0.13		
	(0.92)		
lifex65	-0.03		
	(1.01)		
fatalism		-0.02	-0.07
		(1.70)	(3.28)***
altruism	1.15	0.05	0.05
	(3.59)***	(1.99)*	-1.65
landlock	0.17	0.00	0.00
	(0.42)	(0.12)	(0.10)
abscent_lat	1.16	0.13	0.13
	(1.60)	(3.02)***	(2.52)**
total_factor_productivity2010	0.44	0.02	0.02
	(1.26)	(0.90)	(0.75)
Fertility_2010	-0.09	-0.06	-0.06
	(0.38)	(5.27)***	(4.38)***
rule_of_law_2010	0.11	0.04	0.04
	(0.66)	(4.26)***	(3.55)***
urbpop10	-0.35	0.10	0.10
	(0.57)	(2.81)***	(2.34)**
fatalism_residual1		-0.05	
		(2.21)**	
Constant	2.02	0.84	0.84
	(0.99)	(12.75)***	(10.61)***
N	**39**	**39**	**39**
F statistic	2.87	37.11	28.65
R-squared	0.54	0.92	0.88
Adjusted R-squared	0.35	0.90	0.85

*	p-value < .10
**	p-value < .05
***	P-value < .01

Table 4.12: Model (2) Test of Endogeneity/2SLS regression – Altruism

	Durbin-Wu-Hausman Test / 2SLS		
	altruism **[36]**	Human Development Index **[37]**	Human Development Index **[38]**
Ethnic_Frac	0.10		
	(0.28)		
Language_Frac	-0.04		
	(0.14)		
Religion_Frac	0.39		
	(1.47)		
youth_unemployment	-0.01		
	(2.50)**		
lgnppcav	0.06		
	(0.81)		
fatalism	0.27	-0.05	-0.05
	(2.95)***	(3.80)***	(3.51)***
altruism		0.01	0.07
		(0.28)	(1.72)*
landlock	0.03	-0.01	-0.01
	(0.14)	(0.21)	(0.19)
abscent_lat	0.48	0.08	0.08
	(1.24)	(1.67)	(1.54)
total_factor_productivity2010	-0.33	0.01	0.01
	(1.53)	(0.65)	(0.60)
Fertility_2010	-0.06	-0.04	-0.04
	(0.52)	(3.18)***	(2.94)***
rule_of_law_2010	0.06	0.04	0.04
	(0.63)	(4.29)***	(3.96)***
urbpop10	0.22	0.09	0.09
	(0.61)	(2.40)**	(2.22)**
altruism_residual1		0.06	
		(1.39)	
Constant	1.34	0.72	0.72
	(1.95)*	(8.78)***	(8.11)***
N	**39**	**39**	**39**
F statistic	3.9	28.01	26.88
R-squared	0.64	0.9	0.87
Adjusted R-squared	0.48	0.86	0.84

*	p-value < .10
**	p-value < .05
***	P-value < .01

Table 4.13: Model (2) Comparison of OLS, 2SLS, and 3SLS Regression Results

	OLS	2SLS - Fatalism	2SLS - Altrusim	2SLS - TFP	2SLS - Fertility	3SLS
fatalism	-0.03	-0.07	-0.05	-0.04	-0.04	-0.05
	(3.13)***	(3.28)***	(3.51)***	(3.21)***	(3.52)***	(3.13)***
altruism	0.02	0.05	0.07	0.02	0.02	0.00
	-0.99	-1.65	(1.72)*	-1.18	-0.92	(0.10)
landlock	-0.03	0.00	-0.01	-0.01	0.00	0.00
	(1.11)	(0.10)	(0.19)	(0.49)	(0.07)	(0.06)
abscent_lat	0.12	0.13	0.08	0.12	0.10	0.15
	(2.95)***	(2.52)**	(1.54)	(2.47)**	(2.37)**	(2.96)***
total_factor_productivity	0.02	0.02	0.01	0.06	0.02	0.08
	-1.21	-0.75	-0.60	(1.84)*	-0.95	(2.64)***
fertility_2010	-0.05	-0.06	-0.04	-0.06	-0.06	-0.06
	(4.57)***	(4.38)***	(2.94)***	(4.63)***	(5.19)***	(3.87)***
rule_of_law_2010	0.04	0.04	0.04	0.04	0.04	0.04
	4.37)***	(3.55)***	(3.96)***	(3.86)***	(4.73)***	(4.03)***
urban_pop2010	0.13	0.1	0.09	0.11	0.11	0.11
	(3.78)***	(2.34)**	(2.22)**	(2.94)***	(2.98)***	(2.89)***
Constant	0.76	0.84	0.72	0.76	0.83	0.84
	(12.82)***	(10.61)***	(8.11)***	(10.36)***	(12.76)***	(9.06)***
N	**44**	**39**	**39**	**40**	**40**	38
F statistic	37.83	28.65	26.88	34	38.06	
R-squared	0.90	0.88	0.87	0.9	0.91	0.84
Adjusted R-squared	0.87	0.85	0.84	0.87	0.88	

*	p-value < .10
**	p-value < .05
***	P-value < .01

Similar to the results derived from the 3SLS methods implemented in the GDP per capita model, the results shown in Table 4.14 are robust. The variables all have the expected signs, and they do not alternate from positive to negative (vice versa) when new controls are added to the model. Furthermore, the magnitudes of the coefficients do not fluctuate greatly as the model is augmented with the addition of new control variables.

The difference between the OLS model and 3SLS model in Table 4.14 is seen in the significance of the variable measuring TFP. In the OLS model coefficient associated with *total_factor_productivity* was neither a major contributing factor to the HDI model (with

regards to the magnitude of the coefficient relative to other variables), nor was it statistically significant. However, in the 3SLS model *total_factor_productivity* is now the third largest contributing factor to HDI, and is statistically significant. Given that the instrumental variables that were chosen are proxies for previous economic growth, it is likely that these factors are contributing to the increase in the magnitude of the coefficient associated with TDP, as well as its level of statistical significance.

It is also important to note that altruism remains statistically insignificant in all of the models except for the 2SLS model where altruism is being instrumented by measures of ethnic, linguistic, and religious fractionalization, along with measures of previous economic growth.

Missing Observations

Table 4.14: Missing Observations in The Dataset

Variable	# of Missing Obs	Countries
logGDP_PC_2010	3	Algeria, Libya, and Palestine
HDI_2010	1	Taiwan
fatalism	0	NA
altruism	2	Morocco and Spain
landlock	0	NA
absent_lat	1	Palestine
total_factor_productivity	11	Algeria, Azerbaijan, Belarus, Ghana, Lebanon, Libya, Nigeria, Pakistan, Palestine, Uzbekistan, and Yemen
fertility_2010	2	Palestine and Taiwan
rule_of_law_2010	1	Palestine
urban_pop2010	2	Palestine and Taiwan
coastal_pop_density1995	3	Bahrain, Cyprus, and Palestine

Chapter 5: Concluding Remarks

To my knowledge, this thesis is the first attempt to simultaneously test the hypotheses that an individual's adherence to the Golden Rule, and that they are capable of determining or altering their life outcomes, are critical cultural components that help to explain both economic and human development. This study of economic and human development is also the first attempt that I am aware of that incorporates the Schwartz survey question pertaining to the individual's identification with the importance of doing something good for society. The results of this thesis validate the Harrison hypotheses that the cultural components, altruism and fatalism, play an important role in explaining the level of economic and human development in a cross section of sample countries.

This thesis is also unique in that explores the effect of cultural components on both the level of GDP per capita and the HDI, and identifies how highly significant variables in one model are insignificant in the other. For example, TFP is a major determining factor in the GDP per capita model, but is neither statistically significant nor of considerable magnitude in the HDI model. This interesting result could possibly be explained by the fact that the HDI is a composite index, which extends equal weight to income, health, and education.

A persistent theme throughout this thesis has been the acknowledgement of an extensive branch of research and literature that has focused on the effects that geography, productivity, and institutions have on development. While there have certainly been considerable contributions made to the understanding of economic development, the cultural component of this analysis has only recently been incorporated by economists in the field of economic development. For example, the World Bank has begun exploring how

human behavior (i.e. how individuals make decisions and interact with others) influences the prospect of economic growth and development in their 2015 World Development Report (World Bank, 2015).

When the literature has examined the effects of culture on economic development, its contributors generally control for only one or two of the three other potential factors that have been discussed in this analysis. For example, Tabellini controls for only human capital, and uses historical institutions as an instrumental variable for current cultural characteristics. His work does not take into account geographic differences throughout regions in Europe. However, continental Europe is not likely to display a great deal of variation in geographic characteristics (or are not highly tropical), and therefore may not be a necessary control variable. To my knowledge, this thesis is also the first study that examines the cultural influences on economic and human development while simultaneously controlling for geography, productivity, and institutions

As discussed in the introduction to this thesis, there has been considerable progress made by the international community to improve the lives of impoverished individuals throughout the world. However, certain parts of the world are still faced with mounting limitations for economic prosperity. According to the 2014 Millennial Goals report, India, China, Nigeria, Bangladesh, and the Democratic Republic of Congo account for 780 million of the 1.2 billion people (65 percent) throughout the world living in extreme poverty.

While the number of children who do not attend school has decreased, estimates provided by the United Nation's 2014 report indicate that in 2012 approximately 58 million children were not attending primary school. More often than not children do not attend school because of poverty, gender inequality, and geographic limitations (rural

households). Having children attend primary school is only part of the solution, as it is the ultimate goal to have children complete their education. In developing countries the primary school dropout rates are generally related to children who are older than the age group for their grade placement, children who are geographically isolated from school and must travel long distances to attend, and children who may be forced to work given household poverty.

Many of the policies that international aid organizations implement throughout the world fail to provide long-term economic opportunities for people struggling with poverty in underdeveloped countries. As discussed in Chapter 1, some of development projects fail because they attempt to apply a "cookie cutter" approach to economic development and assume that what has worked in the past in another location will surely work again in a new location. The results from this study do not support this method of economic intervention, and suggest that there are cultural components that must be accounted for when constructing policies of economic intervention.

The results from this study indicate that recognition of a cultural component in economic development policies would strengthen their long-term effectiveness. One potential avenue for addressing the altruistic (lack thereof) and fatalistic characteristics within a society is for economic development policies to identify methods of enhancing the primary and secondary socialization processes that are discussed in Platteau (1994b). In order for this to take place, cultural change needs to begin within the family dynamic.

The values and beliefs related to what we refer to as the Golden Rule are an essential component in molding a society that generally looks after the needs of everyone and not just a select few. This early developmental stage within the family dynamic is what

Platteau referred to as primary socialization. However, often times this moral code does not extend itself much further than to the individuals with whom the child regularly associates herself with. Therefore, a reinforcing system outside of the family circle is also necessary in order to help extend the bonds of compassion beyond the small circle of individuals with whom the child is familiar. This process is what Platteau referred to as secondary socialization.

Along with the dissemination of essential codes of morality and compassion, children should not have to be introduced into a world where the presiding belief is that nothing can be done to alter one's life trajectory. With almost 100 percent certainty, there will be children born into families trapped in extreme poverty, and surely those images can have a lasting effect on a child's ability to believe in the possibility for prosperity. Furthermore, the individuals with whom the child generally interacts with may be deeply entrenched in despair, and have sadly built an acceptance for their position in life. It is in scenarios like these, that it is essential to have a system outside of the family dynamic that effectively promotes prosperity.

Harrison (2006) has argued that the type of cultural change discussed above is likely to occur if those with political power are capable of manufacturing an environment that is conducive to change. Furthermore, Harrison argues that society must adopt an ethic that is comprised of "democracy, social justice, and economic prosperity." In order to instill this ethic, the youth must be socialized not only by the family, but also from external sources of guidance such as schools and the media.

Cultural change is not likely to occur suddenly, as the process is likely to be lengthy, and may require generations in order to take root. The Japanese experience highlighted by

Landes (2000), for example, is a valuable historical illustration of how a culture can be transformed if there is overwhelming commitment to the process.

Like many studies that have explored economic and human development, data limitations considerably constrain the possible empirical work that can be conducted. Researchers should encourage the World Values Survey to continue its progress in identifying cultural measures that are useful for further analysis. It would be helpful if the WVS were to continue its use of the Schwartz survey question, implemented in its most recent survey wave, in the WVS's subsequent survey waves. By doing so, this type of analysis could be enhanced by implementing a time dimension to the cross sectional dataset. With an expanded dataset, the researcher could implement a dependent variable that captures growth in GDP per capita and the HDI. Another interesting question that I was unable to analyze is the effect that historical cultural characteristics have on current institutions. Future research should also focus on identifying strong instrumental variables that are capable of correcting for issues of endogeneity. This process could be improved upon with further work in both constructing datasets that capture relevant historical information, and enhancing the availability of such data for a wider range of countries.

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Appendix

Table A1: Model (1) Robustness Check 39 thru 44

	Dependent Variable: Log of GDP per Capita 2010					
	[39]	**[40]**	**[41]**	**[42]**	**[43]**	**[44]**
	OLS	**OLS**	**OLS**	**OLS**	**OLS**	**OLS**
fatalism	-0.24	-0.15	-0.12	-0.18	-0.16	-0.28
	(3.25)***	(2.91)***	(1.87)*	(2.66)**	(2.41)**	(3.40)***
altruism	0.43	0.25	0.21	0.37	0.33	0.56
	(3.64)***	(3.04)***	(1.96)*	(3.44)***	(3.03)***	(4.56)***
landlock	-0.39					
	(3.29)***					
abscent_lat	0.85					
	(3.04)***					
total_factor_productivity		0.54				
		(5.84)***				
fertility_2010		-0.29				
		(7.27)***				
rule_of_law_2010			0.26			
			(6.31)***			
urban_pop2010				0.96	1.07	
				(4.89)***	(5.65)***	
coastal_pop_density1995				0.00		0.00
				(1.10)		(2.18)**
Constant	3.45	4.12	3.82	2.95	2.98	3.35
	(12.67)***	(16.58)***	(15.67)***	(11.39)***	(11.66)***	(11.15)***
N	**53**	**44**	**53**	**50**	**52**	**51**
F statistic	11.23	33.55	25.32	17.14	21.07	10.48
R-squared	0.48	0.77	0.61	0.60	0.57	0.36
Adjusted R-squared	0.44	0.75	0.58	0.56	0.54	0.33

*	p-value < .10
**	p-value < .05
***	P-value < .01

Table A2: Model (1) Robustness Check 45 thru 49

	Dependent Variable: Log of GDP per Capita 2010				
	[45]	**[46]**	**[47]**	**[48]**	**[49]**
	OLS	**OLS**	**OLS**	**OLS**	**OLS**
fatalism	-0.14	-0.15	-0.21	-0.18	-0.27
	(3.07)***	(2.32)**	(3.48)***	(2.80)***	(4.15)***
altruism	0.25	0.17	0.28	0.27	0.37
	(3.17)***	(-1.59)	(2.74)***	(2.68)**	(3.42)***
landlock	-0.26	-0.11	-0.19	-0.19	-0.33
	(2.66)**	(-0.92)	(1.80)*	(1.67)*	(3.07)***
abscent_lat	0.32	0.61	0.86	0.66	1.10
	(1.74)*	(2.61)**	(3.50)***	(2.74)***	(4.20)***
total_factor_productivity	0.54				
	(6.28)***				
fertility_2010	-0.22				
	(5.09)***				
rule_of_law_2010		0.23			
		(4.91)***			
urban_pop2010			0.67	0.88	
			(3.44)***	(4.49)***	
coastal_pop_density1995			0.00		0.00
			(2.47)**		(3.47)***
Constant	3.91	3.82	3.21	3.11	3.52
	(16.46)***	(16.18)***	(13.31)***	(12.83)***	(14.11)***
N	**44**	**53**	**50**	**52**	**51**
F statistic	28.09	18.12	16.69	16.31	14.51
R-squared	0.82	0.66	0.70	0.64	0.62
Adjusted R-squared	0.79	0.62	0.66	0.60	0.57

*	p-value < .10
**	p-value < .05
***	P-value < .01

Table A3: Model (1) Robustness Check 50 thru 53

	Dependent Variable: Log of GDP per Capita 2010			
	[50]	**[51]**	**[52]**	**[53]**
	OLS	**OLS**	**OLS**	**OLS**
fatalism	-0.11	-0.13	-0.09	-0.13
	(2.69)**	(3.64)***	(2.96)***	(3.28)***
altruism	0.12	0.22	0.10	0.15
	(1.76)*	(3.63)***	(1.86)*	(2.16)**
landlock	-0.16	-0.13	-0.07	-0.17
	(1.88)*	(1.72)*	(1.07)	(2.07)**
abscent_lat	0.24	0.30	0.21	0.34
	(1.60)	(1.90)*	(1.74)*	(2.04)**
total_factor_productivity	0.46	0.52	0.47	0.46
	(6.50)***	(8.01)***	(8.12)***	(6.64)***
fertility_2010	-0.17	-0.18	-0.17	-0.16
	(4.71)***	(5.22)***	(5.75)***	(4.18)***
rule_of_law_2010	0.14		0.10	0.12
	(4.46)***		(3.77)***	(3.80)***
urban_pop2010		0.53	0.46	
		(4.56)***	(4.45)***	
coastal_pop_density1995		0.00		0.00
		(0.52)		(1.01)
Constant	4.04	3.49	3.74	3.95
	(20.67)***	(18.09)***	(21.70)***	(19.93)***
N	**44**	**42**	**44**	**42**
F statistic	39.21	42.69	54.67	37.12
R-squared	0.88	0.91	0.93	0.90
Adjusted R-squared	0.86	0.89	0.91	0.88

*	p-value < .10
**	p-value < .05
***	P-value < .01

Table A4: Robustness Check 54 thru 57

	3SLS Robustness Check			
	Log of GDP per capita 2010 Endogenous: fatalism and altruism **[54]**	Log of GDP per capita 2010 Endogenous: fatalism, altruism, TFP **[55]**	Log of GDP per capita 2010 Endogenous: fatalism, altruism, Fertility_2010 **[56]**	Log of GDP per capita 2010 Endogenous: fatalism, altruism, TFP, Fertility_2010 **[57]**
fatalism (predicted)	-0.21	-0.19	-0.18	-0.18
	(4.87)***	(4.61)***	(4.11)***	(4.30)***
altruism (predicted)	0.31	0.30	0.30	0.32
	(3.53)***	(3.16)***	(3.45)***	(3.43)***
landlock	-0.06	-0.05	-0.09	-0.08
	(0.95)	(0.90)	(1.44)	(1.53)
abscent_lat	0.24	0.26	0.18	0.19
	(1.98)**	(2.28)**	(1.46)	(1.75)*
total_factor_productivity2010	0.40		0.42	
	(7.72)***		(7.82)***	
total_factor_productivity2010 (predicted)		0.51		0.52
		(6.57)***		(7.25)***
Fertility_2010	-0.16	-0.16		
	(4.66)***	(4.65)***		
Fertility_2010 (predicted)			-0.16	-0.18
			(4.08)***	(4.64)***
rule_of_law_2010	0.08	0.07	0.08	0.05
	(2.93)***	(2.82)***	(2.89)***	(2.33)**
urban_pop2010	0.38	0.36	0.41	0.35
	(4.08)***	(4.17)***	(4.30)***	(4.14)***
urban_pop2005				
Constant	3.62	3.5	3.56	3.51
	(15.12)***	(15.44)***	(14.60)***	(15.00)***
N	38	38	38	38
R-Square	0.88	0.9	0.89	0.89

Table A5: Model (2) Robustness Check 58 thru 63

	Dependent Variable: HDI 2010					
	[58]	**[59]**	**[60]**	**[61]**	**[62]**	**[63]**
	OLS	**OLS**	**OLS**	**OLS**	**OLS**	**OLS**
fatalism	-0.08	-0.08	-0.05	-0.04	-0.05	-0.08
	(3.16)***	(3.64)***	(2.82)***	(1.94)*	(2.79)***	(3.32)***
altruism	0.16213	0.11916	0.07542	0.06142	0.09954	0.16471
	(4.42)***	(3.71)***	(2.59)**	(1.92)*	(3.46)***	(4.48)***
landlock		-0.122				
		(3.65)***				
abscent_lat		0.32				
		(4.01)***				
total_factor_productivity			0.052			
			(1.60)			
fertility_2010			-0.09			
			(6.49)***			
rule_of_law_2010				0.077		
				(6.34)***		
urban_pop2010					0.343	
					(6.64)***	
coastal_pop_density1995						0
						(1.55)
Constant	0.56	0.58	0.87	0.69	0.42	0.55
	(6.23)***	(7.79)***	(10.02)***	(9.74)***	(5.95)***	(6.07)***
N	**55**	**54**	**44**	**54**	**54**	**52**
F statistic	10.78	14.44	19.48	25.85	27.65	9.1
R-squared	0.29	0.54	0.67	0.61	0.62	0.36
Adjusted R-squared	0.27	0.5	0.63	0.58	0.6	0.32

*	p-value < .10
**	p-value < .05
***	P-value < .01

Table A6: Model (2) Robustness Check 64 thru 69

	Dependent Variable: HDI 2010					
	[64]	[65]	[66]	[67]	[68]	[69]
	OLS	OLS	OLS	OLS	OLS	OLS
fatalism	-0.08	-0.05	-0.05	-0.6	-0.06	-0.08
	(3.64)***	(3.23)***	(2.68)**	(3.96)***	(3.53)***	(4.35)***
altruism	0.12	0.07	0.05	0.08	0.08	0.10
	(3.71)***	(2.64)**	(1.53)	(2.96)***	(2.95)***	(3.34)***
landlock	-0.122	-0.089	-0.043	-0.05	-0.055	-0.105
	(3.65)***	(2.66)**	(1.36)	(1.98)*	(1.92)*	(3.43)***
abscent_lat	0.32	0.16	0.25	0.29	0.25	0.38
	(4.01)***	(2.57)**	(3.75)***	(4.30)***	(3.91)***	(5.00)***
total_factor_productivity		0.05				
		(1.68)				
fertility_2010		-0.06				
		(4.37)***				
rule_of_law_2010			0.06			
			(5.01)***			
urban_pop2010				0.24	0.28	
				(4.61)***	(5.58)***	
coastal_pop_density1995				0		0
				(1.92)*		(3.07)***
Constant	0.58	0.8	0.69	0.48	0.46	0.6
	(7.79)***	(9.91)***	(10.64)***	(7.48)***	(7.40)***	(8.50)***
N	**54**	**44**	**54**	**52**	**54**	**52**
F statistic	14.44	18.53	22.26	22.83	24.9	16.09
R-squared	0.54	0.75	0.7	0.75	0.72	0.64
Adjusted R-squared	0.5	0.71	0.67	0.72	0.69	0.6

*	p-value < .10
**	p-value < .05
***	P-value < .01

Table A7: Model (2) Robustness Check 70 thru 73

	Dependent Variable: HDI 2010			
	[70]	**[71]**	**[72]**	**[73]**
	OLS	**OLS**	**OLS**	**OLS**
fatalism	-0.04	-0.05	-0.04	-0.06
	(2.93)***	(3.37)***	(3.28)***	(3.77)***
altruism	0.02	0.06	0.05	0.07
	(1.07)	(2.40)**	(2.24)**	(2.63)**
landlock	-0.05	-0.05	-0.045	-0.09
	(1.86)*	(1.68)	(1.55)	(2.78)***
abscent_lat	0.13	0.16	0.14	0.21
	(2.69)**	(2.63)**	(2.76)***	(3.14)***
total_factor_productivity	0.02	0.04	0.04	0.04
	(0.96)	(1.62)	(1.83)*	(1.30)
fertility_2010	-0.05	-0.05	-0.06	-0.05
	(3.95)***	(3.92)***	(4.85)***	(3.22)***
rule_of_law_2010	0.05			
	(5.05)***			
urban_pop2010		0.17	0.18	
		(3.77)***	(4.48)***	
coastal_pop_density1995		0		0
		(0.64)		(1.70)*
Constant	0.85	0.68	0.69	0.77
	(13.38)***	(9.17)***	(9.95)***	(9.42)***
N	**44**	**42**	**44**	**42**
F statistic	30.07	22.64	26.93	17.17
R-squared	0.85	0.85	0.84	0.78
Adjusted R-squared	0.83	0.81	0.81	0.73

*	p-value < .10
**	p-value < .05
***	P-value < .01

Table A8: Model (2) Robustness Check 74 thru 77

	Dependent Variable: HDI 2010			
	[74]	**[75]**	**[76]**	**[77]**
	OLS	**OLS**	**OLS**	**OLS**
fatalism	-0.04	-0.04	-0.03	-0.04
	(2.93)***	(2.99)***	(3.13)***	(3.15)***
altruism	0.02	0.02	0.02	0.03
	(1.07)	(1.04)	(0.99)	(1.05)
landlock	-0.05	-0.03	-0.03	0.05
	(1.86)*	(1.10)	(1.11)	(1.89)*
abscent_lat	0.13	0.13	0.12	0.16
	(2.69)**	(2.51)**	(2.95)***	(2.83)**
total_factor_productivity	0.02	0.02	0.02	0.02
	(0.96)	(1.17)	(1.21)	(0.82)
fertility_2010	-0.05	-0.05	-0.05	0.04
	(3.95)***	(3.95)***	(4.57)***	(3.34)***
rule_of_law_2010	0.05	0.04	0.04	0.05
	(5.05)***	(3.95)***	(4.37)***	(4.39)***
urban_pop2010		0.13	0.13	
		(3.32)***	(3.78)***	
coastal_pop_density1995		0		0
		(0.14)		(0.95)
Constant	0.85	0.75	0.76	0.84
	(13.38)***	(11.70)***	(12.92)***	(12.36)***
N	**44**	**42**	**44**	**42**
F statistic	30.07	30.78	37.83	25.5
R-squared	0.85	0.90	0.90	0.86
Adjusted R-squared	0.83	0.97	0.87	0.83

*	p-value < .10
**	p-value < .05
***	P-value < .01

Table A9: DATA TABLE

obs	CountryRegion	HDI_2010	logGDP_PC_2010	fatalism	altruism	landlock	abscent_lat	total_factor_productivity	fertility_2010	rule_of_law_2010	urban_pop2010	coastal_pop_den	logGDP7095	Cap_PW95	britcol	Fertility_1990	PROT1900	av_youth_unemployment_0509	life_expectancy_1965	Ethnic_Frac	Language_Frac	Religion_Frac
1	Algeria	0.71		3.34	2.51	0.00	0.28		2.82	-0.75	0.68	175.262619	7.46		0.00	4.76	0.00	25.52	51.40	0.34	0.44	0.01
2	Argentina	0.80	4.12	2.64	2.60	0.00	0.35	0.62	2.22	-0.62	0.91	19.44353104	8.12	96275.86	0.00	2.99	0.01	22.00	65.80	0.26	0.06	0.22
3	Armenia	0.72	3.69	3.48	2.22	1.00	0.40	0.37	1.74	-0.47	0.64	0	7.23	18785.68	0.00	2.54	0.00	49.10	71.00	0.13	0.13	0.46
4	Australia	0.93	4.57	2.31	2.76	0.00	0.26	0.83	1.93	1.76	0.89	9.906464577	9.33	207533.41	1.00	1.90	0.63	10.02	70.90	0.09	0.33	0.82
5	Azerbaijan	0.74	3.94	2.77	2.98	1.00	0.40		1.92	-0.85	0.53	0	6.88	17258.93	0.00	2.74	0.00	15.00	67.40	0.20	0.21	0.49
6	Bahrain	0.81	4.33	3.12	2.42	0.00	0.26	0.57	2.14	0.48	0.89		8.96	70158.75	1.00	3.74	0.00	26.66		0.50	0.43	0.55
7	Belarus	0.78	4.13	3.81	2.96	1.00	0.54		1.44	-1.04	0.75	0	7.98	88296.20	0.00	1.91	0.00	12.84	70.40	0.32	0.47	0.61
8	Brazil	0.74	3.95	2.31	1.97	0.00	0.11	0.43	1.84	0.00	0.84	69.45248413	7.53	38423.98	0.00	2.81	0.01	17.42	57.90	0.54	0.05	0.61
9	Chile	0.81	4.15	2.82	2.11	0.00	0.36	0.65	1.86	1.32	0.89	15.15692043	7.53	54414.45	0.00	2.62	0.01	19.70	60.60	0.19	0.19	0.38
10	China	0.70	3.87	2.87	2.71	0.00	0.37	0.37	1.65	-0.33	0.49	474.5777283	5.99	10098.49	0.00	2.51	0.00	8.66	59.60	0.15	0.13	0.66
11	Colombia	0.71	3.89	1.84	1.86	0.00	0.04	0.47	2.38	-0.35	0.75	60.3577919	6.94	47527.54	0.00	3.10	0.00	23.34	60.10	0.60	0.02	0.15
12	Cyprus	0.85	4.45	2.46	1.91	0.00	0.35	0.78	1.48	1.20	0.68		8.61	201510.33	1.00	2.41	0.00	10.68		0.09	0.40	0.40
13	Ecuador	0.70	3.81	2.14	2.22	0.00	0.01	0.50	2.66	-1.21	0.63	67.61750793	6.89	35775.82	0.00	3.77	0.00	13.42	56.80	0.66	0.13	0.14
14	Egypt	0.68	3.67	3.64	2.25	0.00	0.26	0.66	2.88	-0.12	0.43	117.3774185	6.29	9723.68	1.00	4.35	0.01	28.80	49.70	0.18	0.02	0.20
15	Estonia	0.83	4.27	3.65	3.18	0.00	0.59	0.61	1.70	1.13	0.68	35.10718918	8.18	54200.71	0.00	2.05	0.54	15.60	70.40	0.51	0.49	0.50
16	Germany	0.90	4.52	3.20	3.01	0.00	0.51	0.83	1.39	1.62	0.74	129.8691406	10.15	186248.74	0.00	1.45	0.61	12.30	70.80	0.17	0.16	0.66
17	Ghana	0.56	3.37	2.71	1.84	0.00	0.08		4.05	-0.06	0.51	168.4112701	5.90	9698.19	1.00	5.62	0.03	7.78	48.00	0.67	0.67	0.80
18	Hong Kong	0.88	4.57	3.13	3.02	0.00	0.22	0.95	1.13	1.54	1.00	6252.323242	8.98	158954.63	1.00	1.27	0.01	10.26	70.00	0.06	0.21	0.42
19	India	0.57	3.53	4.59	2.63	0.00	0.23	0.46	2.56	-0.04	0.31	447.9181213	5.52	6313.83	1.00	3.88	0.01	9.70	48.00	0.42	0.81	0.33
20	Iraq	0.64	3.60	3.47	2.19	0.00	0.33	0.78	4.21	-1.62	0.69	95.99397278		31156.30	1.00	5.88	0.00	35.10	53.00	0.37	0.37	0.48
21	Japan	0.88	4.48	4.24	3.85	0.00	0.37	0.72	1.39	1.33	0.91	344.6564331	9.58	201071.24	0.00	1.54	0.00	8.12	71.10	0.01	0.02	0.54
22	Jordan	0.74	3.71	2.73	2.00	0.00	0.31	0.39	3.46	0.20	0.82	79.08715057	7.39	34798.80	1.00	5.54	0.00	29.90	51.70	0.59	0.04	0.07
23	Kazakhstan	0.75	4.14	2.97	2.79	1.00	0.48	0.58	2.59	-0.61	0.54	0	7.56	55425.45	0.00	2.72	0.01	8.12	62.90	0.62	0.66	0.59
24	Kuwait	0.81	4.72	2.04	2.25	0.00	0.29	1.45	2.67	0.60	0.98	93.32062531	9.56	167332.91	1.00	2.36	0.00	9.88	64.40	0.66	0.34	0.67
25	Kyrgyzstan	0.61	3.32	2.62	2.52	1.00	0.41	0.30	3.06	-1.28	0.35	0	6.95	21431.74	0.00	3.69	0.00	15.22	61.60	0.68	0.59	0.45
26	Lebanon	0.76	4.11	3.03	2.40	0.00	0.34		1.51	-0.69	0.87	391.4956055	7.50	41443.67	0.00	3.00	0.01	21.44	62.90	0.13	0.13	0.79
27	Libya	0.80		2.70	1.83	0.00	0.27		2.53	-0.94	0.78	18.76974297	8.71		0.00	4.97	0.00	44.26	50.40	0.79	0.08	0.06
28	Malaysia	0.77	4.11	2.50	2.44	0.00	0.02	0.50	2.00	0.53	0.71	69.85081482	7.47	75873.69	1.00	3.52	0.01	10.84	59.40	0.59	0.60	0.67
29	Mexico	0.75	4.09	1.56	2.21	0.00	0.24	0.72	2.28	-0.58	0.78	37.12136459	7.70	67206.90	0.00	3.38	0.00	7.28	60.30	0.54	0.15	0.18
30	Morocco	0.60	3.54	3.82		0.00	0.32	0.38	2.58	-0.16	0.58	102.1158371	6.62	41756.26	0.00	4.06	0.00	17.20	50.40	0.48	0.47	0.00
31	Netherlands	0.90	4.57	3.10	3.11	0.00	0.52	0.88	1.79	1.81	0.87	444.7406006	9.38	175671.11	0.00	1.62	0.60	6.52	73.60	0.11	0.51	0.72
32	New Zealand	0.90	4.42	2.20	2.78	0.00	0.42	0.80	2.15	1.87	0.86	13.87654495	8.97	120801.35	1.00	2.18	0.77	11.58	71.30	0.40	0.17	0.81
33	Nigeria	0.49	3.32	2.78	2.15	0.00	0.10		6.02	-1.17	0.43	303.9902954	6.37	1806.50	1.00	6.49	0.01	13.74	42.00	0.85	0.85	0.74
34	Pakistan	0.53	3.38	2.66	2.31	0.00	0.30		3.43	-0.74	0.37	153.7262726	5.73	12871.63	1.00	6.02	0.00	8.66	47.80	0.71	0.72	0.38
35	Palestine	0.67		3.14	2.52	0.00																
36	Peru	0.72	3.91	2.55	2.58	0.00	0.09	0.53	2.51	-0.60	0.77	59.75603104	7.02	44346.85	0.00	3.83	0.00	9.88	51.50	0.66	0.34	0.20
37	Philippines	0.65	3.53	2.58	2.11	0.00	0.11	0.33	3.15	-0.58	0.45	230.3009186	6.37	25080.79	0.00	4.32	0.00	17.42	56.20	0.24	0.84	0.31
38	Poland	0.83	4.25	3.33	2.20	0.00	0.52	0.81	1.38	0.66	0.61	93.01609802	7.60	80491.12	0.00	2.06	0.03	25.16	69.90	0.12	0.05	0.17
39	Romania	0.78	4.12	2.12	2.63	0.00	0.46	0.56	1.54	0.04	0.54	70.0221405	7.28	36397.73	0.00	1.83	0.01	20.34	68.00	0.31	0.17	0.24
40	Russia	0.77	4.23	4.05	2.57	0.00	0.62	0.61	1.57	-0.77	0.74	38.41400528	8.07	142470.48	0.00	1.89	0.01	15.76	69.00	0.25	0.25	0.44
41	Rwanda	0.45	3.05	3.15	2.88	1.00	0.02	0.21	4.84	-0.30	0.24	0	5.39	1758.70	0.00	7.27	0.00	0.70	44.10	0.32		0.51
42	Singapore	0.89	4.70	3.23	2.66	0.00	0.01	0.96	1.15	1.68	1.00	4895.901855	9.02	115337.36	1.00	1.87	0.01	13.22	67.90	0.39	0.38	0.66
43	Slovenia	0.87	4.39	2.12	2.19	0.00	0.46	0.62	1.57	0.98	0.50	99.81562042	8.88	106194.83	0.00	1.46	0.00	12.92	69.20	0.22	0.22	0.29
44	South Africa	0.64	3.90	2.88	2.57	0.00	0.29	0.57	2.47	0.11	0.62	63.49021912	7.61	39252.45	1.00	3.66	0.25	47.10	51.90	0.75	0.87	0.86
45	South Korea	0.88	4.43	3.43	3.47	0.00	0.36	0.69	1.23	0.99	0.82	488.41922	8.03	86517.21	0.00	1.57	0.00	9.50	57.60	0.00	0.00	0.66
46	Spain	0.86	4.46	3.05		0.00	0.40	0.77	1.37	1.16	0.78	121.0159073	8.75	184952.74	0.00	1.36	0.00	24.34	71.60	0.42	0.41	0.45
47	Sweden	0.90	4.54	2.38	2.91	0.00	0.63	0.93	1.98	1.96	0.85	50.102211	9.60	152072.49	0.00	2.13	0.99	21.94	74.10	0.06	0.20	0.23
48	Taiwan		4.45	2.52	2.69	0.00	0.24	0.93		1.02		660.043396	8.61	82425.60	0.00		0.00		67.20	0.27	0.50	0.68
49	Thailand	0.72	3.93	2.47	2.71	0.00	0.15	0.42	1.44	-0.20	0.44	164.3484192	6.87	46341.19	0.00	2.11	0.00	5.02	56.70	0.63	0.63	0.10
50	Trinidad and Tobago	0.76	4.27	1.83	2.03	0.00	0.10	1.52	1.80	-0.22	0.09	250.877182	8.21	39910.47	1.00	2.45	0.37	12.54	65.40	0.65	0.13	0.79
51	Tunisia	0.72	3.83	3.36	2.41	0.00	0.34	0.47	2.13	0.12	0.66	99.14632416	7.02	58888.79	0.00	3.54	0.00	28.92	52.10	0.04	0.01	0.01
52	Turkey	0.74	4.14	2.65	2.22	0.00	0.39	1.01	2.10	0.12	0.71	111.4222794	7.36	49169.37	0.00	3.08	0.00	20.26	54.90	0.32	0.22	0.00
53	Ukraine	0.73	3.87	3.44	2.92	0.00	0.49	0.32	1.45	-0.81	0.69	93.36447144	7.78	69752.92	0.00	1.85	0.02	14.98	70.90	0.47	0.47	0.62
54	United States	0.91	4.62	2.27	2.74	0.00	0.46	1.00	1.93	1.63	0.81	97.38170624	9.62	189915.28	1.00	2.08	0.48	12.84	70.40	0.49	0.25	0.82
55	Uruguay	0.78	4.07	2.27	2.43	0.00	0.33	0.55	2.08	0.70	0.94	42.25307846	7.74	72946.53	0.00	2.52	0.02	22.92	68.50	0.25	0.08	0.35
56	Uzbekistan	0.65	3.76	2.20	1.85	1.00	0.42		2.53	-1.37	0.36	0	6.92	12896.70	0.00	4.07	0.00	20.64	62.60	0.41	0.41	0.21
57	Yemen	0.48	3.39	3.60	2.23	0.00	0.16		4.50	-1.07	0.32	32.13843918	5.62	1393.31	1.00	8.67	0.00	26.00	39.60		0.01	0.00
58	Zimbabwe	0.46	3.61	3.57	2.15	1.00	0.19	1.81	3.72	-1.81	0.33	0	6.40	8038.78	1.00	5.18	0.02	10.16	49.00	0.39	0.45	0.74